2021

iCoASL

7th International Conference of
Asian Special Libraries

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Asian Special Libraries

🌐 Opening Remarks

🌐 Adress

🌐 Keynote

🌐 Vote of Thanks

🌐 Paper

Dr. Hye-Ran Suh

Chief Librarian, National Library of Korea

Greetings.

I'm Suh, Hye Ran, Chief Executive of the National Library of Korea.

It is my pleasure to welcome you all to the 7th International Conference of Asian Special Libraries.

Due to the ongoing Covid-19 pandemic, the conference is being held online, for the safety of all.

However, online communication without space limit
enabled more professional librarians in Asia to participate in the conference.
So, I look forward to more diverse and active exchange at the meeting.

I would like to extend deep appreciation to President Debal C. Kar, representatives of each country and joint chairman Oh Moo Seok and Kim, Jae Soo who strived to hold the conference successfully.

I would also like to extend special thanks to Shin Gi Nam, President of the Presidential Committee on Library and Information Policy of Korea, Hyun Jin Gun Director of the National Assembly Library, Nam Young Jun President of the Korean Library Association who are here with us to congratulate the opening of the event.

Also, I would like to thank the Korea Special Library Association and Korea Institute of Science and Technology Information, the cohost of this conference, who prepared and put in effort to hold a successful event.

Since being held for the first time in 2008, in India, ICoASL has been a place for network building, information sharing, exchange and cooperation among librarians of special libraries in Asia.

At the 7th ICoASL, starting today, I hope we can share visions and strategies of special libraries, that respond to changes of the social environment and knowledge information ecosystem, accelerated due to the unexpected covid-19.

At the moment, we are going through the digital transformation era.
Technological convergence services including blockchain, AI and metabus, data analysis and processing services are applied in all areas of our daily life.

Moreover, due to the global covid-19 pandemic,
non face-to-face, online information service has become essential and more and more people are aware of the economic value of data.

Amid this environment of rapid change, how should we, in charge of special information service, design a constructive future and achieve that goal?

Now, we need to put our utmost energy in creating the foundation for data collection, data processing and utilization, which is an economic asset and value creation source.

To meet the era's demand, we should develop library service and content, and collect various types of information data to provide customized user service.
We should also be able to embrace all intellectual and emotional desires of special information consumers.

At a time when we are facing common tasks to solve together,
I hope the conference becomes an opportunity to prepare for the future and inspire each other.

I believe that the professional librarians' collective intelligence will serve as a stepping stone for the bright future of libraries.

Adding to that,
I look forward to sharing libraries' covid-19 exerience and experimental policies at the conference.
I wish we could overcome the current crisis and take a big step toward a constructive library field through cooperation.

Once again, I sincerely appreciate and welcome all librarians of special libraries of Asia gathered at this meaningful event and hope you have an exciting and fruitful time.

Thank you.

Dr. Jae-soo Kim

President of Korea Institute of Science and Technology Information

Good morning.

I am Jae-soo Kim, the president of Korea Institute of Science and Technology Information, one of the co-organizers of the 7th International Conference of Asian Special Libraries.

It gives me great pleasure to welcome the librarians and library professionals from all across Asia.

I would like express my sincere gratitude to our co-organizers.

Chief Executive Hye Ran Suh from the National Library of Korea, President Jeong Hoon Oh and Chairman Mu-suk Oh from Korea Special Libraries Association.

Also, I would like to thank our presenters, President Yunkeum Chang of Sookmyung Women's University SLA President Catherine Lavallée-Welch and Professor Bum-hoon Lee from Sogang University.

We are facing exponential changes that will transform the fundamentals of human civilization.

The COVID-19 pandemic has accelerated digital transformation, climate crisis continues to threaten our survival and carbon neutrality has become a common goal for the entire globe.

These are all very important matters for the library communities as well.

Special libraries will have to weather these times of great change and fulfill their duties and responsibilities to usher in the new future.

I also believe this topic, 'Future of Library in the Post-Coronavirus Era,' is a very timely theme for our discussions today.

That is because, in the post-Coronavirus era in the future, special libraries will have to establish policies in line with the unprecedented changes, and take on new roles, functions, and cooperative models.

It's been almost 2 years since the outbreak of this pandemic.

We had to learn ways to live with this virus, whether we like it or not.

The pandemic has also been a trigger for us to apply daring and innovative technologies in our everyday lives that we'd hesitated to attempt due to economic, social or cultural barriers.

Acceleration of digital transformation not only brought advances in technology but it has taken us closer to the new normal.

Cities, home to modern humans, have traditionally offered efficiency with high-density populations but now because of the pandemic, societies are starting to think about low-density cities that enable contactless activities and social distancing.

We are increasingly adopting new ways to work and collaborate remotely.

Many fields are exploring the possibility of integrating virtual and augmented reality.

Library communities will have to be prepared for the new normal brought upon by these changes and challenges.

Ashurbanipal, king of Assyria in the 7th century BC, is considered to have built the world's first systematically organized library.

Ever since then, great civilizations have all built libraries.

Just like libraries of our times, ancient libraries were used to collect and share knowledge to make lives better.

Great advances were dispersed via libraries, in agriculture, architecture, medicine, arts and manufacturing.

Libraries have always evolved according to environmental changes and public demands.

They always had the latest and the most advanced media and information technology and served as a gateway to knowledge, ideas and culture.

This will be the same in our future.

Now, we see a massive demand for open science.

Last year, scientific literature owned by commercial publishers became accessible through libraries' open access repositories and facilitated better and faster research towards vaccines and medications.

From now on, libraries will have to play a more significant role in open science practices like open access, open data and open collaboration.

The era of information technology has evolved into an era of digital technology and we are living in a world where it is so important to create value from data.

I hope, in the near future,

we can use AI-integrated data technologies more readily in our libraries and through the metaverse where reality can be extended infinitely we can access all the knowledge and information in this world .

As a science and technology information research institute, KISTI wants to use data and scientific infrastructure to change the world.

Using Data, Network and AI, the DNA of science and technology, we will do our utmost to further promote open science, solve social problems and contribute to scientific and technological advancement of Korea and the entire humanity.

I also hope this conference serves as a valuable experience for those envisioning the future of libraries in the post-Coronavirus era.

Thank you.

Address

Mr. Ki-nam Shin
Chairperson of the Presidential Committee on Library & Information Policy of Korea

This is Kinam Shin, chairperson of the Presidential Committee on Library & Information Policy of Korea.

It would be my pleasure to congratulate the successful hosting of the 7th International Conference of Asian Special Libraries.

This conference, organized by the Special Libraries Association (SLA) Asia Community and first held in 2008, is an international event for the information-sharing and cooperation between Asian Special Libraries and their librarians.

Originally, the event was planned to be held in May this year, but due to COVID-19, it was delayed 6 months to be held today as an online conference.

 I would like to thank the people who made this conference possible: Dr. Hye-Ran Suh of National Library of Korea, Dr. Jaesoo Kim of Korea Institute of Science and Technology Information, Mr. Mu-Suk Oh of Korea Special Library Association, Mr. Jeong Hoon Oh of Korea Special Library Association, Dr. Debal C Kar of Asia Community of SLA, as well as those who have strived for the development of libraries.

I would also like to thank Dr. Jin Kwon Hyun of National Assembly Library, Dr. Young-Joon Nam of Korean Library Association, our keynote speakers Catherine lavallée-welch of Special Libraries Association, Yunkeum Chang of Sookmyung Women's University, Bum-Hoon Lee of Sogang University, and all the people who have participated in the presentations.

The role and status of libraries today have changed immensely, compared to libraries 20~30 years ago.

Human history, which has evolved into a knowledge and information society, is in an upheaval more than ever in the face of rapid changes in the information

environment caused by the development of computers and the Internet.

To promote the developmental future of the library, which is now located in the center of a changing information environment, we need to take time to look back on the current situation and conditions of the library and prepare for the upcoming future.

This conference's topic is 'Envisioning the Future of Library in the Post-Coronavirus Era'.

We are facing an era of digital transformation hastened by COVID-19, an unprecedented infectious disease in human history.

I sincerely hope today's meeting will prove to be a place of communication where various experts and librarians of different fields gather to come up with and share solutions for the library to remain a valuable asset even in the post-coronavirus era.

It is with fervent hope that this ICoASL will serve as an opportunity for all libraries around the world to wisely prepare for the post-COVID era and once again resolve to leap forward as a Knowledge-Information platform in the New Normal.

It would be pleasant to be able to meet face-to-face at the conference venue, not at an online meeting, and present ICoASL as an actual festival venue by 2023.

Until then, I wish the health and happiness of all librarians present.

ICoASL

Address

Dr. Jin-kwon Hyun
Chief Librarian of the Korean National Assembly Library

Hello. I'm Jin-Kwon Hyun.
Chief Librarian of the Korean National Assembly Library.

Welcome to all members of the Korea Special Library Association and participants at the International Conference of Asian Special Libraries this year.

I really congratulate each one of you for holding the 7th ICoASL event.

It is my great honor to deliver the speech at this international conference attended by information experts and library professionals.
I'd like to thank the colleagues from the Korea Special Library Association, Korea Institute of Science and Technology Information, and National Central Library of Korea who organized this great event where information experts from Asia and around the world can interact even in this pandemic situation.

The Special Library Association, Asia Branch is an international organization through which cooperation and knowledge sharing are carried out with the participation of librarians and information experts from special libraries in Asia.

I'd like to express my deep gratitude to Mr. Debal Kar, Chairman of the SLA Asia Branch.

I'd also like to give special thanks to speakers and panels for your great contribution. Despite the delay of the conference schedule once, it is regrettable that with the pandemic, there is no choice but to transform it to online event.

In November, South Korea finally chose to coexist with COVID-19.

The vaccination rate for the entire nation has exceeded 75 percent, and the return to daily life is taking place slowly but clearly, with the emergence of treatments. With such daily recovery going on around the world, the topic of "Envisioning the Future of Library in the Post-Corona virus Era" is truly appropriate.

Now it's time for us to leap again. Regardless of the types of libraries, their services have shrunk overall.

The National Assembly Library also had to go through a period it had to suspend public service.

However, even in inexperienced situation Involving an infectious disease, the library has continued to make efforts to fill the gap in services with various measures and welcome users in a new environment.
Recently we received a lot of favorable reviews for providing the National Assembly minutes' big data service.

We focused more on improving the convenience of non-face-to-face services such as e-libraries, e-books, book curations, and mail copying.

Now the library reopened on November 3rd, and is regaining its daily activities despite the difficult times. The 4th Industrial Revolution is becoming a reality faster due to the prolonged pandemic.

In order for in-person-based libraries to survive in the "untact" age, we must create new services. Until now, libraries have made innovations such as automation using information and communication technology.

In the future, innovation based on content, such as data construction and processing, will also be necessary. In addition, it is time for new concepts such as the expansion of non-face-to-face services and metaverse to emerge, and it is necessary to think about the direction of professional libraries.

The National Assembly Library also held an online conference in September with the theme of D.N.A. (Data. Network. Artificial Intelligence) and continues to conceive the future library.

I hope that it will be a time to find answers to how professional libraries will respond to upcoming social changes. I believe that this conference will be a venue for exchanging ideas, experiences, and best practices among members,
and provide useful insights in developing library innovation for future social responses.

I hope that we could build a strong and solid professional library network through this event.

I look forward to the conference that will be held offsite again, and I sincerely congratulate you on holding the 7th ICoASL once again.

iCoASL

Address

Prof. Young-Joon Nam
Chairperson, Korean Library Association

Welcome Dear Members of the ICoASL. Good afternoon.

My name is Young Joon Nam, and I am the President of the Korean Library Association. I would like to first extend a huge congratulations to the librarians who have made today's conference possible in order to advance the Asian special libraries despite the challenges of the COVID-19 pandemic.

To continue advances in libraries, the research capability of a librarian is becoming as important, if not more than, preparing quality contents. This makes today's conference all the more meaningful. I have no doubt that the 6 themes to be discussed today will take the capability and expertise of our special librarians one step forward.

I would like to thank in advance the speakers from India, Indonesia, the Philippines, Pakistan, Bangladesh and Japan for their time today. The KLA and I very much look forward to learning ways to advance special libraries, and try our best to support such efforts. To conclude, I would like to say a big thank you to Dr. Jeong Hoon OH for leading the planning and preparation of today's conference.

Thank you.

Dr. Debal C Kar
President, Asia Community of SLA (Ambedkar University, Delhi, India)

Dear Dr. Hye-Ran Suh, Chief Librarian, National Library of Korea, Mr Mu-Suk Oh, Librarian, Korea, Speakers, Presenters, participants, Ladies and Gentlemen. It gives me immense pleasure to propose the Vote of Thanks for the 7th International Conference of Asian Special Libraries (ICoASL 2021) on envisioning the Future of Library in the Post-Coronavirus Era held in South Korea organised virtually.

I would like to take this opportunity to place on record our hearty thanks for the support and guidance extended by our Dr. Hye-Ran Suh, Chief Librarian, National Library of Korea to deliver welcome address. We thank you sir for sparing your valuable time and delivering the welcome address.

Our first gratitude is due to keynote speakers- Catherine Lavallée-Welch, President-elect, Special Libraries Association, USA. She is from Canada; Yunkeum Chang, President, Sookmyung Women's University, Bum-Hoon Lee, Professor, Sogang University, South Korea for addressing the gathering.

I also take this opportunity to extend our gratitude to the distinguished speakers Dr. Jaesoo Kim, President, Korea Institute of Science and Technology Information, Mr. Kinam Shin, Chairperson, Presidential Committee on Library & Information Policy of Korea, Dr. Jin Kwon Hyun, Chief Librarian, National Assembly Library, Prof. Young Joon Nam, Chairperson, Korean Library Association, Dr. Debal C Kar, President, Asia Community of SLA, for granting the valuable time and addressing the gathering

The international and national resource persons from all over the world will be also sharing their knowledge and experiences. We understand that you have taken time out of your very important schedules to contribute to this Conference. T I extend gratitude to the distinguished panel of speakers, discussants and learned

guests for participating at the event.

I would also like to thank for the support given by SLA Asian Chapter, Korea Special Library Association (KSLA), Korea Institute of Science and Technology Information, (KISTI), National Library of Korea and Society for Library Professionals. We thank them for agreeing to support us as associate partners for the Conference.

Would also like to thank all theCountry Representatives from India: Dr. Parveen Babbar, President Elect, Asia Community, Librarian, from Indonesia : Dr. Labbiab Zain, Librarian, from Philippine : Dr. Shirley, Librarian, from Pakistan : Dr. Arshad Mahmood, Librarian, from Bangladesh : Dr. Dilara Begum, Librarian and from Japan : Ms. Yuko Sawada, Librarian for their contribution and support.

I am thankful to the Platinum Sponsor: Futurenuri and Gold Sponsors: ARGON-ET, DongSung OA, ACS publications and De Gruyter for their support.

I am also thankful to Dr Debal Kar, Dr Parveen Babbar, Dr Nabi Hasan, Mr Mu-Suk Oh, Librarian, Korea, Mr Eun-Kyung Nam from Korea and all who contributed for ICoASL 2021. Without their support it was not possible to organize this Conference during such hard times. I am also thankful to all others who had whole heartedly given support and guidance to me for this Conference.

Last but not least, I am thankful to the participants of the conference who have spared their valuable time.

Thank you all

Keynote
iCoASL

Dr. Yunkeum Chang

President of Sookmyung Women's University

ICoASL 2021: Envisioning the future of Library in the Post-Coronavirus Era

The New Normal:
The Innovative Post-Pandemic Library Service

Presenter:
Dr. Yunkeum Chang
President of Sookmyung Women's University

Nov. 24, 2021

SOOKMYUNG
WOMEN'S UNIVERSITY

How has the role of a library changed?

Pre-pandemic

- Cooperative
- Creative space
- Brings the community together
- Information space

Post-pandemic

- Safe
- Private space to study
- Digital hub

Case Study: Sookmyung University Library

What we heard from students:

I need a safe place to study

I need a quiet space to listen and respond in remote lectures

I need a place I can stay for a long time to focus on my studies

I don't have a laptop to do my homework

Case Study: Sookmyung University Library

Safe

Social distancing between people

Simple & clean: easy to disinfect

Self-service: minimize contact with other people

Case Study: Sookmyung University Library

Private space

Individual spaces

Quiet spaces

Multi-functional: Classroom, study room, exam room

Case Study: Sookmyung University Library

Digital hub

Laptop rentals

Studio design to optimize the digital experience

Digital literacy / metaverse

Case Study: Sookmyung University Library

Human-centered design

Ability to **choose your own space**

Bringing nature inside the library

Maker space

SLA-Asia
Connecting Information
Professionals

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

1. SAFE PLACE

Before: Closed working space

Blocked air circulation

Closed room
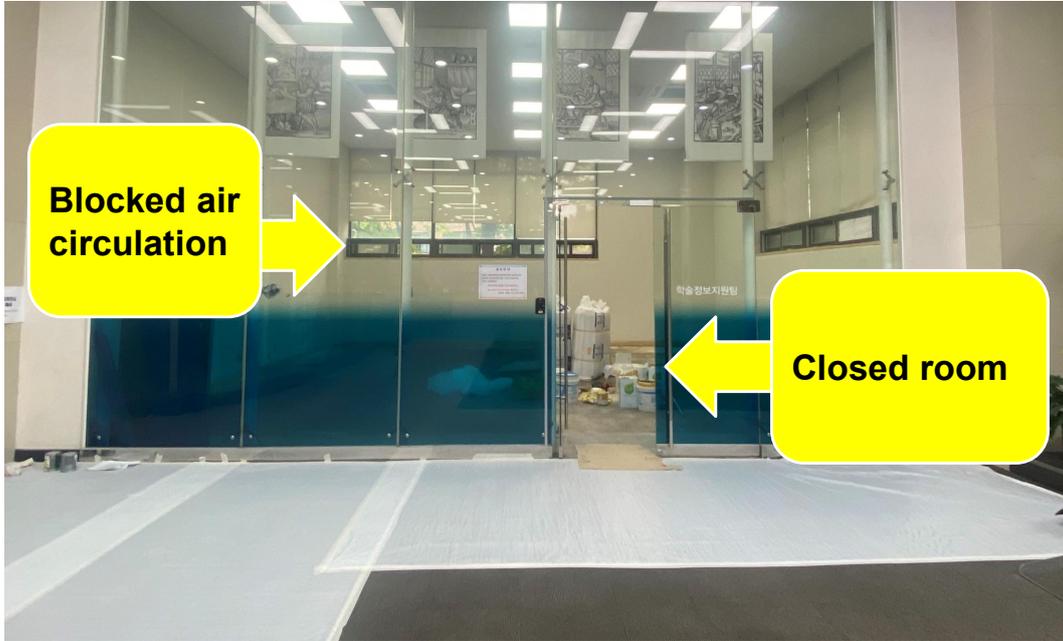
1. SAFE PLACE

After: Open lounge

Provides air circulation

Open floor plan accessible to everyone

1. SAFE PLACE

Easy to clean areas

2. PRIVATE SPACE

Individual spaces with dividers

SLA-Asia
Connecting Information
Professionals
| Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*
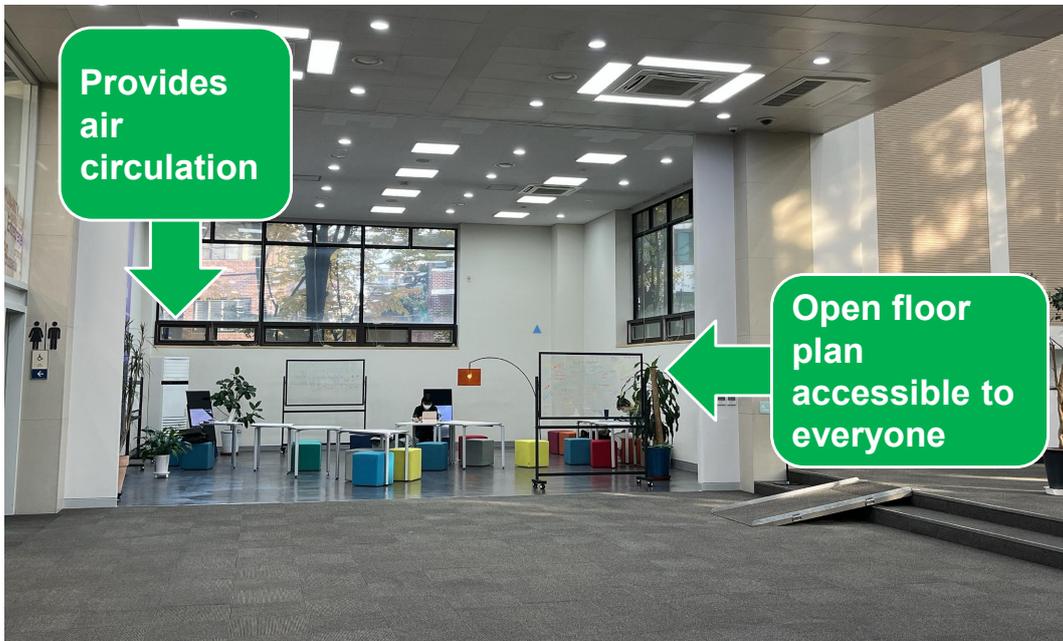
2. PRIVATE SPACE

Individual spaces facing windows

2. PRIVATE SPACE

Individual spaces near windows

2. PRIVATE SPACE

Quiet spaces to participate in lectures or study

3. DIGITAL HUB

Before: Dedicated computer area

SLA-Asia Connecting Information Professionals

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

3. DIGITAL HUB

After: Self-service laptop kiosk

3. DIGITAL HUB

Studios with lighting and blue screens

3. DIGITAL HUB

Studios with lighting and a large display

3. DIGITAL HUB

MOU with the National Public Library to increase digital literacy

SLA-Asia
Connecting Information
Professionals
Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

4. HUMAN-CENTERED

Bringing nature inside

Plants placed around the library

4. HUMAN-CENTERED

Bringing nature inside

Variety of individual spaces

Fun and interesting designs

SLA-Asia Connecting Information Professionals | Collaboration with KSLA, NLK, KISTI *ICoASL 2021*

4. HUMAN-CENTERED

Fun and interesting designs

4. HUMAN-CENTERED

Maker space for digital literacy

Thank you

Prof. Bum−Hoon Lee
Professor of Sogang University

Library and Open Access :
A Researcher's Perspective

Bum-Hoon Lee
Sogang University

COVID-19 : Its Impact

Impact of COVID-19 on ICT Usage by Households January and March 2020

An Phríomh-Oifig Staidrimh / Central Statistics Office

Buying food or groceries online **doubles** 13% in March 6% in January

16% Buying furniture home accessories or gardening products online in March 10% in January

72% Seeking health related information online in March 60% in January

Communicating with instructors or students online **doubles** 13% in March 7% in January

90% Using email in March 86% in January

74% Using internet telephoning in March 72% in January

eLEARNING

Measures to continue students' learning during school closure
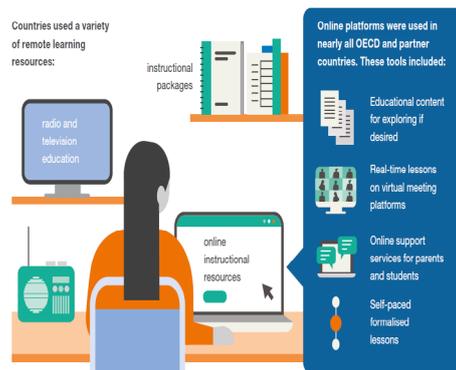
Countries used a variety of remote learning resources:

instructional packages

radio and television education

online instructional resources

Online platforms were used in nearly all OECD and partner countries. These tools included:
- Educational content for exploring if desired
- Real-time lessons on virtual meeting platforms
- Online support services for parents and students
- Self-paced formalised lessons

With the school shut down, many countries took the measure investing for remote learning resources

Impact on Research

CQUeST — Center for Quantum SpaceTime

Blog   Previous CQUeST

Overview   Members   Achievements   Collaboration   Forum   External

Forum   Calendar   Confere

Dark energy with

Written Date 2021-11-05
Speaker   Prof. David W
Event Date   Nov. 12 (Fri.)

The 17

Benjamin Lee Professorship Lecture Series

✓ Date : Oct. 20(Wed.), Nov. 1(Mon.) – 2(Tue.), 2021
✓ Program :

Oct. 20 11:00 – 12:00 (KST)	Nov. 1 10:00 – 11:30 (KST)	Nov. 2 10:00 – 11:30 (KST)
[APCTP-KPS Plenary Talk] Constraints on Quantum Gravity	[Lecture 1] Physics and Mathematics of Calabi-Yau Manifolds I	[Lecture 2] Physics and Mathematics of Calabi-Yau Manifolds II
Online(ZOOM) & #512 Hogil Kim Memorial Bldg., POSTECH, Pohang	Online(ZOOM) & #512 Hogil Kim Memorial Bldg., POSTECH, Pohang	Online(ZOOM) & #512 Hogil Kim Memorial Bldg., POSTECH, Pohang

Main Page
Registration/Participants
Accommodation
Program
Talk/Lecture Abstract

Venue
Online: Zoom link https://us06web.zoom.us/j/82761998864?pwd=N1hLYWs3SVY3QTdUNHQzTk1xQUxaQT09
Offline: Kunsan National University(depending on COVID situation)
Natural Science Building #4 Room.4101 (자연과학대학 4호관 4101실)

Virtual Conference

Seminar		
DATE & TIME	November	
PLACE	Online	

CQUeST Group II workshop 2021
Venue
Offline: Pineart Label Hotel, Gangneung
Online: CQUeST of Sogang University

Period : September 15 (Wed) ~ September 24 (Fri), 2021

Online meetings, seminars, workshops, lectures, etc.

COVID-19 : Its Impact is on every daily life

- **ICT** usage uprising in everyday life social business working place, daily life
- Remote eLearning **online** :With the school shut down, many countries took the measure investing for remote learning resources
- Change to **Online** from the usual Face to Face activities

  Education : Online classes,

  Research & Business : Online Meetings, Seminars, Conferences, etc.

Online : Pros & Cons

Cons :

 Online cannot substitute the face-to-face activities completely.

Pros:

 As for online Seminars, Workshops, Conferences
 Easy to invite and arrange diverse speakers
 Can attend many workshops
 Sometimes, quite convenient

The more dependence on the online may remain in Post Covid19 era.

POST CORONAVIRUS ERA:

Q1 : Will everything be back to the pre-coronavirus era?

Some of these may not be completely vanish in post COVID19 life.
Online will be more important and widely used :
- Some advantages and convenience,
- better infrastructures during the COVID-19 era.

Q2 : What it will & should look like? What should be prepared?   Especially for the Library?

- What should be the role of the Library?
   Importance of digital, & online
   for researchers, and education
- Education Institute & Libraray : the role of the internet is important.
- I will mainly focus on the role of the library in the research aspects.

Table of Contents

√ **1. COVID 19** - Impact & Post Coronavirus Era

2. Library, Open Access & the user
   - What has been the Library to me?
   - Open Access,

3. SCOAP³, Preprint Server Repositary as an OA model

4. Outlook- the role of the library in Post COVID19

2.1 What has the Library been to me?

- **My experience after coming back to Korea from US : as a User**

- Until 1990's, it was not easy to get the access to some of papers in the journals
- The journals subscribed through the library was rather limited

- The appearance of the **Preprint archive** in 1990's was a big revolutionary booster in particle physics community, especially to those in the environemnt with limited journal subsription,
- Additional **Online Journal** "Journal of the Highe Energy Physics" in the mid of 90's helped the access to the information :
- These lead to the increasing Research output in Particle Physics from the developing countries (including Korea) worldwide.
- Providing the Universal opportunities to the Science community, independent of the national and institutional economic or budget status.
- The movement of **SCOAP³** in 2010's is another boost contributing towards the open access.

2.2 Open access (OA)

Open Access logo, designed by Public Library of Science

- a set of principles and practices through which
- research outputs are distributed online, free of cost or other access barriers.
- Barriers to copying or reuse are reduced or removed

- Open access can be applied to all forms of published research output
- conventional journals: publishing costs subscriptions, site licenses or pay-per-view charges,
- open-access journals : by funding models which do not require the reader to pay

Open access - Wikipedia

Open Access (OA) 2020 Initiative

- Established at the 12th Berlin Open Access conference in 2015
- OA2020 aims to
- replace the **subscription business model** with new models that ensure outputs are **open and re-usable** and that the costs are transparent and **economically sustainable**
- Engage all parties involved in scholarly publishing, in particular universities, research institutions, funders, libraries, and publishers in transformative actions to achieve a rapid and efficient transition for the benefit of scholarship and society at large.
- analysis shows there is already enough money within journal publishing to allow for a transition to open access that will be – at a minimum – cost-neutral.
  Global journal subscription spending : €7.6 billion (Expenses per article €3,800)
  (White Paper, published by the Max Planck Digital Library in April 2015)
- endorsed by scores of scholarly organizations from five continents.

UNESCO promotes Open Access (OA)

- UNESCO works to improve awareness about the benefits of OA among policy makers, researchers and knowledge managers.
- UNESCO facilitates the development and adoption of OA-enabling policies, through its global network of Field Offices, Institutes and Centers,
- UNESCO pays particular attention to African and other developing countries.

UNESCO
United Nations
Educational, Scientific and
Cultural Organization

Plan S   -The "S" stands for "shock".-

- is an initiative for open-access science publishing launched in 2018
- by "cOAlition S", a consortium of research agencies & funders from 12 European countries.
- state-funded research to be published in open repositories/journals by 2021.

Ten Key principles of Plan S

1. **authors retain copyright** ;publications under an open license
2. Funders establish **robust criteria** for article compliance.
3. **Funders** provide incentives to establish & support **OA journals or platform** if they do not yet exist;
4. **OA publication fees** should be covered **by the funders** or universities, **not individual researchers**;
5. publication fees should be standardized and capped;
6. universities, research organizations, and libraries should align their policies and strategies;
7. for books, the timeline may be extended beyond 2021;
8. **open archives and repositories** are acknowledged
9. hybrid OA journals **not compliant** with the key principle;
10. Funders should monitor and **sanction non-compliance**.

The Global Open Access Portal (GOAP)

- funded by the Governments of Colombia, Denmark, Norway, and the US
- presents a current snapshot of the status of Open Access (OA) to scientific information in 158 countries worldwide.
- The Global Open Access Portal is designed to provide necessary information for policy-makers :

- **Funding Agency**

 ex) NIH Public Access Policy (2008) : an open access mandate was put into law

- **Universities** : **institutional repositories**

 Ex) DAREnet(2005)-16 Dutch Univ, 47,000 research papers

   COAPI(2011), 50 univs in North America

- **Libraries (& institutional repositories)**

 Ex) Canadian Association of Research Libraries :

Open Access Journals
Directory of Open Access Journals (DOAJ)
Global : 126 countries,
            16,276 journals (Korea 143)

Open Access Repository
OpenDOAR
Global : 5,659
(US 905, Japan 683, UK 315, Korea 41)
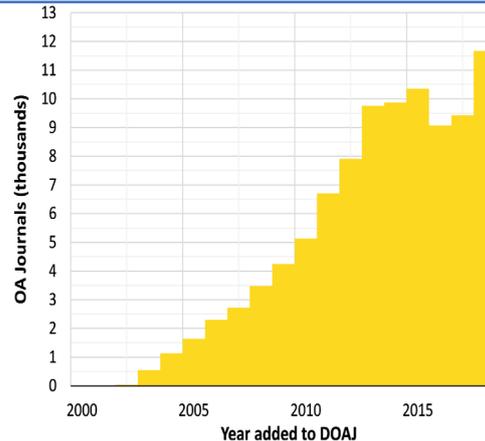
The movement towards OA in Korea,

- Many efforts in diverse forms towards OA
- KOAR : OA Repository run by KISTI
- there has been a successful example of converting the subscription fee to part of the APC
- Still lacking the nationwide policy lead by the funding agency

WHO BENEFITS WHAT?

Researchers
Retain the right to **freely share and reuse** their research as they wish.
Achieve maximum visibility of their outputs, through **open dissemination**.
Gain immediate, free and unrestricted access to all of the latest, peer-reviewed research.

Librarians
Take a **central role** on behalf of their institution **in the emerging open access environment**.
Satisfy the demands of the new generation **of researchers**, with access to everything.
Demonstrate new value in managing the strategic interests of their institution.
Cultivate **opportunities for innovation and leadership** in shaping the role of the library

Funding Bodies and Institutions
Scholarly impact, in their repositories and everywhere researchers want.
Enhancing scientific exchange and innovation for the advancement of knowledge.
Ensure transparency & accountability of their funds and the research they have financed.

Publishers
Secure a transition roadmap to the Open Access environment **in a win-win scheme**
Generate strategic partnerships with Institutions, Libraries and Researchers.
Gain more **opportunities** for **new market** entrants

Science and Society at Large
will finally gain open access to the latest scientific research and the foundations

1. COVID 19 - Impact & Post Coronavirus Era

2. Library, Open Access & the user
    - What has been the Library to me?
    - Open Access,

3. SCOAP³, Preprint Server Repositary as an OA model

4. Outlook- the role of the library in Post COVID19

3.1 SCOAP³ : as a model for OA

**Sponsoring Consortium for
Open Access Publishing in Particle Physics**

- global partnership in 44 countries &
- 3 intergovern organisations
  (CERN,IAEA, JINR)
- 3,000 Libraries,
  Funding Agencies &
  Research Institutions   https://scoap3.org/

Partnership

- ■ 43 countries participating in SCOAP³
- ■ >60 other countries with at least one SCOAP³ author
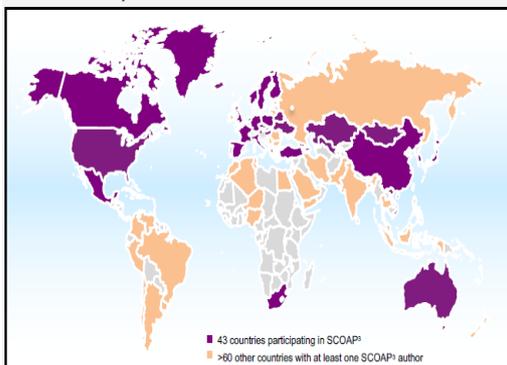
SCOAP³ Journals

Publisher	Journal
APS	Physical Review C[a]
APS	Phisical Reiew D[a]
APS	Physical Review Letters[a]
Elsevier	Nuclear Physics B
Elsevier	Physics Letters B
Hindawi	Advances in High-Energy Physics[a]
IOPp / Chinese Academy of Sciences	Chinese Physics C[a]
IOPp / German Physical Society	New Journal of Physics[a b]
IOPp / SISSA	Journal of Cosmology & Astropart. Phys.[a b]
Jagiellonian University	Acta Physica Polonica B[a]
Oxford University Press / Physical Society of Japan	Progress of Theoret. & Experim. Physics[a]
Springer / Italian Physical Society	European Physical Journal C
Springer / SISSA	Journal of High-Energy Physics

Headquarter at CERN
2005 : Business Model under Disussion
2014 : The 1st Phase,
2017 : The 2nd Phase,
2020 : The 3rd Phase

SCOAP³ converts subscription journals in High-Energy Physics to **Open Access** through re-direction of subscription funds

Author **User**

Publisher **Library**
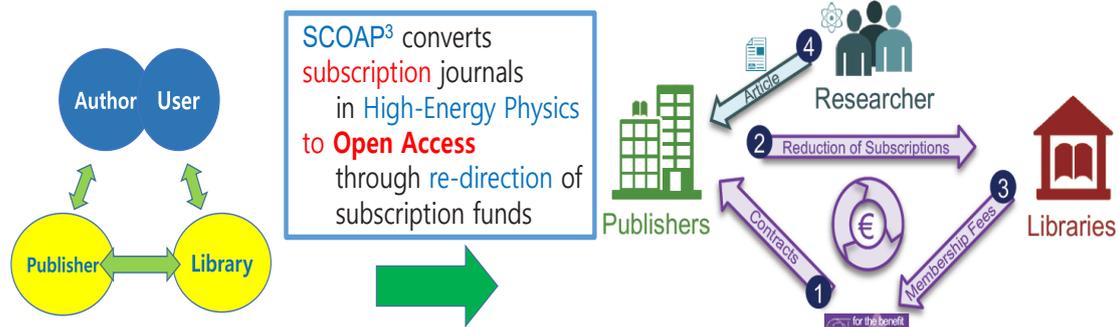
Country membership fees scale with HEP publications

Share of 2014-2015 authorship of SCOAP³ and APS HEP articles
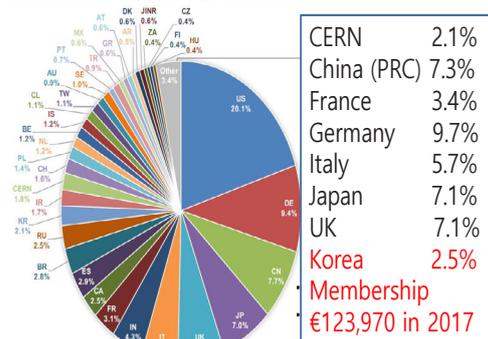
CERN	2.1%
China (PRC)	7.3%
France	3.4%
Germany	9.7%
Italy	5.7%
Japan	7.1%
UK	7.1%
Korea	2.5%

· Korea 2.5%
· Membership
  €123,970 in 2017

Each country contributes commensurate to its scientific output in the field.

Researcher

Publishers

2 Reduction of Subscriptions

Libraries

Article 4

Contracts 1

Membership Fees 3

SCOAP³ Repository : **46,324 Open Access** articles

1) SCOAP³ centrally arranges payment for Article Processing Charges for OA
2) publishers, in turn, reduce subscription fees to all their customers,
3) who can re-direct these funds to contribute to SCOAP3 for APC payment.

SCOAP³ is (more than) a successful model of Open Access

Category	Subscribed Journals	OA Journals	SCOAP³ Journals
Author	-	APC	**Free**
Reader	Reading Fee	**Free**	**Free**
Institute	Subscription Fee	APC	Contribution
Funding Agency		Budget for APC	Budget for Contribution
People	Tax +Fee for Use	Tax	Tax

Achievement of SCOAP³
- ~90% of HEP journal literature covered
- Repository : 46,324 OA articles
- Supported 20,000 authors from over 100 countries
- 99.8% article compliance

SCOAP³satisfies all the 10 key principles and beyond.

SCOAP³ is expanding the Open Access range to books
- SCOAP3 started from the journals in High Energy Physics
- Now it is extending to the books in High Energy Physics
- Korea is also attending this movement through KISTI

Korean Participation to SCOAP³

2014 : Participation of Korea in The 1st Phase,
(Korea Institute of Science & Technology
Information(KISTI)
as the National Contact Point)
2017 Korea SCOAP³ Association Launching

Number of Articles Including Korean Authors (2014-16)
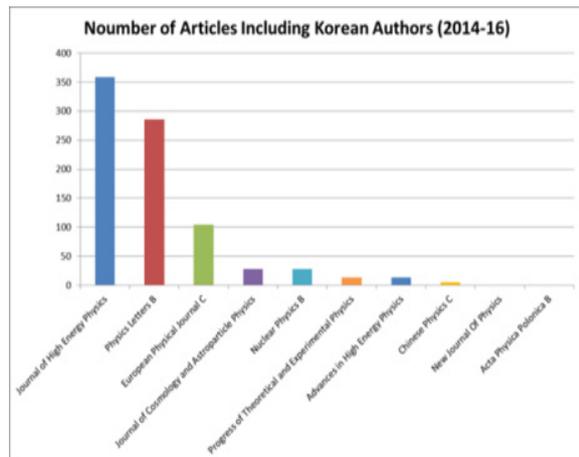
Outcome of the First Stage (2014~2016)

➢ Participating Korean Institutes
  ✓ 14 institutes + NCP(KISTI)
➢ Benefits
  ✓ In 2014, the subscription fee of $20,000 saved
  ✓ Free access to 10 journals
  ✓ APC for 836 articles which include Korean authors
    were exempt.

Benefits

1) Institute, Funding Agency, Country
the journal is available with the **reduced budget**,
at the level of **each library** and also at the level of the **funding agency** or **country.**
2) Researchers
No cost burden (APC) for **authors**
Anybody can have an access to those articles with no cost, anywhere, and any time.

Example) Participation of **Korea** to SCOAP³ (since the 1st phase at 2014 with KISTI as the NCP)
1) Annual **budget save** about $20,000 in 2014. Saved budget increased later.
2) More than 51,000 **physicists in Korea uses the HEP articles with no cost**.
Ex) In 2017, the total 335 papers with **Korean authors** involved were **APC-exempt.**

How did it help my research?
This has helped my research activities very much!
- Access to the Journals is not restricted to my institutue, Sogang University,
  but became possible anywhere and anytime
  (while visiting other institute or during the workshop, etc.)
  as long as the internet is available!

Why Particle Physics ?- the Characters-

Research is on the **Ultimate structure of the Matter** and **the Universe**

93% of SCOAP³ articles have 1-10 authors

Articles published in SCOAP³ journals 2014-2015 by number of authors

n = 8,752 articles

Mostly theoretical articles

Experimental articles by large collaborations:
- 53% experiments at CERN
- 47% other experiments (mainly in Japan, China, US)

SCOAP³ Forum 2017

Particle physics looks at matter in its smallest dimensions.

Astrophysics looks at matter in its largest dimensions.

Microscopes / Microscopes

Jumelles / Binoculars

Telescopes optiques & radio / Optical & radio telescopes

Accélérateurs et détecteurs / Accelerators and detectors

L'oeil nu. / Naked eye

THE TWO FRONTIERS OF PHYSICS

- International Collaboration is essential!
  - Needs Large Experimental Facilities,
  - Thousands of Scientists under Collaboration
- Towards the Open Access :
  Sharing the research output is highly needed
  1) Preprint Server → arXiv.org
  2) e-journal : Journal of High Energy Physics

Particle Physics as the role model of the International Collaboration

CERN : Conseil Européen pour la Recherche Nucléaire", or European Council for Nuclear Research

Source : CERN

founded in 1952, 22 member states

~ 1/8th of the people who made CMS possible

CMS has ~4300 Scientists (including 800 PhD students), Engineers and technicians from 41 Countries and 190 institutes
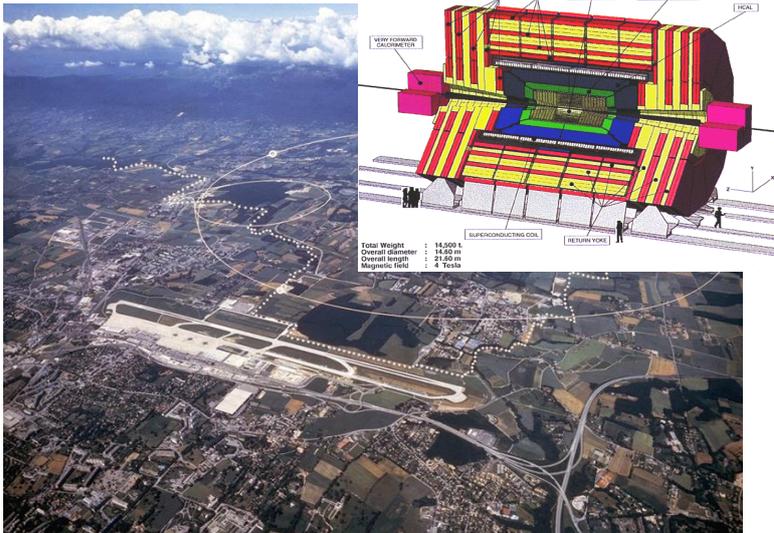
The birth of the web

The World Wide Web (www),
invented at CERN in 1989 by British scientist Tim Berners-Lee,
has grown to revolutionize communications worldwide

The Higgs boson

Fundamentals on Structure of Matter
& Space-Time (Universe)
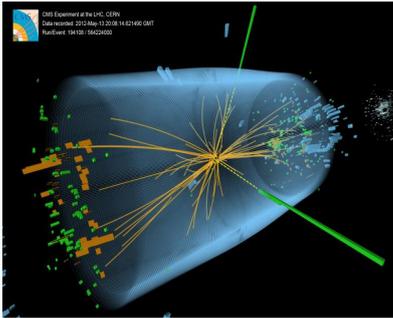
**Open Experimental Data
etc.**
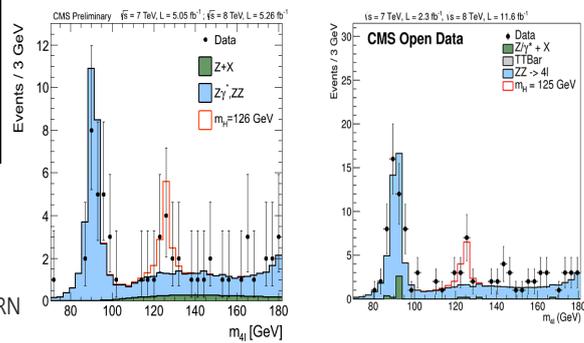
Source : CERN

3.2) e-print Server : Open Access Repository of e-prints (pre-&post-print)

Towards Sharing the information through the Open Access

- In August 1991, **Paul Ginsparg** created a central **repository** of the **particle physics** preprints at the Los Alamos National Laboratory (LANL)
- With the articles (in TeX file) authors upload before (and after) submitting to the journal
- The storage was a mailbox which could be accessed from any computer.
- Additional access modes added: FTP 1991, Gopher 1992, and the World Wide Web in 1993.
- The term e-print was quickly adopted to describe the articles.

- Historically, the preprints have been distributed to (major) institutes or colleagues ("friends").
  Helping early access before the publication (which may take about 6 months (or more)):
  →costly, limited sharing, information inequality, inconvenience
- In 1990, Joanne Cohn began emailing the physics preprints to colleagues as TeX file.

- In 2001, Ginsparg moved institutions to Cornell University and changed the domain name from xxx.lanl.gov to **arXiv.org**.
- Now, expanded to include other branch of physics, astronomy, mathematics, computer science, quantitative biology, statistics, electrical engineering, mathematical finance, and economics.
- It contributed to the later open access movement.
- Ginsparg was awarded a MacArthur Fellowship in 2002 for his establishment of arXiv.

arXiv.org : open-access preprint archive Server, Repository

- arXiv is a free distribution service, accessible online.
- Materials on this site are not peer-reviewed by arXiv.
- Some publishers grant permission for authors to archive the peer-reviewed postprint.
- Begun on August 14, 1991, arXiv.org passed
- the half-million-article milestone on October 3, 2008, and
- had hit a million by the end of 2014.
- As of April 2021, the submission rate is about 16,00 articles per month.

- Hosted principally by Cornell, with 5 mirrors around the world.
- The annual budget for arXiv $826,000 for 2013 to 2017, funded jointly by
  - Cornell University Library,
  - the Simons Foundation
  - and annual fee income from member institutions.
- The voluntary annual membership fees are set in four tiers from $1,000 to $4,400, based on institutional usage ranking.

97% of yearly HEP articles available as preprint on arXiv

(Since 1992: in total 60% of all articles ever published in all leading journals)

Rounds of drafting & informal feedback

Preprint
Work in progress
Submitted version
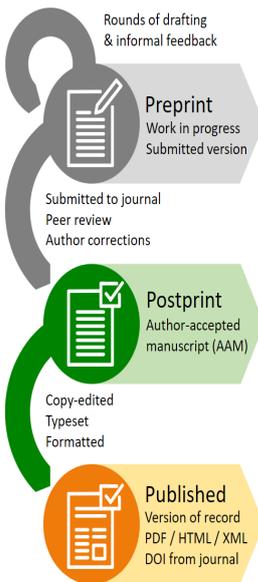
Can always be shared in a green OA repository at any time

Submitted to journal
Peer review
Author corrections

Postprint
Author-accepted manuscript (AAM)

Can always be shared in a green OA repository after accepted by journal (sometimes after embargo)

Copy-edited
Typeset
Formatted

Published
Version of record
PDF / HTML / XML
DOI from journal

Can usually only be shared if published by a gold OA or hybrid journal
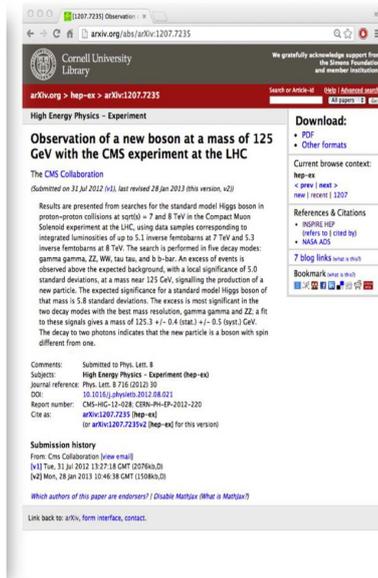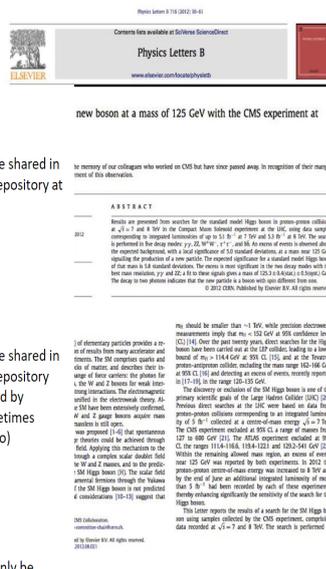
Do HEP researchers read preprints or journals?
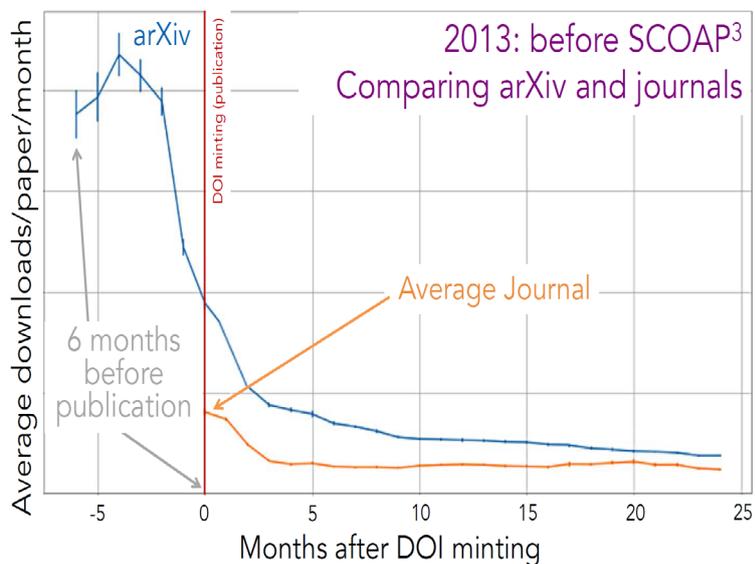
Downloads 3Q13, 4Q13 on arXiv.org and publishers' platforms
~50k articles in Elsevier *Phys.Lett.B, Nucl.Phys.B* & Springer *Eur. Phys. J. C, JHEP*

What happens when journals join SCOAP³ ?
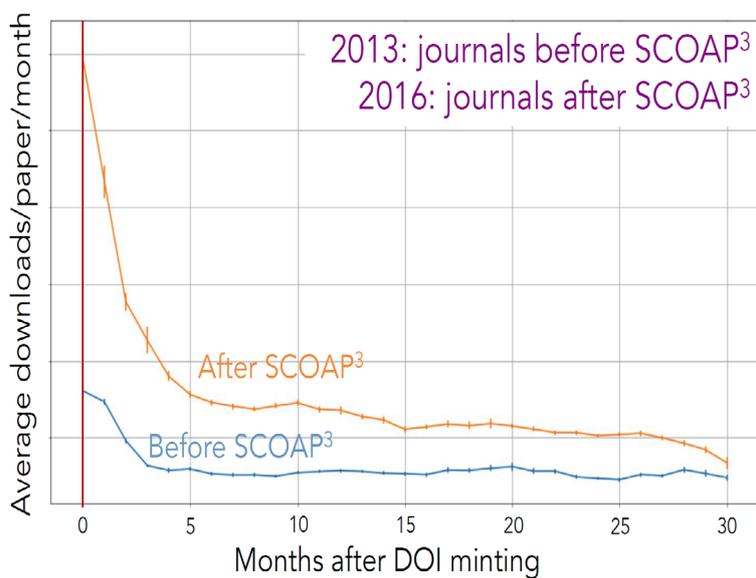
Downloads 3Q13, 4Q13, 1Q16, 2Q16 on arXiv.org and publishers' platforms
50k non-Open Access articles and 8k Open Access articles
Elsevier: *Phys.Lett.B, Nucl.Phys.B;* Springer: *Eur. Phys. J. C, JHEP*

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

SLA-Asia
Connecting Information
Professionals

Downloads of preprints AND journals increase
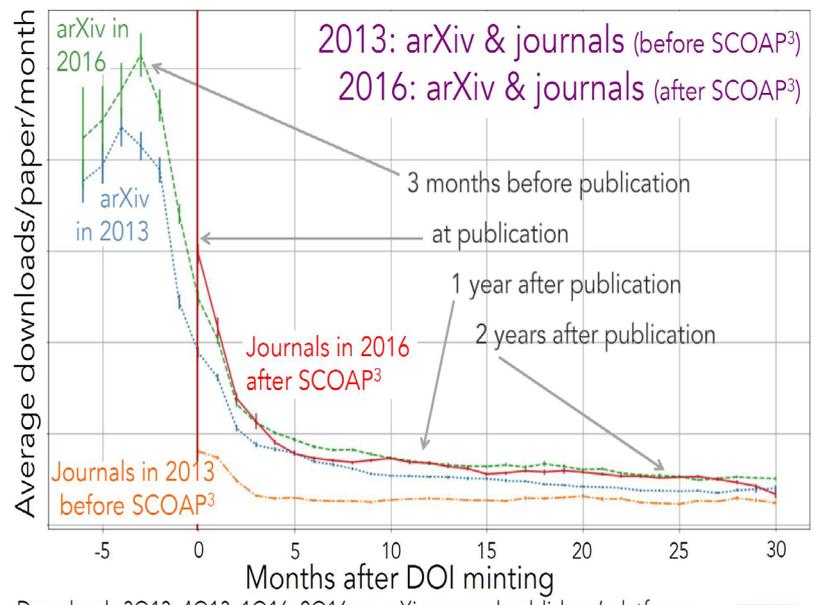
Average downloads/paper/month

arXiv in 2016

arXiv in 2013

2013: arXiv & journals (before SCOAP³)
2016: arXiv & journals (after SCOAP³)

3 months before publication

at publication

1 year after publication

2 years after publication

Journals in 2016 after SCOAP³

Journals in 2013 before SCOAP³

Months after DOI minting

Downloads 3Q13, 4Q13, 1Q16, 2Q16 on arXiv.org and publishers' platforms
50k non-Open Access articles and 8k Open Access articles
Elsevier: *Phys.Lett.B, Nucl.Phys.B*; Springer: *Eur. Phys. J. C, JHEP*

Towards Sharing the information through the Open Access
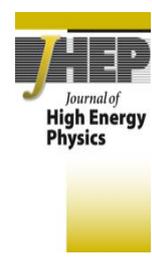
1) Electronic Journal –Journal of High Energy Physics (1997 ~)

- E-Journal only from the beginning
- Starting with Open Access, Subscription fee 0, Publication fee 0
 (To overcome the access barriers such as High level of subscription fees, APC)

Impact factor | 5.875 (2019)

Journals

Articles

Nr of Articles   Nr of Journals
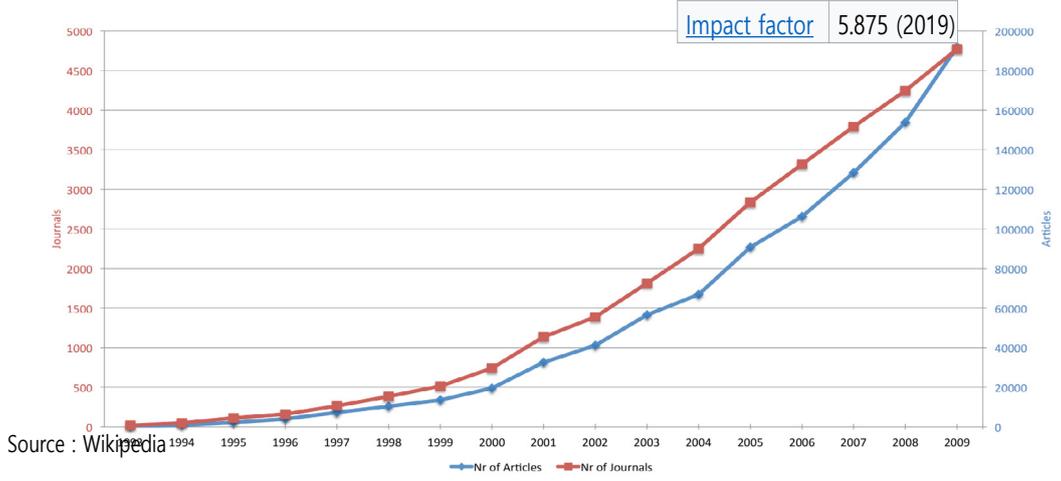
Source : Wikipedia

Impact to the researchers

1) The arXiv **repository** (e-journals and the SCOAP3 as well) helped very much

- Making the access possible for **anybody, anywhere, and anytime** with **no cost**.
- Essentially, the access to the article contents is possible even without the journal subscription.
- This has helped scientiests' (& my) research activities very much!

Ex1) Even my institute subscribed the journal, I have an access only inside the campus, not at my home, neither during my visit to any other institute domestic or foreign.

Ex2) Before the advent of these, my travel bag is usually packed with the copy of the papers that I might need during the travel. However, with all these, nowadays, there is nothing needed as long as the internet is available.

2) The preprint server gave an additional benefit to the community by

- Contributing to the controversies on Originality, plagiarism etc.

- Letting the articles from the developing countries have increased very much!

Remaining Homeworks :
Example) Back Issues

When I made a visit the University in Germany, I can see the journals more than 100 years old in the department library.
Sometimes, when I want to take a look at the original works or historic papers written long time ago, still it is not easy to have an access inside Korea, since the burden of the additional subscription fee for the back issues online

1. COVID 19 - Impact & Post Coronavirus Era

2. Library, Open Access & the user
    - What has been the Library to me?
    - Open Access,

3. SCOAP³, Preprint Server Repositary as an OA model

4. Outlook- the role of the library in Post COVID19

4. Outlook- the role of the library in Post COVID19
What should be the role of the Library?

1. Continuous **efforts by science communities** for lowering the barrier for the open access :

   Ex) Particle Physics Community have made an effort for the open access.

   a) Preprint ArXive : as a Repository in 1991

   b) 100% E-Journal : Journal of the High Energy Physics 1997~

   c) SCOAP³ : lead by CERN, 1st phase in 2014, now extending to books in particle physics

2. **International efforts** towards Open Access among the **libraries, and funding agencies**

   - OA 2020

   - Plan S,

   - and many activities by many institutes, funding agencies, libraries,

     towards OA including repository

3. **Social Infrastructure** :

- The unprecedented COVID 19 pandemic influenced the every aspect of the human being's society over the whole world.

- Some of the change may not disappear in the Post Corona Virus era

- One important change that may persist is more replying on the ICT and online in the education and research as well as in the daily life

- With the school shut down, many countries took the measure investing for remote learning resources.

- The strengthening the online connection through the internet may work as the important opportunity in the future.

4. **Future Role of the Library** :

- It is high time for the libraries and Librarians leading the Open Access Transformation.

- Access to the information via **online** should be a new chance for libraries in the future.

  - **Shift from subscription base into OA frame**

  - **Repositories,**

    - Importance of the repository-The role of Libraries and Librarians important

    - Each institute researchers products (papers, books, thesis, etc.) archiving.

Thank you!

SLA-Asia
Connecting Information
Professionals

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

Vote of Thanks
iCoASL

Dr. P.K. Jain
Librarian Institute of Economic Growth, India

Dear Dr. Hye-Ran Suh, Chief Librarian, National Library of Korea, Mr Mu-Suk Oh, Librarian, Korea, Speakers, Presenters, participants, Ladies and Gentlemen.

It gives me immense pleasure to propose the Vote of Thanks for the 7th International Conference of Asian Special Libraries (ICoASL 2021) on envisioning the Future of Library in the Post-Coronavirus Era held in South Korea organised virtually.

I would like to take this opportunity to place on record our hearty thanks for the support and guidance extended by our Dr. Hye-Ran Suh, Chief Librarian, National Library of Korea to deliver welcome address. We thank you sir for sparing your valuable time and delivering the welcome address.

Our first gratitude is due to keynote speakers- Catherine Lavallée-Welch, President-elect, Special Libraries Association, USA. She is from Canada; Yunkeum Chang, President, Sookmyung Women's University, Bum-Hoon Lee, Professor, Sogang University, South Korea for addressing the gathering.

I also take this opportunity to extend our gratitude to the distinguished speakers Dr. Jaesoo Kim, President, Korea Institute of Science and Technology Information, Mr. Kinam Shin, Chairperson, Presidential Committee on Library & Information Policy of Korea, Dr. Jin Kwon Hyun, Chief Librarian, National Assembly Library, Prof. Young Joon Nam, Chairperson, Korean Library Association, Dr. Debal C Kar, President, Asia Community of SLA, for granting the valuable time and addressing the gathering

The international and national resource persons from all over the world will be also sharing their knowledge and experiences. We understand that you have taken time out of your very important schedules to contribute to this Conference. T

I extend gratitude to the distinguished panel of speakers, discussants and learned

guests for participating at the event.

I would also like to thank for the support given by SLA Asian Chapter, Korea Special Library Association (KSLA), Korea Institute of Science and Technology Information, (KISTI), National Library of Korea and Society for Library Professionals. We thank them for agreeing to support us as associate partners for the Conference.

Would also like to thank all theCountry Representatives from India: Dr. Parveen Babbar, President Elect, Asia Community, Librarian, from Indonesia : Dr. Labbiab Zain, Librarian, from Philippine : Dr. Shirley, Librarian, from Pakistan : Dr. Arshad Mahmood, Librarian, from Bangladesh : Dr. Dilara Begum, Librarian and from Japan : Ms. Yuko Sawada, Librarian for their contribution and support.

I am thankful to the Platinum Sponsor: Futurenuri and Gold Sponsors: ARGON-ET, DongSung OA, ACS publications and De Gruyter for their support.

I am also thankful to Dr Debal Kar, Dr Parveen Babbar, Dr Nabi Hasan, Mr Mu-Suk Oh, Librarian, Korea, Mr Eun-Kyung Nam from Korea and all who contributed for ICoASL 2021. Without their support it was not possible to organize this Conference during such hard times. I am also thankful to all others who had whole heartedly given support and guidance to me for this Conference.

Last but not least, I am thankful to the participants of the conference who have spared their valuable time.

Thank you all

A Comprehensive Comparison of arXiv and the Web of Science (WoS)

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Chair of Information and Knowledge Management

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Abstract

Scientific exchange is increasingly shifting to the Internet. Today, online literature and citation databases are important tools for scientific work, e.g. for exchanging information or investigating the current state of the art on a topic. Due to the large number of literature and citation databases that exist, and the limited amount of time available for a search, it is necessary to choose few or even only one database.

In this paper, we carry out a comprehensive comparison between Web of Science and arXiv. We compile a list of criteria for the comparison of these resources based on a literature analysis. Finally, 62 documents were found that dealt with comparisons between literature databases. Based on these comparisons, a concept matrix was created according to Webster & Watson (2002), in which the criteria for the comparison were summarized.

These criteria were then integrated into an adapted version of the criteria catalogue for the comparison of software packages from Jadhav & Sonar (2009) in order to provide a comprehensive picture, not only of content aspects, but also of functionality and usability issues. Based on these criteria, the Web of Science and arXiv databases were compared.

The main results can be summarized as follows: arXiv covers only a limited number of disciplines and has a strong focus on physics, mathematics and computer science. Web of Science covers significantly more subject areas and generally includes significantly more papers, which in contrast to arXiv all come from peer-reviewed journals. arXiv's biggest advantage is the topicality of the articles, since preprints are also accepted and thus the peer-review process can be bridged. Both databases are intuitive to use and have a similarly good simple search, but Web of Science's advanced search gives an experienced user much more possibilities to refine searches and to formulate distinctive queries. In general, Web of Science offers significantly more possibilities to conduct comprehensive literature searches due to the additionally stored citation data and corresponding analysis functions. arXiv, on the other hand, is

particularly well suited to learn about the latest state of the offered disciplines.

1. Introduction

Scientific exchange, and thus also scientific literature and citation databases, is increasingly shifting to the Internet. Today, online literature and citation databases are important tools for scientific work, e.g. for exchanging information or investigating the current state of the art on a topic (Falagas et al., 2008; Cronin & Blaise, 2001; Tsay, Tseng & Wu, 2019). Citation atabases are a special form of literature databases that store citation data in addition to bibliographic data (Jacso, 2004). Since there are a large number of online literature databases that differ, for example, in terms of scope, topicality or search functionalities, the question arises for many, especially junior researchers, which of these databases is the right one for which user and for which purpose. In order to answer these question(s), comparisons between different databases have already been carried out by several authors (Jacso, 2005; Falagas et al., 2008). So far, however, there is no comprehensive comparison between the literature databases Web of Science and arXiv.

In order to determine suitable criteria for a comparison between literature databases, a literature analysis, according to the methodology of Webster & Watson (2002), is carried out on already existing comparisons. The criteria identified in this process are then integrated into the criteria proposed by Jadhav & Sonar (2009) for comparing software packages adapted for this task. Based on these criteria, a comparison between Web of Science and arXiv is then performed. The paper is further structured in this sense: In the next section, we will first briefly introduce the objects of comparison (Web of Science and arXiv). In the following section we will go into detail about the methodology used for the comparison in order to identify the relevant criteria for the comparison. In the following section, this comparison is carried out and finally the findings are summarized and an outlook on further research potential is given.

2. Objects of the comparison

2.1 Web of Science

Web of Science (WoS) is a fee-based literature database for searching literature offered by Clarivate Analytics. It consists of several scientific literature databases from different subject areas, first and foremost the multidisciplinary database Web of Science Core Collection (Clarivate Analytics, 2020a) This consists of several indices, including the Science Citation Index Expanded(SCIE), probably the best-known index, which has existed since 1964, when it was still called the Science Citation Index, and is constantly being expanded (WoS Group, 2020a). The Web of Science Core Collection alone includes articles from over 21,100 peer-reviewed journals in 254 scientific disciplines (WoS Group, 2020b). An important feature of Web of Science is that not only bibliographic data are stored in the databases, but also data on citations (WoS Group, 2020c). Thus, it is possible to find related, directly or indirectly relevant, publications to a selected publication (Jacso, 2004). Thus, the Web of Science is one of the most important tools for a wide range of bibliometric studies at all levels of observation (Bauer & Bakkalbasi, 2005). The

deliberately limited number of sources included and evaluated by Web of Science, according to its own criteria, is a considered quality feature. The included sources are regularly reviewed and adjusted (Tunger, 2007). For example, if a journal in the SCIE no longer meets the required criteria, it will be removed from the SCIE and moved to the ESCI (Emerging Sources Citation Index). If it no longer meets the criteria for ESCI, the journal will be removed from the Web of Science Core Collection(see WoS Group (2020d) for the exact process and the evaluation criteria).

2.2 arXiv

arXiv (pronounced like the English word "archive," the X represents the Greek letter "chi") is a free, scientific literature database, originally founded in 1991 by Paul Ginsparg, now maintained and operated by Cornell University (Steele, 2012). Unlike Web of Science, arXiv is limited to specific subject areas (physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering, and economics) and includes not only articles from peerreviewed journals, but also preprints, among others (Berg et al. 2016; arXiv, 2020a).
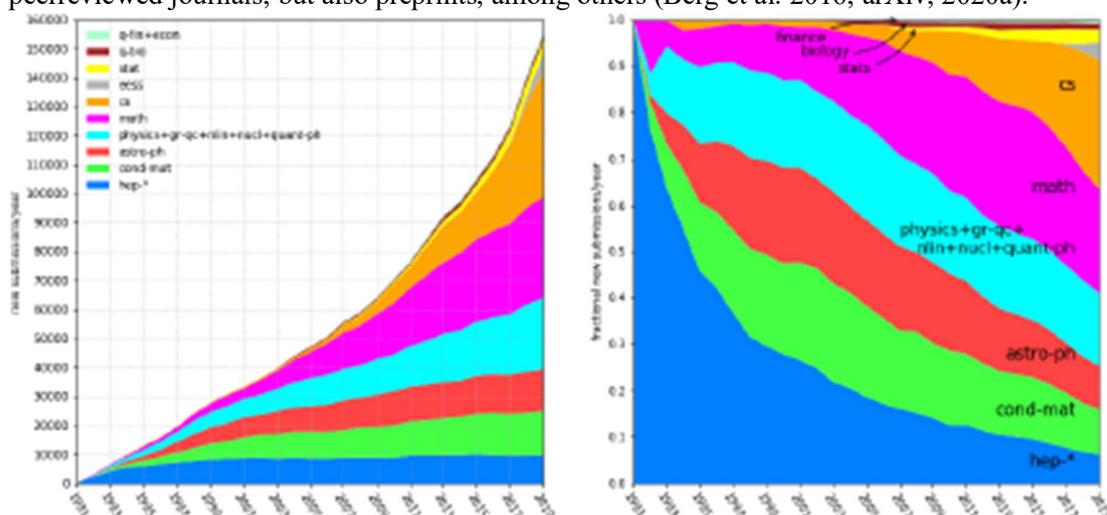
Figure 1: Annual submissions by field on arXiv ("hep" = High Energy Physics, "cond-mat" = Condensed Matter Physics, "astro-ph" = Astrophysics, "phys+gr-qc+nlin+nucl+quant-ph" = Other Physics, "math" = Mathematics, "cs" = Computer Science, "stats" = Statistics, "biology" = Quantitive Biology, "finance" = Quantitive Finance (arXiv, 2020b)

Although arXiv includes papers from several disciplines, Figure 1 shows a clear dominance of physics and mathematics - and in recent years an increasing share of publications from computer science. As already mentioned, arXiv, in contrast to WoS, also includes articles that have not yet been peer reviewed. Preprints play a major role in scientific exchange, especially in the fields of astronomy and physics or in those areas, as we all had to recognize just now in the Corona crisis, where the fastest possible communication of scientific findings is required. So, arXiv enables faster exchange than would be possible through peer-reviewed journals by bridging the time to publication (Lariviere et al., 2014).

All registered users can submit articles. This also distinguishes the moderation process, which does not check journals for quality, but mainly determines whether the submitted papers have a "scholarly value" (arXiv, 2020a) and assigns the papers to a corresponding subject area (arXiv,

2020c). Although arXiv, in contrast to Web of Science, does not store citation data, it is possible to use the extension Bibex (arXiv Bibliographic Explorer), a project that displays citation data for the respective articles from Semantic Scholar, ADS (astrophysics data system), Prohpy and Inspire HEP29 and has been integrated into the site (Bierbaum, 2020).

3. Methodology

In order to make a comparison between the two databases, it is first necessary to identify criteria for such a comparison. For this purpose, a literature analysis was carried out with the aim of identifying comparison criteria from existing comparisons between known literature databases.

Pairwise searches were conducted for comparisons between the Google Scholar, Scopus, and Web of Science databases. This resulted in 3 queries that were searched in the Web of Science database:

[comparison AND „Web of Science" AND „Google Scholar"],
[comparison AND „Web of Science" AND „Scopus"] and
[comparison AND „Google Scholar" AND „Scopus"].

The results were then narrowed down to the WoS categories "Information science library science", "Computer science interdisciplinary science", "Computer science information systems" and "Multidisciplinary sciences", since many of the results came from other scientific fields, such as medicine and biology. As a result, we retrieved 231 results. After removing the duplicates, the rest was analyzed for thematic relevance and further relevant results were identified via a backward and forward search based on these articles. As final result set 62 comparisons between literature databases were found.

4. Criteria Catalog and Comparison

As a basis for the comparison, the criteria proposed by Jadhav & Sonar (2009) for the comparison of software packages were used in order to compare not only, as most of the comparisons examined in the literature review, only key figures on literature databases, but to go one step further and also examine more software related criteria, such as user-friendliness, or criteria relating to the provider, so that the user can form a comprehensive picture of the databases examined. Table 1 shows the criteria catalog with the categories according to Jadhav & Sonar (2009) and as the result of the analysis of the literature analysis and their explanation.

Table 1 Citeria Catalog with its explanations (structure according to Jadhav & Sonar, 2009)

Criteria Category	Criteria: Explanation
Functionality	• Main aim: areas that the database is specifically focused on • Functions: all the features provided by the literature database • Interoperability: ability to use the database together with other tools or applications • Openness: to further developments or to external applications
Quality criteria	• User interface: how easy it is as a user to navigate and use the database • User types: ability of the database to be used by users of different types, such as beginners,

	advanced users, and professionals • Data presentation: how search results and any additional data are presented • Customizability of results: all the ways to refine search results after a query • Ease of use: how easy it is for a user to learn how to use the database and apply it accordingly. • Backup and recovery: options available to prevent data loss due to system crashes • Scope of articles: describes not only the number of all articles stored in the respective database, but also the period of publications covered (Bosman, 2006; Knackstedt & Winkelmann, 2006) • Completeness: articles published by one (or more) selected author(s) are all included in a database (Garcia-Perez, 2010; Tsay, Tseng & Wu, 2019; Goertzen, 2019). • Uniqueness: describes the proportion of articles that can only be found in one of the databases (Tsay, Tseng & Wu, 2019). • Quality of articles: is a statement about the control mechanisms of a database, which are intended to ensure the highest possible quality of the work by including only selected papers or journals (Cronin, 2001). • Scope of the citation data: quantity of all works for which citation data are available in addition to the bibliographic data. • Citation metrics: which of the numerous existing metrics are offered by the database (e.g.number of citation, h-index, or impact factor). • Actuality: how fast an article is included in the database. • Domain diversity: ability of the database to be used for different domains, not only different scientific disciplines, but also languages and regions of publication and types of content (Ball & Tunger, 2007).
Vendor criteria	• User manual: is there a manual for users and whether this manual contains relevant information and the main commands. • Tutorial: is a tutorial available to help users learn how to use the database. • Training: describes whether training is offered by the provider to explain the database and how to use it. • Consulting: provides the supplier of the database technical support and a consulting contact. • Communication, communication channels between user and provider. • Vendor experience: vendors experience as database provider. • Product reputation: reputation of the database in the market • Vendor reputation: reputation of the vendor in the market.
Costs	• License costs: costs of the database e.g. per user • Training costs: costs for the training for a user
Output	• Output: what options the database offers for exporting

4.1 Functional Criteria

Main aim: The main aims of the two databases examined are fundamentally different. Web of Science is especially designed for literature research and further bibliometric analysis. arXiv, on the other hand, emphasizes the fast provision of scientific documents for effective scientific communication by bridging the peer-review process. Functions: Web of Science has 5 different search functions:

- simple search,
- advanced search,
- author search,
- citation search and
- structure search.

For all search functions except the author search, it is possible to select which of the WoS databases or which indexes in this database are to be searched and in which time period. The

simple and *advanced search* support search operators - e.g. AND, OR, NOT-, wildcards, phrases and brackets to group compound Boolean operators (WoS Group, 2020e). The *advanced search* allows to formulate more complex searches by also including fields like title, author, organization etc. in the search term. The *citation search* should find all papers referencing one or more publications. In the first step, the publications are searched similar to the Basic Search and then, in the second step, the desired publications are selected from the search results. The *structure search* allows to draw chemical compounds or structures in an integrated tool and to search for articles on these compounds or structures. *Author search* allows to search for authors or, more precisely, to retrieve author profiles. These profiles contain information about an author as well as a list of all publications assigned to him. The search results are displayed as a list and can be analyzed using an extra button. As we can see in Fig. 2, the analysis shows how many papers from which subject area were found. Below this graphic, this data is also presented in full in tabular form. By clicking on one of the categories, the search results from that category can be displayed.

It is possible to create a citation report as can be seen in the upper right corner of Fig. 2. Figure 3 shows the citation report for the same example search. The h-index is calculated for the search results, and the total number of citations and citing articles is displayed. In addition, these numbers are also displayed without self-citations. Below this data, the citation data for each individual article is displayed in tabular form.
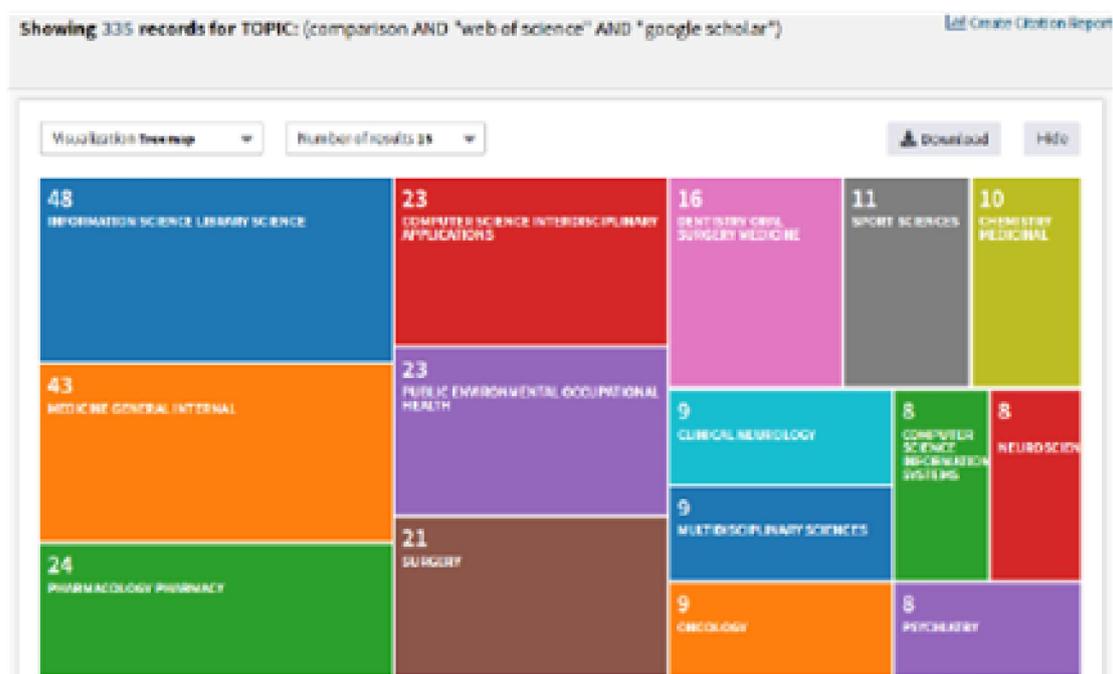
Figure 2: Analysis of the search results of a sample search
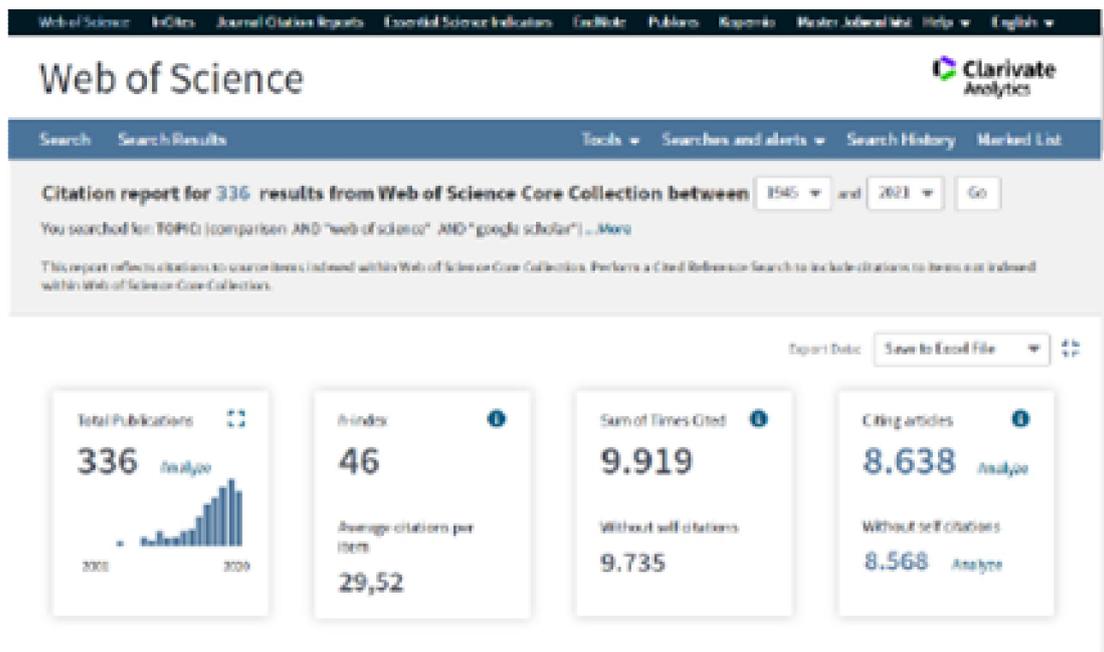
Figure 3: Citation report for a sample search

Search results can be further refined on the results page, e.g. a further search can be performed in the search results, or, for example, only certain document types or subject areas can be displayed. For each article included by Web of Science, the citation data is stored and can be displayed. Articles that cite the selected article can be displayed in a list like search results, filtered by additional criteria, and analyzed. The articles themselves are not stored on Web of Science, but a link to the article's page at the publisher is shown. The results of a search can be exported to various literature management programs, including EndNote, Citavi, RefWorks. etc. Export to Excel is also supported. Search queries that have been performed are automatically saved briefly in a search history but can also be saved manually. The search results are checked for new hits on a daily, weekly, or monthly basis, depending on the user's settings. If there are new matches, the user is notified by e-mail. Web of Science also offers a variety of other functions, such as a citation alarm, which, however, go beyond the search and analysis functionalities and are therefore not mentioned further here.

arXiv has only two search functions. A simple search and an advanced search. For both search functions, arXiv also supports searching for phrases, Boolean expressions, and wildcards. Only in the advanced search can search results be narrowed by subject and time period. In addition, similar to the advanced search of Web of Science, several fields can be addressed in a search query in order to make the search more precise. arXiv displays the search results in a list, as in Web of Science, but unlike WoS, they cannot be further refined. The individual articles can be downloaded directly from arXiv as .pdf files. Although arXiv does not store citation data, it is possible to display citation data for an article through an integrated extension - Bibex. This citation data is retrieved by several third parties, e.g. Semantic Scholar, Prophy, ADS and Inspire HEP. arXiv has no builtin functionality to export search results to a literature management program and no possibility to save search histories. Furthermore, it is possible to search for

authors, but there are no author profiles like in the Web of Science and only articles of the respective author are displayed as search results.

Interoperability: Web of Science offers interfaces for exporting to a variety of literature management programs (including EndNote, InCites, Refworks), as well as export functionality to Excel and a number of other data formats (such as HTML, BibTeX, plain text or CSV). arXiv does not offer export options by default.

Openness: Both providers offer an API that allows users to develop their own extensions and interfaces to the services of the. arXiv additionally maintains a list of projects via GitHub in which volunteers can participate.

4.2 Quality Criteria

In Table 2 we present the detailed comparison of the quality criteria section.

Table 2 Quality criteria comparison WoS arXiv

	WoS	arXiv
User Interface	 WoS Startscreen The interface is self-explanatory to a large extent. The buttons are labeled in an understandable way. When the dropdown menu for the search fields is opened, a short explanation for each of the options is displayed in addition to the choices.	 arXiv Startscreen The start page is much more overloaded compared to the start page of WoS, due to a huge amount of hyperlinks (on the screen-shot only about 50% of the hyperlinks are visible due to space limitations). The actual search function is placed in the upper right corner, very decentralized. The search interface itself is very organized, especially the simple search consists only of an input field for the search term, a dropdown menu for the examined fields and some explanations about the search options below.
User Types	Both databases are very easy to use for simple searches, even for beginners. For advanced users, both databases offer a more specific search functions in the form of the advanced search	
	Web of Science's simple search already includes all the functionalities that arXiv offers in its advanced search. The advanced search of Web of Science is suitable for advanced users, since the search results can only be limited by a self-written search expression. WoS offers (as written above) a lot more of analysis and report functions.	Advanced search in arXiv is done by selecting categories through a checkbox.

Data presentation	Both databases display the search results in the form of a list.	
	• Between10 and 50 results per page with: • title, author(s), journal title, date and number of citations • via hyperlink abstract and also usage data for each article is shown • via button WoS refers to publishers fulltext page • article data are supplemented with DOI, the author's address, information about the publisher, assigned subject areas, and a list of referenced works.	• Between 25 and 200 results per page with: • title, author(s), date, arXiv identifier, the DOI (if available) and abstract • arXiv allows you to download the work directly as a .pdf file
Customiz ability	For both literature databases, search results can be sorted according to certain criteria like:	
	• date of publication • number of citations, • number of uses (how often the full text of an article was accessed via Web of Science or how often the article was exported to a literature management system), • relevance, (indicates in WoS how many of the search terms were found in the fields Title, Abstract, Keywords, Keywords Plus. and Keywords Plus were found. Title and Keywords fields are weighted slightly higher), • last added to WoS, • number of uses in the last 180 days, • name of first named author, • source title, and • name of conference WoS allows to perform a further search within the search results or to filter by specific criteria, such as subject, date of publication, etc.	• announcement date, • submission date (for arXiv), and • relevance (without specifying how this is measured) arXiv does not allow to further refine the search results.
Ease of use	The basic functions of the Web of Science are very intuitive to use. Simple searches are no more complicated than a search on Google. For a user who has never used a literature database before, the amount of information and setting options of the search results might be a bit overwhelming, but it is not mandatory to use them. In order to use the advanced functions like the advanced search it is necessary to get familiar with Boolean expressions etc. first. Many functions such as the analysis of citations can be performed by simply pressing a button. Exporting to various literature management programs is also simple. However, if you want to export to literature management programs that are not directly supported, such as Citavi, you have to take the detour of exporting to a text file, which can then be imported into Citavi.Only the function for saving a search is unfortunate named. On the search results page you save a search with the button "Create an Alarm", because the functionality for alarms and saving a search in Web of Science belong together.	At arXiv, the search function is also very intuitive, and a simple search is no more complicated than a simple search on Google. The advanced search is, as already mentioned, more comparable to the simple search of the WoS and just as easy to use.

Backup and Recover	In WoS search queries are automatically saved in a search history until the browser is closed. In addition, it is possible to save search queries permanently.	arXiv does not offer any possibilities to save search queries.
Scope of articles	The Web of Science includes (in all databases together) about 171 million papers (articles from journals, books and contributions from events), as well as over 90 million patents and 9.7 million records from studies. The Web of Science Core Collection includes articles from 1900 to the present; the entire Web of Science contains literature from 1800 to the present (Status as of 27.07.2020, Clarivate Analytics, 2020b).	arXiv contains about 1.8 million articles(arXiv, 2020f). The oldest article is from 1991(Status as of 16.09.2020). If one tries to search for articles from 1990 or earlier, you get an error message saying that it is not a valid date.
Uniqueness	Tsay, Tsen, and Wu (2019) also compared the uniqueness of papers between Web of Science and arXiv that were available from Nobel Prize winners in physics, from 2001 to 2013. They found that around 43% of all articles from the Web of Science could not be found on arXiv, and only 1.27% of all articles on arXiv could not be found on the Web of Science. However, this number may be heavily distorted, since it concerns the work of very specific, important(because Nobel Prize winners) scientists. Another, more comprehensive study showed that, across disciplines, only 64% of all arXiv articles can also be found on the Web of Science. This number varies greatly by discipline; for example, the share of articles from arXiv that can also be found in the WoS is 80% for highenergy physics, but less than 20% for computer science (Lariviere et al., 2014).	
Quality of articles	WoS decides on the inclusion of a journal after a four-part selection process. 1. it is examined whether the journal can be clearly identified. 2. it is checked whether a complete editorial evaluation of the journal is justified. This includes checking whether the journal contains mainly scientific material, whether English-language titles and abstracts are available for the articles, and whether bibliographic information is available. 3. editorial review for quality, looks at consistency between the journal's title, stated scope, editorial board composition and authorship, and published content. It also looks for evidence of editorial rigor and adherence to community standards. If a journal is rejected at this step,it cannot be reexamined for at least 2 years. 4. is to examine the impact of the journal. This is determined mainly on the basis of citations. Both the number of citations and their origin play a role. In addition, it is examined whether the journal is of importance and value to subscribers of WoS. Significance can take the form of a novel perspective, a regional focus, a unique specialization, or unusual content (WoS Group, 2020d). However, WoS has been criticized several times for including mainly English-language titles from North America and Western Europe (Meho, 2007; van Leuven, 2001).	The arXiv moderation process is much less rigorous. Submitted articles are rejected only if, in the eyes of the moderators, they do not contain original or substantive research (including undergraduate research, course projects, and research proposals), if they are insufficiently formatted (lacking references, presentations, etc.), or if they concern a subject area that is not offered by arXiv. In addition, duplicates will be rejected, as well as titles that have been submitted even though the submitter does not own the rights to the title. A continuous peer review process is not necessary (arXiv, 2020c). WoS arXiv Scope of the citation data Web of Science stores citations for all papers included in the Web of Science CoreCollection (1.6 billion citations in total) (Clarivate, 2020b).

Scope of the citation data	Web of Science shows the number of citations for each included article. Furthermore, it is possible to display the h-index.	The Bibex extension integrated in arXiv collects citation data from several sources: Prophy, Semantic Scholar, Inspire HEP and ADS. Prophy includes citations to over 90 million titles (Prophy, 2020), Semantic Scholar claims to include over 180 million titles (Scholar, 2020), Inspire HEP includes about 1.4 million titles Inspire, 2020), and ADS includes over 13.3 million titles (ADS, 2020). The extent of the overlap of titles among these different providers is not known.
Citation metrics	Web of Science shows the number of citations for each included article. Furthermore, it is possible to display the h-index.	In arXiv, the number of citations for individual articles can be displayed by the integrated extension Bibex. An h-index for authors or searches is not calculated.
Actuality	WoS databases are updated at different intervals, from daily to monthly. The Web of Science Core Collection, for example, is updated daily (Monday - Friday) (Clarivate 2020b).	arXiv is continuously updated because articles are submitted by the authors.
	A study by Lariviere et al. (2014) showed that the average time between publication of a preprint on arXiv and publication of the final paper in a journal (and thus inclusion in the Web of Science) depends strongly on the subject area. For physics, for example, this time span is comparatively low, averaging less than half a year, while for mathematics it is comparatively high, averaging more than a year.	
Domain diversity	Web of Science includes articles from all scientific disciplines, but according to its own statement, the coverage of natural sciences, health sciences, engineering, computer science and material sciences is the highest. There are regional indices for Korea, Latin America, Russia and China (Clarivate, 2020b). Although non-English papers are included, around 95% of all papers are in English. The majority of papers were published in North America and Western Europe, led by the United States and the United Kingdom (see Vera-Baceta et al.; 2019, Meho & Yang, 2006).	arXiv only accepts papers from the departments of physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering, and economics (arXiv, 2020a). The focus is on articles from the departments of physics, mathematics, and computer science. Non-English language papers are also accepted as long as an Abstract in English is included. No details are available on the distribution of languages or the origin of papers (arXiv, 2020d).

4.3 Vendor Criteria, Costs and Output

Both databases offer a quick guide to the most important search functions and terms, which can be found directly next to or below the search field. WoS offers a much more comprehensive guide, which can be accessed directly via a link next to the search button. Both databases also offer help files and a FAQ. Only WoS provides tutorials in the form of videos and self-guided training it also offers live training in several languages (WoS Group, 2020f). Only Web of Science offers customer support. Technical support is offered by both. WoS provides different contact options: a form on the website, by email, or by phone (Clarivate, 2020c). arXiv can only be contacted by email. Web of Sciences oldest index The Science Citation Index Expanded, (formerly known as the Science Citation Index) has been in operation since 1964. Web of Science was the first citation database and the only one of its kind for over 40 years (Li et al., 2010). Today, it is still considered one of the most important citation databases (Vera-Baceta et al., 2019). arXiv was founded in

1991 and has enjoyed increasing popularity ever since (arXiv, 2020a). In 2019, 243 libraries, institutions, and associations supported arXiv financially (arXiv, 2020e).

For the use of Web of Science, a license is required. The cost is not made public, as prices are always negotiated on an individual basis. A statement exists from the Texas A&M University Libraries that the cost of the Web of Science subscription in 2019 was $212,000 (Tabacaru, 2020). The cost of the video tutorials and live training is included in such a license. arXiv is completely free as a user

Web of Science supports a variety of export options: Single articles or multiple search results can be exported to End-Note Desktop or End-Note Online (both provided by ClarivateAnalytics), as well as to Excel, InCites, RefWorks and other file formats such as BibTeX, HTML and plain text. Furthermore, the search results can be sent by e-mail or printed (the last function is called "Fast 5k", because it can export up to 5,000 articles at once). However, with Fast 5k only author, title and source can be exported. With all other options, the abstract can also be included, or even the entire records of articles. However, it is not possible to export the original articles via Web of Science, because they are not stored by Web of Science. It is not possible to export more than 500 titles at once, except with Fast 5k. arXiv does not offer any functions to export to literature management programs or similar. Instead, it is possible to download any article directly from arXiv. Mostly in .pdf format, but some articles are also available in other file formats like Post-Script.

5. Summary and Outlook

In summary, both databases have different strengths. Web of Science is particularly well suited for basic literature searches due to the stricter quality controls and also due to the larger volume of articles. Web of Science is also better suited as a source for bibliometric analysis, as arXiv itself does not store citation data and does not offer any functions for analysis. arXiv, on the other hand, is particularly well suited to providing an overview of very recent research developments in one of the supported subject areas, because arXiv is a database that specializes primarily in preprints and provides highly current research results. Nonetheless, there is a potential loss of quality, as there appears to be no peer-review process. arXiv gains attractiveness that it can be used free of charge and all articles can be downloaded directly, also free of charge.

So far, the two databases have been compared exclusively from the point of view of content. However, data could not be found for all identified criteria, such as the costs of the Web of Science or the distribution of languages and countries of origin of the papers on arXiv. Some criteria, such as the completeness of the papers or the uniqueness of the papers, were only compared on the basis of data from the found literature, since an independent comparison would have exceeded the scope of this study. Furthermore, criteria such as ease of use and user interface have only been evaluated subjectively.

During the work on this topic, it became apparent that there are many uncovered areas that can still be explored. For example, the sources for citation data used by arXiv could be examined for

overlap or uniqueness of their data in order to get a complete picture of the citation data on arXiv, which in turn could be compared with the data of the Web of Science. Especially with regard to the criteria completeness and uniqueness of the articles, additional investigations could be carried out, as already mentioned in the critical appraisal, since the two investigations found on uniqueness, for example, resulted in different values. Moreover, the criteria catalog presented here could be used for comparisons between other literature databases.

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Analysis of Knowledge Productivity on Architecture: A Comparative Study on India and South Korea

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Abstract

The paper explores the knowledge productivity on Architecture with comparison of India and South Korea which is revealed in SCOPUS database. This study analyses the growth of research work and found that the mean RGR is 0.86 and realized about productivity of authors, the most prolific author is Yoo, H.J. with 126. When come institutional productivity Korea Advanced Institute of Science & Technology has stands first with 2607 publication. Then found that knowledge productivity is by India is more than South Korea i.e., 38807 over 23761, and India's growth rate of productivity is higher than South Korea on architecture literature.

Keywords: Knowledge Productivity, Architecture, Comparative study, India, South Korea, Relative Growth Rate (RGR), Doubling time (Dt).

1. Introduction

India and South Korea have different traditional, architecture and culture. Therefore, a comparative analysis of research productivity on Architecture between the India and South Korea. Scientometrics is an analysis of quantitative features and characters of scholarly communication on any field. Its Emphasis is placed on the investigation in which the development and mechanism of science are studied by statistical mathematical techniques. Therefore, an attempt has been made to analyze and determine the Relative Growth Rate (RGR); Doubling time of research publications; authorship pattern; collaborative measures and ranking of journals based on a few publications appeared and make suggestions for special libraries dealing with architecture collections for framing the library policy and program.

2. Literature Review

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

Pattanashetti & Harinarayana (2017) has inspect the research output of Mechanical engineering of Indian and South Korean indexed in Science Citation Index – Web of Science for the period 2011 2015 by several parameters like growth of literature, communication channels and geographical distribution, collaborative between different countries publication and Top productivity institutions, most productive authors, and cited research paper. They founded 11,041 publication and count 34,437 citation. They suggest that to improve the quality of Indian and South Korea research publication. Also they suggest to build a competence and knowledge base research output to help bridge fill gap between Science and Technology of leading countries. Gupta et al. (2013) are analyses the deferent qualitative and quantitative measures of Science and Technology (S&T) publications of 15 years i.e., 1996 to 2011 retrieved from SCOPUS database. They suggest that need to increase the quality of Indian research publication compared with other developed countries. Also, India have developed scientific capacity in research publication. Brij Mohan Gupta (2010) is compared overall S&T publications output of India, China and South Korea from twenty broad subjects as extracted by the SCOPUS database in terms of growth of publication, share of Publication collaboration, H-Index and Most cited papers. He explained that china has far better South Korea and India in the global publication and h-Index but lack behind in the international collaborative and high cited papers.

3. Architecture in India and South Korea

Indian architecture, means "Vastu-Shastra", literally "Science of construction" have glorious from Mamuni Mayan (Mahabharat period) to Indo-Saracenic Revival architecture, developed by the British in the late 19th century, depicted on Indo-Islamic architecture (*India - Wikipedia*, 2020). South Korea have tumultuous history, construction and destruction has been repeated boundlessly, resulting in an interesting combination of architectural styles and designs. The Korean traditional architecture is considered by its harmony with nature. After Korean War the reconstruction, incorporating modern architectural trends and styles in architecture. Development of economic growth in the 1970s and 1980s, active redevelopment saw new horizons in architectural design. Contemporary architectural efforts have been constantly trying to balance the traditional philosophy of "harmony with nature" and the fast-paced urbanization that the country has been going through in recent years (*South Korea - Wikipedia*, 2020).

4. Objectives

To find out the growth rate of research publications on architecture from India and South Korea
To compute the Relative Growth Rate and Doubling time of publications.
To find out Institutional productivity and channels of Publications
To Know the most prolific authors in architecture research literature

5. Method of Study

The SCOPUS database is chosen for the study. A total 62196 documents have been found, out of that 38807 from India and 23761 are originated from South Korea. Micro office 365 has been used for the data analysis.

6. Knowledge productivity on Architecture

Literature on architecture first published in year 1956, then gradually increases by year by year, recently every year the research productivity has attained more than 6000 publication. So, a total of 62196 publications found on Architecture in SCOPUS database.

6.1. Year-wise distribution of publications

Table-1 Year-wise Publication

Year	Publications	Year	Publications	Year	Publications
2021	411	2002	553	1983	9
2020	6308	2001	466	1982	6
2019	6840	2000	416	1981	8
2018	5912	1999	393	1980	7
2017	4847	1998	366	1979	5
2016	4774	1997	419	1978	7
2015	4353	1996	269	1977	4
2014	3656	1995	180	1976	7
2013	3197	1994	148	1975	1
2012	3107	1993	124	1974	3
2011	2752	1992	58	1973	6
2010	2266	1991	62	1972	1
2009	1951	1990	53	1971	4
2008	1801	1989	38	1970	2
2007	1651	1988	34	1969	3
2006	1572	1987	23	1967	1
2005	1288	1986	21	1964	1
2004	1015	1985	19	1958	1
2003	764	1984	12	1956	1

The table 2 reveals that India's publications in recent block period i.e., 20,993 (2016- 2021), is twice than previous block period is 10,905 (2011-2015) whereas it is not in case of South Korea. Therefore, it is inferred that comparatively, India's publications is higher than South Korea.

Table-2 Research Publication in Five-year Block period

Year	India	South Korea	Collaborated	Total
2016-2021	20993	8327	228	29092
2011-2015	10905	6255	95	17065
2006-2010	4238	5037	34	9241

2001-2005	1462	2633	9	4086
1996-2000	664	1205	6	1863
1991-1995	299	273	0	572
1986-1990	140	29	0	169
1981-1985	53	1	0	54
1976-1980	29	1	0	30
1971-1975	15	0	0	15
1966-1970	6	0	0	6
1961-1965	1	0	0	1
1956-1960	2	0	0	2
	38807	**23761**	**372**	**62196**

6.2. Relative Growth Rate (RGR) and Doubling time (Dt) of productivity

Relative Growth Rate (RGR) and Doubling time (Dt) is related to growth study of the literature productivity. RGR is relative growth rate of the publication means the increase the number of productivity in the specific period and Dt is directly related to relative growth rate and is defined as the time required for the publication to become double of the existing amount (Science, 1994).

Table-3 RGR and Dt

Year	No. of Publication	Cumulative No	Log p1	Log p2	RGR	Mean RGR	Dt	Mean Dt
1956-1960	2	2	-	0.69	-	-	-	-
1961-1965	1	3	0.69	1.10	0.41		0.59	
1966-1970	6	9	1.10	2.20	1.10		1.59	
1971-1975	15	24	2.20	3.18	0.98		1.42	
1976-1980	30	54	3.18	3.99	0.81		1.17	
1981-1985	54	108	3.99	4.68	0.69		1.00	
1986-1990	169	277	4.68	5.62	0.94		1.36	
1991-1995	572	849	5.62	6.74	1.12	0.86	1.62	1.24
1996-2000	1863	2712	6.74	7.91	1.16		1.68	
2001-2005	4086	6798	7.91	8.82	0.92		1.33	
2006-2010	9241	16039	8.82	9.68	0.86		1.24	
2011-2015	17065	33104	9.68	10.41	0.72		1.05	
2016-2021	29092	62196	10.41	11.04	0.63		0.91	

Growth of architecture literature is depicted in table 3. The highest growth of literature found during the year 1996-2000 and lowest growth of literature in the beginning year 1961-1965. The mean relative growth rate is 0.86 and mean doubling time is 1.24. After the year, 2001 relative growth rate and doubling time has gradually decreases.
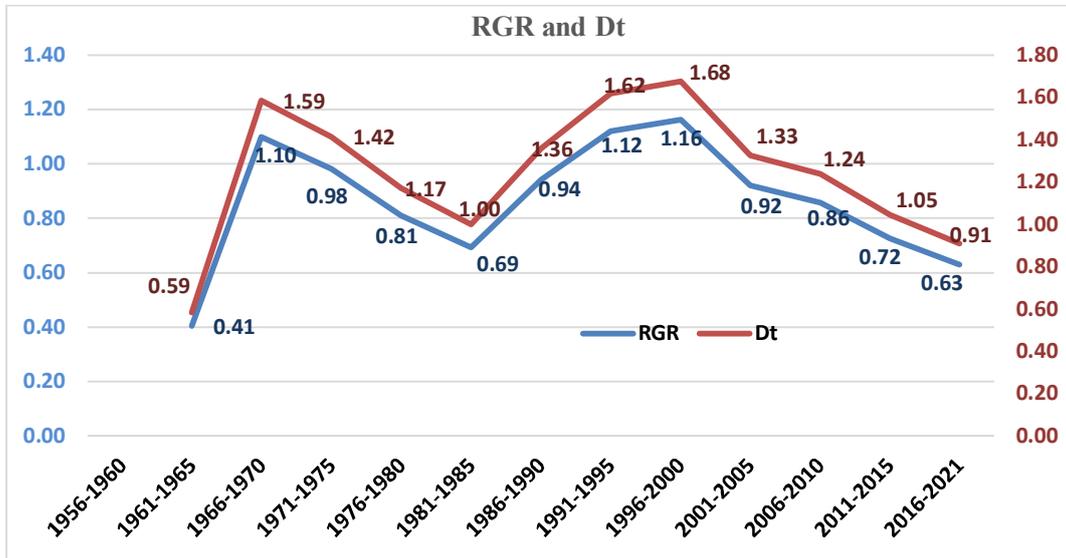
Fig. 1 RGR and Dt

6.3. Institutional productivity

Table-4 Top 20 Affiliated Institution

Ranking	Affiliation	Country	Publications
	Korea Advanced Institute of Science & Technology	S. Korea	2607
	Seoul National University	S. Korea	2326
	Electronics and Telecommunications Research Institute	S. Korea	1929
	Yonsei University	S. Korea	1229
	Indian Institute of Science, Bengaluru	India	1223
	Samsung Electronics Co. Ltd.	S. Korea	1194
	Indian Institute of Technology Kharagpur	India	1187
	Korea University	S. Korea	1162
	Sungkyunkwan University	S. Korea	1158
	Anna University	India	930
	Hanyang University	S. Korea	856
	Pohang University of Science and Technology	S. Korea	847

Indian Institute of Technology Delhi	India	829
Vellore Institute of Technology, Vellore	India	805
Indian Institute of Technology, Bombay	India	788
Kyungpook National University	S. Korea	766
Indian Institute of Technology Madras	India	717
Kyung Hee University	S. Korea	664
Jadavpur University	India	627
Indian Institute of Technology Kanpur	India	576

The table 4 depicts the institution-wise publications. Highest numbers of publications were originated from Korea Advanced Institute of Science & Technology (South Korea) i.e., 2607 followed by Seoul National University (2326); and Electronics and Telecommunications Research Institute stands 3rd position with 1929 publication.

6.4. Prolific of Authors in terms of publications

Table 5 Top twenty prolific authors list

Sl. No	Name	Country	Publication
1	Yoo, H.J.	S. Korea	126
2	Choi, K.	S. Korea	109
3	Nandy, S.K.	India	109
4	Oh, S.K.	S. Korea	104
5	Dhar, A.S.	India	85
6	Rahaman, H.	India	85
7	Park, I.C.	S. Korea	83
8	Sunwoo, M.H.	S. Korea	83
9	Kang, S.	S. Korea	82
10	Kim, L.S.	S. Korea	82
11	Gupta, M.	India	79
12	Hong, C.S.	S. Korea	78
13	Kim, H.K.	S. Korea	78
14	Kim, S.D.	S. Korea	78
15	Chakrabarti, I.	India	77
16	Lee, H.	S. Korea	76
17	Pedrycz, W.	S. Korea	74
18	Saxena, M.	India	74
19	Park, B.G.	S. Korea	71
20	Paul, A.	India	70

In the above table shows that highly productive author(s) on Architecture. Yoo, H.J. has produced 126 publications followed by Choi, K. with 109 publications. Both are south Korean

second position shared Nandy, S.K. with 109 he from Indian. Therefore, it is inferred that South Korean authors are more productive than Indian authors.

6.5. Forms of the document

Table 6 Types of the Document

Sl. No	Type	India	Korea	Total
	Article	18178	12080	29989
2	Conference Paper	18064	10831	28830
3	Review	1038	498	1515
4	Book Chapter	1286	202	1479
5	Book	120	27	142
6	Short Survey	26	32	57
7	Editorial	18	33	50
8	Note	20	26	46
9	Letter	20	14	34
10	Erratum	9	11	19
11	Data Paper	9	3	12
12	Retracted	5	0	5
13	Business Article	0	1	1
14	Undefined	14	3	17

Table 6 show that form of the document which published on Architecture. Highest published research in the form of journal articles i.e., 29989, followed by conference papers with 28830 publications and reviews 1515 publications.

6.6. Channels of publications

Table 7 Channels of communication

Sl. No	Source	Publications
1.	Lecture Notes in Computer Science Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics	1808
2.	Advances in Intelligent Systems and Computing	1005
3.	Communications in Computer and Information Science	723
4.	International Journal of Applied Engineering Research	621
5.	Lecture Notes in Electrical Engineering	547
6.	ACM International Conference Proceeding Series	482
7.	IEEE Access	321
8.	Proceedings of SPIE The International Society for Optical Engineering	300
9.	IEEE Region 10 Annual International Conference Proceedings TENCON	288
10.	International Journal of Innovative Technology and Exploring Engineering	288
11.	Proceedings IEEE International Symposium on Circuits and Systems	269

12.	Proceedings of The IEEE International Conference on VLSI Design	253
13.	Procedia Computer Science	250
14.	Journal of Advanced Research in Dynamical and Control Systems	227
15.	IEEE Transactions on Consumer Electronics	221
16.	Wireless Personal Communications	213
17.	ACS Applied Materials and Interfaces	206
18.	International Journal of Recent Technology and Engineering	205
19.	RSC Advances	205
20.	Scientific Reports	203

The above table reveals that "Lecture Notes in Computer Science Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics" is most preferred channel with 1808 publications followed by "Advances in Intelligent Systems and Computing" that is 1005 publications; Communications in Computer and Information Science that is 723 publications.

7. Conclusion

The study results may help the library authority of Architecture libraries in India and South Korea dealing with collections in general and Architecture in particular, to frame the library policy and chalk out the programmes as well as allocate the library budget. It may also help to subscribe to the core journals also to weed out obsolete collections to make the collection up-to-date and lively.

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Automation and Digitization of School Libraries : Issues and Challenges with Special Reference to Delhi Schools

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Abstract

As we see computers are being used in every field of human activity as its number of physical properties. Computers have been in use from last many years into library and providing best possible information services to the library users.. Automated libraries have taken shape in the society. This paper will help us to know various library processes that have been automated, to identify the school libraries schools that have automated, to determine challenges faced by schools in automating the libraries, to determine what policy makers can do about school library automation in Delhi.

Keywords : Library Automation, Serial Control, Internet, Intranet, OPAC

1. Interduction

The library is considered part and parcel of the academic set-up in any school. Manyeducational institutions create the library primarily for it to serve as a supporting facilityfor educational activities. As the information technology revolution sweeps across everysector of the society, the library and information field is not sparred. Schools arerecognizing the importance of having computers in the library and automating theirprocesses. The results realised from automating are of great importance to schools asthere is efficiency and cost-reduction in terms of Library processes.

Now in these day's we have just entered in new millennium or new technological era. The ICT make lots of changes in every field also in Library information Services. In recent decades we have witnessed the establishment of automation industries and library information networks and services around the world through use of ICT. The use of Information Technology tools facilitates a vast flow of information to end user via information services.

Reasons for automating as given by Addullah (2002) ranges from need for school and libraryefficiency, curriculum support, information access, information skills instruction,

publicrelations and facilitating collaboration. The other significant reasons especially for usersof the systems include improved cataloguing and circulation of resources, availability ofreports while educational benefits for students would include greater access of resources.

ICT makes several changes in the area of library information services such as book acquisition, cataloguing Serial-control, Web-Opac (Online Public Access Catalogue), CAS and SDI etc. And change the traditional library into the e-library or information centre. Library information Officers saves budget, time, manpower in routine jobs and able to provide effective library information services without any geographical limitation.

The users of the library are from different areas such as producers, policy makers & experts, judges, observers, professors, teachers and students, as well as educated workers and farmers etc. The main purpose of the library is to provide "information" to all of these according to their needs. After re-updating the information, alloingaccess to this information to their respective users is the main purpose of libraries. But the students who are actually our future, who are the developers of the new society, new grounds of technology, and therefore they are most priotorised ones who must be served with this facility of automated library.

The late period of the twentieth century has been the peak period of the development and communication of knowledge related to science. Since 1965 its growth rate has increased from 5% to 7% per annum. Communication techniques are playing an important role in spreading knowledge. The modern instrument of communication presented by the web; and internet has introduced a special energy and velocity in the world of knowledge. Now we have to anticipate the future libraries of 21st Century and need to develop them accordingly.

Information technology is a mode used to convey or disseminate information and use innovative research in technology. Today, this information technology has absorbed all sectors from its activities. Computers are contributing in almost all the works. But information technology has given its attention to its work. Information technology is being used in the library for the spread of knowledge science.

2. Importance of research presented

Every day, the science is leaving its effects in different areas of the society. Science has left its impact so far that we cannot complete any activities of life without the help from any of these informatics techniques and devices. In the era of this scientific revolution, we have gradually been using information technology in all areas. In other words, the whole world has become a global village. Within a few seconds, we can broadcast any kind of information, through information technology, everywhere. Most of the use of information technology is currently being used to disseminate information along with the industrial areas. While the whole world is moving towards this technical edge the students who are perceived to be our future are the ones who must be made habituate with these technology and techniques. And particularly library automation could be the one from where a student can take the maximum advantage of learning.

3. Understanding Automation

The term automation is used in automatic manufacturing, control system, computing machinery or equipment that reduces the participation of human labour in production or services"

– New Encyclopedia Britannica

"Any work which has been done with help of automatic machine like computer without any human interface is called automation. The biggest benefit of automation is that it saves labor, however, it is also used to save energy and materials and to improve quality, accuracy and precision".

On the basis of the definitions of automation the following may be considered to be its essential characteristics:-

• The operations of processes are carried out automatically
• Avoids or reduces human actions and thus save labour
• Increases accuracy and quality of work
• Increases efficiency and spped- up the operations

4. Library Automation:

The Phenomena of mechanization of traditional library activities, such as acquisition, serial control, cataloguing, circulation control etc., was called library automation.

"Library automation refers to use of computers, associated peripheral media such as magnetic tapes, disks, optical media etc. and utilization of computer based products and services in the performance of all type of library functions and operation. Computers are capable of introducing a great degree of automation in operation, function since they are electronic, programmable and are control over the processes being performed".

Library automation is the general term for Information communication technologies that are used to replace manual system in the library.

5. Importance of Proposed Investigation:

Traditionally school libraries have been catering to the document needs of their users These libraries also provide their library and information services to the students by allowing them to have access and use of books, journals, magazines, maps and atlases, reference books, audio and visual documents, and other such printed and non-printed documents. Libraries have to provide their valuable library and information services to the large community of students as it comes under their duty of social and professional obligations.

Since now a days, computers are being used in every field of human activitybecause of its speed, accuracy and capability of large scaleprocessing.Computers have literally invaded and entered into library andinformation services for the effective use and for the benefit ofthe library users.It is perfect space saving device as well because information storedon computer readable devices takes much less space than theconventionally stored systems.

Libraries and information centres have devised libraryautomation efforts and practices in order to provide their betterlibrary and information services to the right users in right time atthe earliest.

The following are the areas where computer are being used at present.

1   Online public access catalogue
         Online Public Access Catalogue (OPACs) the problem being faced by the users

in locating the document was the first to be targeted in the library automation. As a result the work first started in this direction. There was one more reason for this and that was the availability of CDS/ ISIS software which had the facility of catalogue only. It was in contrast of the special libraries where the work first started on providing information services like CD-ROM search. Even today this area of automation has more activity than any other area. It has now graduated to Web-OPAC (web based online public access catalogues) where university libraries have made their databases available on their websites. This has eliminated the need of installation of search software on the user's terminal. One potential which remains unutilized is the use of search data for research purpose as the search history can provide very useful tools for the librarians to formulate their collection development plans.

2   Circulation

Circulation Circulation is one of the main activities of a university library or any library per say. In university libraries, however, the number of books issued and retuned are more than in special libraries. Therefore, the next area which was taken up was the circulation. In some of the libraries the number of books issued/returned may be more than one thousand per day. We at IIT Roorkee (formerly University of Roorkee) has experience of issuing 1500 books in six working hours. Sometimes there used to be a queue of more than 100 students, since the free hours for all students used to be the same, before automated circulation started. Use of barcodes had made the life very simple due to added accuracy and speed. Besides speeding up the issue/return, printing reports, sending reminders also become very easy. Circulation data also provides a very important insight into the book use pattern. Librarians should try to use this data for research and development purpose.

3   Acquisition

Acquisition- Use of computers in acquisition remains a low priority area. Not many libraries are using computers in acquisition. On reason may be the continuously reducing budget for purchase of books. But this area needs to be strengthened. Computerization at the stage can help not only in order processing but also can be a very effective tool in budget control. You can allocate funds to different departments based on a set formula, can send department heads about non availability of funds, can control over ordering and also utilize the data entered at this stage for technical processing and OPAC.

4   Serial control

Serial Control Idiosyncracies involved in serial control affects the use of computers in serial control and hence the area is not very well represented at automation scenario. One more reason is the unsuitability of serial control modules available in most of the library Management Softwares. The procedures developed by these softwares are so cumbersome that sometimes it looks easier to use normal method rather than automation. However, this area provides very good stage for use of computers as it can help tracking the missing issues very efficiently and provide the current awareness services and

even the SDI services besides budget control.

5   Intranet

Making the information available on intranet is also growing popularity as it eliminates the need of installing the software on the users' terminals. Users can access the catalogue through intranet or they can find the status of the books issued to them through web access. CD-ROM resources and other digital resources can be accessed on intranet. The beauty is that one need not be conversant with the software as the web links are available through the web page. Growing installation of campus wide networks is also playing a positive role in this direction.

6   Internet

Internet Use of Internet for academic purposes is also increasing day by day. More and more libraries are putting their resources on Internet. Internet is the medium both to access and disseminate information. Internet has emerged as a very big virtual library which has information on practically every subject and in every media may it be text, audio or video. Libraries should use this facility to the best of their capability. They should provide links to similar type of libraries through web pages. One very good use can be designing of e-gates where user can have access to the electronic resources through a common user interface. I would like to mention that a number of free e-journals are available on the Internet. The prominent among library and Information Science are 'D-Lib Magazine', Issues in science and Technology Libraries", "Cybermetrics" etc.

7   CD-ROM services

Digital Libraries: Digital library has recently become the buzzword for librarians. In the last year most of the seminars and the conferences had 'digital libraries' as their theme. Digital libraries can be of two types i.e. digital libraries of the digital text available in the market such as e-journals, CD-ROM databases, e-books, software etc. or it can be developed from the printed text available in the library. If a library takes a decision to develop a digital library of its collection specially theses, dissertations and old journals, it can solve the problem of space and preservation both. But the decision about creating such decision is taken to be very carefully as it will prove a very costly venture both in terms of money and manpower.

6. Prospects: Futute of Library Automation

Having talked about the problems and areas of applications let us talk about future prospects. I can definitely say that the things are changing for the good. Now school authorities are realizing that there is no way to escape library automation. They are finding various ways to finance their library automation projects. Librarians are also realizing that they can not remain indifferent to the change, otherwise they will be labeled outdated. One area of concern is the library science graduates being produced by our library schools.

It is surprising that UGC is giving responsibility of refresher courses of library science to the

library science school and not to the libraries who are established themselves as advanced libraries and uses the technology far ahead than the library science schools. Existing staff is getting rid of the fear of computerization. They are coming forward to learn and make themselves suitable to face the challenges of the new millennium. Standardization is increasing and the better softwares are available.

7. Review of Literature

BEHRA (J K) & SING(S P). Problem & Challenges of Collection Development of Indian Libraries in Digital Era -An Assignment .Journal of Arts, Science & Commerce .V2(1).Jan,2011 Singh has written in his present article that the advancement of knowledge in the human civilization led to the emergence of the library. Due to the increase in daily library collection, one time physical stocking becomes difficult due to this problem. The library has started.

BERGMAN (H).The Library and its User as Examplified by Vienna University Biblos V 34(4), 2002. In his report, Vienna University conducted a survey related to their library usage among 500 teaching staff. The literature related information was included in it. The facilities provided by the School Library, User Training, SchoolLibrary opening hours, critical studies about services and the need for improvement etc. have been taken into account.

CHOI(Y)and RASMUSSEN(E).What is Needed to Educate Future Digital Librarian: A study of Current Practice & Staffing Pattern in Academic & Research Libraries.D-lib.V12(9),sep,2006 In view of the current changes in the library, in the article, what is the quality and education in the library should be evaluated in the future.

DAS (A K) and DATTA(C D). Information Retrieval Features in India Digital Libraries: A critical Appraisal Vol23(1),2007. Das, Datta and Sen have tried to explain the current nature of digital library, various aspects of digital library and requirements in their joint articles.

DEOGHURIA(S)Are research Libraries in India Prepared in Digital Age? LIS conference,2010. In this article, they told that digital information is continuously growing as a component. Research has a significant impact on research libraries. The collection of research by digital libraries in digital form is increasing day by day

But how much adaptation of research libraries in India and how much adaptation of this new technology has been introduced, it has been presented in this article. At the same time, detailed explanation of what difficulties are being faced by the research libraries in India

JONES&THOM: Mobility, Digital Libraries & a Rural Indian Village.JCDL.2009. Jones, according to one of his surveys, found that in the developed countries, lots of people use information technology in daily activities. Therefore, they have prepared a blueprint for Information Technology-based libraries for the promotion of education. In this article, on 3 mobile platforms, they have been explained.

SAMANTARAY (M).Preservation & Management of Digital Resourses Polices, Issues & Challenges INFLIBNET Planner. 2006. Analyzing the long term strategies and techniques for their preservation, while explaining the difficulties in the maintenance of digital tools and their systemization in their articles.

Ahmad (2009) studied on Library Automation of Al-Barkaat Institute of Management Studies, Aligarh with the help of Alice for Window (AFW) LibrarySoftware. The study found that ABIMS Library was the first fully automatedlibrary among all self financing Institutes available in Aligarh,

which hasprovided, Online services to its users through Inter Library LAN System in whichusers can access the library database from the Online Public Access (OPAC) andalso help to library staff to provide good reference service to staff and students.

The concept of automation has changed the scenario of librarymanagement. In this regard, discussing library automation, its problems andprospects Bhanja and Barik (2009) highlighted in a study that success of libraryautomation mostly depend upon nature of softwares used for the purpose andemphasis on selection of good library software for automation.

Ibohal Singh and Giridhari Singh (2009) in a study discussed thelibrary automation in public library system in North East India. Based on thefindings of a sponsored research project, the study highlighted Public LibrarySystem, ICT, Scope and Methodology adopted and emphasized backgroundinformation, services, existence of library committee and automation status of thelibraries in the region.

The status of Automation of the Central Library, IIT Guwahati has beenassessed by Sarma and Jyotirekha (2009). The study discussed the status ofautomation and networking, hardwares used in the library, services and facilitiesprovided. The same has shown that the library was fully automated using Libsys software package. The study also revealed that IIT Guwahati Library providesexcellent service to its user and it could be considered as one of the best librariesin North East India.

In carrying out a pilot survey in ten special libraries in Manipur assessingtheir automation status, Vaiphei and Bembem (2009) analysed the problems andprospects of automation in Manipur. The study revealed that most of the speciallibraries in Manipur are not automated due to various problems like lack ofseparate building, untrained staff, no qualified librarian and paucity of funds forlibrary, etc.

Information has been regarded as a national resource which affects allhuman activities. Information is power and indispensable. In this context,Bhuyan (2011) in a study discussed about the automation and networking ofpublic libraries in India with special reference to two districts of Assam. Thestudy shown that due to financial inadequacy, lack of proper administrativestructure within the library, lack of professionally trained staff and nonavailability of mechanical devices, the public libraries are limiting themselves tothe traditional and pedestrian functions of the library.

In assessing the present status of automation of public libraries in Assam,Das (2011) found that infrastructure and the service of the public libraries inAssam are not modernized but somehow traditional services are provided tocommunity and public library automation is in its initial stage though its processhave been started during 2004-2005.

Jayaprakash and Balasubramani (2011) in their study have emphasized that automation of library operations and services are essential for efficientfunctioning of the library and saving the library user's time. In this purview, thestudy has investigated the Automation in University libraries in Tamil Nadu. Itdiscussed automation, its need and application in university Libraries. The studyexplained the various problems faced by authorities and the staff during theprocess of automation. The tool adopted to conduct the study was a wellstructured questionnaire.

Joshi and Nikose (2011) discussing problems and prospects inautomation and networking in libraries in India, highlighted some of the scientificand technical libraries working and leading in library automation under suchR&D institutions like CSIR, ICMR, ICAR AND DRDO. The study alsodescribed networking as the linkage of working procedures for the exchange ofinformation

resources and revealed some of the barriers of networking as highereducation authorities still have a dilemma as to whether or not resource sharing ispossible through networking. Potentialities of INFLIBNET, as the study shows,are still not known to many academic libraries and UGC fails to provideappropriate funds to academic libraries for computer software and hardware.

A study was carried out to assess the automation status of district libraryKamrup by Medhi and Deka (2011) which has revealed that the library does notuse computer for automation of the library services. The study also found that thelibrary was still giving traditional based services to the users.

Akinyi R, Mulaha in "The evolvement of school library resource centers inKenya" aimed to help the Kenyan educational authorities and others to understand thevalue of a school library resource center in the educational process and in the schoolprogram.

"School library provision in Nigeria: case studies ofsix secondary schools in Oyo, Ondo, and Ogun states" by Olabisikolapo was a summary of findings on school libraries into the development of formal education in Nigeria and the relative neglect of school library provision. The author attempted to establish the factors responsible for the generally poor standard ofschool library provision and suggested what might be done to improve the status.

Omrin and Olayinka (2007) in a study seek to find out the advent of computer on libraries and information centers. Majority of the public libraries in Nigeria are found to perform their operations manually and have no requisite technologies to easily access information resources and services most especially on the internet, on-line data bases and CD ROM databases and lack of skilled staff in computerization was also observed. Computerization has a lot of impact on library and information centers since it helps them perform better than when their operations are manually carried out.

Imchen (2009) in his study, discussed computer application in libraries of Nagaland and also made an attempt of bringing awareness among the librarian the importance of computer application in libraries in the state. Personalinterview and random sampling technique, and observation method have been used successfully in his study.

ICT infrastructure is an important resource of modern library or information centre. In the study of ICT Infrastructure in Special Libraries in Kerela, Mohamed (2006) has revealed that the libraries of Kerala apply ICT for providing efficient services. The investigation also shows that majority of the special libraries have basic hardware facilities like servers, computers, printers, barcode printer, and barcode scanner, etc.

College libraries play an important role in keeping pace with modern development in information technology and information service to the student, as Sinha and Bhattacharjee (2007) studied. The study concluded that the status of computerization of library housekeeping operations and computer based library services of college libraries of Southern Assam was in nascent stage. Only few colleges, which are best colleges affiliated to Assam University, Silchar have started implementing project of automation and networking their college libraries which serve of the students more better. The study suggested that Government of Assam and UGC should come forward to provide substantial financial assistance to the colleges located in the remote areas of South Assam, which is popularly known as Barak Valley to start with modernization of their college libraries and services so as to bring these colleges at par with the college libraries located in other parts of India. ICT in fact encompasses any medium to record information (magnetic disk/ tape, optical disks (CD/DVD), flash memory etc. and arguably also

paper records); technology for broadcasting information- radio, television, and technology for communicating through voice and sound or images- microphone, camera, loudspeaker, and telephone to cellular phone.

Libraries and Information centres have been employing ICT and electronic information resources and delivering services to satisfy the diverse information needs of their users. Gupta (2009) in a study investigated the views of the users towards e- resources provided by CSL library. The finding of the study have shown that most of the users are using computer daily and revealed that CDRL library uses LINUX Windows NT and Windows 98/2000/XP operating system for networking purpose which are useful in automating the library.

While conducting a national survey of the status of school library automation in Malaysian Chinese secondary schools, Tee Lay (2010) revealed that the Malaysian Chinese secondary school libraries started automation during 1990s and have been actively involved in library automation projects since 2000. It also identified important factors in determining the system used and areas, need for future planning, initiatives in implementing library automation, etc.

8. Research Gaps Identified in the Proposed Field of Investigation

Under the above review, it has been clarified that no research work has been done in the current research study. It will be the first research work by the researcher who will reveal the state of the application of information technology in the selected school libraries of Delhi. So there is a considerable distance between research available and current research research.

Objectives of the study
- Recognize the need for information technology in libraries.
- Information about the various software used in library digitization and the usefulness of their methodology.
- Responses to the implementation of Information Technology in the selected school libraries of the State of Delhi (To identify appropriate, useful, economical and simple rules from the methods used in the information mechanism)
- To study the difficulties in the implementation of Information Technology in the selected school libraries of the State of Delhi.
- Analysis of the impact of information on employees working in libraries from information technology.
- Evaluation of benefits and services from digitization.

9. Hypothesis

The proposed research report is based on some important concepts: The following hypothesis for this research work has been created: -
1. Information technology in the libraries of the State's School is developing.
2. If proper use of Information Technology is used in Library, than they lack its systematic implementation.
3. The present practice of information technology is boosting in libraries of the Selected School of Delhi State.

4. In the school's library, the status of trained employees in the service of the ICT is not satisfactory.

5. In the absence of proper Student's training, the response of Studentin using ICT based automated Library remains negative.

Source of information
1. Books
2. Journals and Magazines
3. WebandInternet

Other tools and research methods

The tools and research methods used in this study will be the primary sources of research. In the absence of which, we cannot build research-oriented building. Therefore, the selection of appropriate, competenttools and procedures for the quality, authenticity and utility of research should be extremely prudent.

Method of Research:

Out of many methods available for any research, any one can be adopted. And here I as a researchers will use the survey method for my current study. Survey method is such a significant method, when it is to identify, what is the behavior of normal or representative situations in the present state. Hence we found the survey method to be most appropriate.

Justification of the study:

Collections of responses related to the survey work will be done from the selected school of Delhi state.

Responses will be collected from the selected school of Delhi statethrough questionnaires and interviews, in which the samples will be collected from the following consumers.
1 Librarian
2 Faculty
3 Student

A total of 200respondantswill be asked to fill a questionnaire for the comparative analysis, and on the basis of the data obtained the results of the research will be measured using the statistical method. We hope to get feedback from around 70% of respondents. The table and Graph will be displayed as per the requirement and comparative study will be done.

Extraneous

Many research methods will be used in this research such as-
1 Questionnaire and Interview
2 Reviews
3 Survey
4 Statistical Tests

Questionnaire is a technique by which we can easily learn about users and their needs.

Questionnaire will be divided into two parts.

Part I: - Personal details of consumers and

Part II: - Details regarding their requirements and usage procedures will be given.

Based on the received questionnaire, the available facts and data a comparative analysis will be done on this basis. Therefore, in this research, both the direct and indirect questions will be collected and analyzed by the statistical method so that the situation can be understood properly.

This Thesis is divided into following chapters as follows:

1. Introduction
2. Review of Literature
3. Research Methodology
4. Data Analysis
5. Findings, Conclusions and Suggestions.

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Case Study on Sharing and Cooperation on East Asian Digital Resources : Focusing on the East Asia Digital Library(EADL) pilot service

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Abstract

In December 2020, the National Library of Korea(NLK) and the National Diet Library(NDL) of Japan launched a pilot service of the East Asia Digital Library(EADL). About 8,000 digitized materials can be used freely by anyone online via EADL. These materials have been digitized over the years by NLK and NDL for users in their countries. At EADL, these materials can be accessed using integrated search and curated collection browsing. This is likely to be a very useful service for various users such as researchers who need to use the materials of Korea and Japan. This study analyzed the contents and services provided by the EADL pilot service and discussed ways to improve them.

Keywords: Digital Library, East Asia, National Library of Korea, National Diet Library

1. Introduction

Over the past 30 years, many libraries have digitized their collections. As a result, libraries have a fairly large amount of digital resources. Due to this, effective digital library services have recently become available. By simply accessing the digital library, digital resources can be used by anyone, anytime, anywhere in the world. This is especially the case for historical materials that have no copyright restrictions. For these materials, it is possible to provide easy access and various methods of use so that anyone can use the digitized materials. It is very meaningful for various institutions and countries to work together in order to provide these services. World Digital Library and Europeana are representative examples of international cooperation in digital libraries. Libraries, museums and archives from various countries are participating in the World Digital Library and the Europeana. Thanks to these large projects, the digital cultural heritage and digital knowledge resources available on the Internet have increased. In addition, researchers who study history and culture and art can easily access a wealth of research materials.

The National Library of Korea(NLK) has digitized over 8 million materials and provides them online. It would be very meaningful to provide these digitized materials to users not only in Korea

but also around the world. The National Diet Library(NDL) of Japan also provides more than 2.75 million digitized materials. Among them, there are many materials whose copyright protection period has expired, and these materials can be used for free by anyone on the Internet. If these digital resources of Korea and Japan are provided to anyone around the world to use online, it will be a useful service for researchers doing research on Korea, Japan and East Asia, as well as students and general users interested in East Asia. In March 2020, NLK and NDL signed an MOU to share digital resources and provide new access. Since then, NLK and NDL have been cooperating to build an East Asia Digital Library(EADL). As a result, in December 2020, the EADL pilot service was launched. The EADL is an online service that provides integrated search and access to the digital collections held by NLK and NDL. Over 8,000 digital materials and metadata are available via EADL. EADL is a pilot service stage, so there are many points to be improved in the future. More institutions need to participate in EADL and more digital resources must be provided via EADL. In doing so, EADL should be a service that is actually helpful to users. This study analyzes the contents and services of the EADL pilot service and proposes improvement plans.

2. EADL contents

2.1 Scope and features

Currently, EADL allows users to access 119 digitized books and 3,926 metadata from NLK's digitized materials. Users can also access NDL's 80 digitized books and 3,988 metadata(Table 1).

Table 1. Current status of data available on EADL

Institution	Digitized books	Metadata	Total
National Library of Korea	119	3,926	4,045
National Diet Library of Japan	80	3,988	4,068
Total	**199**	**7,914**	**8,113**

These are ancient and modern materials published between 700 and 1945, and the era distribution of the materials is quite wide. Table 2 shows the distribution of materials by publication year. Since EADL's materials are mainly old books, there are many materials whose publication year is unknown. Except for the materials of unknown publication year, the materials provided by the NLK were mainly published after 1800. Many of the materials provided by the NDL were published between 1600 and 1800.

Table 2. Current status of materials by publication year

Institution	Unknown year	~1000	~1200	~1400	~1600	~1800	~2000	Total
NLK	1,238	0	3	25	349	332	2,098	4,045
NDL	1,874	2	9	35	244	1,894	10	4,068
Total	**3,112**	**2**	**12**	**60**	**593**	**2,226**	**2,108**	**8,113**

Table 3. Current status of materials by chronicle

Korean chronicles		NLK materials	NDL materials	Japanese chronicles	
Unified Silla	(676-935)	0	2	Nara era	(710-794)
			6	Heian period	(794-1185)
Goryeo Dynasty	(918-1392)	22	15	Kamakura shogunate	(1185-1333)
			116	Muromachi shogunate	(1336-1573)
Joseon Dynasty	(1392-1897)	1,007	161	Azuchi Momoyama	(1568-1603)
			1,892	Edo shogunate	(1603-1868)
Korean Empire	(1897-1910)	143	2	Japanese Empire	(1868-1945)
Japanese occupation	(1910-1945)	768			
Republic of Korea	(1945-)	867	0	Japan	(1945-)
Unknown		1,238	1,874	Unknown	
Total		**4,045**	**4,068**		

On the other hand, Table 3 shows the status of materials by each country's chronology. Except for the materials of the unknown period, there are many materials from the Joseon Dynasty(1392-1897) among Korean materials. And there are many Japanese materials from the Edo period(1603-1868).

Table 4 shows these materials by language. There are many materials written in Chinese characters among the NLK and NDL materials. This shows that both Korea and Japan belong to the Chinese character culture.

Table 4. Current status of materials by language

Insti.	Korean	Chinese	Japanese	English	Dutch	Germany	Russian	Manchu	Combodian	Total
NLK	95	3,939	27	3	0	1	1	1	0	4,067
NDL	54	1,197	2,814	0	2	0	0	0	1	4,068
계	**149**	**5,136**	**2,841**	**3**	**2**	**1**	**1**	**1**	**1**	**8,135**

Still, there are not many materials available on EADL. However, if you look at the composition of the current materials, you can see the service scope and features of EADL. EADL can be said to be a service to share and provide access to historical materials of East Asia, which belong to the Chinese character culture region, such as Korea, Japan and China, so that they can be used anywhere in the world. The scope of materials provided by EADL is not limited to those held by institutions in the East Asia region. The purpose is to share materials published in East Asia such as Korea, Japan, China, etc. or written by authors in East Asia or related to East Asia. Therefore, any institution that has East Asian materials can be a participating institution in EADL, regardless of whether it is in the United States, Europe or anywhere in the world. As is the case with materials from other cultures, East Asian old materials are held by various institutions around the world. If such dispersed materials can be searched and accessed online, it would be very useful to related researchers.

2.2. Data construction and management

For EADL service, NLK and NDL provided metadata and original image files of digitized materials. In EADL, provided metadata is saved in Linked Data format and managed according to RDF-based ontology rules. EADL's data model is shown in Figure 1. CJKObject means data describing the original printed materials of digitized materials, and DigitizedObject means data describing the digitized materials. Also, ImageObject is data describing digital image files of digitized materials. Collection is data describing a digital collection composed of digitized materials. In the EADL data model, DigitizedObject and ImageObject are connected and managed centering on CJKObject, and CJKDLCollection is formed by organizing them.
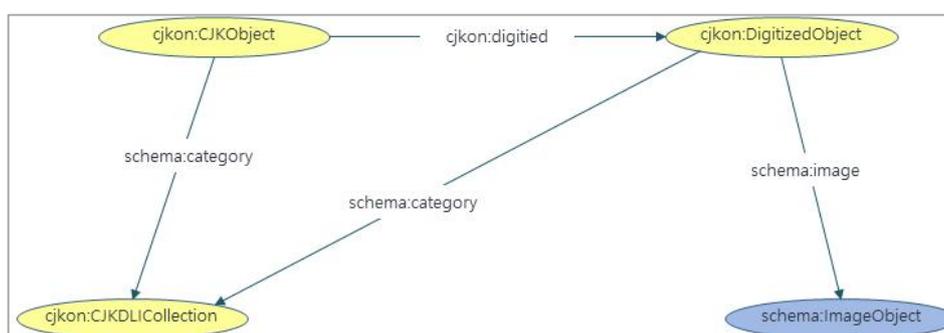
Figure 1. EADL ontology model

The metadata items for each of these types are shown in Table 5. In order to secure global interoperability, a metadata item based on DublinCore was constituted. The final saved data format is shown in Figure 2.

Table 5. EADL metadata item

Type	Term (mandatory)	Term (optional)	Note
Collection	Country / URI(Depth1)~ URI (Depth3) / Label / Description		Description of the Collection
Object	ID / Category / Label / Country that provides data / DataProvider	Author / Publisher / Subject / date / Issued Date / Description / Abstract / Language / Alternative title / Audience / Size / Publication Place / Local Holding and so on	Description of the original materials
DigitizedObject	ID / Category / Format / Publisher who digitized content / Holding Agent	Volume Number / Source / Thumbnail / Next Volume / URL viewing contents / Rights / contributor / Edition / Publisher / DOI / Date digitized / Medium / Number of image file	Description of the digitized materials
ImageObject	ID / Volume Number / Locator / Format / Bit-depth / File Path	Color Space / Compression Ratio / Resolution / Scan Ratio / Original Source	Description of the digitized image files

Figure 2. LOD publication page for EADL materials

In the case of objects with digitized images, major metadata such as Title, Creator, Publisher and Abstract are provided in three languages: English, Korean and Japanese. Digitized images of materials are provided to be viewed, printed and downloaded via the EADL viewer or viewers of each data provider(Figure 3).
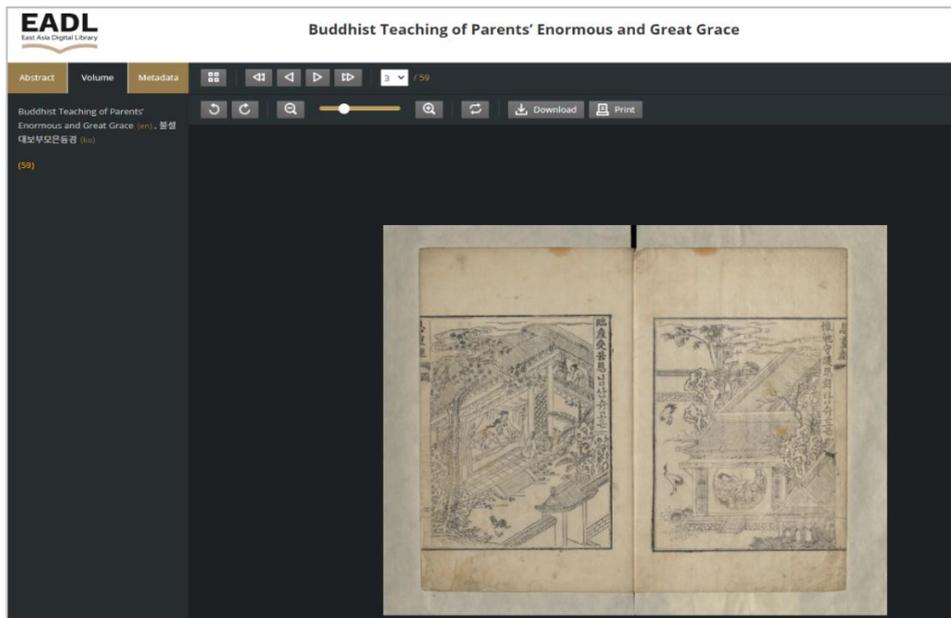
Figure 3. EADL viewer

3. EADL services

3.1 Target users

The target users of EADL are researchers who study East Asian Studies, Korean Studies, Japanese Studies and Chinese Studies. The greatest meaning of EADL is that it can provide digitized materials to researchers who explore East Asian history, culture, thought, literature and art. Also, for students and general users interested in East Asia, EADL can be a gateway to find useful materials. EADL will provide East Asian copyright expiration materials that can be freely captured or downloaded over the Internet. Then, users will be able to use EADL's materials for their own content or share it on social media. This will help users know about East Asia and increase their interest in East Asia. It will also encourage active use of East Asian materials.

3.2 EADL website

The EADL website supports the use of materials on the web. Figure 4 is the main page of the EADL website. The menu of the website is shown in Table 6. EADL is basically provided in English. However, some textual content such as About, FAQ, Terms and Policies are also available in Korean, Japanese and Chinese.
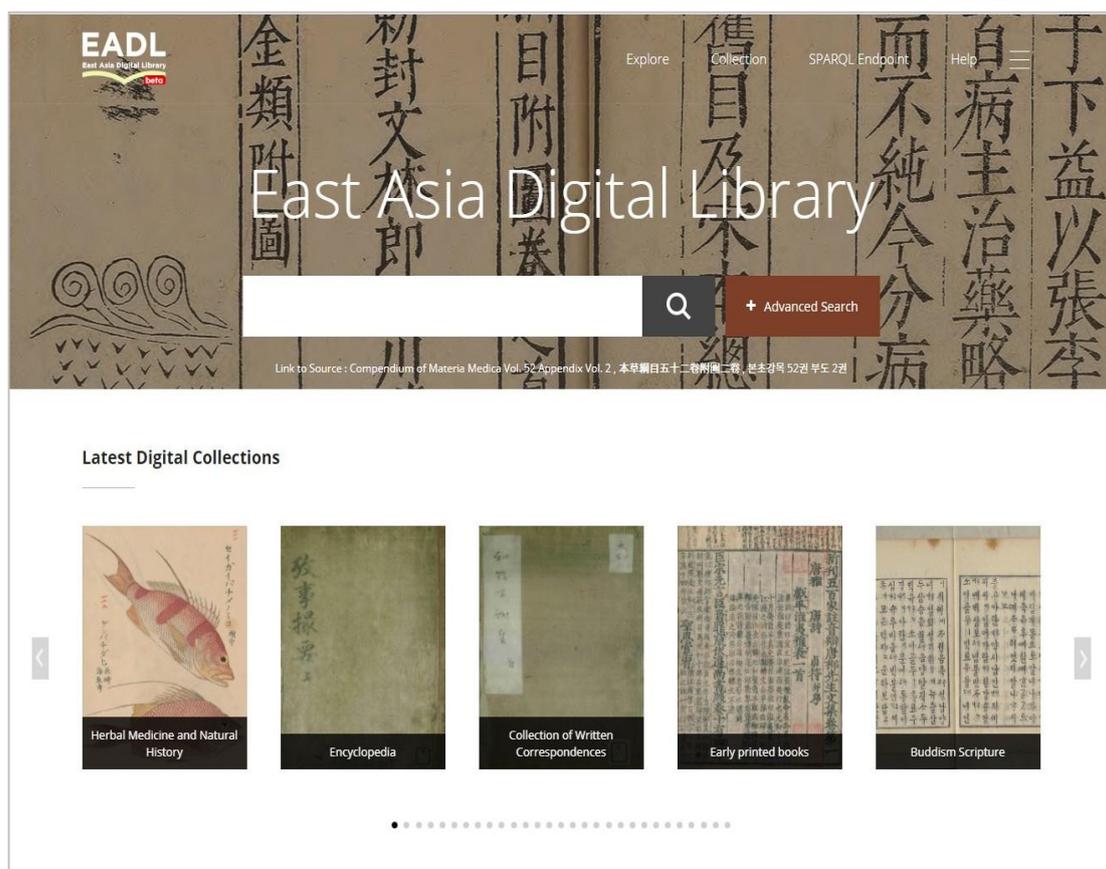
Figure 4. Main page of EADL website

Table 6. Menu of EADL website

Menu	Sub-menu	Function
Explore		It shows the full list of EADL materials
Collection	By Topic	It shows digital collection materials by topic
	By Institution	It shows digital collection materials by institution
	By Time	It shows digital collection materials by time
	By Chronicle	It shows digital collection materials by chronicle
SPARQL Endpoint		It provides SPARQL query function
Help	FAQ	It provides frequently asked questions and answers
	System Documents	It provides service information, ontology terms and ontology specifications etc.
Bottom information	Information	Introduction of EADL and participating institutions, contact information, Terms and Policies
	Contact Info	Contact information of EADL
	Quick Link	Links to NLK, NDL and SPARQL endpoint

The search box is fixed at the top of the website so that you can use the search function whatever page you are on. You can search by keywords of title, author or publisher etc., but not by keywords in Abstract. In addition, facets are provided so that the search results can be limited by holding institution, region, material type, language and publication year.

Collection is a service that enables users to browse materials by subject, institution, time and chronology. In 'By topic', materials are collected and provided by subject or type of material such as Korean arts, Korean Buddhism, Japanese old printed books, herbal medicine and natural history(Table 7). In 'By institution', you can see the collections of NLK and NDL that are currently provided. In 'By time' you can browse materials by publication year and in 'By chronicle' you can browse the materials by chronology(Figure 5).

Table 7. EADL collection by topic

Institution	Topic	Digitized materials
NLK	Documents of the Joseon Royal Family(25) / Korean arts(12) / Korean Buddhism(8) / Joseon Tongsinsa (21) / Women in Joseon era(18) / Dictionaries from Joseon Dynasty(5) / Scenic spots with beautiful landscapes(8) / First paperback novels in Korean, Ttakjibon(22)	119
NDL	Herbal medicine and natural history(10) / Old movable-type printed books(11) / Old printed books(9) / Others(50)	80

Figure 5. EADL browsing by time and chronicle

3.3 Data services

Linked Data is structured data which is interlinked with other data. It builds on standard web technologies such as HTTP, RDF and URIs. However, rather than using data to serve web pages only for human readers, Linked Data extends data to share information in a way that can be read automatically by computers. The vision of Linked Data is to make Internet a global database(by Wikipedia).

SPARQL is the standard query language of W3C to extract desired data from such Linked Data. As SQL is a standard query language in relational databases, SPARQL is used in Linked Data. Being able to query SPARQL means that it provides developers or users with a higher degree of freedom to access data conveniently. SPARQL Endpoint is an access point at which you can make SPARQL queries on the web(by NLK LOD).

EADL data is saved and managed in Linked Data format. If SPARQL Endpoint is provided, users can directly access data published as Linked Data through query. Therefore, EADL provides SPARQL Endpoint from a data service point of view. Figure 6 shows an example of using SPARQL Endpoint. Users can download data not only in RDF/XML format, but also in JSON, Turtle and other formats.

Figure 6. Example of using SPARQL Endpoint

4. Analysis and suggestion

Currently, EADL is open as a beta version and is in pilot service. Official service will begin in the future by improving errors or problems found through the pilot service and reflecting opinions of users. In this study, contents and services of EADL pilot service were analyzed. The results are as follows.

First, EADL could be a very useful service for researchers in related fields as EADL is a service that enables integrated search and use of digitized materials of national libraries in Korea and Japan. However, not enough materials have been collected yet to satisfy users. In fact, in order to become a useful service for researchers there needs to be much more materials available on EADL. Also, EADL currently provides only materials from Korea and Japan, so the range of materials provided is narrow compared to the name 'East Asia'. In addition to materials of Korea and Japan, it is necessary to collect and provide various materials from Chinese character culture regions including China. Then, the service that EADL aims for will become possible.

Secondly, EADL's target user setting is highly efficient. Since there are similar digital library services provided by various institutions, in order for EADL to differentiate its service, it is necessary to clarify the scope and features of materials provided and clarify target users. To do this, data collection and service planning should be done based on target user demand investigation. That way users can request a variety of services by research field, language and purpose of use. During the pilot service period, the user demand analysis and detailed service planning needs to be carried out.

Thirdly, EADL allows access to data through basic search function and search result restriction function through facets. The facets fit the features of materials provided on EADL. However, the search function needs to be continuously improved over the long term. It is necessary to make it convenient and easy to access data through searching by securing and utilizing controlled vocabulary. In order to improve the search function, EADL should consider the characteristics of Chinese characters and East Asian materials such as traditional and simplified Chinese characters, Japanese Chinese characters, Korean notation, Japanese furigana and Chinese pinyin. In addition, in EADL, metadata is not used as a path value to other materials, but only as the data itself. If metadata is used as a path value, users can move to view materials of the same title, author, era, subject etc.

Fourth, EADL provides data services such as SPARQL Endpoint for users to use data usefully. In the future, it will be possible to provide more various types of data besides Linked Data. Data service will become an important service not only to ordinary users but also East Asian data librarians.

Lastly, UI convenience of the EADL website should be improved. One of the purposes of the pilot service operation would be upgrading UI to be suitable for actual user usage pattern.

5. Conclusion

In this study, the contents and services of EADL were analyzed and the strengths and weaknesses were identified to derive improvement points. Since starting pilot service on December 17 2020, EADL has been operating the service for over a month so far. In the future, we need to collect more materials, attract participation from various institutions and reflect the

needs of real users. Through these efforts, EADL should be turned into a useful digital library service. EADL is a very meaningful attempt in that it provides digitized materials from Korea and Japan to anyone online. EADL should also collect rare materials related to East Asia that are scattered around the world and provide them to related researchers. Research and planning should be continued to make EADL a useful digital library service for users

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Digital Shift in LIS Education: How Covid-19 Has Changed the Way the LIS Students Learn

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Abstract

Pandemic of covid-19 appeared in the middle of the term, in the end of the first quarter of 2020. The government's sudden announcement about closing schools, universities, offices, shops, malls, and others confused people in general. Like the other institutions, universities finally closed their campuses and replaced the traditional classrooms into online classes. This sudden shift affected students and faculties. Adjustment and trials with the use of technology for classes were experienced by both students and faculties. This was a qualitative study to find out whether students of Library and Information Science enjoyed online classes rather than traditional ones. The results showed that students could not concentrate better in the online classes, because the physical environment was different. The surrounding people often distracted concentration because they never thought about online education before. The students felt that they could not interact with their classmates socially like that in the traditional classes. They also experienced increasing cost for education especially those with prepaid wireless. Faculties need to find strategies for online classes so that students will not feel bored with the online classes.

Keywords: Digital shift, LIS education, online classes, pandemic

1. Introduction

Covid-19 emerged in Indonesia in the middle of March 2020 when students were enjoying their traditional classroom—meeting their classmates and professors face-to-face. Some students enjoyed finishing their thesis and discussed their works with their classmates. However, it did not last long and it was not even half of the Spring semester that they had to end the joy of meeting classmates and professors in the campus. In such a sudden the condition changed: Students should stay at home, universities should close their traditional classrooms. Students could only meet the faculty through the screens.

The pandemic of covid-19 was announced when students were enthusiastic to study. People were asked to stay at home instead of working in the office, studying at schools or universities,

and travelling. The university soon also announced the closing of campuses and shifted the teaching and learning model from onsite to online classes. People experienced confusion with this sudden condition, including students who were enjoying studying in the universities. They could not go to their campuses. Instead, they should stay at home or apartment and studying online.

In a very short time, campuses became so quiet. Few people visited the campus for only some important issues. Some students stayed in the apartments or boarding houses due to finishing their thesis or dissertation, but most students coming from different cities or provinces went back home, teaching staff were all at home and they gave lectures from home. Of course this was such a hard change as in Indonesia teaching and learning are usually held in the traditional classrooms, instead of online ones.

Online classes are not common for most educational institutions—from elementary schools to higher education institutions. The general regulation required campuses to hold traditional classes instead of online ones and students are expected to attend most of the classes. In addition, like other Asian countries, teaching in Indonesia is rooted from confucian heritage, in which teachers or professors are the center of the classroom. Students are not expected to speak when the teachers or faculties give a lecture and the students should listen to the them. Students may ask questions when the teachers or professors finish their talk. This style of teaching and learning may shift in the online classes, depending on their adjustment to the environment and technology. However, in the beginning of the "forced online classes," in the early days of pandemic, it was clearly seen that the concept of online teaching and learning was still the same with that of the traditional classroom. Students were expected to listen to the professor who is explaining the topic in the online class. The same situation also happened in the elementary to high schools. Students wore uniforms and sat down in front of their laptops. Even during the ceremony, students should stand in front of the computer at home. When students should sing the national anthem, students were asked to stand up in front of the computer at home. In short, the physical real-world atmosphere was applied in the online space.

Nishikant (2009) stated that actually teaching online is different from the traditional one. Traditional classes require both students and faculty to be in the classroom during the sessions, while in the online classes, students are in distance and they even can hide their appearance on the screen and mute themselves. Onsite or traditional classrooms enable faculties and students to interact freely, without any barriers; and therefore, the atmosphere support their social and psychological ties. On the other hand, online classes do limit the interaction between faculties and students and among students themselves (Capra, 2011). Therefore, they should make adjustment when they move from traditional classroom to the online classes.

The shift from traditional classroom to online classes has indeed affected students and faculties socially and psychologically. Senior faculty who never attended online meeting experienced hardship in making adjustment, while young faculty and students had no problem with technology and online meeting as they already lived in both the real world and cyber space. However, the shift also raised questions: Whether students and faculty could make adjustment with this change, whether they enjoyed studying online, what aspects they find as challenges and opportunities?

2. Objective

This study was conducted to find out the impact of covid-19 pandemic on LIS teaching and

learning process and the effectiveness of online classes instead of traditional ones and the future of Library and Information Science (LIS) education in the developing countries, such as Indonesia.

3. Methodology

This case study was conducted at the LIS department (Graduate School of Information and Library Management), Gadjah Mada University in Yogyakarta, Indonesia during pandemic time. As it was impossible to distribute questionnaires and online distribution of questionnaires did not guarantee the responses, therefore, this study was conducted as a qualitative study by way of asynchronous and synchronous interviews using Whatsapp application. Whatsapp is used for this interview because most students use Whatsapp to communicate with anyone in Indonesia. Whatsapp is also the most popular medium for communication among university students and faculties. Students use whatsapp to contact their faculties or send files to them. Also, in the academic world, sharing files and contacting colleague are mostly conducted using mobile applications, while emails are not so common as Whatsapp. This is due to the convenience among them to use mobile phones for all activities. Sometimes they even joining the online classes using mobile phones instead of using desktop or laptop.

The study was conducted among 12 master's students who were still studying and those who was doing research for her thesis.

4. Discussion

Gadjah Mada University opened the Graduate School of Library Management in 1996 due to the need of the government to prepare library officers at the department of education in all 34 provinces. After the government no longer needed the master's program in library management continued and welcome any students to study librarianship at Gadjah Mada University. Since 2003, the Graduate School of Library Management changed its name into Graduate School of Information and Library management. Unlike in the old days, when students were mostly librarians who have already worked in the libraries, most current students are fresh graduates, especially from the department of library and information science.

The interviews were conducted using Whatsapp and it was conducted both synchronously and asynchronously depending on the students' availability to answer the questions due to the students' activities. There were two (2) students who were writing thesis while the other ten (10) were still taking courseworks.

4.1. infrastructure

Based on the interview responses, it was found out that since the beginning of online classes, students were able to adapt to the new way of learning in the beginning of the online classes although they never experienced online classes before, and the platforms varied among the faculties. Some senior faculty preferred Webex, while some other faculty chose Zoom and Google meet.

The students stated that they were ready with the shift from traditional classroom to online classes as they were capable of working with technology, but the infrastructure did not always

support the process of learning. In fact, not all cities and town had good Internet network.

Prepaid wireless did not always support their Internet access, while at some other time, some students had to find WIFI network by going to a café or any other places to get WIFI network because either their Internet connection at home was poor or they could not afford the budget for the prepaid wireless. Webex was the platform that students did not feel satisfied because it required so much bandwidth and therefore they spent so much budget for this medium for learning. According to Pratnyawan (2020) Webex is the medium for learning that required so much bandwidth.

Pic. 1. Comparison of bandwidth requirements among Zoom, Skype, Hangout, and Webex. Cited from Pratnyawan (2020), Zoom, Skype, Google Hangouts, dan Webex, Mana yang Paling Irit Bandwidth? Suara.com. accessed from https://www.suara.com/tekno/2020/03/31/182955/zoom-skype-google-hangouts-dan-webex-mana-yang-paling-irit-bandwidth

Students preferred using Zoom and Google meet instead of Webex due to the infrastructure of the Internet. Besides spending so much amount of budget for their prepaid wireless, they sometimes had to go to a café to attend the online classes because the Internet was not always good in their homes.

In term of infrastructure, another problem that could happen was power cut. When the power cut happened, students could not do anything but waiting for the power restored.

4.2. Atmosphere

As stated earlier, online classes are different from traditional ones. While in the traditional class, students and faculty are in the same physical space, in the online class, every student and faculty are in different places and each has atmosphere that may supportive or disruptive to the online class. In addition, during the online class, noise may come from the presence of someone in the same place, any passingby vehicles, and other possible disturbance.

According to some students, as they never eperienced online classes before, they could not concentrate well in the online classes as the environment of online classes was not a classroom with only students and faculty member speaking in from of the classroom, but a home with family members or a café with other people sitting down nearby and vehicles passing by. In their opinion, noise could come from the family members who asked questions or asked to do something as their family did not see them as "attending a class" but "only sitting in front of a laptop". Another noise may come from the poor Internet connection that may cause poor sound or picture. Students sometime lost their connection too and therefore, they missed some of the lesson. These noise made them have less concentration during their online class.

4.3. Time

The university policy for teaching and learning during pandemic has changed in term of length of time. In the traditional classroom, students attend 14 sessions in one semester and 1 credit semester means students will study for 60 minutes per sessions. However, since the pandemic, the teaching was only about 30 minutes for 1 credit. Also, in one semester, students attend only 10 sessions in one semester instead of 14 sessions. For one thing, the faculty adapted their materials to the length of time they could spend in shorter sessions; while students might get less materials or too much in a short session.

Besides having less time to interact online with faculty in the online class, students often experienced another problem of time. When the class began, students sometimes had not got connection to the Internet yet causing them to miss some part of the session.

4.4. Knowledge and research agenda

Those who were doing research for their thesis experienced problems with their data collection. First, they changed their research from quantitative to qualitative because they had difficulties in finding respondents onsite and, secondly, the difficulty in distributing questionnaires online as the responses were not as many as they expected, due to the respondents' reluctance to respond online. Qualitative method was chosen because they could interview the informants using digital devices such as videocall, telephones, and online chats. However, for students who never experience qualitative research, they found it difficult to do so. In this study, both students changed their research method from quantitative to qualitative and they had to change their work and data collection.

5. Conclusion

The shift from onsite to online has made students change their learning process. There are four identified problems when traditional classroom is replaced by online class, namely (1) infrastructure, (2) social and psychological condition, (3) time, and (4) knowledge and research agenda.

Problem with infrastructure may cause students hardship in learning because they may find better internet connection by going to a café or other places, budget that students spend increase for the wireless connection, and uncontrollable infrastructure problem such as power cut. Meanwhile, people around the students sometimes disturb their online studying because they do not know there is someone who is studying or they disturb the student with noise. Students may also get noise from passingby vehicles and people.

Students may get less knowledge due to lesser time to study and work harder because they must change their research methodology.

It is important for higher education institutions to consider the impacts of changing policies, regulations, and even agenda due to unexpected happening. Making decision without considering them will impact on the teaching and learning outcome.

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Digitizing The Balinese Lontar Manuscript:
A Case Study of Puri Kauhan Ubud, Bali

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ABSTRACT

The preservation of the Balinese Lontar Manuscript can be done by digitizing the physical manuscript. This study aims to determine the preservation of the Balinese Lontar manuscript through the digitization process at Puri Kauhan Ubud. This study uses descriptive qualitative research methods. Research data were obtained through interviews with three people (Chairman of the Puri Kauhan Foundation, Ubud, Coordinator of Balinese Language Extension, Gianyar Regency, Librarian of the Center for Lontar Studies, Udayana University). In addition, data were also obtained through documentation, observation and literature study. Data processing and analysis techniques through stages, data collection, data reduction, data presentation and drawing conclusions. The results showed that Puri Kauhan Ubud has 64 cangkep lontar manuscripts, the lontar manuscripts are passed down every Saniscara Umanis Wuku Watugunung precisely during Saraswati Day, at that time the preservation and maintenance of the lontar manuscripts at Puri Kauhan Ubud was carried out as a form of devotion to Bhatara Kawitan because he had bequeathed a source of knowledge in the form of the Balinese Lontar Manuscript. Preservation at Puri Kauhan Ubud is done by digitizing the lontar manuscripts. Do it process The purpose of digitizing the lontar manuscripts at Puri Kauhan Ubud is so that the original physical form of the lontar manuscripts inherited from the Puri Kauhan Ubud family can be preserved and the information contained in them can be saved. All lontar manuscripts belonging to Puri Kauhan Ubud were digitized but not all were transliterated,

what was transcribed was a distinctive and unique lontar script. Currently, there are 18 digital lontar manuscripts that have been published on the website special of Puri Kauhan Ubud.

1. Introduction

Preservation is a process in an effort to protect library materials against damage and keep library materials intact. Preservation of library materials is a very important thing if the library materials contain important information. Collections of library materials include printed collections and non-printed collections. Printed collections are collections whose physical form is printed, printed collections such as books (textbooks, reference books, and physical books) and serial publications (newspapers, magazines, and reports). Non-printed collections are collections whose physical form is not in print, for example in the form of sound recordings, video recordings and pictures. In addition, there are examples of printed collections known as Balinese ancestral cultural heritage, namely the collection of lontar manuscripts.

Preserving Balinese culture in the current era of globalization is very important, the current generation is required to keep up with technology that is developing faster. The preservation of lontar manuscripts in which there are scripts and Balinese language as a part of Balinese culture cannot be underestimated because in the lontar manuscripts, almost all the activities of the ancient Balinese people are presented and can be traced from the lontar records. Technology in the current era of globalization is developing rapidly and of course it can be utilized, it is better if the papyrus manuscript is archived also using technological advances, namely by digitizing the manuscript.

The lontar manuscript is part of the Indonesian manuscript which is the object of cultural promotion as stated in the Republic of Indonesia Law no. 5 of 2017 concerning the Advancement of Culture. Article 5 of the Law for the Advancement of Culture states that 10 objects of cultural promotion include: oral traditions, manuscripts, customs, rites, traditional knowledge, traditional technology, arts, languages, folk games, and traditional sports. The lontar manuscripts contain mantras, traditional medicine, science, songs *(kakawin, kidung, geguritan),* history and other things. Puri Kauhan Ubud stores 64 lontar manuscripts which testify to the history of Puri Kauhan Ubud and contain flashes of the history of Ubud, stories of the daily lives of the people of Ubud and Bali.

Based on the observations made by the author, the phenomenon that occurs in the lontar manuscripts is that they suffer some damage because the lontar manuscripts are hundreds of years old. Considering the lontar sheets as manuscripts derived from palm leaves which have the risk of being easily damaged such as cracks and even breaking during use, so it is necessary to preserve the lontar manuscripts that are good and accessible to the wider community without having to look at the physical form of the lontar manuscripts. There

are many lontars at Puri Kauhan Ubud to maintain the information value and physical condition of the lontars, Puri Kauhan Ubud conducts digitalization activities. This was done to make a copy of the lontar in Puri Kauhan Ubud. The purpose of this paper is to determine the preservation of the Balinese Lontar manuscript through the digitization process at Puri Kauhan Ubud.

2. Literature Review

3. Preservation of Library Materials

As one of the information managers, the library is responsible for collecting, processing, presenting and maintaining collections for use by users in an effective and efficient manner. For this reason, collections need to be cared for and preserved so that the science and technology contained therein can be passed on to future generations (Rahayuningsih, 2007).

Preservation is the main task of every library where the librarian manages library materials, one of which is maintenance and care, this activity is carried out to maintain the quality of library materials so that they can still be used effectively for users (Sutarno, 2006).

4. Media Transfer of Library Materials Media

Transfer is the transfer of media to *micro film* and other non-paper media with high security, such as CD-ROM and *Worm* (Government Regulation No. 88/1999). Media transfer or transfer of form is one of the conservation business models carried out by changing the form or information media from paper (printed) into other forms such as micro or video disks or other forms of magnetic tape (Sulistyo-Basuki 1991).

5. Digitization of Library Materials

Digitization is a conversion process from analog media to digital form (Lee, 2001). Digitization is the process of converting printed form into electronic form through scanning*(scan)*to create electronic pages in accordance with the storage, information retrieval, and transmission of computer (Mulyadi, 2016). Digitization is the process of transferring information in printed form into digital form. Digitizing library materials through stages or procedures in its implementation. the stages of digitization planning are, pre-digitalization, digitization process, human resource needs, *hardware* and *software* requirements (Arba'I 2010). Then the digitization process is divided into three main activities, namely, *scanning, editing, uploading (*Pendit, 2007)*.

6. The Manuscript

Great Indonesian Dictionarystates that the lontar manuscript is interpreted as an essay that is still written by hand, someone's composition as an original work, news materials ready to be set. Ancient manuscripts or manuscripts are documents of various types that are written by hand but specialize in the original form before being printed (Primadesi, 2010).

7. The Balinese Lontar

Manuscript is an ancient manuscript which can now be called a manuscript. The lontar manuscript is a valuable and very important ancestral cultural heritage because in the manuscript there is knowledge and historical records of antiquity. Lontar is a means of writing in the past in Bali before the existence of paper. Lontar which became a means of writing was taken from the leaves of the palm tree. In Bali it is known as ental leaf.

The Balinese Lontar Manuscript is made from palm tree leaves which were used as a writing medium in his era. Lontar in Bali uses Balinese and Balinese script. The contents contained in the Balinese Lontar are about mantras, knowledge, traditional medicine, songs (kakawin and kidung), history, stories about religion, and other things. In daily life, Balinese people are guided by the teachings contained in the lontar.

8. Research Methods

Type of research used in this research is descriptive with a qualitative approach. The data sources used in this study consisted of primary data sources and secondary data sources. The data sources used in this study consisted of primary data sources and secondary data sources. Data collection techniques are techniques or methods used by researchers in their research to obtain the data needed in research. data collection "obtained from the results of observations, interviews, documentation, and combination or triangulation" (Sugiyono 2013). The data analysis technique used was through stages, data collection, data reduction, data presentation and drawing conclusions (Miles and Huberman in Satori 2013).

This research was conducted from 01 February to 01 March 2021. The location of this research is in Puri Kauhan Ubud, Jalan Raya Ubud No. 35, Ubud District, Gianyar Regency, Bali. In collecting data, the data sources were obtained from interviews with the three informants, namely: the Chairperson of the Puri Kauhan Ubud Foundation, the Coordinator of the Balinese Language Extension Officer, Gianyar Regency, and the Librarian of the Center for Lontar Studies, Udayana University. In addition, data were also obtained through documentation, observation and literature study.

9. Results and Discussion

10. Collection of Manuscripts of The Puri Kauhan Ubud

Collection of manuscripts of Manuscripts of Puri Kauhan Ubud is a legacy from the ancestors of the Puri family. The Puri lontar manuscripts are hundreds of years old. This lontar manuscript contains family history and the history of the people of Ubud and Bali. Puri Kauhan Ubud stores as many as 64 *cakep* lontar manuscripts.

> *"We have 64 lontar palms stored in Puri Kauhan Ubud, of course the lontars are very intact lontars in a single shell. There are lontars that are indeed in a cake, but there are also small lontars that are separated and we have made them in the form of Penapes"* (AAGN Ari Dwipayana, Chairperson of the Puri Kauhan Ubud Foundation).

Figure 1 Manuscripts Lontar Puri Kauhan Ubud
(Source: Instagram Puri Kauhan Ubud)

Lontar manuscripts have various types in general ranging from *wariga, usada, itihasa, chronicle, tantri, lelampahan* and lontar *prasi* This type ofis determined depending on the information contained in the lontar manuscript. lontar Puri Kauhan Ubud has various types. Lontar Puri Kauhan Ubud has various types.

> *"So the lontars in Puri have various themes ranging from chronicle, said then there is also the theme of usadha and also other lontars, indeed, kakawin, whose titles vary and we have cataloged related to the lontar- the lontar"* (AAGN Ari Dwipayana, Chairperson of the Puri Kauhan Ubud Foundation).

Whereas the lontars owned by Puri Kauhan Ubud have various types such as *chronicle, speech, usadha, kakawin, wariga* and so on. The lontar manuscripts belonging to Puri Kauhan Ubud have been cataloged.

11. Preservation of the Lontar Manuscripts of The Puri Kauhan Ubud

Preservation of the lontar manuscripts is an attempt to protect the lontar manuscripts and the information contained in them from damage and preserve the cultural heritage of Balinese ancestors through the lontar manuscripts which have sacred values. The preservation of lontar manuscripts is a form of devotion to the ancestors of Puri Kauhan Ubud.

> *"Yes, of course, this is part of our form of devotion to our ancestors, what is the name of our Bhatara Kawitan who has bequeathed extraordinary treasures, not only in the form of keris heirlooms, but we also have a source of knowledge that we call lontar. Our obligation is as a dutiful successor to inherit, take care of this but not just take care of it, we want to know and then use all these sources of knowledge for the benefit of the family and also the Balinese people and also the universe. So I think this should have a contribution to all of humanity, that's what motivates us to take care of lontar"* (AAGN Ari Dwipayana, Chairperson of the Puri Kauhan Ubud Foundation).

The preservation of the lontar manuscripts at Puri Kauhan Ubud is carried out as a form of devotion to the ancestors and an obligation for the next generation of Puri Kauhan Ubud to take care of the lontar manuscripts that have been passed down, so that in the future the lontar manuscripts can be fully utilized for the benefit of the family and the wider community

The Balinese Lontar Manuscript is a document in handwritten form which is written on lental leaves so that in caring for the lontar manuscript special attention is needed because the physical nature of the lontar manuscript is very vulnerable to damage, especially if the lontar manuscript is hundreds of years old. Several lontar manuscripts at Puri Kauhan Ubud suffered some damage.

> *"The damage to the lontars stored in Kauhan Castle is of course the first, there are some lontars which do not have a lontar or penkep so that the lontar will most likely break. Then there are some lontars that are eaten by insects, now for age than those stored in Puri Kauhan Ubud, I estimate that they are around a hundred years old because there are many lontars that contain the name Anak Agung Gede Oka, who is none other than the grandfather of Mr. Ari Dwipayana"* (Ida Bagus Oka Manobhawa, Bali Language Extension Coordinator, Gianyar Regency).

Figure.2 Condition of the Lontar Manuscripts of Puri Kauhan Ubud
(Source: https://purikauhanubud.org/lontar-33-panca-aksara/) The

Damage to the lontar manuscripts that occurred at Puri Kauhan Ubud was because there were several lontar manuscripts that did not have *Penapes* or *Penakep* and were eaten by insects. The age of the papyrus manuscript owned by Puri Kauhan Ubud is estimated to be one hundred years because it contains the name of the grandfather of Mr. Ari Dwipayana.

12. The Process of Preserving the Lontar Manuscripts of Puri Kauhan Ubud

Hindu Belief in Bali on Saraswati Day, which is the anniversary of the decline of knowledge which is celebrated every six months. Books and lontars are media for worship during Saraswati Day because books and lontars are symbols of places for storing knowledge. Therefore, the Hindu community on that day sent down books, lontar and other sacred literature to be given offerings of *offerings of* Saraswati as a form of devotion to *Sang Hyang Aji Saraswati* as a manifestation of God as the creator and maintainer of knowledge. The lontar manuscripts located at Puri Kauhan Ubud were taken down from storage on Saraswati Day.

> *"So we in our family have a tradition like the Balinese people, every time we perform a Saraswati ceremony of worshiping Sang Hyang Aji Saraswati at the Saniscara Umanis Wuku Watugunung, and at that time the lontars in Puri are taken down and then a cleaning effort is also carried out, so during that time Indeed, there is a storage process in a special place in a cupboard and in 2017 we put it in a container in a place that we specifically made. In addition, we did regular cleaning of the palm trees, we used to do it by treating it with candlenut and then cleaning it. Then in 2017 the younger brothers from the Balinese language instructor took part in the maintenance and that was the standard for lontar conservation that was already owned by the Balinese language"* instructor(AAGN Ari Dwipayana, Chairperson of the Puri Kauhan Ubud Foundation).

Konservasi Lontar Bali Kuno

Figure 3. Ceremony Procession of Asking for Permission to Ancestors for Preserving
the Lontar Manuscripts of Puri Kauhan Ubud
(Source: Instagram of Puri Kauhan Ubud)

In addition, the manuscripts at Puri Kauhan Ubud before digitizing the manuscript have
been taken care of by the Balinese Language Extension Officer, Gianyar Regency.

*"Well, before the process of digitizing the lontar manuscripts, of course, the lontars
stored at Puri Kauhan Ubud have been treated or conserved by the Balinese
Language Extension Officer, Gianyar Regency. Because previously, before the
treatment was carried out, the manuscript was rarely opened and when the
treatment was carried out there were several drugs used, such as lemongrass
extract mixed with alcohol with levels above 96%, the drug was used to preserve
the papyrus script so that will not be eaten by termites or other rodents. Now the
cleaning process was carried out at Puri Kauhan Ubud by a team of Balinese
Language ExtensionGianyar Regency"* Officers in(AAGN Ari Dwipayana,
Chairperson of the Puri Kauhan Ubud Foundation).

Figure 4. The Cleaning of the Lontar Manuscripts of Puri Kauhan Ubud by the Balinese
Language Extension Team Kab. Gianyar
(Source: Instagram Puri Kauhan Ubud)

13. Digitization of the Lontar Manuscripts of Puri Kauhan Ubud

Lontar manuscripts that are hundreds of years old are easily fragile and digitization can
be done on the lontar manuscripts as an effort to save the contents contained in the lontar
manuscripts. Puri Kauhan Ubud has 64 *cangkep* lontar and all lontar manuscripts go
through a digitalization process, but the lontar manuscripts that are transliterated are only
scripts that are considered unique and unique from Puri Kauhan Ubud.

*"What we have digitized are all the lontars but the ones that are transliterated are
the typical lontars, unique from Puri Kauhan Ubud and we have exposed them as
a preview form of 18 lontars"* (AAGN Ari Dwipayana, Chairperson of the Puri
Kauhan Ubud Foundation).

The process of digitizing Balinese lontar manuscripts at Puri Kauhan Ubud is still using simple tools.

"Now for the preservation of the lontar manuscripts, especially in the digitization process carried out at Puri Kauhan Ubud, the equipment used here is of course still very simple, namely by using a camera and then there are supporting lights as lighting instead of the lontar when carrying out the digitization process" (Ida Bagus Oka Manobhawa, Coordinator of Balinese Language Extension for Gianyar Regency).

Figure 5 The process of digitalisation of manuscripts Lontar Puri Kauhan Ubud

(Source: Webinar Perpusnas 1 Data Scrolls Digital Nusantara)
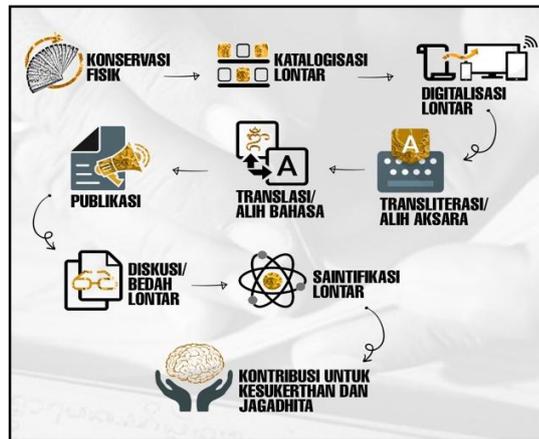
Figure 6 Process Preservation of Manuscripts Lontar Puri Kauhan Ubud In the Form Digitization

(Source: Webinar Perpusnas 1 Data Scrolls Digital Nusantara)

All ejection owned Castle in digitization , only the lontar which is considered unique and typical of Puri Kauhan Ubud which is transliterated. The process of digitizing the papyrus manuscript of Puri Kauhan Ubud is as follows:

1. Previously, the digitized lontar manuscripts were cleaned first so that the resulting images were good.

2. After conservation, the lontar manuscripts are cataloged

3. Furthermore, the process of taking pictures by preparing tools for digitizing the lontar manuscripts such as ancamera *SLR, tripod,* black cloth as the basis for taking pictures of the lontar script, the code of the lontar script and additional lights for lighting.

4. Then the lontar manuscript is opened from its *pen* and placed on a black cloth with a code in a flat position on the table.

5. Then taking pictures of the manuscript using an *SLRcamera*

6. After that, the papyrus script data is stored in the database and editing is carried out such as scripting, for the language transfer has not been carried out, it is still in the process of translation

7. The lontar manuscript that has gone through the editing process, and *published* on the *website* Purikauhanubud.org

14. Lontar Manuscript on the Puri Kauhan Ubud Website

Family of Puri Kauhan Ubud has opened a website https://purikauhanubud.org/ to preserve history and ancestral heritage so that what is passed down does not end in one generation. Ancestral heritage can continue to grow and keep him alive. The website was specifically created so that the wider community would know more about Puri Kauhan Ubud and the history that has happened.

"So, we created this website specifically for Puri Kauhan Ubud about Puri Kauhan Ubud so that people can find out more about Puri Kauhan Ubud, starting with the history of Puri and then the papyrus owned by the third Puri as well as records related to Puri and Ubud and Also events that occur are recorded via video and news can be exposed, up to date on the Puri website" (AAGN Ari Dwipayana, Chairperson of the Puri Kauhan Ubud Foundation).

Figure 7 Initial View of the Puri Kauhan Ubud Website
(Source: https://purikauhanubud.org/)

One of them contained on the website is the Lontar Library page. After going through the digitization process, the papyrus manuscript is stored in the form of a *database* and *published* on the *website* https://purikauhanubud.org/ this is done so that the wider community knows the collection of lontar manuscripts owned by Puri Kauhan Ubud but not all lontar manuscripts belonging to Puri Kauhan Ubud are *published* on the website.

"What we are focusing on and so far there are about 18 lontars that have been exposed on the website as a preview, although we, in the preview, of course people will be able to find out what they have but if they want to know more about the lontar they can ask us to transmit digitization. Of course, it is the family's right to decide who to share it with but the point is that we can expose the lontar which are unique and unique to Puri Kauhan Ubud" (AAGN Ari Dwipayana, Chairperson of the Puri Kauhan Ubud Foundation).
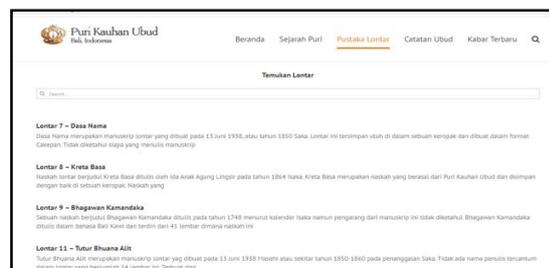
Figure 8 Digital Lontar Manuscripts of Puri Kauhan Ubud
(Source: https://purikauhanubud.org/library-lontar/) A

Special website was created to *publish the* history of Puri Kauhan Ubud, lontar manuscripts owned by Puri Kauhan Ubud, records of Puri Kauhan Ubud, and Ubud as well as events and news of Puri Kauhan Ubud activities . On the papyrus library page, 18 manuscripts of lontar were exposed and there is a *preview* of the lontar manuscript, if you want to know more about the contents of the lontar manuscript, you can request the form available on the website.

15. Conclusion

Based on the results of qualitative research using data collection techniques using observation, interviews conducted at Puri Kauhan Ubud as well as documentation and literature studies on the Digitization of Balinese Lontar Manuscripts, it can be concluded that Anak Agung Gde Oka Krebek inherited lontars starting from the *chronicle, said, kakawin, usadha* and so on. Puri Kauhan Ubud stores 64 *cangkep* lontar manuscripts which are stored in a *keropak*, the lontar manuscripts belonging to Puri Kauhan Ubud are maintained and cared for. The preservation of the lontar manuscripts of Puri Kauhan Ubud is an obligation for the next generation of Puri Kauhan Ubud which is carried out as a form of devotion to the ancestors or *Bhatara Kawitan* to take care of the lontar manuscripts that have been passed down. But not only taking care of the lontar manuscripts, Puri Kauhan Ubud seeks to find out the content of the information contained in the lontar manuscripts by transliteration. The lontar manuscripts of Puri Kauhan Ubud are hundreds of years old, there are several lontar manuscripts eaten by insects. Puri Kauhan Ubud conducts preservation in the form of digitization to treat the lontar manuscripts as knowledge by preserving the physical manuscripts as well as the contents of the knowledge of the lontar manuscripts. The process of digitizing the lontar manuscripts at Puri Kauhan Ubud is first by cleaning the lontar manuscripts before digitizing so that the resulting image is clearer, then the lontar manuscripts are opened from the *pen* and placed on a black cloth and coded, using simple devices such as cameras. and supporting lights.

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Environment, Citizen Science, Libraries: Connecting the Dots

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Abstract

Growing public and professional concerns regarding climate change, environmental degradation and species extinction has put a new focus in these fields. Environment is a key issue in the UN 2030 agenda for sustainable development growth and it is endorsed by IFLA. Libraries in western countries have embraced citizen science, which is playing a key role in the field of environment and biodiversity conservation. SciStarter, an online platform created by Arizona State University Library for promoting and facilitating citizen science projects from all over the world, is one of such initiatives by the libraries. This is a case study of SCiStarter to understand the role of libraries in facilitating citizen science. An attempt was also made to study the citizen science initiatives in India and the role of libraries as community hubs to disseminate community information and facilitate community participation in activities like citizen science. It was found that India has a large network of libraries which disseminate community information and act as community hubs. These libraries have potential to effectively disseminate information and provide a platform for citizen science projects. Emphasis should be laid on developing infrastructure, removing financial constraints, training of staff and promoting collaboration with different stakeholders. Legislative provisions and policies are required to strengthen the library system to provide innovative services like support to citizen science. Library professionals and library associations will have to come forward to advocate for the cause.

Keywords: Citizen Science, Community Information Centres, Community Hub, Library-Community Participation

1. Introduction

Citizen science, described as "active public participation in scientific research", has seen rapid growth since it was coined in the mid-1990s. Apart from growing interest within laymen, scientific research has benefited immensely from citizen scientists. For example there are more than 150 recorded publications from the popular citizen science program, iNaturalist. Fields of environment and biodiversity conservation have always relied on volunteer participation to gather

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

scientific data. Therefore, the large spatial reach of citizen scientists along with emergence of readily available mobile technologies has significantly enhanced their importance in collating wide-ranging data for environmental monitoring, natural observation and biodiversity protection.

Growing public and professional concerns regarding climate change, environmental degradation and species extinction has put a new focus in these fields. Although environmental research is witnessing a rise throughout the globe, experts predict this paradigm shift is essentially crucial in the biodiverse and developing regions of Asia-Pacific. Innovative citizen science projects could be the way forward to mapping and protecting the natural resources of Asia. However, browsing through SciStarter, the largest global repository connecting the public to available citizen science projects, revealed a steep lack of such efforts in Asia. This lack of attention does not signify a lack of activity. Influential projects, both completed and ongoing, in India, Japan and Hong Kong have validated their importance and impact, although their decentralized nature has been identified as a major hindrance.

With the emerging concept of "Libraries as community hubs", libraries hold potential in facilitating citizen science projects at local and regional scales. Libraries can play an important role, functioning as formal regulatory systems liaising between citizen scientists and researchers. Innovative partnerships and access to information is also aligned with the UNESCO 2030 Agenda for Sustainable Development and is endorsed by IFLA. Acting as community hubs for citizen science, libraries in the United States have promoted inclusive scientific practices while aiding scientists in protecting the environment. Incorporation of these latest and innovative trends in Indian libraries would help in expediting the growth of citizen science while adding potential to the scope of public libraries.

2. Objectives

This study attempts to highlight the role of libraries as facilitators bridging the gap between high-quality research and public participation by the platform SciStarter as a case study of SciStarter-University of Arizona.

Focusing on India, the objectives would include,

1. Gathering information on citizen science initiatives for the environment,
2. Understanding the role of libraries in facilitating citizen science, and
4. Suggesting ways to promote libraries as community centres for citizen science at a local scale, while finding synergies from the global case study

3. Methodology

The methodology involves case study of Scistarter, a citizen science initiative facilitated by libraries. An extensive search of databases SciStarter and CitSci.org was taken up to understand representation of Asian citizen science projects in these global databases. To gather data on citizen science initiatives being undertaken in India, local databases citsci-india.org, Centre for Citizen

Science and Earthwatch India were scanned. The emerging role of libraries as community information centres in various sectors was explored through review of literature. The analysis of the data thus collected was used to identify the factors that hinder libraries in promoting citizen science and find synergies from the global case studies to suggest ways to promote libraries as community centres for citizen science.

4. SciStarter - a movement facilitated by libraries

SciStarter is an online platform for promoting and facilitating citizen science projects from around the globe which was founded in 2011 by Darlene Cavalier, professor at Arizona State University's School for the Future of Innovation in Society. This hub connects communities with projects, tools and associated resources to successfully participate in scientific research. This is enabled by National Science Foundation supported APIs (Application Programming Interfaces) which allows researchers and organizations to amplify their projects and users to find suitable projects to contribute. Over 3000 projects, tools and related events have been registered on the platform by researchers and project leaders which are accessible to interested people for exploration and contribution. These citizen scientists belong to various age groups and may participate for curiosity, entertainment or even academic credits. Students in American schools are part of initiatives like Girl Scouts can participate in registered citizen science projects to earn credits which contribute to their academic coursework and experience. These features are provided in collaboration with its partners which include schools, colleges, universities, museums and libraries.

Such community-based organizations help in implementing and monitoring the projects offered via the SciStarter platform. SciStarter is a research affiliate of Arizona State University (ASU) and was founded by a group of researchers from the university. Libraries at ASU facilitate the citizen science hub by providing customized tool kits, celebrating Citizen Science Month and connecting ASU researchers to larger interested communities utilizing their library networks. Since its inception, the collaboration of SciStarter has expanded from ASU library to include public libraries in Arizona and California in the USA. Libraries are acting as community hubs training interested citizens, providing necessary resources for participation, monitoring progress and communicating feedback from researchers and citizen scientists. It not only engages the community but also provides an opportunity for assisting research in academic libraries. For example, North Carolina State University in association with SciStarter has established the first Citizen Science Campus. This is an innovative program to increase the research capacity of the university while enhancing the undergraduate experience. University libraries are playing an active role in this initiative by connecting different sectors of the university community, providing training and toolkits for participation in citizen science projects. Citizen science is not limited to any particular discipline. Academic libraries have access to a wide scientific community and can create opportunities for faculty members to demonstrate citizen science as an effective teaching tool, while utilizing data collected by citizen scientists in their research.

Team at SciStarter has also come up with a comprehensive guide to introduce the concept of citizen science and to help libraries and other community based organizations to induce citizen

science within their network. This guide provides a brief introduction to the various STEM-related citizen science projects available on the SciStarter platform. It also highlights the role libraries can play in increasing engagement with such projects. It also provides opportunities for networking with libraries already working as community hubs for citizen science in the form of information to join their weekly live discussions, celebrating Citizen Science Month and various other events throughout the year. Their step-by-step guide is a freely accessible resource to induce citizen science through interested libraries and professionals.

5. Citizen Science initiatives in India

Our search of the global databases, SciStarter and CitSci.org, revealed very low participation in terms of citizen science initiatives from or targeted at Asia. The SciStarter project finder tool presented 804 when location was specified as "Asia". According to the database, 99% of these projects encompass global (like Ebird and Stream Selfie) or online (like Stall Catchers and Galaxy Zoo) projects available for citizen scientists throughout the world, including Asia. Only 3 projects forming less than 1% of the total were geographically specific to Asia which also included projects focusing on the environment and biodiversity in the tropical regions. CitSci.org is an initiative developed at Colorado State University to promote involvement of citizens in scientific research. Unlike SciStarter which provides a repository of active citizen science programs, CitSci.org also empowers researchers and concerned citizens to start and customize their own projects. An exhaustive search of their global database showed that only 3.5% of the project headquarters were based in Asia resulting in 20 projects from the 583 globally recorded initiatives.

Limited number initiatives targeting on and initiating from Asia is alarming, especially given the dwindling biodiversity and expanding development in this region. In Asia, India is a rapidly growing economy which also harbours around 8% of the global biological diversity along with four out of the 34 biodiversity hotspots. In the global citizen science databases, SciStarter and CitSci.org, a significant proportion (66% and 30% respectively) of the Asian initiatives were from India. Hence, we tried to assess the status of citizen science targeting environment and biodiversity monitoring in India to understand its lack of representation and impact on the global platform.

Our search of Indian resources revealed records of 36 ongoing and/or completed projects which were identified as "citizen science projects" by citsci-india.org, Centre for Citizen Science and Earthwatch India. The names of these projects, their websites (where available) and the source of information is listed below in Table 1. This number is much higher than reported on the searched global databases which showcases lack of representation of Indian initiatives despite their significant prevalence.

Table 1. Details of the recorded Citizen Science projects in India

S.No	Name	Link	Source

1	Big4mapping	https://snakebiteinitiative.in/snake/	citsci-india.org
2	Biodiversity Atlas - India	http://bioatlasindia.org/	citsci-india.org
3	BirdCount India – eBird India (BCI-eBird)	https://birdcount.in/	citsci-india.org
4	Butterflies in India	https://www.ifoundbutterflies.org/	citsci-india.org
5	Citizen Sparrow	http://www.citizensparrow.in/	citsci-india.org
6	Common Bird monitoring Project	http://www.ibcn.in	citsci-india.org
7	Community based monitoring of fisheries in Lakshadweep	https://www.dakshin.org/mobilizing-communities-for-sustainable-and-equitable-fisheries-governance-in-lakshadweep/	citsci-india.org
8	Dragonfly South Asia	https://dragonflysouthasia.wordpress.com/	citsci-india.org
9	Frogwatch	https://indiabiodiversity.org/group/frog_watch/show?pos=7	citsci-india.org
10	Hornbill Watch India	https://www.hornbills.in/	citsci-india.org
11	India Biodiversity Portal	https://indiabiodiversity.org/	citsci-india.org
12	The invasive Indian bullfrog on the Andaman archipelago	NA	citsci-india.org
13	eMammal Project	https://emammal.si.edu/museums-connect-india	citsci-india.org
14	Marine Life of Mumbai	https://www.marinelifeofmumbai.in/	citsci-india.org
15	OwlIndia	https://www.facebook.com/groups/owlsindia/	citsci-india.org
16	Pterocount - South Asia Bat monitoring Programme	https://pterocount.org/	citsci-india.org
17	Roadkills	http://www.roadkills.in	citsci-india.org
18	Roadwatch	NA	citsci-india.org

19	SeasonWatch	http://www.seasonwatch.in/	citsci-india.org
20	Village Wildlife Volunteers	https://www.tigerwatch.net/	citsci-india.org
21	Project Meghdoot	http://citizenscience.in/about/	Centre for Citizen Science
22	Khagol Vishwa	http://citizenscience.in/about/	Centre for Citizen Science
23	Satark Landslide Alert system	http://citizenscience.in/about/	Centre for Citizen Science
24	Project Sahyadri	http://citizenscience.in/about/	Centre for Citizen Science
25	Lonar	http://citizenscience.in/about/	Centre for Citizen Science
26	Light Pollution Monitoring	http://citizenscience.in/about/	Centre for Citizen Science
27	Maharashtra Drought Monitoring Program	http://citizenscience.in/about/	Centre for Citizen Science
28	Nature 24	http://citizenscience.in/about/	Centre for Citizen Science
29	Study of fireflies in Western Ghats	http://citizenscience.in/about/	Centre for Citizen Science
30	Hailstorm, Dust Storm, Thunderstorm monitoring	http://citizenscience.in/about/	Centre for Citizen Science
31	Pollinators	https://www.earthwatchindia.org/bees-and-butterflies	EarthWatch India
32	Bird Find	https://www.earthwatchindia.org/bees-and-butterflies	EarthWatch India
33	Butterflies and Bees	https://www.earthwatchindia.org/bees-and-butterflies	EarthWatch India
34	Frog Find	https://www.earthwatchindia.org/tree-watch	EarthWatch India

35	Spider Watch	https://www.earthwatchindia.org/tree-watch	EarthWatch India
36	Tree Watch	https://www.earthwatchindia.org/tree-watch	EarthWatch India

In India, the tradition of using public participation to gather scientific data is believed to be over a century old. However, unarguably the first recorded contribution of citizen scientists in ecological studies is believed to be in 1987 in the Asian Waterbird Census coordinated by prominent organization, Bombay Natural History Society (Rahmani, Laad, & Islam, 2003). The field of citizen science has grown and evolved since then to incorporate a larger spectrum and volume of projects ranging from initiatives monitoring snakebites (Big4Mapping) to diversity of life (Indian Biodiversity Portal). This growing interest is about a decade old with rapid reporting in both mainstream media and academic publications. With over 30 reports in the media annually and nearly 20 research papers from a single project (Biodiversity Atlas - India), the potential and prevalence of citizen science is being acknowledged in India and the world alike.

However, a recent and first-of-its-kind report titled "Citizen Science in ecology in India - an initial mapping and analysis" identified some key problems faced by these public participation driven initiatives in India. Apart from financial sustainability and ambiguity regarding data ownership, the chief limiting factor was lacking platforms for discussion and regulatory systems. Lack of support from government and centralized associations (like Association of Citizen Science in the United States of America, Australia and Europe) hinder these projects in realizing their true potential and reach (Sekhsaria & Thayyil, 2019).

6. Discussion and recommendations

Role of libraries as Community Information Centres, specially Public Libraries, has been emphasized at global level by UNESCO and IFLA and by National Knowledge Commission(2005) at national level. Community information centres are providers of community information i.e. information that is vital and needed to cope with crisis by the community such as information related to health, education, employability, natural disasters, culture, leisure activities, etc. Public libraries have been established in India at national, regional, state, district and village level in India. These libraries provide information to the local community and help in implementation of Government to Citizen(G2C)initiatives, Government to Business(G2B) initiatives and Government to Government(G2C) initiatives. Libraries as information centres play an important role in enhancing the quality of life of the local community. But, there is a need for the libraries to collaborate. Karkee, Mazumdar and Ghosh (2015) opine that public libraries should collaborate with other information providing agencies such as NGOs, banks, government departments, educational institutions, local health centres, etc. to gather and disseminate information. Not only public libraries, but academic libraries also need to act as community information centres. Roy and Dasgupta (2015) stress that, "academic libraries should collaborate and reach out to the local community to empower the community and uplift and revive libraries as a social learning space".

As providers of vital information libraries as community information centres act as "Community Hubs" and hence have potential to facilitate citizen science. Literature review shows that libraries in India have used crowdsourcing to some extent for collection development and cataloguing (Hasan, Nabi, Khan, Rais & Iqbal, Jafar, 2017) but no instance of libraries facilitating environmental research through citizen science was found.

India has a rich biodiversity which needs to be protected. The Indian government recognizes the importance of biodiversity conservation and environmental research. Biodiversity centres, forest research institutes, institutes related to biological studies, departments of environmental science and related disciplines are all extensively involved in research in this direction. Researchers are also realizing the importance of citizen participation in scientific studies as is evident from this study. But there is a dire need for libraries to come forward and participate in this process.

Libraries, be it public libraries, academic libraries or research libraries, form that "third space" where community meets. It not only has an inflow of local community, it also has the infrastructure to support community events and trained staff to help and support scientific activity. Libraries can collaborate between researchers and citizens; develop necessary information databases for a citizen science project; help in training the community for the project and also provide the necessary infrastructure for the project. Libraries can prove to be the vital link between researchers and community and the life support for smooth implementation and conduction of citizen science projects.

Other than the immensely significant citizen science initiative SciStarter by Arizona University Library, many other libraries have embraced citizen science, to name a few, University College London, University of Barcelona, University of South Denmark, Qatar National Library (Ignat, T and others, 2018) and California Academic and Research Libraries (Cohen, Cynthia M. and others, 2015). The European Citizen Science Association has a Working Group called Citizen Science and Universities which has researchers and libraries from universities collaborating for citizen science. The American Library Association also promotes libraries to participate in citizen science projects through its initiative Libraries Transform. Libraries in India should study these citizen science initiatives being supported by libraries and come up with innovative ways to support scientific research in the field of environmental science through citizen science.

To provide effective community information service Chatterjee (2015) lays emphasis on community profiling i.e. recording all the relevant data regarding the community and the resources and facilities available to the community. The library as a community information centre needs to play an important role in community profiling and involve the stakeholders in the process.

Libraries can provide the platform that Sekhsaria and Thayyil (2019) find lacking in their study to support citizen science. But, this will require strengthening the libraries in all aspects i.e. infrastructure, budget, trained staff and ICT based facilities. Out of the total 28 states in India only 19 states have enacted the Public Library Act (Raja Rammohun Roy Library Foundation)

and are able to establish a network of public libraries even in rural areas. Government has to make legislative provisions to establish and strengthen the public libraries to support effective community information services and innovative practices like supporting citizen science. Library professionals and library associations will have to advocate actively for this cause.

Library professionals need to play a pivotal role in creating awareness about citizen science among all the stakeholders. We will need to convince the authorities, collaborate with scientists and provide them the required information and infrastructure support, and get the citizens to participate in the research. This will require proactive participation from our side.

Policies also need to be drafted so that libraries can collaborate with other organizations and the community, and facilitate research through citizen science. Issues like data ownership, data security, data evaluation, financial implications involved in resource sharing, training, etc. will require clear guidelines. Drafting policies will be a mandatory requirement for smooth implementation of citizen science projects with library involvement.

7. Conclusion

The primary objective of the libraries is to promote education and research leading to welfare of the society. The libraries have always been conscious about societal needs and have played an important role in giving support to the government and scientists in finding solutions to problems. IFLA has endorsed the UN 2030 SDG goals and libraries are developing their infrastructure and innovating their services to meet these goals. Citizen science is now being recognized as a powerful tool for environmental research and the libraries in western countries have been quick to partner in the process. Libraries in India also need to gear up to support citizen science projects. It cannot be denied that libraries here face many challenges related to infrastructure facilities and budget, but they need to collaborate and advocate in order to overcome these problems. Cigarini, A., Bonhoure, I., Vicens, J., & Perelló, J. (2021) have rightly said public libraries can offer leadership in the promotion of citizen science and contribute to the mission of public libraries to act as local community hubs.

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Envisioning the Future of Library in the Post-Coronavirus Era through Web Scale Discovery System: Experience and Expectation

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Abstract

Web Scale Discovery System (WSD) is the nascent information search and retrieval for the hybrid library environment. Especially in the pandemic period this system will help the students and research scholars residing in home and doing eLearning through online classes etc., It has so many special features like which allows users to discover content from the full range of library holdings (including A&I databases) and web resources in a single search, providing fast results, with relevancy ranking, faceted results browsing, content suggestions, full-text linking, and a variety of social and reference-management features. In addition, there are detailed metrics and reporting for institutional use. This article will describe the implementation experience of India's pioneer medical institute All India Institute of Medical Sciences (AIIMS) central library resources utilization and its economic impact. Usage statistical analysis by above mention facets will be discussed and suggest the viable options and expectation of the discovery system in post coronavirus period. The objective of this paper will emphasis the essential feature of discovery system and its effectiveness in return of investment (ROI) focusing on E-resources dominated budget system in this digital era.

Keywords: web scale discovery system (WSD); EBSCO discovery Software (EDS); E-Resources of Medical Libraries

1. Introduction

Google generation readers in the electronic environment with ubiquitous availability of internet networking in current information ecology, readers are become paper readers to screen readers

with various kind of digital devices such as desktop, laptop, tablets and smart-phone. They keen to have a search engine in the library also with customization of library resources. With the results library come across with various resources discovery tools federated search engine to the web scale discovery service (WSD).

Before going to explain about the future of Web Scale Discovery services, I would like to share professional experience in search and discovery of information at our workplace. One of my favourite subjects in library science is the Information Storage and Retrieval. The term information retrieval was coined by Calvin Moores from that onwards research and development in this domine stayed developing tools. That tools from punch cards by Henry P. Stamford and descriptor, (now known as index term or metadata tag) then online searching this made searching quite stressful. In 1994 my experience at corporate library on Dialog Database (Online) with Knight-Ridder search charged by the minute. Mistakes are costly in time and money. So I do spend an hour or more in the library before handling, consulting printed thesaurus for descriptors, considering how to combine Boolean operators most efficiently, and plotting our overall search strategy. That time computer's time was more precious than a human's, so I sweated every keyword. Then we want further research on effectiveness and measurement of search. Precision and Recall, our most basic measures tool arisen. Precision measures how well a system retrieves only the relevant documents. Recall measures how well a system retrieves all the relevant documents. The relative importance of these metrics varies based on the type of search.

The way that libraries organize and manage their resources has also changed along with the formats of resources to which libraries provide access, advancement of information technology, the development of tools, such as integrated library systems (ILSs), and metadata standards that are used for recording bibliographic information, storing cataloguing records, and employing them in search and discovery of resources that libraries hold. For distinguish search and discovery Sadeh's (2013) distinction between search and discovery i.e., "traditional library catalogues and databases constitute search systems, as they offered structured search interfaces tailored to the specific data they hold. Bibliographic records tend to be homogeneous, as they are constructed with the same metadata standards: these systems expect users to possess good searching literacy. Discovery systems may not offer searchers the same options to describe their information needs in detail (e.g.,via the use of controlled vocabulary) but instead offer them simple search interfaces complemented with multiple post search options for assessing findings, refining results, and navigating to other results of possible interest. "Providing access to resources is increasingly challenging as libraries offer information resources in all formats. Library users' expectations and needs require to provide an easy way to access all these collections in a comprehensive manner. Millennial generation users start with simple searches and use facets to limit their results (Diamond, Price, and Chandrasekar 2013; Duranteand Wang 2012). Users work with idiosyncratic methods and favourite tools that might not be the most efficient but are comfortable for them. It is our job to figure out what works for our users and either adapts our systems accordingly for to teach them better practices (Daigle 2013). So we arrived the latest information retrieval tool called web scale discover service (WSD). what is Web Scale Discovery (WSD) Service?

The term "discovery" means by Carter (2011) yields the following definitions:

Something learned or found; something new that has been learned or found

The process of learning something; the fact or process of finding out about something for the first time.

The process of finding something; the process or act of finding something or somebody unexpectedly or after searching.

The way we think about discovery with our goal of finding recorded information exhaustively, expeditiously and pin-pointed for use of the researcher to develop the discovery system should have Chang's five general browsing themes of discovery behaviour in digital environment;

1. Looking for a specific item, to locate
2. Looking for something with common characteristics, to find "more like this"
3. Keeping up-to-date, to find out what's new in a field, topic or intellectual area
4. Learning or finding out, to define or form a research question
5. Goal-free, to satisfy curiosity or be entertained.

2. Grave's concepts of Web-scale discovery

- Web-When one thinks of a web, one might think of a spider, a browser, or a page among many possibilities. These words associated with web seem to indicate the need for communication as relayed in the iconic story of Charlotte and Wilbur. We communicate on the Web through browsing or searching for something we perceive we need; we communicate through paging or paging by others. For example, we page a person and we call up a Web page about a person or a business.
- Scale-it means to climb, ascend or attack. It can also refer to a thin membrane, a protective covering, or an apparatus used for weighing or balancing.
- Discovery-It means the finding out or bringing to light of that which was previously unknown; uncovering; disclosing; revealing; divulging.

When one puts the words all together, Web-scale discovery, one can think of it as the Web being a container of information that people are scaling, attacking or searching to discover resources that support their learning, teaching, and research. We can help with the discovery process and provide a landing place to interpret and analyze the wealth of discovered resources. Web-scale discovery is a pre-harvested central index coupled with a richly featured discovery layer providing a single search across a library's local, open access, and subscription collection. According to Vaughan (2011) Web Scale discovery is "Harvested content is normalized into an underlying schema, developed by the discovery service vendor, that facilitates indexing, relevancy ranking, and an even level of presentation for different content types with potentially varying levels of metadata."

Web scale discovery services are a tool with major potential to transform the nature of library systems. These services are capable of searching quickly and seamlessly across a vast range of local and remote content and providing relevancy-ranked results in the type of intuitive interface that today's information seekers expect. Discovery Services are systems that harvest and pre-index a wide variety of library content from separate sources (records from library databases, the online catalog, perhaps the local institutional repository or other locally developed databases), build one giant index of all that content, and provide near-instant, relevancy ranked results through one search box (Vaughan 2011, Adams et. al. 2013). Web Scale Discovery Service search

library collections the way Google searches the web; by searching the entire breadth of content available in library's collection" (Fry 2013)

This paper describes the the Web Scale Discovery service implementation at Dr. B.B. Dikshit Library, AIIMS, New Delhi and usage efficiency in the remote access environment. It starts with needs and important of Discovery Service in the hybrid nature of collection development in medical library. Explain the implementation process in various steps for establishing the Single Point Search solution for accessing and retrieving of library resources. It also explains the various search techniques and the indexing components for ease of doing literature search in the electronic environment similar to ordinary web search engine. It will narrate and emphasize the essential characteristics of discovery services for information processing to the next generation students doctors and research scholars. This study briefly narrates the tools feature which is counterparts of web such as central index, relevancy based search results. Faceted navigation and user-generated content as well as the information organization components and its functionality: End user interface, interoperability, local search and retrieval, ability to communicate interactively and access to remote index platform etc. It concludes with the economic viability and return on investment based on the usage statistics of this resource discovery services.

3. Implementation of EDS at BBDL

As per the NISO definition of discovery services as those library applications that provide a single search box to access a central, pre-indexed database of institutional holdings. These tools are becoming popular all over the world. It is a current technology in information retrieval paradigm crossing the federated search system from the year 2010. Moreover after release of the SAGE white paper in 2012, adoption of web-scale library discovery services offering single search box solutions has grown steadily. The same approach has been adapted in Dr.B.B.Dikshit Library to frame Single Point Search i.e, iSearch@B.B.Dikshit Library that offers a gateway to the library resources. Single Point Search is a powerful, fast, simple and comprehensive way to discover full text EResources (E-Journals, E-Books and Catalogue) available through our library subscription and beyond. It provides a unified platform for AIIMS users to access and search from all the library resources to get single set of results with de-duplication by providing a Google-like search. It is developed through EBSCO Discovery Service (EDS).

The main function of SPS is "Content harvested from local and remotely hosted repositories to create a vastly comprehensive centralized index—to the article level—based on a normalized schema across content types, well suited for rapid search and retrieval of results ranked by relevancy. Content is enabled through the harvesting of DR.B.B. Dikshit Library subscribed resources combined with agency agreements with publishers and aggregators allowing access to their metadata or full-text content for indexing purposes".

4. What is Single Point Search (SPS) or iSearch@B B Dikshit Library?

Single Point Search is a powerful, fast, simple and comprehensive way to discover full text EResources (E-Journals, E-Books and Catalogue) available through our library subscription and

beyond. It provides a unified platform for AIIMS users to access and search from all the library resources to get single set of results with de-duplication by providing a Google-like search. It is developed through EBSCO Discovery Service (EDS). These tools are becoming popular all over the world. It is a current technology in information retrieval paradigm crossing the federated search system from the year 2010. The main function of SPS is "Content harvested from local and remotely hosted repositories to create a vastly comprehensive centralized index—to the article level—based on a normalized schema across content types, well suited for rapid search and retrieval of results ranked by relevancy. Content is enabled through the harvesting of DR.B.B. Dikshit Library subscribed resources combined with agency agreements with publishers and aggregators allowing access to their metadata or full-text content for indexing purposes". It provides a user friendly platform for user to access and search form the subscribed library resources to get single set of results and feel Google like single search. In simple words it is a replacement of OPAC and Google searching habits. It provides a unified platform to AIIMS Users to get single window search tool for required content from available library resources. It is developed and maintained by EBSCO host.

Fig.1: i-Search@ Dr. B.B Dikshit Library

5. Silent Features of i-Search@ Dr. BB Dikshit Library

The user friendly searching interface is helpful tool for researchers to get the most relevant result with the following features:

- A unified platform to search all the library resources including Subscribed, Open access and local collections such as the library catalogue and institutional Repositories.
- Connections to direct full text links.
- Full featured user-friendly interface.
- Google like single search window.
- User can easily print, edit and save searches as well as create journals search alerts.
- Researcher can create and manage personal folders to save, store and export searches.
- User can share any search result permalink to other researcher through social media.
- Relevance ranking across entire results.

- I-search@ Dr. BB Dikshit Library platform supports nine unique style (citation formats — how to cite) such as — AMA, APA, Harvard, Vancouver, Chicago etc.
- Single results list from all collections.

PICO Search: The PICO process is a technique used in evidence based practice to frame and answer a clinical or health care related question. The PICO framework is also used to develop literature search strategies. The PICO acronym stands for

P – Patient, problem or population

I – intervention

C – Comparison, control or comparator

O – Outcome
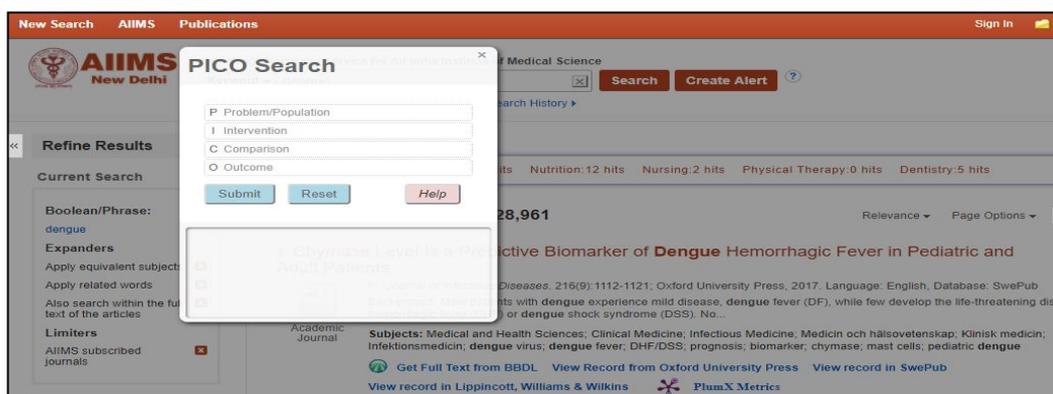
Fig.2: PICO Search

6. Comparison between i-Search @Dr. BB Dikshit Library & PubMed

S. No.	i-Search@Dr. B.B. Dikshit Library	Pubmed
1.	Full text articles can be accessed from subscribed library resources.	Only article abstract available.
2.	Its support to IP based access and Integration with Remote access technologies (e.g. OpenAthens etc.)	It can be accessed anywhere with private network also
3.	This feature is not available in this platform.	Clinical Trial & Review filtering is available from search results
4.	This feature is not available in this platform.	Top Trending articles can be finding on the basis of recent user search.
5.	Possible to limit search to peer reviewed articles.	Peer reviewed article filtering is not available
6.	Integration of Library Catalogue and subscribed database is possible	The provision of Integration of Catalogue and other database is not available
7.	Integration of subject indexes is possible through platform blending	This feature is not available in this platform.

8.	It can be searched sentence, paragraph or whole page through SmartText Searching feature.	This feature is not available in this platform.
9.	More features for narrow downing the search results	Limited features for narrow downing the search results
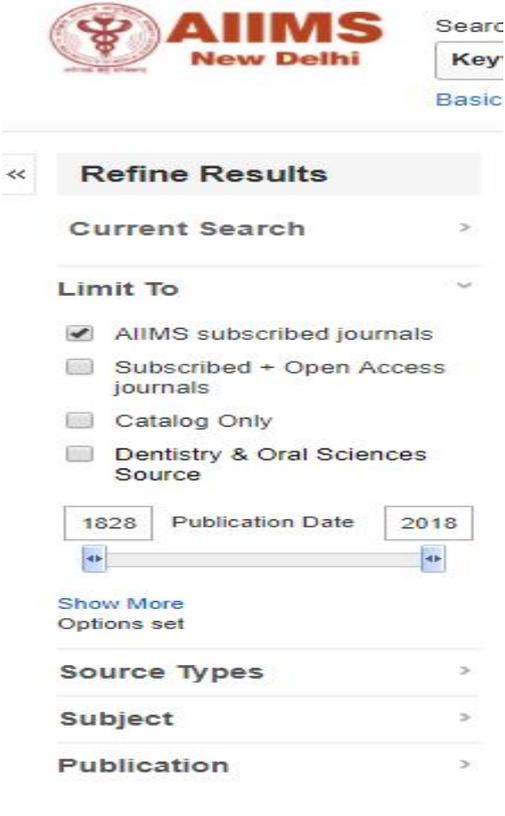
Table. 1: Comparison between i-search @Dr. BB Dikshit Library & PubMed

When using PubMed user always get latest information and can update yourself about latest trends happening in medical field but cannot access the full text articles download through PubMed because it's a very popular indexing database of medical publication worldwide. It covers only free full text articles and provides only abstracts with direct full text link to publisher's sites.

7. Discovery Interface of "Single Point Search"

This discovery interface has administrative aspects of customize the various types of library branding elements like colour and logos, and specify some layout details such as position of logos and choose to have a custom toolbar at the top of the interface. We add the elements according to our requirement in the toolbar such as Folder, Language, and Sign in, New Search etc. In addition, we provide custom text at the bottom of the interface.

Figure 6: Single Point Search User Interface
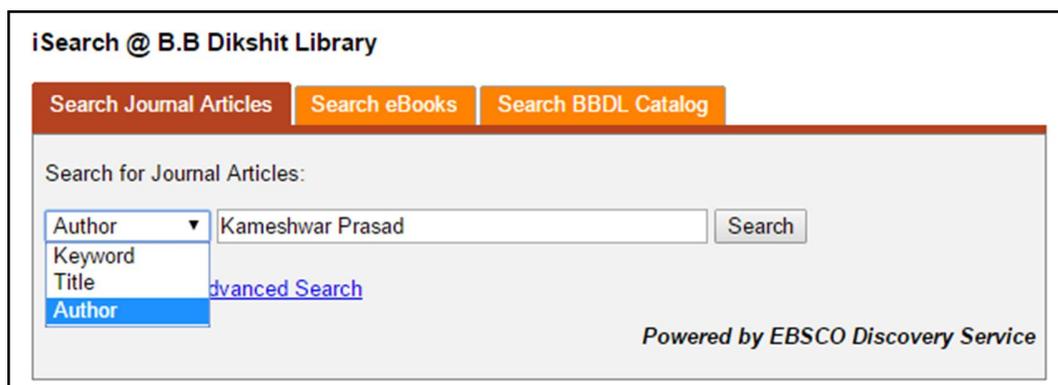
It offers single search box with advanced search hyperlinked below. Advance search takes you to the advance window having Boolean search, find all the search terms, find any of the search terms, and so on. In addition users can indicate if they wish to display only results with linked full text, or scholarly or peer reviewed journals. Users can also search by title, author and indicate a publication date range. The Advance search mode provides the ability to conduct fielded searches and the use of Boolean operators via pull down menus (Figure 1 and 2). Advanced searching supports:

- Searching with Boolean operators
- Proximity searching
- Quotes/phrase searching
- Truncation
- Wildcards and many more ….

Advance options include various search modes that can be applied by a user such as:

"Find all my search terms" "Find any of my search terms" and "SmartText Searching". Limiters in the advanced mode allow users to refine searches to a particular field in the index (TX-All text, AU-Author, Ti-Title, SU-Subject Terms, SO-Journal Title/Source, AB –Abstract, IS-ISSN, IB-ISBN). We can expand the searches to apply related words and search within the full text of journals, eBooks etc.

Figure 7: Advance Searching Facility in SPS

8. Search Result Interface

Once a search is conducted the full interface is displayed and this interface is divided into a large central section and 2 vertical panes having limiters for further refinement of results and links to other important databases. By default, items are ranked by Relevancy, other sort options are chosen by pull down menu include Date Newest, Date Oldest. The user can also define various Page option. Majority of the Discovery service interface contains Results from a search. Each content type such as journal, Book, Articles has a unique icon.

Click the single record to get full information about the record. Link to full text is also provided which takes you to the publisher's website and gives full text (if full text is subscribed). For physical books present within the library, the detail view provides typical citation information (title, author, source etc.). For journal article, the detailed record view contains information about author, title, source, subject term, abstract etc. Full text can be read through Full text finder link.

9. Faceted Navigation and Search Refinement

Single Point Search offers various search refinement methods, including faceted navigation. The left hand side pane is used to refine results with various filters and limiters and the right hand pane is used to incorporate various other databases. Limit your search to AIIMS subscribed Journal or Open Access or Catalogue only. Here AIIMS subscribed journals are set as default setting. Further result can be refined by source type, publication date, subject, publisher, publication, subject, language, geography, location, content provider.

Figure 5: Refining the results in SPS

10. Simultaneous search in all B. B. Dikshit Library Databases

While you perform the search in Single point search it simultaneously federated the same key word search to all subscribed databases such as point of care database like UpToDate, BMJ Best Practice, BMJ Case Report and PubMed which are listed in the right panel important link, for example "Tuberculosis" in other Databases by just clicking the database link at the right side bar.

Figure 6: Simultaneous search on subscribed databases
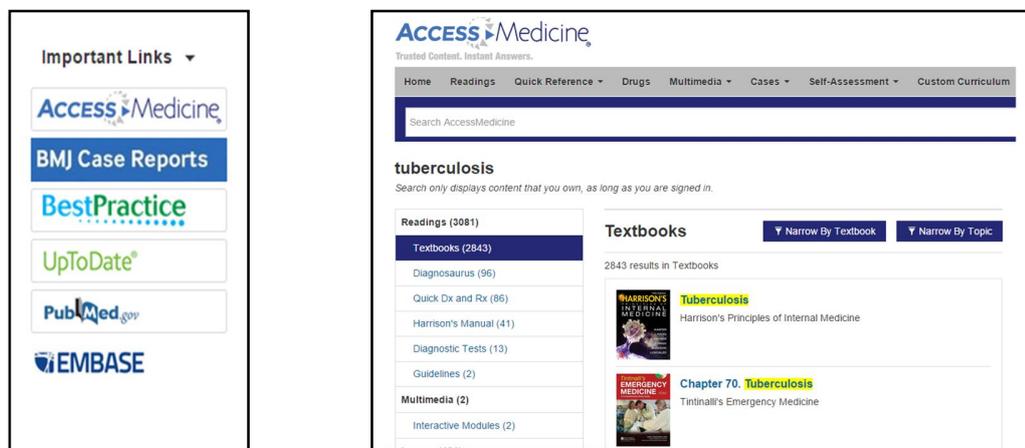
11. Personalisation of Library

Personalisation of your search and search alert through email can be done in SPS. To manage the your searches, you can create a personal folder in Single Point Search, which is accessible by the ID and password and from any interface screen. Document of your intrest can also be added to a folder for futurereference. Using options available through your personal folder you can:

- Save preferences
- Organize your research with folders
- Share your folders with others

- View others' folders
- Save and retrieve your search history
- Create email alerts and / or RSS feeds
- Gain access to your saved research remotely

After adding to a folder documnet can be saved in various standard file format and in different Citation Formats such as ABNT, AMA, APA, Chicago etc

12. Sharing, Export and RSS feeds

Result articles or books or any other documents can be shared through E-mail by just clicking the sharing option at the top of the result page. It also offers variety of export options such as printing, email, saving, and exporting to a citation management program such as Endnote, Procite, RefWork and BibTex. Users can save citations to a file format: direct export to Endnote, Mendely etc. or save to xml, Bibtex format or MARC 21 format.

13. Preparation of various format of bibliographic record

After the literature search in SPS we can make the bibliographic list with different standard formats such as AMA and Vancouver. Select the relevant articles and then open the folder, all the selected search results will be going to the respective folder.

14. Conclusion

In Pandemic environment the information becomes distributed, diversified, and open, library reader prefers web-scale discovery tools that aggregate resources from a range of sources over the library traditional collection born and scanned digital resource from the repositories etc., Most importantly the research and development output in scholarly form nowadays has three interrelated challenges for library discovery. One the types of information researchers seek is changing. Second what researchers intend to do with that information is changing. Thirdly, How the researchers go about looking for that information is changing. Based on these panoramic view Web-Scale Discovery service (WSD) is the right solution to envisioning the future of library in the Post coronavirus era.

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Address

Keynote

Paper

Folklore: A Scientometric Assessment of Fifty years of global research output

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Abstract:

The study aimed to identify the research trends and map the global publications on folklore during 1971-2020. The objectives of this research are to find out year-wise research, relative growth rate and doubling time, types of documents, prolific author, the pattern of authorship, productive journals, most cited documents, and author collaborations, institution, and countries; author keywords occurrences, and to know the latest trends in global folklore research. Fifty years of research data retrieved from the Scopus database covering 1971-2020. The word 'folklore' searched by selecting a 'title' option, refined by year and the language. Only English language research data considered for this analysis. Therefore 1929 publication downloaded in the BibTeX and CVS format. The collected data have analyzed with different software, such as Microsoft Excel, Access, Bibliomatrix.3.0, Vovsviewer and Scientopy. The result shows that the year 2017 recorded maximum research growth (130 documents). Most of the papers published in the form of articles (1111), single-authored papers are 73% (1406). The journal 'Folklore' found the leading producer of research in the considered field (164 papers). The University of California has been the highest collaborative institutions, and the USA contributed maximum articles (724).

Keywords: Scientometrics; folklore; Relative growth rate; Authorship pattern; collaboration; prolific sources

1. Introduction

The word 'folklore' comprises two words: folk (meaning people) and lore (meaning knowledge), the knowledge of people transferred from generation to generation (Bennett, 1993). The present study considered to analyze the changing trends in this field of research in folklore and how these trends brought into a wide range of research. It will evaluate the changing scenario of the studies on folklore with time. Grimm brother's Kinder und Hausmarchen, published in 1812,

is one of the earliest remarkable published works in folklore studies. Folklore was called "popular antiquities" in England in the 19th century. The word 'folklore' was first coined by William John Thoms in 1846 (Bennett, 1993). The genre had been a particular interest for academicians and folklorists, and it has maintained its relevance till date. Colonizers had shown particular interest in collecting and studying the folklore of their colonies and studying them to understand the people of its colonies and their culture and govern them better. Many popular fiction and prose narratives are written in various languages draw its content from folklore. Academicians from all the disciplines are showing immense interest in folklore studies due to its multidisciplinary or transdisciplinary approach. Women's studies, cultural studies, anthropology, literature, etc., are prominent disciplines that extensively study this genre. 'Folklore' was earlier understood by synonymous with folk tales and folk songs. However, it also includes other aspects of folk and their culture, such as architecture, art, food, etc. It studies all the different elements with academic enthusiasm like folk songs and folk tales, which help scholars to analyze the changes in the community's ideology and culture with the change in time. Folklorists are now suggesting that the word 'folklife' defines this genre better than the word 'folklore(Ben-Amos, 2020)'. Like the definitions, the medium of transmission of the lore of the folks is changing with time. Earlier, it transferred through oral traditions, but the medium is also evolving with changing technology. The advent of the internet, it is in the process of rapid transmission across its respective communities. It is no more limited to a small community; it has become easier for academicians and scholars to retrieve the knowledge about it. Similarly, the availability of more translated works of folklore with time, in various languages, has played a crucial role in the expansion of folklore studies. The present study assesses the global folklore research from 1971-2020 by applying scientometric methods. "Scientometrics analyze the quantitative aspect of the generation, propagation, and utilization of scientific information to contribute to a better understanding of the mechanism of scientific research activities." (Osareh, 1996). There is no such bibliometric study conducted on global folklore research except Estonian folklore research and folklore: Electronic journal of folklore from 2005–2014 (Lauk, 2016). The present paper attempts to trace these various factors related to folklore studies, thereby framing a picture of the changing trends through the scientometric research by mapping the published works on folklore. This study would be of immense relevance for scholars working in this area. It would also help them study the factors contributing to the changing trends in this genre.

2. Literature Review:

Lin, Zhu, Ahmad and Han (2019) have attempted to highlight quantitative analysis of global research on Brownfields during 1995-2017. The study data was collected from the web of science database using CiteSpace. The total 630 data downloaded for analyzing on co-authorship, co-word, co-citation, and cluster analysis. Most of the research carried out on Brownfields in the United States of America, followed by the United Kingdom, Canada, Germany, and China. It also revealed the most frequently used words in the studies are "Brownfields", "Heavy metal," "Remediation," "redevelopment" and "Sustainability". However, the term "Management and Biodiversity" received the maximum citation in recent years. The study examined co-citation cluster, and top topics were Sustainable regeneration, Urban Brownfield's regeneration, mental

distribution, and coal mine brownfield and ecosystem services. The study helped the researcher and practitioner understand the salient features and trends of brownfield research globally.

Wuni, Shen and Osei-Kyei, (2019) have explored global research productivity on green building from 1992 to 2018. The study analyzed a total of 1147 research articles for this study from 1992 to 2018. It revealed that research on the green building was increased exponentially from 1992 to 2018. 44% of countries are highly engaged in the green building's research activity; major ten broad themes on the green building identified and suggested for future research. Overall, these papers provide a new insight to the researchers, funding agencies, policymakers, and other professionals.

Fang, Yin and Wu (2018) have described the research output in 'Climate Change' and 'Tourism' from 1990 to 2015. The study collected 1976 research publications during 1990-2015 in Climate change and Tourism using CiteSpace analyzing software. Study visualized collaboration network, co-citation network and recent emerging trends. The number of research publication has been increased exponentially, and it became an interdisciplinary subject. The highly productive authors and institution belong to Australia, United States of America, Canada, New Zeeland, and European countries. The study finds out hot topics of Climate Change and Tourism are consequences of climate change for tourism, necessary adaptations, the vulnerability of the tourism industry, tourist behaviour, demand in response to climate change and emission reductions in the tourism. The paper highlighted an in-depth analysis of climate change and tourism research activity for understanding global trends and directions in this field over the last 25 years.

Rahaman, Md Safiqur, Kumar, Dr Suchetan, Ansari, Khadeeja M N and Rahman, Md Rafiqur (2021) have researched the research trends in novel coronavirus from 1996-2020. A total of 2661 papers have been retrieved from Scopus database and analyzed through Bibliometrix and VOSviewer software. The analysis shows that "articles" were the most type of research form, 'The University of Hong Kong' was productive institutions, and *'Journal of Virology'* was the most impactful source in novel coronavirus. The word coronavirus was the highly appeared author keywords.

Guo, S, Tian, J, Zhu, B, Yang, Yu, K, Zhao, Z (2018) have explored research performance on metabolomics from 1992 to 2017. The study studied thematic trends, Number of articles, Prolific Authors, and most preferred journal in metabolomics. Bibliographic data (66721) has been retrieved and downloaded from the web of science database during 1992-2017. The study revealed that the USA has the maximum number of researches published in metabolomics, China Academic of Sciences has the highest number of publications. The most preferred journal was the *Proceedings of the National Academy of Sciences of USA*, *PLOS ONE* has most of the research Publications. The most prolific author was Nicholson with maximum co-citations. The study suggested that metabolic syndromes and related disease, novel pathways of metabolomics will be significant research work in the future.

Singh and Bebi(2013) have investigated 'Indian Women Scientist's' research productivity of the few selected Indian research institutes in physics and astronomy during 2011-2015. The study identified that active women scientist (12.35%) only while men scientist (87.65%) found that 73 women scientists out of 583, women scientist published 713 research paper from 2011 to 2015. The study explored that National physical laboratory has published the largest number of publication (144). In contrast, Indian Institute Astrophysics has the maximum number of citations, a research paper published in collaboration with other national and international institutes, and the average CC is 0.7480. It also described that most women scientist published the research work in the journal of Astronomy and Astrophysics. The most prolific author is Aditi Sen De, Harish Chandra Research Institutes with 38 articles.

3. Objectives:

The objective of the present study is to assess the fifty years of global research on folklore. In this specific objective, various objectives considered such as: to identify annual scientific production on folklore during 1971-2020, average citation per year, relative growth rate and doubling time, the pattern of authorship, the most impactful journal and authors, the most productive country and institution, the most cited country and to explore the research trends on folklore.

4. Material and Methods:

The research data extracted from the Scopus database. The search (TITLE -folklore) conducted on 14th December 2020, further limit to years (1971-2020) and Language (English). One thousand nine hundred twenty-nine research data downloaded to assess and classify according to different scientometric parameters, including yearly global research, document types, subject-wise distribution of documents, prolific author, etc. The collected records analyzed by using various analyzing tools such as Microsoft Excel, Microsoft Access, bibliometrics.30 (Massimo Aria & Corrado Cuccurullo, 2019), VOSviewer (van Eck and Waltman, 2010) and Scientopy (Ruiz-Rosero, J., Ramirez-Gonzalez, G. & Viveros-Delgado, 2019). The software vitally beneficial to prevent the human error in the analyses and the results are most trustworthy to consider.

5. Result and Discussion:

5.1. Yearly research growth:
Figure (1) shows that year-wise research on folklore from 1971 to 2020. The year' 2017' contributed the highest research papers (130), followed by 2013 (114 papers), and 2016 (108 papers). 1994 recorded the lowest research papers (09). During the first three-decade (1971-2000) the average research contribution per year found lowest (16.87 article per years) as compared to recent two decades (2001-2020), it was 71.15 average research per year.
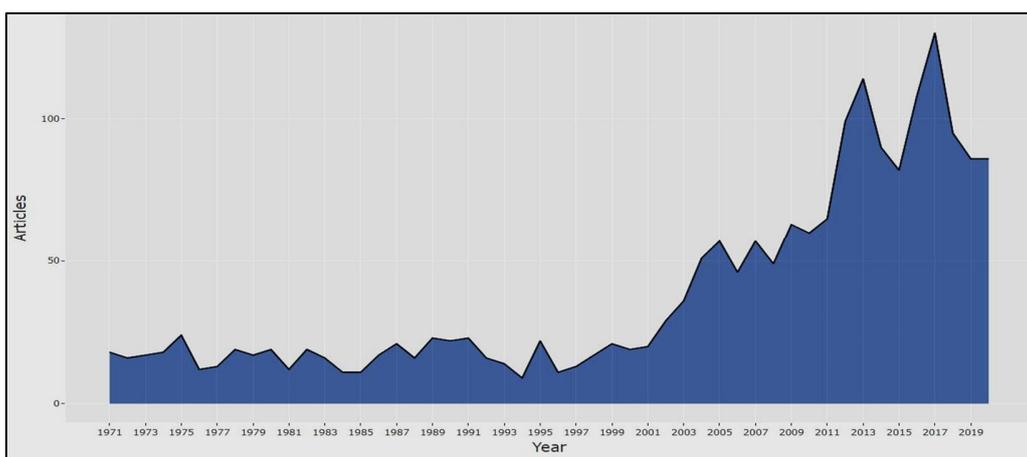
Figure (1): Annual Scientific production

Table (1): Yearly research output, Relative growth rate and doubling time

#	Year	NP	Cum +	Log 1	Log 2	RGR	DT	Mean TC per Year	Citable Years
1	1971	18	18	0.00	2.8903	0.00	0.00	0.3741	49
2	1972	16	34	2.8903	3.5263	0.6359	1.0896	0.1679	48
3	1973	17	51	3.5263	3.9318	0.4054	1.7091	0.1088	47
4	1974	18	69	3.9318	4.2341	0.3022	2.2925	0.0809	46
5	1975	24	93	4.2341	4.5325	0.2984	2.3216	0.0453	45
6	1976	12	105	4.5325	4.6539	0.1213	5.7102	0.2026	44
7	1977	13	118	4.6539	4.7706	0.1167	5.9370	0.0787	43
8	1978	19	137	4.7706	4.9199	0.1492	4.6417	0.1466	42
9	1979	17	154	4.9199	5.0369	0.1169	5.9245	0.0659	41
10	1980	19	173	5.0369	5.1532	0.1163	5.9567	0.0855	40
11	1981	12	185	5.1532	5.2203	0.0670	10.333	0.2521	39
12	1982	19	204	5.2203	5.3181	0.0977	7.0884	0.1675	38
13	1983	16	220	5.3181	5.3936	0.0755	9.1778	0.1554	37
14	1984	11	231	5.3936	5.4424	0.0487	14.203	0.0176	36
15	1985	11	242	5.4424	5.4889	0.0465	14.896	0.3844	35
16	1986	17	259	5.4889	5.5568	0.0678	10.207	0.2664	34
17	1987	21	280	5.5568	5.6347	0.0779	8.8889	0.1255	33
18	1988	16	296	5.6347	5.6903	0.0555	12.4707	0.2265	32
19	1989	23	319	5.6903	5.7651	0.0748	9.2607	0.0743	31
20	1990	22	341	5.7651	5.8318	0.0666	10.3911	0.1651	30
21	1991	23	364	5.8318	5.8971	0.0652	10.6172	0.3373	29
22	1992	16	380	5.8971	5.9401	0.0430	16.1097	0.2209	28
23	1993	14	394	5.9401	5.9763	0.0361	19.1544	0.6772	27
24	1994	9	403	5.9763	5.9989	0.0225	30.6832	0.3547	26
25	1995	22	425	5.9989	6.0520	0.0531	13.0379	0.1763	25
26	1996	11	436	6.0520	6.0776	0.0255	27.1200	0.2840	24
27	1997	13	449	6.0776	6.1070	0.0293	23.5869	0.2775	23
28	1998	17	466	6.1070	6.1441	0.0371	18.6477	0.5641	22
29	1999	21	487	6.1441	6.1882	0.0440	15.7219	0.3424	21

30	2000	19	506	6.1882	6.2265	0.0382	18.1069	0.8815	20
31	2001	20	526	6.2265	6.2653	0.0387	17.8771	1.2736	19
32	2002	29	555	6.2653	6.3189	0.0536	12.9129	0.6436	18
33	2003	36	591	6.3189	6.3818	0.0628	11.0266	0.3251	17
34	2004	51	642	6.3818	6.4645	0.0827	8.37236	0.4754	16
35	2005	57	699	6.4645	6.5496	0.0850	8.14695	0.5216	15
36	2006	46	745	6.5496	6.6133	0.0637	10.8734	0.4534	14
37	2007	57	802	6.6133	6.6871	0.0737	9.39987	0.4966	13
38	2008	49	851	6.6871	6.7464	0.0593	11.6856	0.6938	12
39	2009	63	914	6.7464	6.8178	0.0714	9.70337	0.6320	11
40	2010	60	974	6.8178	6.8814	0.0635	10.8995	0.8783	10
41	2011	65	1039	6.8814	6.9460	0.0646	10.7271	0.6170	9
42	2012	99	1138	6.9460	7.0370	0.0910	7.6142	0.7550	8
43	2013	114	1252	7.0370	7.1324	0.0954	7.2588	0.51503	7
44	2014	90	1342	7.1324	7.2019	0.0694	9.9828	0.53518	6
45	2015	82	1424	7.2019	7.2612	0.0593	11.6846	1.13414	5
46	2016	108	1532	7.2612	7.3343	0.0731	9.47961	0.4652	4
47	2017	130	1662	7.3343	7.4157	0.0814	8.50853	0.45384	3
48	2018	95	1757	7.4157	7.4713	0.0555	12.4671	0.7	2
49	2019	86	1843	7.4713	7.5191	0.0477	14.5018	0.4302	1
50	2020	86	1929	7.5191	7.5647	0.0456	15.1950		0

*NP=Number of publications, **RGR=Relative growth rate,***DT=Doubling time, ****Cum+=Cumulative*

5. 2. Mean citation per year:

Table (1) shows that 2001 produced 20 research papers with the highest mean citation per year (1.2736) followed by 2015 contributed 82 papers with mean citation per year 1.1341. The year 1971 has the highest citable year (49) and 2020 has the least citable year (0).

5. 3. Relative growth rate (RGR) and doubling time (DT):

The concept of relative growth rate given by Mahapatra in the year 1985 (Mahapatra M, 1985). The relative growth rate and doubling time are associated with each other. Doubling time calculation is based on depending on relative growth rate. The equation of relative growth rate as below:-

$$R\,(1-2) = \frac{W1 - W2}{T2 - T1}$$

Where R (1-2) means the relative growth rate over a specified period of interval
W1=Log w1 (Natural log of the initial number of publications/Pages)
W2=Log W2 (Natural log of the final number of publications/ pages)
T2-T1= the unit difference between the initial time and final time
The relative growth rate for publications and pages calculated separately.
Therefore,
R (a) = Relative growth rate per unit of time (year)
R (p) =Relative growth rate per unit of pages, per unit of time (year).

Doubling time have a direct relation with the relative growth rate. If the number of research publications/ articles/pages of a subject double during the given period, then the difference between the logarithms of numbers at the beginning and end of this period must be the logarithms of number two. If one uses natural logarithms, then this difference has a value of 0.693. Thus, the corresponding DT for publications and pages can be calculated by the following calculations.

$$Dt = \frac{0.693}{R}$$

Where, DT =Double time, R= Relative growth

The table (1) show that relative growth was highest in 1972 (RGR=0.635989), and it was lowest in 1994 (RGR=0.022586). The table reveals that RGR was fluctuating and overall trends of RGR was decreasing during the study time (1971-2020). The doubling time was highest in 1994 (DT=30.6832), followed by 1996 (DT=27.12002), 1997 (DT=23.58696).DT (1.089642) was lowest in 1972. In the table, Dt was changeable in the fifty-year study with increasing Dt trends. The table shows an inverse relation between RGR and DT. This result agrees with the (Kumar and Rahaman, 2019).

5.4. Subject wise research contribution on folklore

The table(2) illustrated subject wise research papers in folklore from 19971-2020. 'Arts and Humanities' contributed maximum research papers (1089) followed by 'Agricultural and Biological Sciences' (81), 'Computer Science' (79), 'Biochemistry, Genetics and Molecular Biology' (47). 'Dentistry' (02) was the least contributed subject to folklore during fifty years of research.

Table (2): Top ten Subject wise research

#	Subject	NP	Ranks
1	Agricultural and Biological Sciences	81	2
2	Arts and Humanities	1089	1
3	Biochemistry, Genetics and Molecular Biology	47	4
4	Business, Management and Accounting	46	5
5	Chemical Engineering	07	9
6	Chemistry	15	8
7	Computer Science	79	3
8	Decision Sciences	16	7
9	Dentistry	02	10
10	Earth and Planetary Sciences	28	6

5.5. Prolific author

The table (3) described the top 15 prolific authors in the global folklore research. The table revealed that 'Newall V' (12 papers) produced maximum international research on folklore with 12 total citations followed by 'Baron R' (09 papers) with 52 total citations. The authors' Bronner SJ', Sanderson SF and 'Wood J' were contributed 08 papers each. 'Bronner SJ' has received the maximum total citation (90) for 08 research papers followed by 'Blank TJ' (TC=70) for only five

research papers. Bronner SJ has the highest h-index (6) and g-index (8) for eight papers. 'Dash S' and 'Dinda SC' have least (01 papers each) contributed authors among the top 15 authors.

Table (3): Author impact

#	Author	h_index	g_index	m_index	TC	NP	PYS
1	Newall V	3	4	0.06	17	12	1971
2	Baron R	4	7	0.222	52	9	2003
3	Bronner SJ	6	8	0.194	90	8	1990
4	Sanderson SF	1	1	0.02	3	8	1971
5	Wood J	3	4	0.079	17	8	1983
6	Eliason EA	2	2	0.222	8	7	2012
7	Hasan-Rokem G	3	5	0.176	29	7	2004
8	Tangherlini TR	5	7	0.455	72	7	2010
9	Untiedt Kl	1	1	0.059	2	7	2004
10	Greenhill P	2	3	0.105	11	6	2002
11	Mysels KJ	2	3	0.063	13	6	1989
12	Blank TJ	4	5	0.333	70	5	2009
13	Chan PC	3	5	0.188	30	5	2005
14	Dash S	1	1	0.125	4	5	2013
15	Dinda SC	1	1	0.125	4	5	2013

*TC=Total citation,**NP=number of publications,*** PYS=publications year start*

5.6. Authorship pattern:

Figure (2) shows the authorship pattern in the field of global folklore research. The table reveals that single author-produced 73% (1406 papers) of research followed by double authors (262), three authors (122), four authors (62) and fifth author (41). It was clear from the table that only 1% of papers published by more than eight authors. Thus, the researchers are not interested in collaborating work while writing research on folklore.

Figure (2): Pattern of authorship

5.7. Corresponding author's country

Table (4) shows that most of the authors belong from USA (234 articles), followed by India's author (70 articles), United Kingdom's author (66 articles) and Canada's authors contributed 18 articles. Finland's authors were the least produced (9 articles) among the top ten corresponding authors country.

Table (4): Top ten Corresponding author's country

#	Country	Articles	Freq	SCP	MCP	MCP Ratio
1	USA	234	0.3662	222	12	0.0513
2	India	70	0.10955	69	1	0.0143
3	United Kingdom	66	0.10329	64	2	0.0303
4	Canada	18	0.02817	17	1	0.0556
5	Slovenia	13	0.02034	13	0	0
6	China	12	0.01878	9	3	0.25
7	Germany	12	0.01878	11	1	0.0833
8	Australia	10	0.01565	9	1	0.1
9	Japan	10	0.01565	9	1	0.1
10	Finland	9	0.01408	9	0	0

*SCP=Single county publication,**MCP=Multiple Country publications*

5.8. Productive journals

Table (5) described the top 15 highly productive sources out of 1021 on global folklore research. The journal '*Folklore*' (164 papers) found leading contributed journal for fifty-years research followed by *'Journal of American folklore'* (67 papers), *'Journal of folklore research'* (37) and '*Folklore* (United Kingdom)' (31). The *Lecture notes in computer science* (5) studied the least contributed journals on global folklore research. In terms of total citation received by journals, *'Journal of ethnopharmacology'* received maximum citations (TC=569) followed by Folklore (TC=425), *'Journal of American folklore* (TC=443). *'Celebrating 100 years of the Texas folklore society*, 1909-2009' have zero citation for 16 papers. *'Journal of American folklore'* has the highest h-index (11) for 67 papers with 443 total citations. It also has leading g-index (17) for 67 papers with 443 total citations.

Table (5): Source impact

#	Source	h-index	TC	NP	PYS
1	Folklore	10	425	164	1971
2	Journal of American Folklore	11	443	67	2002
3	Journal of Folklore Research	8	185	37	2002
4	Folklore (United Kingdom)	3	49	31	2012
5	Western Folklore	6	102	28	1980
6	Fabula	5	51	24	1972

7	Milli Folklore	2	30	24	2008
8	Folklore (Estonia)	2	14	23	2012
9	FF Communications	1	11	19	2003
10	Traditiones	3	22	18	2011
11	Celebrating 100 Years of the Texas Folklore Society, 1909-2009	0	0	16	2009
12	A Companion to Folklore	6	92	15	2012
13	Folklore in Utah: A History and Guide to Resources	1	5	14	2004
14	Journal of Ethnopharmacology	7	569	10	1982
15	Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	5	77	10	1991

5.9. Affiliation wise research contribution

Table (6) illustrated that the University of California was the leading affiliated institutions in the field of folklore research (26 papers) followed by Pennsylvania state university (16 papers), Indiana University (15), Brigham young university (12). The China medical university, Michigan state university, and New York University contributed minimum papers (07). Most of the leading affiliated institutions are from the United States of America.

Table (6): Institution wise research

#	Affiliations	Articles
1	University of California	26
2	Pennsylvania state university	16
3	Indiana university	15
4	Brigham young university	12
5	Ohio state university	11
6	University of Pennsylvania	10
7	California state university	9
8	Harvard university	9
9	University of Massachusetts	9
10	University college	8
11	University of Alberta	8
12	University of Tartu	8
13	China medical university	7
14	Michigan state university	7
15	New York university	7

5.10. Country-wise research

The table (7) display the US found the most productive country in folklore research during 1971-2020 followed by India (193 papers), United Kingdom (175), Canada (57), China (49), Australia (40) etc. Georgia contributed least (2 papers) amongst the top 15.

Table (7): Most cited and productive country

Country	Total Citations	Paper
USA	2411	724
India	1115	193
UK	492	175
Israel	243	27
Italy	153	25
Australia	145	40
China	139	49
Turkey	138	29
Poland	135	09
Japan	131	27
Portugal	119	08
Canada	111	57
Nigeria	100	17
Pakistan	82	25
Jordan	76	02
Korea	60	05
Germany	56	28
Georgia	53	02
New Zealand	42	15
Switzerland	40	09

5.11. Most cited country

Table (7) show that the USA found the most cited country (2411) followed by India (TC=1115, UK (TC=492), Israel (TC=243), Italy (TC=153), Australia (TC=145). Switzerland received minimum (TC=40) citation.

5.12. Visualization of co-citation of cited authors

Co-citation selected from 'types of analysis,' and cited authors selected from a 'unit of analysis', a full method used for calculation. Minimum five authors considered for analysis. There are 51067 authors out of which 1913 to meet the thresholds. The authors, with the highest total link strength, selected. Full item found 994, cluster, 22, links 63649, and total link strength 382386.

The figure (3) visualized that 'Dundes, A.' found the most co-citation of cited authors with 646 citations, followed by Bauman, R, SJ (214 citations). Dorson, RM (199 citations), Bronner, S.J (159 citations), Thomson, S (130 citations), Ben-Amos, D (129 citations), Abrahams, R.D (123 citations) and Krishenblatt-Gimblett, B (114 citations) etc.
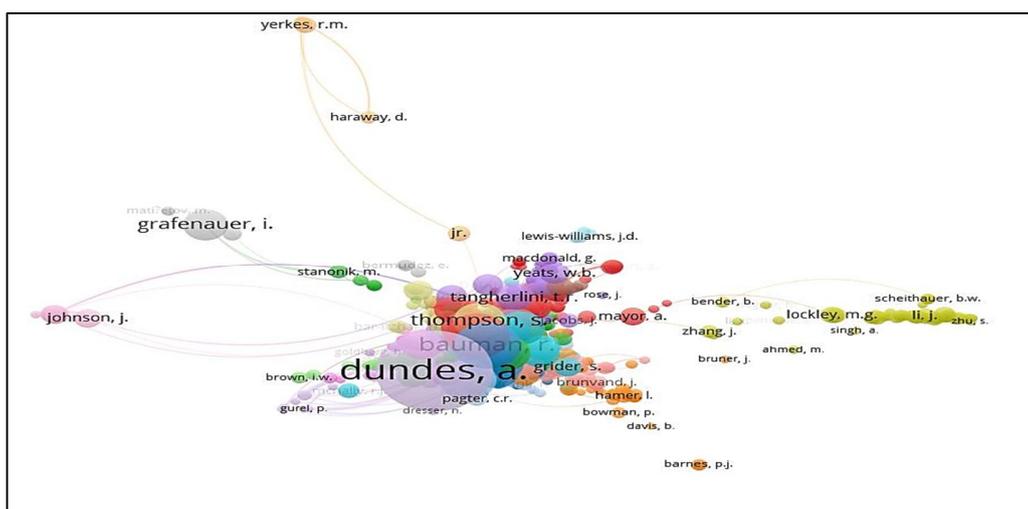
Figure (3): Co-citation of cited authors

5.13. Global most cited documents

Table (8) shows that the documents entitled '*Sudden and rapid death during psychological stress. Folklore or folk wisdom?*' (1971) by Engel, G.L was the most global cited papers with 303 total citations, followed by '*Antibacterial activity of some folklore medicinal plants used by tribals in Western Ghats of India*' (2000) by Perumal Samy R. Ignacimuthu S with 271 TC, '*Witching Culture: Folklore and neo-paganism in America*' (2004) with 137 citations. '*Metaphors of Masculinity: Sex and Status in Andalusian Folklore*' (2015) and '*Erythrocyte sedimentation rate from folklore to facts*' (1985) have 136 citations for each paper. '*Killing by neutrophil extracellular traps: Fact or folklore? (2012)* and '*Turning Facts into Stories and Stories into Facts: A Hermeneutic Exploration of Organizational Folklore (1991)* has 135 citations each, respectively. The paper titled '*What Folklore Tells Us about Risk and Risk Taking: Cross-Cultural Comparisons of American, German, and Chinese Proverbs (1998)* has least citations among the top ten most cited papers (TC=120).

Table (8): Top ten most Cited papers

#	Paper Title	Author	Year	Source	TC	TC/Y
1	Sudden and rapid death during psychological stress. Folklore or folk wisdom?	Engel G.L.	1971	Annals of internal medicine	303	6.06
2	Antibacterial activity of some folklore medicinal plants used by tribals in Western Ghats of India	Perumal Samy R., Ignacimuthu S.	2000	Journal of Ethnopharmacology	227	10.8095
3	Witching culture: Folklore and neo-paganism in America	Magliocco S.	2004	Witching Culture: Folklore and Neo-Paganism in America	137	8.0588
4	Metaphors of Masculinity: Sex and Status in Andalusian Folklore	Brandes S.	2015	Metaphors of Masculinity: Sex and Status in Andalusian Folklore	136	22.6667
5	Erythrocyte sedimentation rate. From folklore to facts	Bedell S.E., Bush B.T.	1985	The American Journal of Medicine	136	3.7778

6	Killing by neutrophil extracellular traps: Fact or folklore?	Menegazzi R., Decleva E., Dri P.	2012	Blood	135	15
7	Turning Facts into Stories and Stories into Facts: A Hermeneutic Exploration of Organizational Folklore	Gabriel Y.	1991	Human Relations	135	4.5
8	Antimicrobial and anti-inflammatory activity of folklore: Mallotus peltatus leaf extract	Chattopadhyay D., Arunachalam G., Mandal A.B., Sur T.K., Mandal S.C., Bhattacharya S.K.	2002	Journal of Ethnopharmacology	130	6.8421
9	A randomized controlled trial of Turkish folklore dance on the physical performance, balance, depression and quality of life in older women	Eyigor S., Karapolat H., Durmaz B., Ibisoglu U., Cakir S.	2009	Archives of Gerontology and Geriatrics	121	10.0833
10	What Folklore Tells Us about Risk and Risk Taking: Cross-Cultural Comparisons of American, German, and Chinese Proverbs	Weber E.U., Hsee C.K., Sokolowska J.	1998	Organizational Behavior and Human Decision Processes	120	5.2174

5.14. Three Fields-Plot of author, country and Institutions:

The three fields-plot used to identify the relationship between author, country and institutions (figure 4). The figure observed that most of the authors and institutions belong from the USA, followed by the United Kingdom, China and India for folklore research.
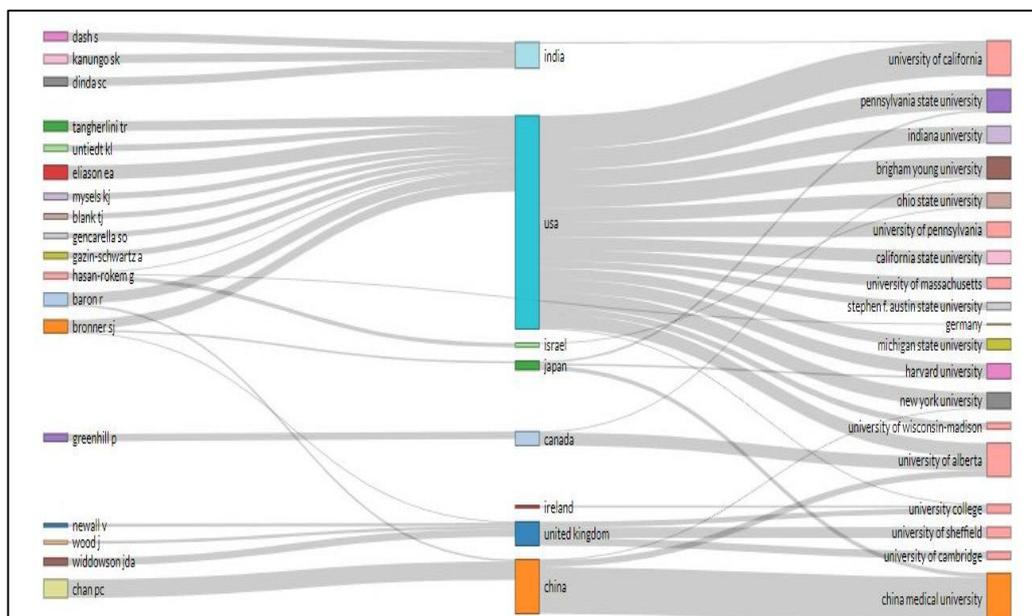
Figure (4): Relationship between the author (Left), country (Middle) and Institutions (Right) for folklore research

Figure (5): Evolution of author keywords

5.15. Author keywords evolution

Figure (5) shows the author keywords evolution of folklore research from 1971-2020. The most used author keywords were *folklore, Culture, Medicinal plants, Literature, history, Identity, Proverbs, Tradition, Mythology, Nationalism, Anthropology, Antibacterial activity, Antimicrobial activity, Antioxidant, Folktales* etc. The author keyword '*folklore*' appeared maximum (184) with the highest average document per year (24.5) followed by 'Culture' (18) with 27.8 ADY. The top 5 author keywords appeared before the year 2004 to till 2020.

5.16. Research trend by title topics

Figure (6) illustrated research trends by title topic in the field of folklore from 1971 to 2020. The figure revealed the highly trends topics by titles which frequently occurred were Folklore (freq=1986), Study (freq=161), Culture (freq=122), Tradition (freq=96), Society (freq=85), Medicine (freq=84, and History (freq=69) etc. The topic folklore had highest log frequency (1986) in 2011.

Figure (6): Trend topic by titles

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5.17. Title word dynamics

Figure (7) shows the title words growth from 1971 to 2020 in folklore. The most used title word dynamic was 'folklore' since 1971, and the word appeared 1986 times in the folklore research. The other title word dynamic was Study, Culture, Tradition, Society, Medicine, History, Fact, American, Literature, Plant, Folk, Nation, Popular, Modern, Active, Note, Case, Public and India.
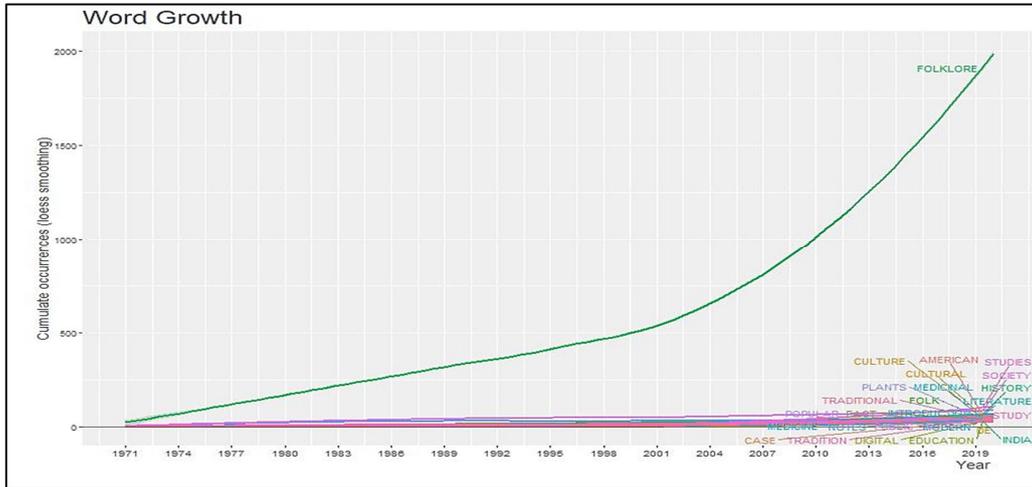

Figure (7): Title word dynamics

6. Conclusion

To summarize, based on the analysis of global research on folklore during the last fifty years (1971-2020). There were 1021 sources for 1929 research papers. The average years from publication is 14.6, with average citations per documents (5.309), and Average citations per year per doc (0.4268). A total of 76300 references used for 1929 research paper on folklore in the last fifty year. There were keywords plus (ID) (4055), author's keywords (2802). Two thousand four hundred eighty-seven authors contributed 1929 papers with author appearances (3009). Single author-produced 1141 documents while multi-author contributed 1346 articles. The single-authored collaboration for 1406 papers, documents per author (0.776), authors per document (1.29), co-authors per documents (1.56) and collaboration Index (2.57).

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Future Of Libraries In India

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Abstract

This paper is based on the impact of artificial intelligence and advanced computer technology on the nature of future libraries will be enormous, and the quality differences will be different from what our current work expects. It further emphasizes the need for change in libraries in the context of the emerging knowledge economy. On this topic, we want to tell that library needs to be expanded in India, everyone is connected to the library whether they are School, College, University, etc. The expansion of technology in modern society has become possible in the library. LIS departments and teachers are increasing to produce best LIS professionals to lead the 21st century librarianship. Most library-oriented artificial intelligence applications developed until today or currently under development are basic business aids of the runtime because they built today. The National Knowledge Commission (NKC) is an advisory body constituted by the Prime Minister to provide recommendations for improving India's knowledge infrastructure. As part of this Commission, a set of recommendations has been developed to improve India's long neglected library system. Today, the library services all over the world depend on technology. That is why it is important for the librarian to written and read at this time, only then he can give good services to the student, researcher, When he himself has knowledge of library technology.

Keyword: Future of librarian, Artificial intelligence, Expert system.

1. Introduction

Libraries are going through a renaissance, both in terms of the social infrastructure they provide and in terms , Notifications, Sources, There is a collection of services etc. The word library is the Hindi version of the word library in English. Origin of the word liberi' Lighter ' Resulted from, Which means book. The history writing system of the library is associated with the methods and systems of preserving the nature of books and documents. Library This word is made up of two words - Book + Alaya. Library is the place where study material (books), movie, Leaflets, Map, Manuscript, Gramophone records and other readable material) are stored and this material is

protected. A library full of books or a collection of books near a bookseller is not called a library because books are kept commercially there. The National Library of China has about five crore books and the university also has a large library. Establishment of the National Library of the Imperial Cabino Library1881Took place in AD. In addition, there are several large libraries in Japan.1713In the United States, a first public library was run in the city of Philadelphia, USA. The Library of Congress is the largest library in the United States. It was founded in Washington1800Took place in The number of texts in it is three and a half crores. In the library2,400Employees work. This library also publishes many books from time to time and a weekly paper also comes out from here. Establishment of the American Library Association1876 And was founded after the library, Mainly public libraries, It started developing at a rapid pace in the United States. Public Library Law1849And probably New Hampshire was the first state in the United States to implement this law. Each state of America has a state library. Year1885A Children's Library was established in New York City. Gradually, the child departments were formed in each public library. Development of school libraries also in America20Started in the 20th century itself. Books additionally enlightening movies, Gramophone records and latest modern materials are here for the use of the students. Establishment of the United Nations Library in the famous city of Canberra, Australia1927occurred in. In fact, it was a revolutionary chapter in the direction of the library movement. Establishment of Victoria Library in Melbourne1853 Was in library science (Library science or Library and Information science) That science is management, Information Technology, Uses tools of pedagogy and other genres in the context of the library. Library science is the science under which specific procedures related to the procedures to be performed in libraries, Technicians, And processes are studied and taught. Modern library science, 'Library and Information Science' It is called because it is only the acquisition of books, Submission, Classification, Cataloguing, The panel is not limited to administration but search for information under it, Attainment, Resources, Communication, And recovery. Modern libraries are making very good use of the updated information communication technology. It is through the education of library and information science that qualified and skilled staff are prepared to organize and operate the libraries. Library science comes under the category of technical subjects and is a service related profession. This management, Information Technology, Uses the principles and tools of pedagogy and other disciplines in the context of the library. The library is a developing institution as there is a steady growth of books and other essential supplies. For this reason, it is necessary to pay attention to this fact only at the time of its establishment. History of transmission units, Organization, Management, Various technologies, Services, His duties towards the society and general activities are a broad subject based on theoretical and practical study. Its shape-type and extent varies continuously with the subject and information world. Therefore, in library science education, along with the various techniques and techniques of the library, adequate knowledge and knowledge of various library related services are also provided. of a diversification of the services and experiences they offer. In corporate environments they are playing an increasingly important role in the provision of collaborative and diverse workspaces. In communities they are evolving into hubs for education, health, entertainment and work. Libraries are encouraging people back into the physical space, through the integration of, for example, cafes, free Wi-Fi, maker spaces or child care programs. In addition, the "walls" of libraries continue to expand beyond the physical space, with online resources, social media, crowdsourcing and mobile services changing how collections and services are

accessed and shared while on the go. However, these trends are not uniform across all regions, countries and contexts. In many parts of the world, access to libraries is still not the norm. Even in developed regions, not all libraries are capable of delivering the change required to survive and thrive in the long-term. Funding shortages and replacement through online service are obvious risks facing smaller, more local libraries. Despite these risks and uncertainties, trends shaping the future of libraries have the potential to reshape and reinvigorate the role they play in public, academic and corporate settings. This report explores some of the key trends shaping the future of public, academic and corporate libraries. It outlines the implications on future design, operation and user experience; and suggests what we may expect to see, feel and do in the library of the future.

Future of Librarian - The development of the Future Ready Librarians Framework identified specific ways in which librarians could support — as well as teach and lead — strategic work in schools. Based on the same gears and language used by district leaders, the framework offers specific examples of ways in which librarians can align their practice with school and district priorities. Over the last four years, the Future Ready Librarians initiative has changed the conversation about the role of school, College, University librarians and the ways in which they lead, teach, and support student learning. To date, the initiative has both clarified strategic roles for school librarians and also engaged and empowered the librarian community to build understanding, professional capacity and visibility as leaders in schools. Most importantly, the Future Librarians translates well. Rather than competing with other standards or professional guidelines, it offers simple and concrete ways for librarians to align their practice to help solve the same challenges faced by school and district leaders. And while Future Ready Schools began in the Obama White House, the challenges of meeting the needs of future learners is, and always has been, universal.

2. Expectations of the future librarian among library directors and library students

The future challenges of university libraries and key competencies of future library professionals. Five main areas of challenge are identified by the library directors with emphasis on economical concerns and focus on new services because of changing customer needs.

3. Economical challenges

There is a strong concern that the financial resources are diminishing because of the competition between the universities. At the same time the costs are increasing both when it comes to e-resources and library premises. The management of financial resources is crucial but at the same time external actors like publishers and national university politics affect the costs more than is manageable directly by the library.

4. New services

There is a shift in research processes including aspects of e-science and a networked culture among students and researchers. The library customers are part of a networked and global environment. This put special emphasis on developing services like research data management

and supporting scholarly communication, including bibliometrics, social media services, and open access. Flexibility is underlined as well as being knowledgeable in knowing your research environment and integrating library services in the learning and research processes.

5. Communication and management

The importance of communicating the role and importance of the library within the university organization is underlined. It is about making the library visible beyond the physical library premises, integrating the library activities into the whole university and research community. Change management is important in this context while there is also a concern about the collaboration between university libraries because of the competitive situation between universities on a national level in Finland.

6. Collections development

The role of physical collections is diminishing while the digital collections grow rapidly. The balance between these collections are challenging as well as keeping the collections relevant and up to date. This involves a deep understanding of the customers' needs, moving from the traditional role of collection based towards customer-based services. The changes also affect the libraries' physical spaces.

7. Personnel

New areas of competencies emerge and there might be lack of personnel with relevant skills. Recruiting competent personnel is also a challenge because of decreasing financial resources. Innovative technologies to implement at the library of the future-

This article presents a range of relevant and useful innovative technologies to implement at the library. We focus on the technology's applicability and the benefits it could bring to the library.

Want to also know what are the current technology trends in libraries? From digital storytelling, VR to kinetic bikes and RFID technology, John Garland helps us look at how libraries are using technology to improve services for customers today.

- Big data
- Artificial Intelligence
- Black chain technology
- Internet of Things
- Library book mark App
- User-focused interfaces and application
- Augmented reality
- Digital Interfaces for printed book
- Driverless Car
- Drones

Artificial intelligence- Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may

also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving. Artificial intelligence is based on the principle that human intelligence can be defined in a way that a machine can easily mimic it and execute tasks, from the most simple to those that are even more complex. The goals of artificial intelligence include mimicking human cognitive activity. Researchers and developers in the field are making surprisingly rapid strides in mimicking activities such as learning, reasoning, and perception, to the extent that these can be concretely defined. Some believe that innovators may soon be able to develop systems that exceed the capacity of humans to learn or reason out any subject. But others remain sceptical because all cognitive activity is laced with value judgements that are subject to human experience. Libraries have evolved structurally and content-wise through different eras: the ancient, medieval and modern era. In the ancient times, clay tablets and stones were used as media for transmitting information, through the medieval era of papyrus and parchments and the modern era of paper, microform and now the digital or electronic media. Libraries have acquired and maintained various forms of information resources throughout these eras so as to meet the information needs of its user communities. Similarly, a library was formally defined as a function of the physical building where books were kept for reading and other purposes. However, the definition of library today has gone beyond the physical building, it now centers on the collections and services offered, since virtual libraries have no physical walls and services could be rendered to users from remote locations. Consequently, in the effort to satisfy the dynamic information needs of its clientele at the same time uphold its relevance in this ever-changing technological society, libraries have explored, incorporated and metamorphosed through different technological revolutions of clay tablets, stones, papyrus, parchments, paper, microforms, computers, Internet, virtual libraries, library 2.0, cloud computing etc. Interestingly, artificial intelligence is the current technology that has evolved with huge prospects and promising applications in libraries. Hence, the need to also explore this tech, its pros and cons, in order to adequately maximize its rich benefits for innovative and optimal services delivery in libraries, as Corker (2013) asserted that artificial intelligent systems (robots) will be an important technology in this century. In a nutshell, the crux for applying artificial intelligent systems in libraries is the fact that they are less prone to errors unlike human beings; they can work for 24 hours/7 days without getting tired thereby freeing the librarians to do other jobs. Virtual libraries are electronic libraries that provides access to distributed information resources in electronic format to users in remote locations. It is a term used to denote libraries without walls, an organised collection of links to various information resources on the network or Internet. It is a collection of electronic information resources in form of e-books, journals, online databases, media and other forms of data. Typically, virtual libraries provide remote access via an online portal or gateway, of information resources in varieties of contents/formats, including online databases, e-books, e-journals, e-magazines, e-newspapers etc, and provides other services traditionally offered by libraries. Digital and virtual libraries have their services fully automated. Moreover, automation is the process of using machineries to facilitate human activities and saving the human power and time. Library automation refers to the use of computers to automate the routine procedures in libraries such as cataloging, user registration, charging and discharging of books, shelf-reading etc., it the technology concerned with the design and development of the process and system that minimizes the necessity of human intervention in library operations. The main purpose of library automation is to free the librarians and library staff and to allow them to contribute more meaningfully to spread of knowledge and

information. Artificial intelligence play a vital role in library automation especially in digital and virtual libraries where their resources and services are fully computerised.

Advantages of Artificial Intelligence -

    a) Can take on stressful and complex work that humans may struggle /can not do;

    b) Can complete task faster than a human can most likely;

    c) To discover unexplored things. i.e. outer space;

    d) Less errors and defects; e) Function is infinite.

 Disadvantages of Artificial Intelligence-

    a) Lacks the "human touch"

    b) Has the ability to replace human jobs

    c) Can malfunction and do the opposite of what they are programmed to do

    d) Can be misused leading to mass scale destruction

8. Robots in Libraries

It is difficult to define clearly the word "robot" because it is often used in various ways. For example, it can be expressed as "a device that works on behalf of a human, which automatically and continuously performs some steps or procedures". Robots can be classified as follows in terms of roles, missions, and forms. Robotics is a subfield of artificial intelligence and it focuses on the perceptual and motor tasks. It also refers to the branch of technology that deals with the design, construction, operation, and application of robots . A robot is a machine that performs automation tasks and carries out series of complex operations under the supervision of a human or automatically (autonomous) under the control of pre-defined program using artificial intelligence techniques. The term robot was first used to depict artificial people or androids coined in a 1921 Czech science fiction play. Following these, so many robot stories were written including Isaac Asimov's robot series. Robot is "An automatically controlled, reprogrammable, multi-purpose manipulator programmable in three or more axes, which may be either fixed in place or mobile for use in automation applications." The robots are on scrambling, rolling, flying, and climbing. They are figuring out how to get here on their own.

As libraries provide a growing array of digital library services and resources, they continue to acquire large quantities of printed materials. This combined pressure of providing electronic and print-based resources and services has led to severe space constraints for many libraries, especially academic research libraries. The goal of the Comprehensive Access to Printed Material (CAPM) is to build a robotic, on-demand and batch scanning system that will allow for real-time browsing of printed material through a web interface. The user will engage the CAPM system that, in turn, will initiate a robot that will retrieve the requested item. The robot will deliver this item to another robotic system that will open the item and turn the pages automatically.

Expert System- An expert system is a computer program that attempts to mimic human experts by the system's capability to render advice, to teach and execute intelligent tasks. Library developed expert systems will address problems in a number of areas. Most will focus on narrow domains with an emphasis on local concern. Information and referral system s will be among the first expert systems to be developed by libraries. Expert system will assume an important role in library instruction and clearing houses will allow libraries to share tutorial systems with one

another. Tutorial systems may one day replace library work books and other forms of in house documentation for user assistance.

The future of expert systems in libraries will follow the evolution of expert systems as knowledge media. Expert systems, which are now clever, occasionally useful computer programs, will eventually assume and important role as a format for recording the working knowledge of human experts. Information media vary in suitability for carrying different types of message, and expert system are now exception. Expert System are the knowledge based computerized systems which play a role of intelligence interface or gateway for providing access to database and to obtain relevant information. They range in scale from simple rule-based systems with flat data to very large scale, integrated developments taking many person, years to develop. An expert system is a computer program that provides expert advice, decisions or recommended solutions for a given situation. The different components of expert systems are: Knowledge base, Inference Engine, and User Interface.

Characteristics of Expert System-
- o Right on Time Reaction:
- o Good Reliability.
- o Flexible:
- o Effective Mechanism
- o The Highest Level of Expertise
- o Capable of handling challenging decision & problems

Components of the Expert System
- ❖ User Interface
- ❖ Inference Engine
- ❖ Knowledge Base

Applications of Expert Systems
- Information management
- Hospitals and medical facilities
- Help desks management
- Employee performance evaluation
- Loan analysis
- Virus detection
- Useful for repair and maintenance projects
- Warehouse optimization
- Planning and scheduling
- The configuration of manufactured objects
- Financial decision making Knowledge publishing
- Process monitoring and control
- Supervise the operation of the plant and controller
- Stock market trading
- Airline scheduling & cargo schedules

9. Conclusion

Although there are speculations that this technology will render librarians jobless, artificial intelligence will greatly enhance library operations and services delivery, and will upload the relevance of libraries in an ever changing digital society. In addition, as it is with many emerged technologies, artificial intelligence is also viewed as thread to librarians and the touch of humans

in libraries, the eventual acceptance and incorporation of artificial intelligence into library services will no doubt reveal the many potential promise it has in librarianship.

AI related recorded information on its AI technology and its utilities in various areas/subject fields. The success in Expert systems field, Natural Language Processing field, Pattern Recognition field, Robotics field has precipitated substantial commercial activity, including the formation of many ventures. The practicability of artificial intelligence in the areas such as cataloguing, classification, documentation, collection development etc appears to be improving year after year. It is sure that in the near future artificial intelligence will occupy in all the spheres with the introduction of competent models with AI techniques. Library and Information Science will be greatly benefited by the development of the efficient expert system for technical services as well as Information processing and management.

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Indonesian Islamic Academic Libraries Amidst the COVID-19 Pandemic: A Social Media Observation

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Abstract

From a historical perspective, Islamic libraries have a unique role, starting from being a center for learning, research and translation up to being a hub of technological innovations. As technology develops, they are transformed into modern libraries that are adaptive to technology. Since the pandemic hit Indonesia, Islamic libraries, especially in the academic realm, have also been adapting to provide extensive library services to their patrons. This study aims to describe the role of Islamic academic libraries in Indonesia amid the pandemic. These observations were focused on the social media owned by the library, specifically their Instagram (IG) accounts. Three IG accounts of Islamic academic libraries in Indonesia were observed in this study: UIN Sunan Kalijaga Library, UII Library, and UMY Library. The three libraries were considered to represent the characteristics of Islamic academic libraries in Indonesia. This study will be observing the volume and variant of the libraries' posting materials during the last three months (September-November 2020) in Instagram. Aside from this, user engagement will be measured using analisa.io analytics. In addition, this study will describe the role of Islamic academic libraries in Indonesia in socializing and disseminating the dangers and prevention of COVID-19 which can serve as a model for evaluation for other libraries against the pandemic.

Keywords: academic libraries, COVID-19, Indonesian Islamic academic libraries, Islamic libraries, social media

1. Introduction

Background of the Study

Islamic libraries are libraries that either owned by Islamic institutions, having collections of Islamic fields, or serving Muslim users (Laugu, 2015, p. 88). Islamic libraries have a significant contribution to society and the world from a historical perspective. Some of these contributions include as a learning resource, research center, center for translation, and book copying (Laugu, 2013, p. 319). However, in the context of the modern world, its role is the same as that of libraries

in general. The difference is that the library usually assists Muslim communities who are in schools, universities, or state institutions that have an Islamic population.

Indonesia, as a country with the largest Muslim population as well as being a beacon of an Islamic state (Wajdi, 2016, p. 93), has many Islamic-based universities. Academic reference sources in these tertiary institutions are supported by academic libraries. Academic libraries in Indonesia generally have a function to help universities carry out the duty of higher education tri dharma, which includes: teaching, research, and community service. Meanwhile, Islamic academic libraries carry out these functions based on Islamic values.

The COVID-19 pandemic that hit the world around the beginning of 2020 made everyone need to adapt to a new life order or what is commonly referred to as the new normal (Prabowo, 2020, p. 8), including library services. Library services, which were originally dominated by physical services, during this pandemic, came to be oriented towards virtual services. One of the most effective virtual tools used during this pandemic is the social media. Social media is capable of being a reliable medium of communication as well as a medium for disseminating information. Libraries can use it for several things, such as for surveys of user information needs, evaluating user satisfaction with library services, and others (AlAwadhi & Al-Daihani, 2019, p. 228; Winata et al., 2020).

During the COVID-19 pandemic, libraries around the world adapted to welcome the new normal era. Provision of long-distance services is an inevitable part of the adaptation process towards this new normal era. Each type of library has a different tendency in providing this remote service. For example, innovation in school library activities during a pandemic is storytelling through social media platforms. Then, the service for searching scientific articles online for academic libraries (IFLA, 2020).

Libraries' social media accounts during the pandemic are commonly used to inform library services and to promote events. Only a few libraries use social media to promote public health during this pandemic (Koulouris et al., 2020). In addition, this role is truly strategic because through social media, there is a lot of misinformation due to the massive coverage of COVID-19 on the Internet, which is very much worrying.

Libraries need to take an important role in preventing misinformation by providing education or providing accurate information (Ale, 2020, p. 1). In this context, the library's social media can play a bigger role such as to help users avoid being misinformed. Islamic academic libraries will not only consider fake news as a social deviation phenomenon but also the practice of violating religious teachings. To overcome this issue, Islamic academic libraries are not only based on the spirit of professionalism but on the sentiment that is oriented towards upholding the truth (Norazman et al., 2019, p. 249).

There are various dimension variants in the Indonesian Islamic academic library, such as religious thought, organizational pathways, and gender issues (Laugu, 2015, pp. 191–206), that are interesting to observe especially during this pandemic. His findings potentially yields a comprehensive perspective on social media content from Islamic academic libraries. This study aims to describe the role of social media in disseminating the dangers and overcoming COVID-19 in selected Islamic academic libraries in Indonesia such as the UIN Sunan Kalijaga Library, UII Library, and UMY Library.

These three libraries were chosen because they are considered to represent Indonesian Islamic academic libraries with a large amount of Islamic literature. Based on the data obtained in 2015, it is known that UIN Sunan Kalijaga Library, the UII Library, and the UMY Library have quite a lot of Islamic literature with 13,518 titles , 3,644 titles, and 2,033 titles, respectively (Laugu, 2015,

p.105). Moreover, the three libraries have various ideological variants, both traditionalist and modernist (Laugu, 2015, pp. 161–169). The three of them, according to Laugu (2015, p. 166), also have moderate ideologies. In terms of ownership, these three libraries are considered to represent government ownership (UIN Sunan Kalijaga Library) and private ownership (UII Library and UMY Library). In the context of achievement and recognition, the three of them have achieved an A accreditation from the National Library.

If you look at the research locus that takes place in the UIN Sunan Kalijaga Library (a government institution), the UII Library, and the UMY Library (a private institution), there is a complex miniature to explain Islamic ideology in library management. As a government-owned institution, the UIN Sunan Kalijaga Library is indeed more open from an ideological perspective because almost everyone has the opportunity to reach it due to the guarantee of policies and regulations from the government. The UII Library is also quite similar. However, since the library is managed by the private sector, there may be some limitations that may not be as free as in UIN Sunan Kalijaga. It is different from the UMY Library, which is a product of Muhammadiyah mass organizations, which certainly have a spirit of Muhammadiyah in every step of the organization.

The social media platform for Islamic academic libraries that will be observed in this study is Instagram (IG). Instagram, as one of the social media platforms used to share visual content, is said to be relatively not easily infiltrated by fake news (Anderson, 2018, p. 4). Instagram's popularity continues to increase from time to time (Habibi & Cahyo, 2019, p. 400). Social media is said to be widely used for Indonesian higher education institutions (Kurniawan et al., 2020, p. 887) because it has interesting features for visual publication purposes. Some of the Instagram features include; stories, messenger, IGTV, shopping, and search and explore (Instagram, 2020). Through these features, users can optimize their upload variants with media that are not only informative but also interesting.

Based on data search on December 3, 2020, it is known that the profiles of the Instagram accounts of the three selected libraries are as follows:
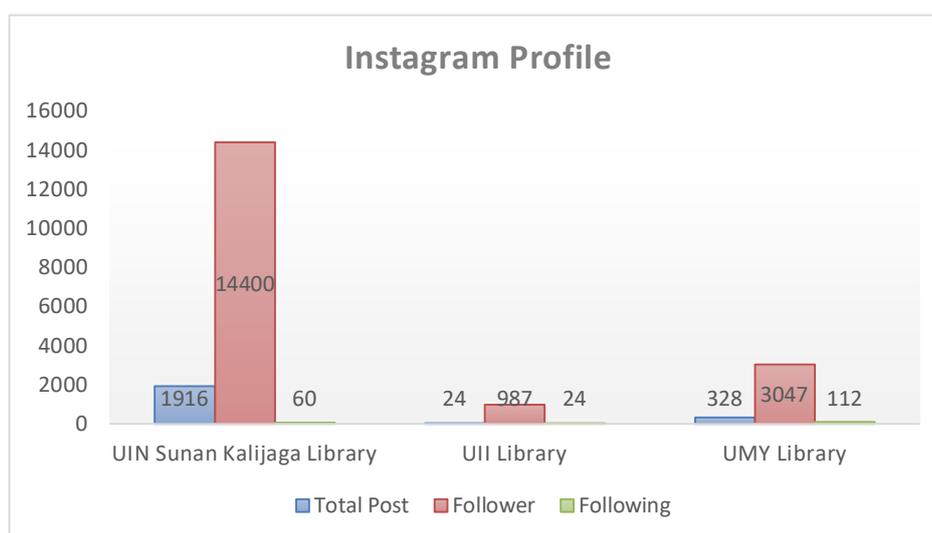

Figure 1. Library Instagram Profiles
Source: instagram.com (December, 3rd 2020)

Figure 1 shows the Instagram profiles of these three libraries. The UIN Sunan Kalijaga Library has 1,916 uploads, 14,400 followers, and follows 60 IG accounts. Furthermore, the UII Library IG account has 24 uploads, 987 followers, and follows 24 accounts.. Finally, the UMY Library account has 328 uploads, 3047 followers, and follows 112 accounts.

Based on the phenomena and data description above, this research will not only discuss the technical aspects of social media management from several Islamic libraries but also discuss whether the Islamic ideology as described above also has implications on whether or not the use of library social media in socializing the dangers and prevention of COVID-19. The results of this study will not only contribute to knowledge at the technical level regarding the optimization of library social media during the pandemic but also highlights social media as a representation of organizational ideology.

Given the aforementioned reasons, this study aims to describe the role of social media for Indonesian Islamic academic libraries in the socialization of the dangers and prevention of COVID-19.

2. Literature Review

Even though COVID-19 escalated in the many parts of the world at the beginning of 2020, there are quite a few studies related to it, specifically, researches related to library services during the pandemic. One of these studies was conducted by Koulouris et al. (2020) which aims to explore the presence and participation of social media in libraries in Greece during the lockdown period. This study surveyed 189 libraries of various types of libraries excluding school libraries. The study revealed that Facebook was the most used social media platform during the lockdown period. In general, social media was used to announce library services and events. However, its use to inform public health was not utilized. There were only a few libraries that use social media to help promote health awareness during the pandemic.

The study conducted by Sobaih et al. (2020) aims to describe the role of social media in universities, both by lecturers and students for formal communication and teaching and learning activities in developing countries. They conducted an online survey among students and lecturers. The study revealed that lecturers specifically use social media only for teaching and learning purposes, as a substitute for the learning management system (LMS). Meanwhile, students use social media not only to learn but to form and join online communities to encourage and support one another, especially during a crisis.

Another research was conducted by Chan et al. (2020 which aims to formulate an effective knowledge dissemination strategy related to COVID-19 through social media. Based on some of the literature cited in this study, it presented the potential of social media to be a successful channel for knowledge dissemination such as infographics. An infographic is a type of upload that meets the criteria for good knowledge dissemination (Thoma et al., 2018, p. 301). The success of knowledge dissemination through infographics uploaded on social media depends very much on the reputation of the institution, the quality of the images/infographics, and the content and speed of knowledge dissemination. One such good practice found in this research was having an infographic that represented and made by professionals, so it can be freely disseminated by various institutions. Thus, each institution does not need to bother making promotional materials related to COVID-19, they just need to disseminate it through their social media accounts.

This research is conceptually a slice of the three studies mentioned above. Taking into account some similarities and diferences on both subject and objects, the study conducted by Koulouris et al. (2020) is the most identical to this study. As mentioned, the role of library social media in promoting public health during the pandemic was still lacking, so this research focuses on the role of library social media in the efforts to prevent COVID-19. Moreover, this research will focus on the COVID-19 related content of the Indonesian Islamic academic library's Instagram accounts. These libraries' locus and ideologies will provide a specific and in-depth perspective on the role of libraries in dealing with COVID-19. This study highlights the role of libraries in various dimensions such as social media and library ideology.

3. Theoretical basis

Islamic Academic Libraries in Indonesia

Libraries consist of four main components, such as place, people, activities, and collections which together make up the library organism. More specifically, the four main components are also present in an Islamic library, of course, with Islamic characteristics. Islamic library, according to Laugu (2015, pp. 88–89), is one type of library which at least can be grouped into five types, namely; mosque libraries, madrasah or Islamic boarding school libraries, libraries of Islamic state rulers, private/scientific libraries, and Islamic academic libraries.

Laugu (2015, pp. 161–177) argues that the Islamic library is not a site without ideology, on the contrary, it contains ideological contestations with or without being realized by the actors in it. Some of these ideologies according to Laugu (2015, pp. 161–177) include traditionalism and modernism, liberalism and fundamentalism, moderates, and pluralism and non-pluralism. This ideology is said to have direct implications for increasing the dynamics of individual and group performance in the library. This understanding is important as a starting point for researchers to verify Laugu's theory, especially concerning library performance in terms of social media use during the pandemic.

When discussing the profile of Islamic academic libraries in Indonesia, it cannot be separated from the dualism of higher education management in Indonesia as the parent institution of the Islamic academic library, namely by the Ministry of Education and Culture (Kemendikbud) and the Ministry of Religion (Kemenag) (Zakaria, 2018, p.105). The higher education institutions under the Ministry of Education and Culture that have Islamic libraries usually come from universities associated with certain mass organizations such as Muhammadiyah, Nahdlatul Ulama (NU), or other organizations that have a spirit of Islam (Laugu, 2015, p. 89). Meanwhile, universities under the auspices of the Ministry of Religion consist of State Islamic University (UIN), State Islamic Institute (IAIN), and State Islamic Religious College (STAIN) (Laugu, 2015, p. 88).

4. Social Media in Library during COVID-19

In general, libraries use social media for several purposes, which include promoting collections, promoting activities or services, uploading photos/pictures of activities that have been carried out, developing services, informing internal activities, promoting activities from libraries or other institutions, informing various things that are important to users, and simply greeting users (Istiana, 2017, p. 69; Kurniasih, 2017, p. 2). Each library which uses social media shows different activities and intensities (Istiana, 2017, p.69). As for the intensity and success in managing social media to gain attention from the audience, it depends on the commitment and ability of the organization (Guesalaga, 2016, p.72).

The purpose of using social media by libraries should not only be oriented to the volume of information but must also ensure the validity of the information presented. Therefore, in this case, the librarian is also responsible for providing information literacy education to its users (Fatmawati, 2017, p. 25). In the context of its use during the pandemic, libraries that social media platforms must be more careful in sharing information. Lots of information is available on social media which contains COVID-19-related contents without any scientific basis that can endanger the public (Pennycook et al., 2020, p.770). While the information on social media can be reassuring, well-founded information can be stressful. Therefore, there is a need for social media managers and its users to share accurate news (Bashingwa, 2020, p. 419).
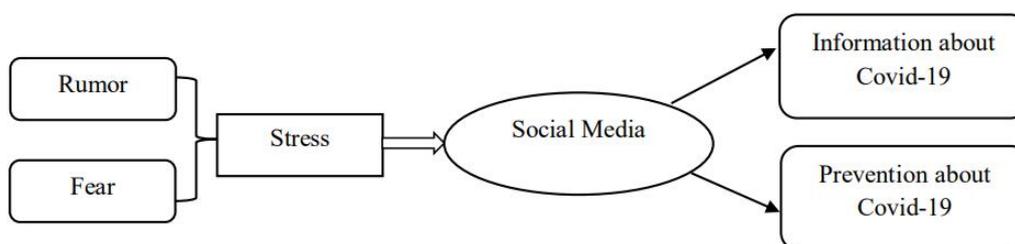

Figure 2.Illustration of COVID-19 News on Social Media
Source: (Bashingwa, 2020, p. 419)

Social media has several roles in helping to prevent the spread of falsified information relating to COVID-19 pandemic such as fostering a culture of disaster preparedness, providing psychological support, supporting distance learning, being a reference for remote diagnosis of COVID-19 symptoms, accelerating research, preventing misinformation, and media for disseminating scientific literature (Goel & Gupta, 2020, pp. 1–4; Merchant & Lurie, 2020, pp. 2011–2012). Social media can also be a platform for coordination in crises due to COVID-19 (Li et al., 2020, p. 698). The indicators of social media use mentioned by Goel & Gupta (2020) and Merchant & Lurie (2020) will be used as a measure of how far the social media use of Indonesian Islamic academic libraries in the dissemination of information related to the mitigation of the COVID-19 pandemic disaster.

Information dissemination through social media needs to be carried out effectively, efficiently, and also attractively. In a study, it was found that there were 23 uploaded themes related to awareness of COVID-19 on Instagram, which included epidemiology and statistics, training and care, general prevention guidelines, hygiene, diet, and healthy lifestyle, and others (Niknam et al.,

2020). Dabbagh (2020) also presented that Instagram has proven to get positive feedback from the audience when it is used to inform about COVID-19. In the context of the number of Instagram users, Indonesia is the fourth largest country in the world with a user age range of 18-34 years (Damayanti, 2020, p. 177).

5. Content Analysis of Social Media

Social media, which is the library's new service window for at least the last ten years (Gerolimos & Konsta, 2011), needs to be evaluated for its utilization. Although its use is relatively easy, to achieve optimal results for library service purposes is not as easy as it seems. This can occur because the vision and reality in social media are viewed differently by librarians or social media users of the library itself (Chu et al., 2010, p. 11). To understand social reality in social media, a special approach is needed. This research adopts the media object approach and experiential stories developed by Cantoni & Tardini (2006) in (Nasrullah, 2020, p.63) below:

Level	Object
Media object	- The context in the online space - Interactions that occur on the social media - The reality that occurs in the online space and its relationship with the offline space
Experiential stories	- The context in the offline space - The motive, reason, or purpose of the text on social media - The reality that occurs in the offline space and its relationship with the online space

Table 1. Levels of Cyber Media Analysis
Source: (Nasrullah, 2020, p. 63)

The choice of media object and experiential stories approaches is to provide a complete picture of the phenomena that is happening in the online and offline space. This approach fits well with thematic analysis, which focuses on examining themes or patterns of meaning in data (Nowell et al., 2017). Themes or patterns in social media that have been determined can easily be seen with the media object approach and experiential stories.

Research Methodology

This research combines qualitative research and literature study. The object of this research is social media content from selected Indonesian Islamic libraries that are related to library services and the response to COVID-19. The researchers collect primary and secondary data independently. Primary data from this study will be collected using a qualitative approach. Meanwhile, secondary data will be collected from related academic works of literature. Primary data collection in the form of uploads related to COVID-19 where came from three Instagram (IG) accounts of the Indonesian academic Islamic libraries, namely; the UIN Sunan Kalijaga Library (https://www.instagram.com/perpusuinyogyakarta/), the UII library (https://www.

instagram.com/perpustakauii/), and the UMY library (https://www.instagram.com/perpustaka_umy/) were carried out by in-depth observation. These observations were carried out from September to November 2020. Social media data analysis was carried out using the assistive media portal https://analisa.io/. Uploads related to COVID-19 from the three IG accounts will be described in the narrative, tabulation, and image formats. The data will then be analyzed using thematic analysis. Thematic analysis is used in qualitative research and focuses on examining themes or patterns of meaning in data. In this context, the themes and patterns of the posts from the three libraries will be mapped, either directly by the researchers or by comparing them with related literature.

6. Discussion

Literature Analysis

To obtain an overview about the role of social media for Islamic academic libraries in the efforts to socialize the dangers and prevention of COVID-19, a simple analysis was carried out on some of the latest literature discussing this as presented on Table 2 below.

Author	Title	Role of Social Media in During the Pandemic
A. K. M. Chan, C. P. Nickson, J. W. Rudolph, A. Lee, & G. M. Joynt	Social media for rapid knowledge dissemination: early experience from the COVID 19 pandemic (2020)	Providing access to reliable information related to COVID-19 quickly and effectively
A. Dabbagh	The role of Instagram in public health education in COVID-19 in Iran (2020)	Public health campaign related to COVID-19
A. Damayanti & K. Yuriawan	Instagram as a Medium of Risk Communication in COVID-19 Pandemic: A Netnography Study of Virtual Community KawalCOVID19.id (2020)	Risk communication about the COVID-19 virus
A. Goel and L. Gupta	Social Media in the Times of COVID-19 (2020)	• Fostering a culture of disaster preparedness • Provide psychological support • Supports distance learning • Become a reference for remote diagnosis of COVID-19 symptoms • Research acceleration • Misinformation prevention • Media for disseminating scientific literature

A. Koulouris, E. Vraimaki, & M. Koloniari	COVID-19 and library social media use (2020)	• Announce library services and events (major) • Promote public health (minor)

Table 2.Literature Analysis of Some Articles on the Role of Social Media among Islamic Libraries during the Pandemic

Source: (Chan et al., 2020; Dabbagh, 2020; Damayanti, 2020; Goel & Gupta, 2020; Koulouris et al., 2020)

As shown on Table 2, it can be generally understood that the role of social media can be summarized in the research conducted by Ashish Goel & Latika Gupta (2020). These roles include fostering a culture of disaster preparedness, providing psychological support, supporting distance learning, being a reference for remote diagnosis of COVID-19 symptoms, accelerating research, preventing misinformation, and media for disseminating scientific literature. Unfortunately, the research did not specify how social media was utilized during the pandemic by institutions such as libraries. Some of the items described by Goel & Gupta (2020) also do not always coincide with the library's core business, so it is understandable that not all libraries have contents like these items. The item "being a remote diagnostic reference for COVID-19 symptoms" according to the researchers' opinion is more suitable for uploading by health institutions, such as hospitals. However, libraries can upload these items by providing relevant references.

Separately, in other literature, it is stated that the role of social media for library services, including promoting collections, promoting activities or services, uploading photos/images of activities that have been carried out, developing services, informing internal activities, promoting activities from libraries or other institutions, informing various things that are important to users, and greeting users (Istiana, 2017, p. 69; Kurniasih, 2017, p. 2). The roles mentioned by Istiana (2017) and Kurniasih (2017) do not directly have implications for the dissemination of the dangers and prevention of COVID-19. However, indirectly along with the transformation of library services from offline to online, all forms of these activities contribute to the socialization of the dangers and prevention of the virus.

In a crisis due to virus, just staying at home can be considered as an effort to prevent spreading the virus because it is an implementation of "physical distancing" as mandated by WHO. The "physical distancing" policy does limit the movement of everyone, but that does not mean that they do not need to do anything. Creativity during the quarantine period must be maintained (Yip & Chau, 2020, p. 154). Likewise, with libraries, the adaptation of physical services to online services is creativity oriented towards the prevention of COVID-19.

Analysis of the Indonesian Islamic Academic Libraries' Instagram Accounts

To provide a comprehensive understanding, the role of social media before, during, and after the pandemic needs to be further analyzed. Several types of social media uploads from Islamic academic libraries will be discussed to disseminate the dangers and prevention of COVID-19, both with direct or indirect implications.

As mentioned, Instagram (IG) is said to be the most used social media platform in Indonesia. The researchers analyzed the Instagram account of the three libraries and then describes them through meaningful narratives, pictures, graphics, and tabulations. Figures 3, 4 and 5 shows the

data about social media uploads from UIN Sunan Kalijaga Library, UII Library, and UMY Library, respectively. Table 3 below shows a summary of the libraries' IG account profiles which include the number of uploads, most used captions, and most used hashtags from 1 September 2020 to 30 November 2020 which were collected through analisa.io portal.

Instagram (IG) Account Profiles	UIN Sunan Kalijaga Library (@perpusuinyogyakarta)	UII Library (@perpustakaanuii)	UMY Library (@perpustakaan_umy)
Number of uploads	90	8	10
5 Frequently Used Captions	- Journal - Sunan Kalijaga - Library - Book - Event	- Library - Book - Islam - Research - University	- Library - Services - Collection - Essay - Building
5 Frequently Used Hashtags	- #uinsukalib - #uinsukalibrary - #sukacorner - #uinsuka - #sunankalijaga	- #PerpustakaanUII - #UIIYogyakarta - #PerpusUII - #uiilibrary - #PerpustakaanUII Melayani	- #perpustakaanumy - #temanperpus - #layananperpus - #resourceguide - #muhammadiyah

Table 3. Instagram Account Profiles of Three Islamic Academic Libraries (Source: analisa.io)

Figure 3. Instagram Profile of UIN Sunan Kalijaga Library (@perpusuinyogyakarta)
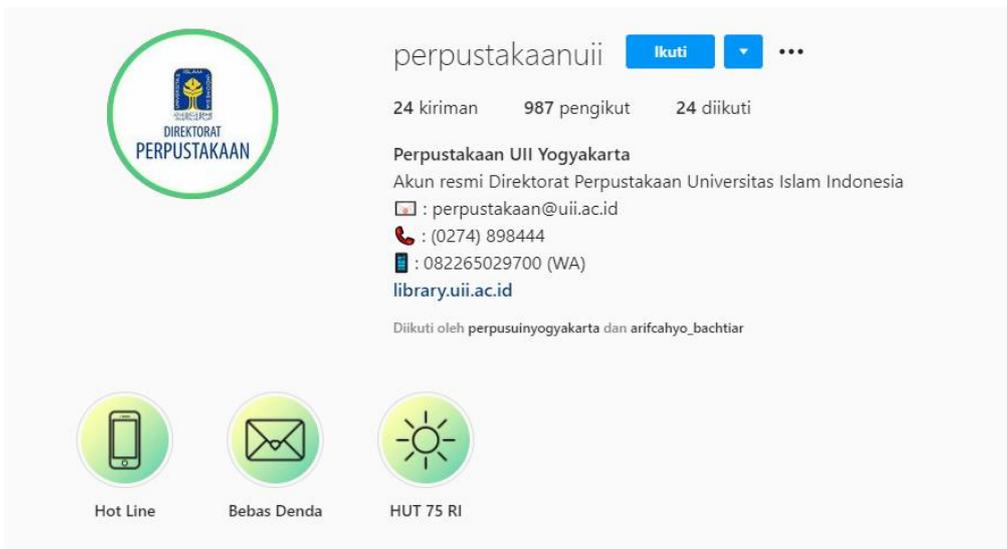Source: www.instagram.com/perpusuinyogyakarta (2020, December 3)

Figure 4.UII Library Instagram Profile (@perpustakauii)
Source: www.instagram.com/perpustakaanuii (2020, December 3)

Figure 5. Instagram Profile of UMY Library (@perpustaka_umy)
Source: www.instagram.com/perpustakaan_umy (2020, December 3)

The UIN Sunan Kalijaga Library and UMY Library Instagram account profiles provide information related to hashtags that refer to uploads from the library and contact details such as office and email addresses, office hours, telephone numbers, other social media accounts (Facebook, Twitter and Youtube), and website. The same goes with the UII Library Instagram account which also provides contact information such as description/biography, email address, telephone number, mobile phone number, and website. Among the three library IG accounts, the UMY Library Instagram account profile provides the most complete information. The use of captions and hashtags from the three libraries refers to strengthening the branding of each library as well as services and events carried out by the library.

Based on popular captions and hashtags that have emerged from the three libraries, the COVID-19 pandemic has not received enough attention. Uploads from the three libraries show the library's adaptation to the pandemic with the emergence of adjustment policies and new services such as the dispensation of fines for late return of books, online user education, online training, online referral services, and others. The library's adaptation to the pandemic, which is informed through social media, does not directly reduce the number of cases affected by the virus but informs the adjustment policies and new services to their patrons. In that way, users do not need to come directly to the library to avail the services.

Uploading announcements or posts to promote the library and its services is said to be the primary goal of having a library social media account. Through uploads, the library is now able to reach more clients and audience. To find out audience participation among the three library IG accounts, Figure 6 presented the uploading volume and engagement calculated based on the average number of likes.
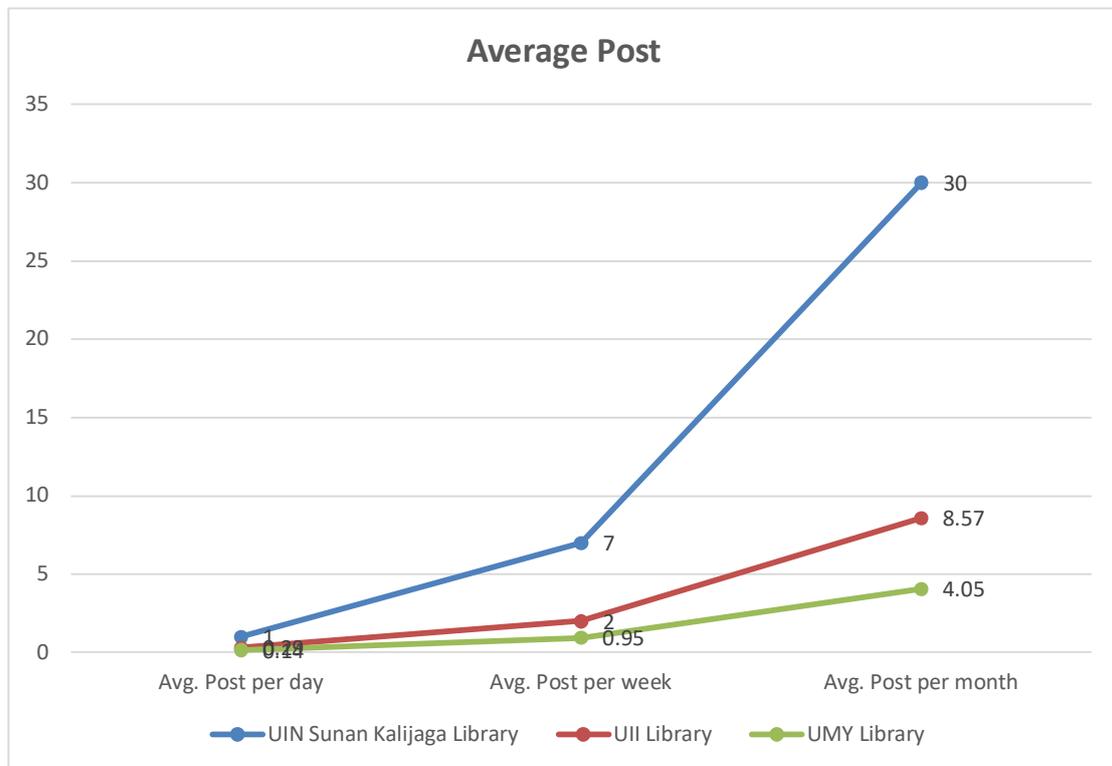
Figure 6. Average Instagram Uploads of Libraries
Source: analisa.io (December, 3rd 2020)

As shown on the graph, it can be seen that the UIN Sunan Kalijaga Library IG account has an average of uploads of 1, 7, and 30 per day, week, and month respectively, which means that the Library uploads at least one post per day. Furthermore, the UII Library IG account has an average upload of 0.29, 2, and 8.57 on per day, week, and month respectively. Finally, the UMY Library IG account has an average upload per day, week, and month of 0.14, 0.95; and 4.05. As per engagement, the UIN Sunan Kalijaga Library is again superior when compared to the other two libraries.

Figure 7. Engagement Instagram Library
Source: analisa.io (December, 3rd 2020)

Social media engagement is also important to measure the reach of the posts of the social media accounts of the library. Figure 7 pr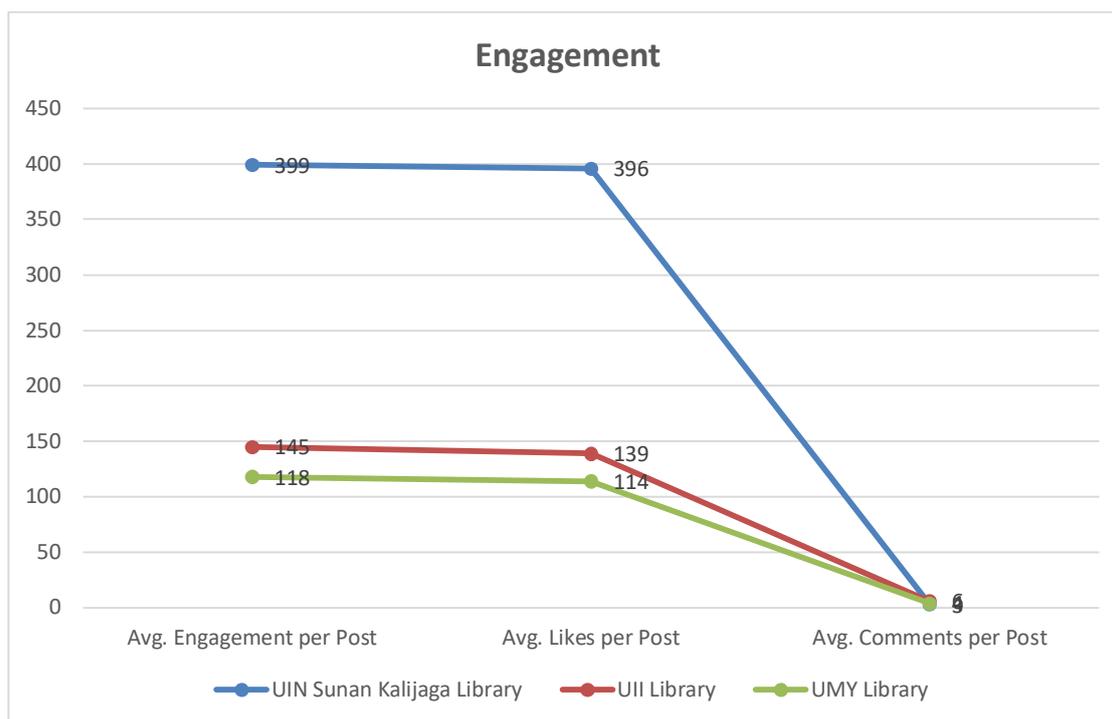esents the number of engagements generated per library IG account. As observed, the UIN Sunan Kalijaga Library IG account generates an average engagement of 399, an average of 396 likes, and an average of 3 comments. Furthermore, the UII Library IG account generates an average engagement of 145, on average like of 139, and an average of 6 comments. Finally, the UMY Library IG account generated an average engagement of 118, an average of 114 likes, and an average number of 4 comments. The engagement of UII Libraries and UMY Libraries is quite similar, however when compared to the UIN Sunan Kalijaga Library, the two were quite behind. The UIN Sunan Kalijaga Library has received twice the engagement of the other two libraries. This might happen because of several things such as the number of followers of the Instagram account of the UIN Sunan Kalijaga Library which is indeed the largest of the three and possibly due to the consistent number of uploads generating more permanent audience or enthusiasts.

In terms of the number of followers, the average number of uploads, and average engagements, the UIN Sunan Kalijaga Library IG account is superior when compared to the other two library Instagram accounts. Furthermore, the uploaded material from each library will be analyzed based on the matrix of the role of social media for library activities as conveyed by Istiana (2017, p. 69) & Kurniasih (2017, p. 2) and the role of social media to disseminate hazards and prevention of COVID-19 presented by Goel & Gupta (2020). Table 4 below shows a matrix of upload types on the Instagram account of each library:

No	Indicator	The UIN Sunan Kalijaga Library	The UII Library	The UMY Library
1	Promotion of library collections	6	2	1
2	Promotion of library activities or services	9	1	2
3	Activities that have been carried out by the library	23	0	0
4	Development of new services	2	0	1
5	Information on the internal activities of the library	8	0	1
6	Promotion of collaborative activities	3	0	0
7	Information on various things that are important to users	26	1	2
8	Greeting users	13	4	3
	Total uploads	**90**	**8**	**10**

Table 4. Library Social Media Activities from September-November 2020

As shown in Table 4, it can be understood that UIN Sunan Kalijaga Library carries out all activities according to the matrix regarding the role of social media for libraries. Meanwhile, the UII Library only did four of them, and the UMY Library was slightly superior in doing six of them. The three libraries were certain to carry out activities even though they have a different number of uploads, including promoting library collections, promoting library activities or services, informing various things that are important to users, and greeting users. Posts of these three libraries varies depending on what message or announcement they want to convey to their clients, thus, the IG accounts should be utilized. They can do this by increasing the volume of uploads, which may have implications in increasing upload variants as observed with the Instagram account of the UIN Sunan Kalijaga Library.

Furthermore, uploaded materials that are oriented towards the dissemination of the dangers and prevention of COVID-19 from each library are presented in the table below:

No	Indicator	The UIN Sunan Kalijaga Library	The UII Library	The UMY Library
1	Enabling a culture of preparedness	3	0	0
2	Enabling connectivity and psychological first aid	4	1	0
3	Advancing remote learning	43	1	0
4	Diagnostic tool and referral system	0	0	0

5	Accelerating research	7	1	2
6	Against misinformation	0	1	0
7	Scientific literature dissemination	9	2	2
	Total	**66**	**6**	**4**

Table 5. Types and Number of Library Social Media Uploads Related to COVID-19

In terms of quantity, the IG uploads of the UIN Sunan Kalijaga Library during the pandemic totaled 66 (73.33%) out of 90 uploads. The percentages of the uploads were 4.54% oriented to foster a culture of disaster preparedness through posters related to COVID-19, photos, and appeals to obey the health program; 6.06% about provision of psychological support through return dispensation, tardiness, and fines; 65.15% oriented to support distance learning through promotions and reports on online learning activities such as webinars, online courses, and online user education; 10.6% related to research acceleration including limited services to support final projects, adjustment of library services during the pandemic; and 13.63% as a medium for disseminating scientific literature through the promotion of book collections and resources.

Furthermore, the UII Library's IG uploads during the pandemic amounted to 6 (75%) out of 8 uploads. The percentages of the uploads were 16.67% about provision of psychological support through uploading posters with the hope that pandemic would pass quickly; 16.67% oriented to support distance learning through promotions and reports on online learning activities such as webinars, online courses, and online user education; 16.67% about research acceleration including adjustment of library services during the pandemic; 16.67% oriented to prevent misinformation through uploading posters related to the importance of literacy during the pandemic; and 33.33% as a media for disseminating scientific literature through the promotion of book collections and resources.

Finally, the UMY Library has uploaded 4 (40%) out of 10 uploads during the pandemic. The percentages of the uploads were 20% oriented to accelerated research including information and adjustment of library services during the pandemic; and 20% as a medium for disseminating scientific literature through the promotion of book collections and resources.

The UIN Sunan Kalijaga Library and UII Library have 5 out of 7 upload types according to the matrix. Meanwhile, the UMY Library only has 2 types of uploads. All libraries' IG accounts has posts related to accelerating research and scientific literature dissemination. Meanwhile, the three libraries did not perform the diagnostic tool and referral system at all. This is understandable considering that the three libraries do not have a core business related to the diagnosis. However, in the aspect of enabling a culture of preparedness which is the public domain, only the UIN Sunan Kalijaga Library has done it. The same thing also happened in the aspect against misinformation which was only done by the UII Library.
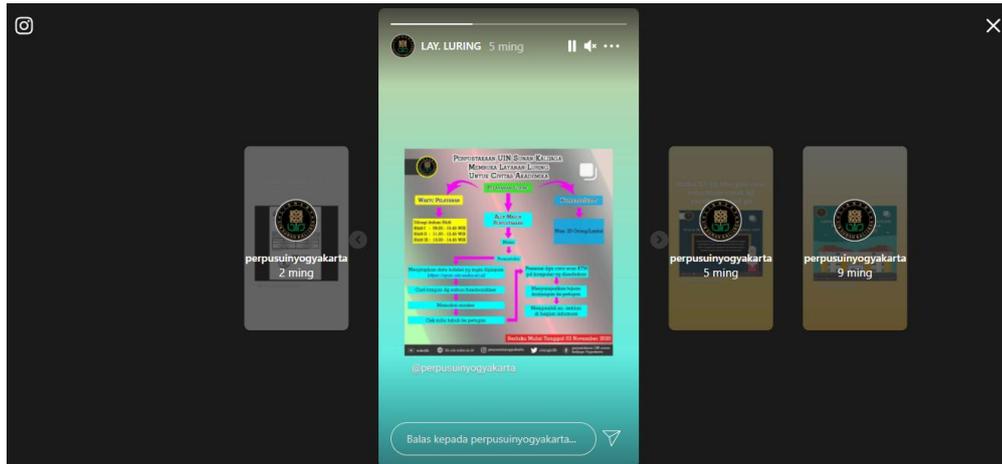
Figure 8. Sample IG Story of UIN Sunan Kalijaga Library
Source: www.instagram.com/perpusuinyogyakarta (December, 3rd 2020)

The UIN Sunan Kalijaga Library utilized the IG Story feature to highlight information uploads for users from feed uploads. The uploads were highlighted such as official announcements, infographics, and short-duration videos related to adjustments to library services during the pandemic, online user education, limited-service infographics, free online library services, event promotions, and activity reports such as webinars, research support for final projects, collection promotion; books and resources, as well as activity reports from librarian activities. In terms of IG story clusters, the UIN Sunan Kalijaga Library has the most clusters than the other two libraries.
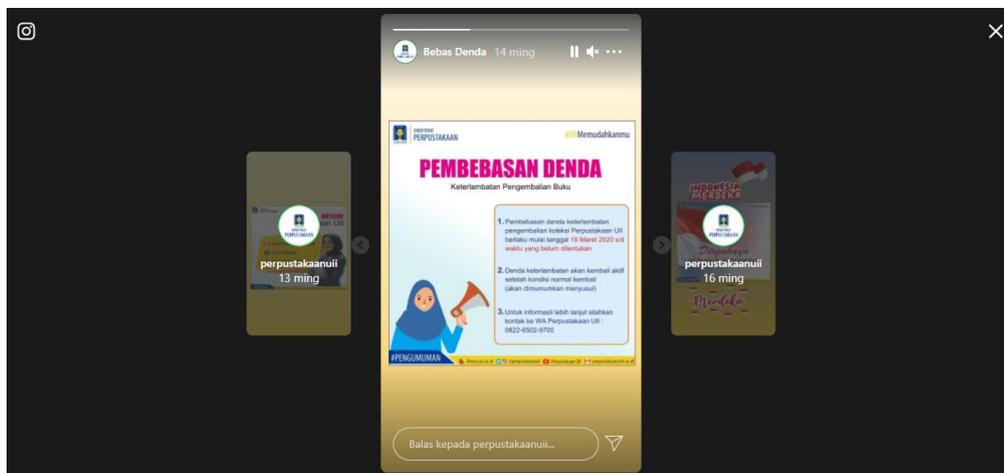

Figure 9. Sample IG Story of UII Library
Source: www.instagram.com/perpustakaanuii (December, 3rd 2020)

The UII library uses IG Story to provide some information such as library service hotlines and information on the dispensation of fines for late repayment of collection loans. As observed, the IG Story feature was not fully utilized.

Figure 10. Sample IG Story of UMY Library
Source: www.instagram.com/perpustakaan_umy (December, 3rd 2020)

The UMY library uses IG Story to provide some information such as library hotline, checking plagiarism, free libraries, final project support, user service Q&A, and promotion of webinar events. The UMY library was able to utilized the IG story feature by making series of stories in one post which makes it easier for users to find information because users are given more choices.

With regards to the use of other IG features, IG TV has not been utilized that much by UII Library and the UMY Library. Even though it is not as much as a photo or image uploaded feed, the UIN Sunan Kalijaga Library has used IG TV quite well since they used it to post live event uploads of the library. The UIN Sunan Kalijaga Library often uses other platforms when conducting online meetings such as Zoom Meeting rather than IG TV.

The UIN Sunan Kalijaga library is the most prominent of the three libraries when it is viewed from the aspect of volume and upload variants. The nuances of spontaneity and carefulness to perpetuate every moment of library activities are the hallmarks of this library. This turns out to refute the assumption that state institutions have lower performance when compared to private institutions, even though the data obtained is certainly not sufficient to describe the performance of government organizations and private organizations as a whole. At least in the context of social media utilization by Islamic library institutions, the UIN Sunan Kalijaga Library is quite superior compared to other two libraries.

The superiority of the UIN Sunan Kalijaga Library compared to the other two libraries is not directly interpreted as the victory of the state institution over the private sector, or the victory of an institution that is more pluralist than the other, which is more exclusive. However, based on the literature review, this success can be interpreted as recognition from the audience for the commitment and competence of the UIN Sunan Kalijaga Library in managing social media. The consistency of the uploads is evidence of commitment and competence that can be witnessed by the audience at the moment, while offline programs are not.

However, to provide a comprehensive understanding, it is certainly necessary to carry out further research on the realities that occur in the online space. Does it have significant implications for offline space or not? As for other factors that may influence this phenomenon such as organizational culture, leadership, resources, and other factors (e.g. ideology in the organization).

7. Conclusions and suggestions

The role of library's social media during the pandemic must also develop along with the evolving needs of its users. Apart from providing the information needed even before the pandemic, libraries also need to provide valid information related to the pandemic to support the health and safety of its users.

The social media for the Indonesian Islamic academic library did not directly reach the COVID-19 prevention stage. However, uploads from the three libraries' Instagram accounts helped prevent the spread of the virus by informing them of limited services following health protocols. These services include online services such as optimization of electronic journal database services, online search guidance, and so on. Meanwhile, physical services are provided with limited services, especially as a form of support for student final assignments.

Furthermore, from the seven matrices obtained from a literature review related to the direct role of social media in efforts to socialize and prevent COVID-19, Islamic academic libraries in Indonesia carry out six functions including enabling a culture of preparedness, enabling connectivity and psychological first aid, advancing remote learning, diagnostic tools and referral systems, accelerating research against misinformation, and scientific literature dissemination. The diagnostic tool and referral system functions are still not available in the three libraries because libraries do not have a service orientation in that direction. Given this reason, some of these functions particularly enabling a culture of preparedness and against misinformation are still not being fully performed.

Of the three Islamic academic libraries in Indonesia, there are differences in using Instagram during the pandemic. The difference lies in the variant and upload volume as well as the utilization of additional social media features. The UIN Sunan Kalijaga Library has the highest upload volume when compared to the UII Library and the UMY Library. In terms of upload variants, the UIN Sunan Kalijaga Library is the same with the UII Library, while the UMY Library came the least.

To see the complete reality regarding the role of social media from Islamic academic libraries in Indonesia to disseminate the dangers and prevention of the virus, researchers suggest that further research be carried out by observing the offline realm. Likewise, to find out the level of influence of the ideology of each library on the material, volume, and variant of the upload, it is necessary to carry out further research involving informants or research respondents for deeper data mining.

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Is 'Diamond' Open Access an Appropriate Publishing Model for Asian Countries? A Case Study from Latin America

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Abstract

The Coronavirus pandemic has highlighted the need to reinforce Open Access policies and practices around the world by moving away from commercial publisher-owned journals towards alternative methods of publication with no charges for authors and readers. Our paper aims to identify the main Open Access trends in Latin America – a region with a long tradition of publicly funded, scholar-led publishing infrastructures streamlining and sustaining the 'Diamond' (non-commercial) Open Access model. In particular, the paper explores the key initiatives and the current status of Open Access in Argentina (the leading country in the region in this regard) highlighting its strengths and remaining challenges. The Latin American model is compared with the Korean approach to Open Access publishing. We believe our research offers fresh insights for Korean and other Asian agencies and research communities to cooperate and possibly drive a new, more efficient business model for non-for-profit Open Access publishing.

Keywords: Open Access, Diamond (Gold no-APC) Open Access publishing model, Latin America, Argentina, Korea

1. Introduction

The COVID-19 pandemic has showed the critical importance of unfettered access to scholarly information. For example, the UN Conference on Open Science, organised in July 2021 by the UN Dag Hammarskjöld Library and the UN Department of Economic and Social Affairs[1], demonstrates the considerable interest Open Science has recently attained because of the

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[1] https://www.un.org/library/OS21

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pandemic and calls on different (inter)national stakeholders to reinforce their Open Science policies and practices, such as Open Access (OA).

The OA movement emerged in the 1990s and was popularised in the mid-2000s (Moore, 2020). It has been driven by advances in computer and networked technologies and such motivations as the taxpayer argument and accountability to citizens who pay for research via taxes (Suber, 2003), 'free culture' in the world of computer software (open source) and within technological disciplines (e.g., arXiv project of the high-energy physics community) coupled with the decline of library budgets due to expensive journal subscriptions (Eve, 2014), etc. The 2002 Budapest OA Initiative Declaration has been considered as a catalyst for the OA movement. The Declaration defines OA to peer-reviewed research literature as its "free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited" ("Budapest Open Access Initiative," 2002).

There are various different models of OA, the best known of which are the 'Green' and 'Gold' OA models. According to a leading theorist of OA and one of the pioneers of the OA movement, Suber (2012), OA delivered by journals, regardless of the journal's business model, is called Gold OA and OA delivered by repositories is called Green OA or self-archiving. Some other researchers provide a more detailed classification of OA models, dividing them into 'Green', 'Gold', 'Hybrid', and 'Bronze' (Robinson-Garcia et al., 2020), while others include the 'Diamond' (also known as 'Gold no-APC') model into the classification as well (Ghent University, 2021; Johnson et al., 2017). According to Fuchs & Sandoval (2013, p. 438), in the Diamond OA model, not-for-profit, non-commercial organisations, associations or networks publish material that is made available online in digital format, is free of charge for readers and authors and does not allow commercial and for-profit re-use. In other words, the Diamond OA is a form of Gold OA (immediate OA publishing of articles by a journal/publication platform with Creative Commons licences) that does not impose article processing charges (APCs) on authors. To avoid confusion and articulate clear differences among OA models, Fuchs & Sandoval (2013, p. 438) recommended categorising all OA models as 'Diamond', 'Corporate' (for-profit OA route in subscription and non-subscription journals), and 'Green' OA. Figure 1 below presents a simplified classification of the major OA models.
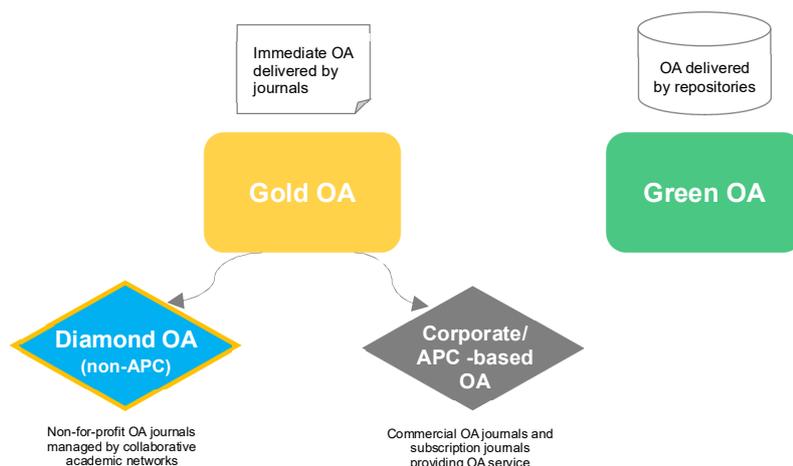

Figure 1. Types of OA models

In addition to the Budapest Declaration, one of the major milestones of the OA movement was a joint initiative adopted by several major European funding agencies (cOAlition S) in 2018 called as 'Plan S' (cOAlition S, 2018). Despite its good intention of accelerating immediate OA for readers, the initiative has been criticised for supporting a for-profit, APC-based OA model through transformative agreements (also known as 'read and publish' or 'publish and read' agreements) with publishers (Guzik & Ahluwalia, 2019; ISC, 2019; Debat & Babini, 2019). Such an OA model is similar, to some extent, to the well-known 'Big Deal' journal subscription model since it implies the commodification of publicly funded knowledge and the direction of significant resources to oligopolistic publishing houses. According to CLACSO (the Latin American Council of Social Sciences)'s OA Advisor Dominique Babini, "With Plan S the big money still goes to publishers. After 20 years of OA, is this a desirable outcome? ... more money should go to building and improving public infrastructure for OA and open science." (ISC, 2019).

The focus of this paper is Diamond OA, which many consider as "the only sustainable future for academic publishing" (Fuchs & Sandoval, 2013) rather than as a survival strategy suited only for developing regions. We stress the importance of policy interventions and concerted efforts for fostering the Diamond OA model in Korea and other Asian countries, which are the members of the Special Libraries Association (SLA), and provide some recommendations for this. To this end, the paper portrays the background of OA publishing in Latin America looking in particular into the collaborative cross-regional initiatives and national policies in Argentina. The paper also reflects the current approach of OA publishing in Korea and compares the OA indicators in Korea and Argentina. We also highlight the strengths and challenges in both countries' approaches.

The main reason behind the selection of Latin America as a case study is the fact that it has been acknowledged by UNESCO as one of the most advanced regions in the world as per percentage of scientific output in local and regional publications available in OA (UNESCO, n.d.). For instance, according to the findings of a 2011 study, over 70% of the academic output of Latin America was OA, while no other region of the world at the time exceeded 20% (Miguel et al., 2011). Latin America is also regularly quoted as having a long tradition of publicly funded, scholar-led publishing infrastructures sustaining the Diamond OA model – over 90% of journals are run by scholar-led non-profit initiatives, mainly universities, and use the Diamond OA model (DORA, 2021). The recent study commissioned by cOAlition S (Bosman et al., 2021, p. 32) confirms that Latin America leads in the number of Diamond OA journals, in comparison with other regions in the world. It was also identified that the Southern Cone (Argentina, Brazil, Chile, Paraguay, Uruguay) is the most productive sub-region, with the highest number of OA publications in Brazil, Argentina, and Chile (Minniti et al., 2018). We chose Argentina as a unit of analysis, since it has a population size relatively similar to Korea as well as it is the headquarter of CLACSO[2] – an international non-governmental institution with associative status in UNESCO, which actively promotes and supports OA initiatives at the national and regional levels.

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[2] https://www.clacso.org/

2. Latin America's approach to OA

2.1. Major cross-regional networks and initiatives

The whole process of scholarly communication (research production, publication, dissemination, consumption) in Latin America is exclusively supported by government or public funds and managed by collaborative, non-commercial academic networks and infrastructures, which have been established since the end of 90s to promote OA to scientific outcomes from all counties in the region. For example, the most known regional initiatives are SciELO[3] and Redalyc[4] – networks of peer-reviewed OA scientific journals of Latin America functioning as bibliometric databases (platforms) with full-text articles. In particular, the current Redalyc's collection contains 716,784 full-text articles from 1,420 OA peer-reviewed journals from 26 countries of Latin America, Spain, and Portugal[5]. Both SciELO and Redalyc have defined standards for domestic OA journals and launched regional bibliometric indexes (e.g., SciELO Citation Index) and alternative metrics (download statistics). Detailed information about SciELO and Redalyc can be found in the study "Open Access Indicators and Scholarly Communications in Latin America" supported by UNESCO (Alperin et al., 2014, pp. 81-142).

Among the other crucial initiatives at the regional level is AmeliCA[6], which is a multi-institutional community-driven association founded in 2018 for strengthening non-profit publishing model (Diamond OA). It is supported by UNESCO, CLASCO, Redalyc, and several Latin American universities. AmeliCA provides markup technology in XML language (AmeliCA XML) to scholarly journals, editorial professionalisation support, journal quality assessment, offers visibility and discoverability, metrics, and other services. AmeliCA is often compared with the European Plan S initiative in terms of sharing the same target of fostering OA but using different strategies for this. If Plan S does not question the existence of commercial publishing business model and large commercial publishing houses as the leading disseminators of scholarly outputs, AmeliCA tries to tackle the core of the problem with a more revolutionary approach by building a domestic non-profit publishing infrastructure to be under control of academic institutions (Becerril-Garcia, 2019).

Latin America also has a priority for Green OA initiatives related to the interconnection of national digital repositories in the region. According to Suber (2012), "Green and Gold OA are complementary and synergistic. We should pursue them simultaneously, much as an organism must develop its nervous system and digestive system simultaneously." OA repositories can be used not only for preprints, datasets, dissertations, and other research outputs not published in journals or embargoed articles published in non-OA journals, but repositories can be also used by journals as a long-term sustainable method of preservation of published articles (Suber, 2012). In this light, the important initiative in the region is La Referencia (The Federated Network of Institutional Repositories of Scientific Publications)[7], which represents a network of national systems of digital repositories from eleven countries (Argentina, Brazil, Chile, Costa Rica, Colombia, Ecuador, El Salvador, Spain, Panama, Peru, and Uruguay). The main objective of the

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[3] https://scielo.org/
[4] https://www.redalyc.org/
[5] Data is retrieved from the home page of Redalyc.org on June 18, 2021.
[6] http://amelica.org/
[7] https://www.lareferencia.info/

initiative is to boost interoperability between different repositories for metadata harvesting.

It should be noted that international organisations, such as UNESCO (in particular, UNESCO's Regional Bureau for Science in Latin America and the Caribbean based in Montevideo, Uruguay), BIREME (specialised centre of the Pan American Health Organization / World Health Organization) and CLACSO, are quite active in the region for promoting and supporting OA initiatives to publicly funded research. For example, CLACSO supports and coordinates many collaborative, non-commercial initiatives and national/institutional policies through its 'OA Campaign' (CLACSO, n.d.). One of the recent CLACSO's initiatives is the Latin American Forum on Scientific Evaluation (FOLEC)[8] aiming to foster collaboration and knowledge sharing on research evaluation reform in the region.

2.2. Argentina's OA indicators

To analyse indicators characterising the state of OA journals and repositories in Argentina, we used two international databases respectively – DOAJ (Directory of Open Access Journals)[9] and OPenDOAR (Directory of Open Access Repositories)[10]. These databases were also used to extract the same OA indicators for Korea (see subsection 3.1).

DOAJ is the largest database providing metadata of registered peer-reviewed Gold OA journals from 126 countries and metadata of articles published in those journals. One of the reasons of selecting DOAJ to identify the state of OA journals in our case study countries is the fact that it is considered as the most representative database, while other international databases, such as Web of Science (WoS) and Scopus, poorly reflect research outputs published within the Latin American region. For example, in 2016-2017 WoS and Scopus included less than 1% of regional journals from Latin America in their collections (DORA, 2021). In addition, DOAJ clearly distinguishes two forms of Gold OA journals, Diamond/no-APC and APC-based ones, and provides data on the amount of APCs[11]. Both the journal and the article metadata datasets were downloaded from DOAJ website[12] in JSON format and then converted to CSV format.

According to Table 1, Argentina has 314 OA journals registered in DOAJ with the total number of 50,569 papers, and there are 72 OA repositories registered in OpenDOAR. We can see a stable growth of new OA journals since 2014, most of the journals belong to universities (their units) or scholarly societies and associations. The number of newly established repositories and newly published OA papers fluctuate widely, but there is a growth of OA papers since 2016.

Table 1. Annual growth of new domestic OA journals (DOAJ), OA repositories (OpenDOAR), and OA papers published in domestic OA journals (DOAJ)

Years	OA journals	OA repositories	OA papers
2006	3	1	63
2007	7	0	126

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[8] https://www.clacso.org/en/folec/
[9] https://doaj.org
[10] https://v2.sherpa.ac.uk
[11] The DOAJ metadata about APC amounts are sometimes misleading and incorrect if to compare it with the information displayed on the journals' websites. The limitations of this particular DOAJ metadata were also expressed by other researchers (Scholz, 2015; Morrison, 2018; Zhao et al., 2021).
[12] https://doaj.org/docs/public-data-dump/

2008	5	3	168
2009	2	3	209
2010	10	6	294
2011	7	5	208
2012	13	6	147
2013	16	9	8,342
2014	8	2	984
2015	15	3	3,484
2016	20	2	2,468
2017	40	4	3,391
2018	47	2	5,079
2019	49	16	5,940
2020	60	9	19,766
2021[13]	12	1	
Total	**314**	**72**	**50,569**

We can see that 96,8 % of all Argentine OA journals registered in DOAJ are Diamond ones, which do not charge APCs (Table 2). Among these Diamond journals there is a dominance of the Social Sciences and Humanities (SSH) journals[14]. Only 3,2 % of OA journals (10), from the fields of Agriculture, Earth Sciences, Physics, and Health Sciences, state that they have some form of APCs. In general, APCs are not very high and vary from journal to journal (maximum is 500 USD per article).

Table 2. Domestic OA journals by type (APC-based and Diamond), based on DOAJ data

Type of OA journals	Number and share
Diamond OA journals (without APCs)	304 (96,8%)
APC-based OA journals	10 (3,2%)*
Total (2021)	**314**

However, it is hard to get to know the precise annual expenses of Argentine researchers (their institutes) on APCs for publishing OA papers in both domestic and non-Argentinian journals. According to the 2019 Big Deals Survey conducted with respondents from national science and technology government agencies and consortia of libraries from eleven Latin American countries, including Argentina (Bravo-Marchant & Cabezas-Bullemore, 2020, p. 19), there are no well-established national mechanisms to track and monitor data about funds directed to pay APCs.

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[13] The 2021 data was recorded on [19 June 2021]
[14] This is compliant with the results of the recent study on the Diamond OA journals across the world (Bosman et al., 2021), which confirms that there is a dominance of SSH journals among Diamond OA journals and the scarcity of SSH journals among APC-levying journals.

2.3. Key national OA policies and initiatives in Argentina

The Ministry of Science, Technology and Innovation (MINCYT) and its subordinate organisations (e.g., the National Scientific and Technical Research Council/CONICET) have taken the leading role to promote OA in Argentina. In particular, the country has made sufficient efforts in developing Green OA.

First, in 2011, the National System of Digital Repositories (Sistema Nacional de Repositorios Digitales, SNRD)[15] was created as an initiative of the Advisory Board of the Science and Technology Electronic Library under MINCYT. SNRD portal provides access to more than 362,200 digital objects from an interoperable network of 44 institutional repositories[16]. SNRD is a national node of La Referencia network.

Second, in the same year, when SNRD was created, MINCYT proposed a law to mandate Green OA. Law n. 26.899 "Open access institutional digital repositories" ("Repositorios digitales …," 2013) was approved by the National Senate in 2013 mandating institutions that receive government funds for conducting research to develop interoperable institutional OA repositories, where research results and data must be deposited, with maximum embargo of six months for publications and five years for data. Among other things, the law requests a Data Management Plan for projects, which expect to generate research data. It should be noted that, at that time, Argentina was the second country in the world to have such kind of legislation (Gómez Izquierdo, 2016). And for February 2019, Argentina, together with Mexico and Peru, have been the only countries in Latin America that have approved national laws on OA (ISC, 2019).

In addition to the above-mentioned OA law (the most powerful legal instrument), there are seven other OA policy mandates in Argentina registered in the international Registry of Open Access Repository Mandates and Policies (ROARMAP)[17]. One is adopted by MINCYT (as a research funding agency) and the others are adopted by research performing organisations (universities) that request researchers to provide OA to their peer-reviewed research articles by depositing them in an institutional OA repository.

Regarding Diamond OA *per se*, using public funding mechanisms (academic institutions' budgets), Argentina supports domestic Diamond OA journals (which are part of the above-mentioned collaborative, cross-regional initiatives, such as SciELO and Redalyc), improves journals' quality and technological infrastructures for their visibility. The previous study (Bosman et al., 2021) investigating the worldwide landscape of Diamond OA journals reported that the majority of Diamond OA journals across the world do not use extensive resources to maintain their publishing and other costs. According to this study, annual costs for journal editing and operational work in 2019 were mainly under $/€10,000, with just over a third of the total reported costs below $/€1,000. However, it was stressed that Diamond OA journals are largely dependent on volunteers. In Latin America, in particular, it is standard practice to engage staff in voluntary publishing activities as part of post-doc researcher staff development. The reliance on the goodwill of volunteers can jeopardise the long-term sustainability of a journal and its economic viability.

Argentina has also implemented some policies and initiatives to encourage government-funded researchers to publish domestically in OA journals. For example, the National Scientific and

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[15] https://repositoriosdigitales.mincyt.gob.ar/vufind/
[16] Not all institutional repositories registered in OpenDOAR (see above Table 1) are connected to this network yet.
[17] http://roarmap.eprints.org/

Technical Research Council of Argentina (CONICET) considers the regional indexes from SciELO and Redalyc for academic evaluation of SSH researchers. In 2013, CONICET appointed a commission of experts in SSH, who together with the CONICET's Centre of Scientific and Technological Information (CAICYT) drafted the resolution called "Bases for the categorisation of periodical publications in the Social Sciences and Humanities". The resolution was approved by CONICET in 2014 (CONICET, 2014). According to this document, regional journals indexed in SciELO, along with journals indexed in prestigious international databases, such as WoS, Scopus, and ERIH, have the highest quality value (Level 1), while Redalyc's regional journals together with some international journals are relegated to Level 2. The CONICET's 2014 resolution represents an important attempt to encourage regional scientific publications (Vasen & Vilchis, 2017). In this light, Argentina is considered as one of the pioneers in the region (ISC, 2019).

Despite the fact that Latin America as a whole still faces the challenge of incorporating of regional indexing services in national research evaluation systems, which still rely on the traditional Impact Factor of 'mainstream' journals (UNESCO, n.d.; Becerril-García & Aguado López, 2019), the region has been included in 2021 to the DORA (Declaration on Research Assessment)'s best practices for its efforts dedicated to improve academic career assessment based on regional OA indicators (DORA, 2021). In particular, the DORA community acknowledges the collaborative efforts of the Latin American Forum on Scientific Evaluation (FOLEC) created by CLACSO. Argentina, the center of CLACSO, plays an important role in coordinating this initiative. FOLEC aims to facilitate dialogue among partner academic institutions and organisations (e.g., among them are international organisations, such as UNESCO and the International Science Council) to develop consistent research evaluation policies and practices in Latin America and the Caribbean. In April 2021, FOLEC has convened a working group in collaboration with the OLIVA Project of the National University of Cuyo (Argentina)[18] and the Spanish Higher Council for Scientific Research (CSIC). By November 2022, the working group aims to publish a roadmap to research evaluation reform to guide the implementation of new policies and practices at CLACSO research member institutions.

3. Korea's approach to OA

3.1. Korea's OA indicators

As we can see from Table 3, Korea does not have a stable growth of OA journals, OA repositories, and OA papers as well as their total number is much smaller compared with Argentina (see Table 1). In particular, the total number of OA journals registered in DOAJ is more than as twice as small in Korea. The majority of those journals belong to scholarly societies.

More than a half of Korean OA journals registered in DOAJ (59%) are Diamond journals, while 41% are APC-based journals (Table 4). The difference in numbers of Diamond and non-Diamond journals is not large compared with the situation in Argentina (Table 2), where almost all journals are Diamond ones. There is a wide APC range in Korean OA journals (maximum is 1,890 USD per article), the charges are considerably lower than those charged by international journals, but considerably higher than in Argentine journals.

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[18] https://cecic.fcp.uncuyo.edu.ar/en/oliva-the-latin-american-observatory-of-research-assessment-indicators/

The vast majority of Korean Diamond journals are from the Medicine field, followed by SSH journals. It should be noted that, according to DOAJ data, both Diamond and non-Diamond OA journals in Korea are dominated by journals from the Medicine field; there are some SSH journals, but journals from other disciplines (e.g., Science and Engineering fields) are very rare among OA journals[19]. At the same time we can see that in Argentina and many other countries, domestic OA journals, Diamond journals in particular, are led by SSH journals.

Table 3. Annual growth of new domestic OA journals (DOAJ), OA repositories (OpenDOAR), and OA papers published in domestic OA journals (DOAJ)

Years	OA journals	OA repositories	OA papers
2003	1		
2004			
2005			
2006	1	1	21
2007			21
2008	1	2	
2009	1	2	
2010			
2011	1	8	
2012	2		
2013	9	2	1,092
2014	2	8	750
2015	1	5	646
2016	22		3,363
2017	20	6	8,871
2018	29		12,846
2019	28	4	6,412
2020	20	2	11,957
2021[20]	5	1	
Total	**143**	**41**	**45,979**

Table 4. Domestic OA journals by type (APC-based and Diamond), based on DOAJ data

Type of OA journals	Number and in percentage
Diamond OA journals (without APCs)	84 (59%)
APC-based OA journals	59 (41%)*
Total (2021)	**143**

* According to our investigation, one of these journals (Genomics & Informatics) does not apply APCs since 2019[21].

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[19] This statement is similar to the results of the previous study (Shin, 2020).
[20] The 2021 data was recorded on [19 June 2021]
[21] https://genominfo.org/authors/authors.php

Although there are no collected data on the annual expenses on APCs for OA publishing in domestic journals, they must not be as large as the national expenses on publishing in international SCI-level journals, which still prevails in Korea. For example, most of the research outcomes of projects funded by the National Research Foundation/NRF (main funding agency in Korea) are published in overseas SCI-level journals of large publishing houses and the number of papers published in domestic journals is very small (Joung et al., 2020). Previous studies (Kim, 2018; Jung, 2020) confirms the Korean researchers' preference of largely publishing in oversees prestigious journals guided by the Impact Factor of the journals. According to another study investigating SCIE papers in OA/hybrid journals, where correspondent author was from Korea, around 125-171 million USD was spent on APCs for publishing 73,736 articles in 2019, with the charge ranging from 1,692 to 2,312 USD per article (Kim, 2021, p.38). Finally, a remarkable evidence of Korea's bias in favour of APC-based OA publishing in international journals is the recent transformative ('read and publish) agreement with Elsevier, which the National Research Council of Science and Technology (NST) has concluded for the next three years (2021-2023) (Elsevier, 2020). It is the first transformative agreement in Korea. According to this agreement, NST consortium comprising 25 government-funded research institutes have to pay to Elsevier the agreed charges during three years. In return, the researchers get access to Elsevier ScienceDirect journals and an opportunity to publish their OA papers free of charge in those journals.

3.2. Key national OA policies and initiatives

There are two major actors leading the OA developments in Korea. The first one is the Korea Institute of Science and Technology Information (KISTI)[22], which is a public research institute and a major S&T information service provider under the aegis of the Ministry of Science and ICT (MSIT). And the second one is the National Research Foundation (NRF)[23] established by MSIT and the Ministry of Education to fund research across all disciplines from SSH to the natural sciences. Among the NRF functions are also evaluation of domestic scholarly journals and registration of the accredited ones in the Korea Citation Index (KCI) database. Other players, such as library community, scholarly societies, local publishers, are seen as not very active to promote OA (Shin, 2020, p. 120).

At this moment there is no national or institutional policies that explicitly mandate or encourage OA in Korea (Seo, 2021; Kil, 2021). The exception is one institutional OA policy (Green OA) adopted by KISTI in 2018 and registered in ROARMAP[24]. According to this policy, each KISTI researcher is required to provide an electronic copy of the published version or the final author's version of the research output (e.g., journal article) to make it available to the public in the KISTI OA repository, and the researcher shall permit KISTI to make his or her research outputs available in a non-exclusive and permanent manner based on the CC-BY-NC (Creative Commons Attribution-NonCommercial) licence. To further support Green OA, in 2020, KISTI launched a national-level OA repository "KOAR (Korea

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[22] https://www.kisti.re.kr/
[23] https://www.nrf.re.kr/
[24] http://roarmap.eprints.org/1948/

Open Access platform for Researchers)" [25] , which among other services provides self-archiving for both researchers and journals as well as an integrated search service for OA articles from the linked domestic and foreign journals and institutional repositories.

Even though Korea has not implemented Green OA mandates for government-funded research at the level of legislation, as it is the case in Argentina, a draft bill was prepared by KISTI in 2010-2011. At that time the OA awareness and interest among policy makers and researchers were quite low as well as there was a strong opposition from domestic commercial vendors, such as Korean Studies Information (KSI), providing online access to scholarly societies' journal articles to individuals for a fee and to libraries through a licencing agreement (Jung, 2020). These days, when OA awareness has been greatly raised, KISTI together with MSIT prepare some amendments to the basic legal act for the national R&D system entitled "Framework Act on Science and Technology" (2001)[26]. The amendments will include Open Science mandatory provisions, including OA and open research data.

Another potentially important step is the development of the OA policy implementation plan by NRF ("NRF OA2021"), which follows the Plan S vision (Joung et al., 2020; Yoon, 2020). In particular, according to the initial plan (which has not been implemented yet), the NRF OA policy will stipulate the funded researchers' obligations (e.g., deposit the published articles licenced by CC-BY[27] in an OA repository within a certain period of time) and rights (e.g., obtaining support from the funder for APCs of OA journal articles). As soon as more domestic journals transition to OA and become more mature, NRF is considering to set gradually the mandatory provisions to incentivise the funded researchers (particularly from SSH field) to publish OA papers in domestic journals. However, at this moment, there are no dedicated policy efforts and initiatives to transform the research evaluation systems, which are still driven by the Impact Factor of international SCI-level journals and do not give enough credits for publications in high-quality domestic OA journals indexed in KCI.

In general, Korea shows not to be currently focusing on the promotion of Gold OA in a form of a Diamond publishing infrastructure. Nevertheless, there is an opinion among some local experts that instead of providing support to researchers for paying APCs for domestic publishing, it would be more reasonable to exempt researchers from such charges and better support and reinforce domestic OA journals (Joung et al., 2020, p. 274).

On a general basis, most domestic journals of scholarly societies can apply for a financial support from NRF, such as the "Academic Journal Support Project"[28]. However, such fund is limited and up to one year; a continuous, long-term support is not secured (Joung et al., 2020, p. 273; Park, 2021). As part of the NRF OA policy implementation plan, it is discussed to target in the future only OA journals or journals which are in transition to OA and provide them with more prolonged support based on the evaluation of their performance (Joung et al., 2020, p. 274). In addition to financial support, domestic journals need technical and administrative support to flip to OA model. In this light, KISTI cooperates with scholarly

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[25] https://www.koar.kr/
[26] 과학기술기본법, https://www.law.go.kr/법령/과학기술기본법
[27] It should be noted that at the moment most of the domestic Korean OA journals do not publish papers with CCL (Creative Commons Licences) (Joung et al., 2020, p. 277).
[28] https://www.nrf.re.kr/biz/info/info/view?biz_no=5

societies to help journals with DOI registration, guide them on how to be indexed in DOAJ, provide them online peer review system "ACOMS"[29] and XML-based OA journal publishing platform "KPubS"[30], etc. (Jung, 2020, p. 18-19). Besides, in order to properly develop and operationalise OA publishing model in the Korean context, academic and research libraries should take more active role to provide scholars with consultation and administrative support services related to OA driven scholarly communication and CCL (Creative Commons Licences) (Shin, 2020).

4. Concluding remarks

Our study shows that two countries, Argentina and Korea, have very different approaches to OA development (the former is driven by Diamond OA, while the latter rather adheres to APC-based Gold OA). The key differences between the countries are summarised in Table 5.

Table 5. Key features of OA scholarly publishing environment in Argentina and Korea

	Argentina	Korea
Strengths	1. A long tradition of regional discipline repositories 2. A long tradition of collaborative, cross-regional initiatives and networking (e.g., SciELO, La Referencia) 3. Active role and support of international organisations (e.g., UNESCO, CLACSO) 4. High OA awareness among academic communities and government agencies 5. National OA mandate for government-funded research (law) 6. In most cases, no-APC for domestic OA publishing 7. Considerable efforts in the development of indexing services, editorial proficiency, etc. for OA journals 8. Considerable efforts in leading national and regional initiatives for improving research evaluation based on regional OA indexes	1. High GERD(Gross domestic expenditure on R&D)/GDP ratio 2. Mature ICT infrastructure 3. Ability and willingness to support researchers using OA publishing routes with APCs

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[29] https://acoms.kisti.re.kr/
[30] http://kpubs.org/

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Remaining challenges	1. Uncertainty of long-term sustainability of OA publishing infrastructure, which greatly relies on the government funding and goodwill of volunteers 2. Research evaluation systems still depend on mainstream international databases, such as WoS	1. Lack of sufficient OA awareness among different stakeholders (except KISTI and NRF having a leading role) 2. Strong position of domestic commercial e-journal database vendors (e.g., KSI) 3. Lack of national or institutional OA mandates 4. Low adoption of CCL by domestic journals 5. Large bias towards APC-based OA publishing, especially in international SCI-level journals (substantial expenses) 6. Not sufficient support for domestic OA journals or journals which are in transition to OA 7. Lack of dedicated policy efforts to transform research evaluation systems driven by the Impact Factor

We argue in this paper that Latin America in general, but Argentina in particular, can offer a role model of Diamond OA and possible cooperation with other countries that are at a similar stage of development. We argue that APC-based Gold OA, which Korea is trying to follow, will prove to be a business model with a limited lifetime, and that, following the COVID pandemic, there will be strong pressure to improve the domestic scholarly publishing environment by adopting the Diamond OA model. We do not argue that this is a perfect model; its short and long term costs, and how these are funded, as well as long term viability in terms of the people who operate such journals, need to be evaluated. However, we argue that this is the direction of near-term travel for scholarly publishing. Where Argentina leads, other countries should follow.

Despite the fact that the Asian countries (particularly SLA's Asian countries[31]) are very diverse in terms of Gross Domestic Product, levels of sophistication of ICT infrastructure, volume of research outputs, and numbers of active researchers and librarians, they still have some common features and face similar challenges. These countries still cannot compete with the Western world ('Global North') in terms of the visibility of research outputs, a problem for Latin American countries as well. The initial idea behind the OA movement *per se* was to reduce science and technology gaps between nations, with the potential to especially benefit less-developed or non-Western countries. Taking all this into consideration, we propose below several recommendations for possible cooperation between Asian countries to increase the visibility of research in that region through the Diamond OA route.

One of the recommendations is to establish a Diamond OA Capacity Centre for the Asian region. The inspiration for this can be found in the recent study commissioned by cOAlition S (Becerril, 2021, p. 22). The Centre could be a part of the SLA Asian Chapter with a responsible institution located in an Asian country that has a high commitment and good performance in adopting OA, in general, and Diamond OA in particular. Such a Diamond OA Capacity Centre

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[31] India, Indonesia, Kazakhstan, Malaysia, Nepal, Pakistan, Philippines, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam

would foster partnerships and joint projects in the region and beyond as well as it would build and maintain the informal communities of practice (CoP) allowing them to work together, for example, in areas such as CCL, international and regional indexing, professionalisation of editorial and peer review workflows, journal content preservation. The Centre would also provide consultancy services, training, workshops adaptable to different Asian countries, communities, taking into account disciplines and languages. A special focus could be given to supply support to smaller Diamond OA journals.

In addition to regular activities, the Diamond OA Capacity Centre would be responsible for organising annual regional forums with major stakeholders (e.g., ministries of science, research councils, library communities, academic institutions, scholarly societies, journals, technology/platform providers, international bodies) aiming to discuss and elaborate the quality standards for Diamond OA journals, their co-funding models, approaches of incentivising researchers to publish in Diamond OA journals based on the changes in national research career evaluation systems, etc. It can be organised in a similar way as the Latin America's FOLEC forum mentioned in Chapter 2.

The Diamond OA Capacity Centre would also try to collaborate with the Latin American mature OA publishing platforms, such as SciELO. In particular, collaboration can be in a form of indexing of Diamond OA journals from Asian countries in the SciELO Citation Index[32]. The latter is integrated into WoS and is included, for example, by the Research Council of Argentina (CONICET) in the national journal classification system for academic evaluation in the field of SSH being at the same level as WoS and Scopus indexes. The SciELO Citation Index might help Asian OA journals to improve their quality and to connect the research outcomes to the broader research landscape.

Many consider that research outputs which involve international collaboration have a much greater impact and visibility than articles which only have authors from one country. However, many Asian countries, including China, Japan, Korea and India, still have a relatively low level of international collaboration (OECD, 2017, p. 70; Adams et al., 2019, p. 4-5). Thus, the Centre could also have a role in encouraging international research collaboration within and beyond the Asian region through co-authoring articles in Diamond OA journals. Possible functions of such a Centre are summarised in Figure 2 below.

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[32] Despite the fact the primary focus of the SciELO platform is OA journal collections from Ibero-America (Spanish- and Portuguese-speaking countries), it also includes journal collections from South Africa.

Figure 2. A possible set of activities for the proposed
Diamond OA Capacity Centre for the Asian region

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Library Leadership In Digital Environment

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Abstract

It can be clearly ascertained the role of library leaders in the Digital Environment. This revolution of Digital environment allows the library leaders to reinvent their typical role in this changing environment. Digitization of libraries has redefined the shape and role of the library in this new era.

Libraries can actually fulfil the need of the readers what they want. In this digital environment, we see that retrieval of information is not restricted to limited resources although it is moving to the digitized resources also. Thus, it becomes essential for library professionals to be expert in their field to provide the information to the users through digitized resources also.

This paper will help us to learn the changing roles of libraries and librarians in the society. This change is mandatory to be taken place in different libraries such as colleges, universities, public libraries, schools, research organisation etc. This paper will enable us to learn about objectives, role and challenges faces by library leaders in this digital era.

Keywords: Library Leadership, Digital Environment, Foundational Competencies, Challenges.

1. Introduction:

Library Leaders are the people working in different kind of libraries such as schools, colleges, universities, public libraries, research libraries etc. They are playing a vital role in their field. Thus, library leadership in a professional organization offers library leaders an opportunity to reinvent their work in this changing digital environment of information. Nowadays, library leaders are playing a distinguished role in disseminating information

to the users. They are becoming techno-savvy and providing categorised information to the users.

Library leadership has identified 14 definitive competencies that can be applied across roles, career stages and library types. These competencies support libraries in following ways:-

- Definitive terms can be used for library leadership and its development

- Mapping for professional development

- Foundation for library school curriculum

- Framework for staff training

- Strengthens professional skills and knowledge

Digital Libraries are the libraries where a piece of information is stored in digital form. The concept of digitized library is emerging fast in the world. These libraries are working efficiently likewise traditional libraries were running. The traditional libraries were user-centric and every piece of information was stored in print form mainly. But digital libraries organise, distribute and preserve information resources in more integrated form with the use of more components and technology.

2. Library Leadership and its foundational competencies

Communication Skills

Change Management

Team Building

Collaboration and Partnership

Emotional Intelligence

Problem Solving

Evidence-based decision making

Conflict resolution

Budget Creation and Presentation

Forward Thinking

Critical Thinking

Ethics

Project Management

Marketing and advocacy

DIFFERENT FOUNDATIONAL COMPETENCIES

COMMUNICATION SKILLS

CHANGE MANAGEMENT

TEAM BUILDING

COLLABORATION AND PARTNERSHIP

EMOTIONAL INTELLIGENCE

PROBLEM SOLVING

EVIDENCE - BASED DECISION MAKING

CONFLICT RESOLUTION
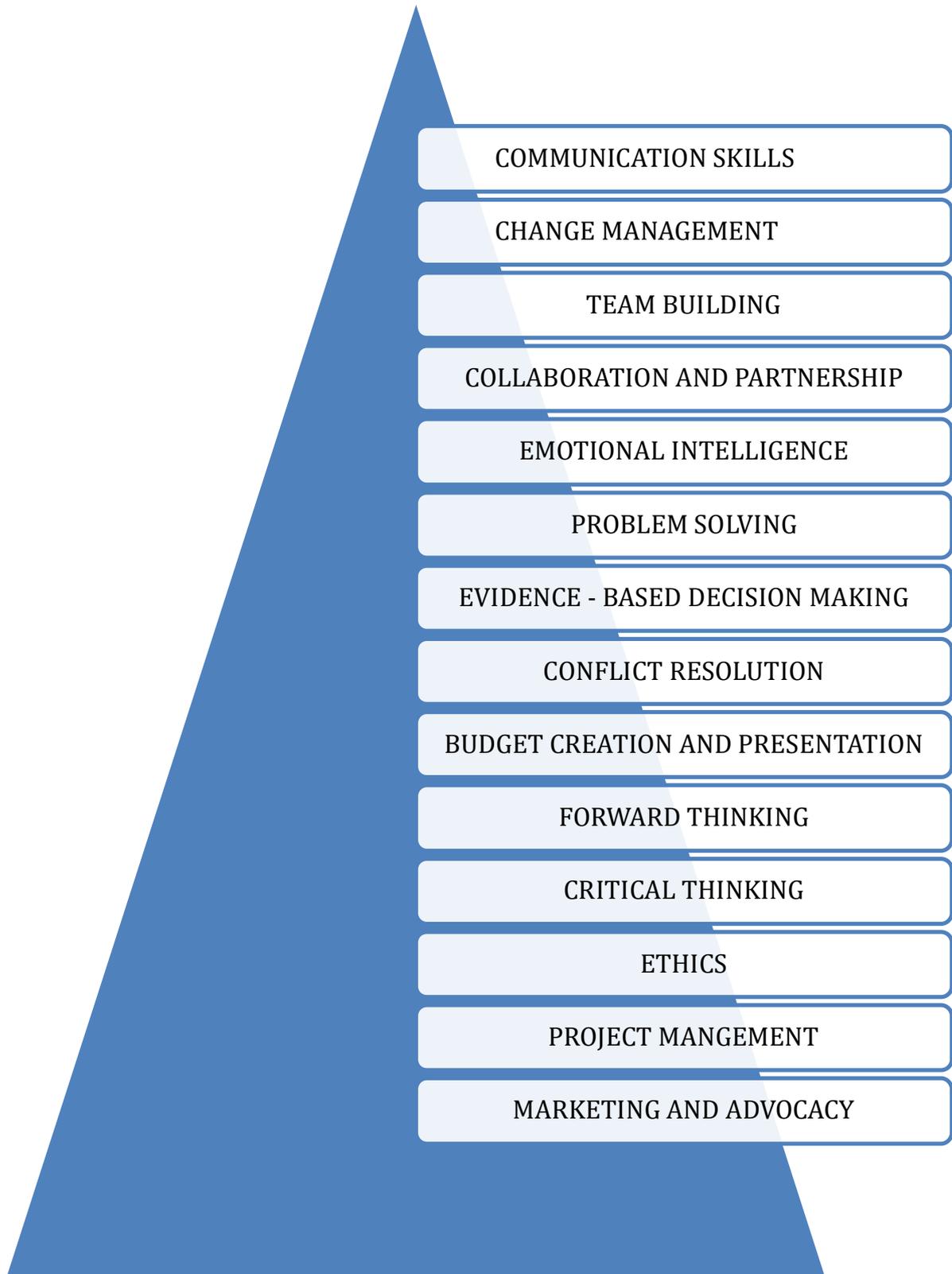
BUDGET CREATION AND PRESENTATION

FORWARD THINKING

CRITICAL THINKING

ETHICS

PROJECT MANGEMENT

MARKETING AND ADVOCACY

- **Communication Skills**

Library Leaders are well versed with written, verbal & non-verbal communication skills to interact with other employees.

- **Change Management**

Leaders provide an environment to innovate, collaborate by continuous two–way communication, flexibility and willingness to learn from faults made and by providing training necessary to make the change happen. This will ensure a library to be transformed from traditional library to digital library.

- **Team Building**

Leaders cooperate and encourages the team. He/She builds up strong communication skills which helps them to interact with the users more efficiently.

- **Collaboration and Partnership**

Library Leaders encourages the team to work for common-goal and supports the dedication of the team also. He/She becomes responsible to improve the status of the library.

- **Emotional Intelligence**

Leaders are effective in understanding and improving the way they manage the people's emotions, apply concepts such as self awareness, self motivation, empathy to interact users.

- **Problem Solving**

Leaders take initiative to resolve conflicts and adopt some precautionary measures to avoid problems. Then only he can make tremendous changes in the libary.

- **Evidence-based decision making**

Leaders determine whether a policy or a program will work at their organisation to meet the need of the users. This decision making policy will help the organisation to improve the library and its facilities.

- **Conflict resolution**

Library Leaders support differences of opinion and help individuals to resolve conflicts in such a manner which could be proved productive for the organisation.

- **Budget Creation and Presentation**

Library Leaders are responsible for formulating budget of the library which should fulfil the need of the library to meet the need of the users.

- **Forward Thinking**

Leaders maintain an understanding of latest trends and developments in the library, use that understanding to position their library to take advantage of opportunities as they arise, moving the library forward from position of strength.

- **Critical Thinking**

Leaders apply critical thinking – which implies a high level of understanding, the ability to break a problem into its constituent parts, and the skills to effectively analyze and assess the issues to their libraries challenges to identify and implement solutions.

- **Ethics**

Library Leaders use ethics in the process of deciding what should be done, reflecting the course of action for providing support to library for its growth.

- **Project Management**

    Library Leaders take steps to execute, monitor the project to improve library facilities.

- **Marketing and advocacy**

Library Leaders create key activities and goals of the organization and aggressively seeks out opportunities to communicate the goals with both internal and external constituencies of the library.

3. Objectives of Library Leadership in digital environment

- **Ascertain the role of library leaders in digital environment**

It is important to understand the role of library leaders in this digital environment. We find that technology revolution is taking its shape and in this changing environment, library leaders need to be alert always so that they can provide an updated access to the users.

- **Important to become a proficient Library Leader**

Library Leaders should have a great capability to understand the need of its organization. This attitude can help them in realising how they can be proved helpful towards the staff and users of the library effectively.

- **Analyse the skills of library leaders in digital environment**

Library leaders should have the knowledge how much it is important to keep themselves updated with the latest resources for disseminating information. Unless they know the changes happening around, they cannot easily satisfy the need of the community.

- **Important to know the strengths and weakness of library leaders**

The organizations should also understand that rapid change is happening in technology, so it is also important for the organisations to know about the strength and weakness of their library leaders. The organisation should provide or allow the library leaders to equip themselves with the latest technologies needed to carry out their work much more efficiently.

- **Analyse the need of the users and how to satisfy their need**

The Library Leaders should be capable to understand the need of their users. They should try to know the exact need of their users so that can help them by providing the required information. Nowadays, we see that we cannot satisfy the users by dictating the text required. But, we need to actually meet them where they are.

- **Sharpen analytical skills**

The library leaders should be equipped themselves with the latest resources of disseminating information. This can surely help them to know the need of their patron and translate their need into services which meets their needs.

- **Feedback from users**

It is also important to know about the feedback from users about the interior of the library and its services. As it makes library leaders a successful leader which helps them to evaluate the experiences of their users. Through this they can make some important changes in the library to grow more/

- **Accomodate the gaps between user and information**

We see the patrons visit the library from different parts of the society. We see much diversity in community, therefore it becomes important for library leaders to know about varieties of the technology to meet their demand about seeking information.

- **Focus on digital strategy**

We can realise that digital revolution can take place only if, we library leaders take some necessary steps. As it is difficult for the organisation to look into each and every necessity to run

the organisation properly. But here we also need to be alert about the changes taking place in technologies in regards to the library. We can recommend to the management for the same as well.

Challenges for Library Leaders in Digital Environment

- **Develop a Digital Strategy-**

This is the biggest challenge for a library leader to develop a comprehensive digital strategy. This strategy should be shared broadly and repeatedly across the organization. Many great librarians understand that library should be accessible digitally these days in all aspects. But still number of librarians are satisfied with the traditional system of the libraries. But we find that local libraries are not merely a collection of books. Although, we clearly see that nowadays, libraries are a set of services that connects the user to all information everywhere.

- **Initiating digital literacy across the organisation**

This is also one of the biggest challenge before the librarians as many people think that digitization of resources reduces the burden of the librarians. But it is not true. As the print material can be easily stored and preserved in libraries. But for a digitized library, a library should know that which web sites are rich in knowledge and authentic. Which publishers are providing information on particular subject. It is the major responsibility of a librarian to identify, acquire and preserve these digital resources.

- **Redefine value of libraries**

Earlier libraries used to focus on cataloguing books and journals so that books could be easily accessed by its users. But in digital environment, users are interested to find information through online search engines. Therefore, access to information is based on what actually users need, its not what a library owns. The budgets of libraries have also raised dramatically, but a few librarians have truly analyzed the electronic resources. This redefining has helped librarians to improve status of libraries in terms of staffing, space or organizational structure.

- **Meeting with the need of Users**

In this changing environment, Library Leaders need to know the need of the users. A library leader should take a feedback from users. This will surely help him to analyse the need of the users. Therefore, if a library leader expects that the users will feel comfortable, then he should listen to his users and fulfil their need whether it is time constraint or layout of the library.

- **A new vision for libraries**

A digital library is a library where we see that technology empowers learning of all patrons and removes some limitations to success. This environment will connect the users with new resources of technology and disseminating information. Thus, digital learning tool is surely going to engage them up and encourages them to access library more frequently.

4. Conclusion

Joshua Rothman has mentioned in an issue of *"The New Yorker" in 2016 that our coming generation should understand the need of Library Leadership as well. In this transition phase, we see many changes occurring in the society. Thus, organisations are the ones which reflect the digital era. We see many hierarchical differences, different skill sets and different responsibilities.*

In the digital era, library leadership requires recalibration as well. The libraries should also designate library leaders as they are responsible for articulating the mission and vision of digital library. The librarians are generally trained to facilitate the local community but it is now becoming the need to change the mind of the management of the organisations also. The libraries should have the positions of Heads/ Leaders also who should be guided to give a new look to the library.

Libraries are now stepping towards the digitization and are highly prized and preserve valuable collection. This collection may be in the form of audio/video collection, digitized collection of books and journals. So library leaders should be trained to impart knowledge to the users through accessing various search engines. They are enabled to abridge the gap between user and digitized information.

In this digital era, we need to invest in services which allows the users to access libraries more efficiently instead of maintaining catalogs.The users now want to search information through various search engines, blog posts, multimedia resources, web-pages etc.

Therefore, we can say that digital libraries are the future of academic and research institutions. And Library Leaders are entitled to have more knowledge and skills to disseminate information as and when required. So, the librarians should not only be given technical skills and traditional library training, but should also be given training of library management – a project based training. Library Leaders should develop interpersonal skills, communication skills and team-work skills.

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Library Transformation through Open Virtual Literacy (OVL) during the Covid-19 Pandemic: Best Practices of Indonesian Center for Agricultural Library and Technology Dissemination, Ministry of Agriculture

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Abstract

The impact of the corona virus disease (COVID-19) as a global pandemic has a wide impact on human life around the world, including on libraries. Therefore, the Indonesian Center for Agricultural Library and Technology Dissemination, Ministry of Agriculture launched the Open Virtual literacy (OVL) program, namely online interactive communication literacy. OVL is a transformation of library activities and the dissemination of agricultural technology online through video conferencing (zoom meeting application) which aims to bring libraries closer to the community; increase community knowledge and skills in the agricultural sector; transactions medium for agricultural business, and is useful as a medium to bring together information sources/experts/agricultural business actors with massive stakeholders. The study method used descriptive analysis of the OVL activity from April to December 2020. The results showed that since the start of OVL in a period of nine months starting from April to December 2020, 244 virtual literacy times have been implemented. The types of virtual literacy carried out were technical guidance as much as 75 (30.74%), webinars 64 (26.23%), Focus Group Discussion 62 (25.41), Live Action Library/Agriculture 24 (9.84%) and Information Literacy 19 (7.79%). In addition, stakeholders who use OVL as a medium that brings together information sources/experts/agricultural business actors are 28 times (12.28%). Based on the results of the analysis, it is known that OVL is very useful for users and stakeholders.

Keywords: Information literacy; transformation; library ; agriculture

1. Introduction

The Indonesian Center for Agricultural Library and Technology Dissemination (ICALTD) Ministry of Agriculture which is one of the special libraries in Indonesia, is the only one that provides the largest source of agricultural information. ICALTD in accordance with its main

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duties and functions is to carry out library management and dissemination of information on agricultural science and technology, as well as to support the Ministry of Agriculture's program that realizes advanced, independent, and modern agriculture with the aim of sustainable farmer sovereignty and welfare, starting in 2020, ICATD has make efforts to bring agricultural information closer to stakeholders, namely library users, the general public and related stakeholders who need agricultural information.

ICALTD which has offline services in four places, namely are the (1) PUSTAKA Juanda 20; (2) Gedung Perpustakaan dan Pengetahuan Pertanian (P3D); (3) Soil and Agriculture Museum; and (4) Dramaga Library for supporting agricultural development with a digital library, as a center for education and recreation, agricultural innovation show cases, workspaces/meetings, business incubators in agriculture, promotion of agricultural technology innovation, and facilitating technology; and start-ups and agricultural innovation.

The pandemic impact of covid-19 causes all library services to transform into several types of services from onsite/offline to online/virtual services. The transformation of services from onsite/offline to online/virtual carried out by the Center for Library and Dissemination of Agricultural Technology is a program conducted by Open Virtual Literacy (OVL) on March 3, 2020. Agricultural information sources are also to share the same contribution in facing the COVID-19 pandemic.

The Open Virtual Literacy (OVL) program is an interactive communication-based agricultural literacy activity to bring ICALTD more closer to audiences who need agricultural information wherever they are. people throughout Indonesia with the aim of increasing the knowledge and skills of people and farmers in agriculture; agricultural business transacting media; and as a medium to bring together sources of information for both agricultural experts and business actors, as well as to build a productivity spirit for librarians.

This program allows ICALTD to continue and interact with users, communities and other stakeholders even though they are far away and not in one place. In addition, the OVL program was launched with the consideration that agricultural literacy is important for farmers to master because Indonesia's economy is highly dependent on farmer productivity.

Farmers can be given training about agriculture through video conferencing, as well as get access to capital and guidance from cultivation to marketing so that they can get optimal benefits. The OVL program implemented includes activities to utilize various agricultural information content contained in the ICALTD portal to stakeholders, namely researchers, extension agents and policy makers within the Ministry of Agriculture; the general public, especially farmers, by transforming various agricultural contents so that they are easily understood by farmers. The information disseminated is related to increasing the productivity of researchers, extension workers, and policy makers so as to produce new technological innovations and various information related to farming for farmers to increase the productivity of the agriculture they run. This paper reviews the OVL implementation that has been implemented by ICALTD in 2020. The assessment method uses OVL utilization data for a period of one year in April-December 2020 with descriptive analysis.

2. Open Virtual Literacy (OVL)

The OVL program actually is a video conferencing activity using teleworking applications by combining video, audio and text to communicate with participants in cyberspace online to literate participants (the community) who follow so that agricultural information literates. The benefit of using video conferencing is that it facilitates the ICALTD directly with the public, effectively and efficiently. In addition, according to the government's appeal for social distancing and physical distancing, ICALTD through OVL can face-to-face interactions even though they don't participate. OVL it is hoped that it can break the chain of spreading the corona virus in Indonesia.

OVL aims to increase the knowledge and skills of the community, farmers and extension workers in the agricultural sector; agricultural business transacting media; and as a medium to bring together sources of information, both agricultural experts and entrepreneurs, as a means of technical guidance for both agricultural technology and libraries, as well as building a spirit of productivity for librarians.

The use of OVL enables ICATLD to perform its main tasks and functions, which are usually mostly offline, online and interactive by approaching users (the library comes to you). OVL is expected to fulfill the presence of ICALTD wherever the community is, can reach people throughout Indonesia, can still interact with users, communities and other stakeholders even though the places are far apart and not in one place.

Another important task related to economic development for farmers is PUSTAKA's support for the Ministry of Agriculture's program to build agricultural ecosystems using digital means. Through Oviral, farmers are given training and knowledge about agriculture; get access to capital and guidance from cultivation to marketing so that they can get optimal profits.

Figure 1 showed concepts of the ICALTD task in library management. Most of the services and dissemination of agricultural technology are carried out offline, but through OVL, program is still running well by utilizing video conferencing. Library service programs, activities of the Museum of Soil and Agriculture, and activities of disseminating agricultural technology can still be carried out through oviral.
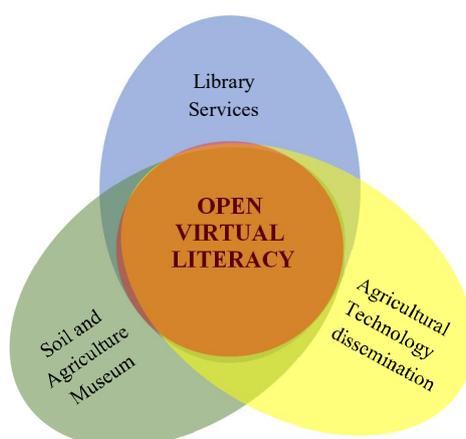

Figure 1 Open Virtual Literacy (Oviral) Concept

3. Implementation of Open Virtual Literasi (OVL)

3.1 Types of Services

During the period March-December 2020, OVL has been used 244 times by users, in means, OVL implemented by ICALTD on average once per day. However, this OVL program did not necessarily eliminate the onsite service activities that were previously implemented. The transformation of the Library Center and Agricultural Technology Dissemination services carried out in 2020 can be seen in Table 1.

On the Table 1 showed that PUSTAKA activities that use OVL are almost all library service activities except for library circulation. Library circulation during the Covid 19 pandemic emphasized digital library services through ITani applications and repositories. As for the dissemination of agricultural technology, an activity that uses OVL is live in action agricultural technology, which is a program to bring together farmers and agricultural experts. In the soil and agricultural museum activity, OVL was used for a virtual live tour of the museum which previously could only be done onsite.

Tabel 1 Types of services on ICALTD 2020 during pandemic Covid (March-Desember 2020)

No	Types of Services	Onsite	Online	OVL
Library Services				
1	Library circulation	-	√	-
2	Library Training	-	-	√
3	Information Literacy training	-	-	√
4	Knowledge Sharing activity	-	-	√
5	Librarianship coaching	-	-	√
6	User education	-	-	√
7	Live Tour Library	-	-	√
Agricultural Technology Dissemination				
1	Website	-	√	-
2	ITani (digital library application)	-	√	-
4	Live In Action agricultural technology	-	-	√
5	Social Media content	-	√	√
Soil and Agriculture Museum				
1	Live Tour Museum	√		√

3.2 Open Virtual Literasi Programs

Based on the results of data analysis, it is known that the programs that use the most OVL are user education activities 75 times (30.74%), followed by Webinars 64 times (26.23%); 62 Focus Group Discussion / FGD times (25.41%); and the lowest is live action / live tour library / museum as much as 12.28% (24 times) (Figure 1). In addition, the information literacy program, which was initially carried out onsite, was carried out through OVL 19 times (7.79%) in 2020.
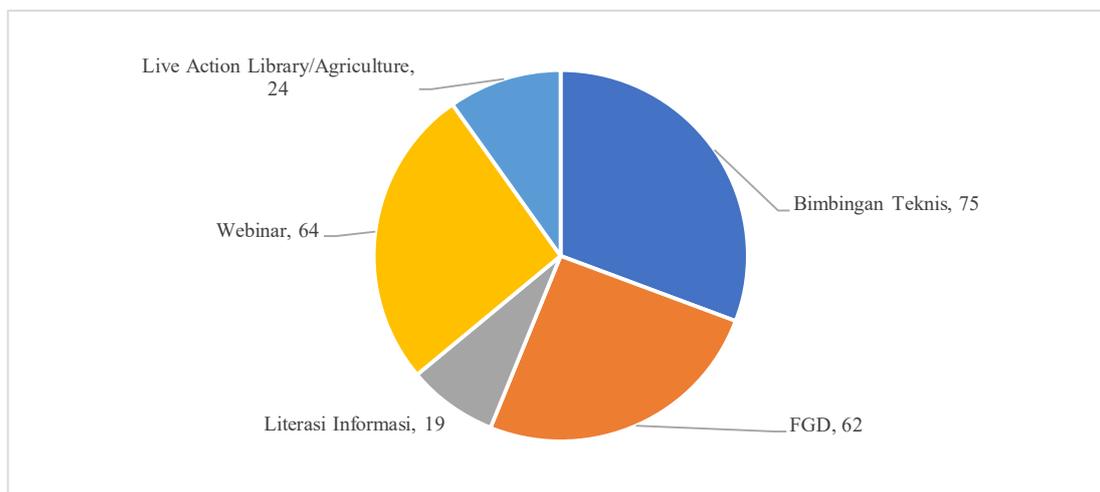

Figure 2 Open Virtual Literacy Program

User education occupies the most programs because ICALTD has the main task of fostering library work units within the Ministry of Agriculture. The user education is a routine activity for librarians throughout Indonesia. Forum Group Discussion (FGD) is also held very often, where the FGD is mostly focused on internal and external meetings which are usually held onsite but during the pandemic through OVL

During 2020, user trends indicated that OVL utilization was quite high, especially during April-July and began to slope slightly in the following months to December. However, when compared to the onsite utilization of various ICALTD services, OVL is felt very rapidly. (Figure 3).
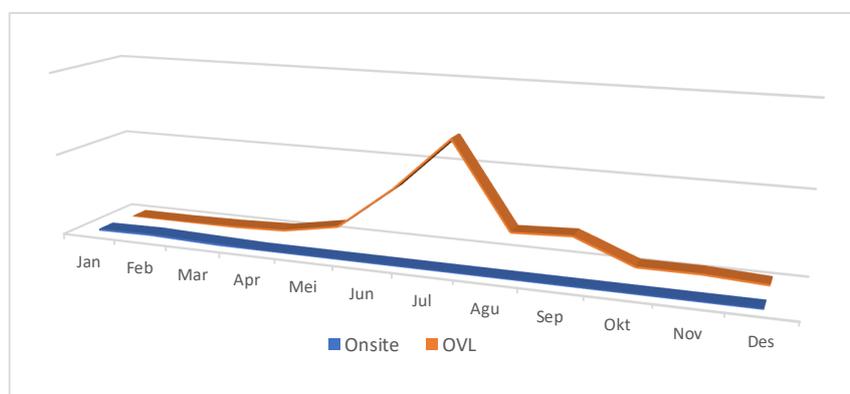

Figure 3 Trend of iCALTD user

4. Conclusion

PUSTAKA has the main duties and functions of carrying out library management and disseminating information on agricultural science and technology. In the midst of the COVID-19 pandemic, ICATLD carried out activities namely bringing library services closer to its users, by utilizing a video conference program, namely the Open Virtual Literacy Program. The OVL program has been proven to be able to reach various users from within the Ministry of Agriculture, farmers and the wider community. The material in the OVL program is very diverse and it is hoped that it will be useful for increasing competence and productivity, and community welfare. Most importantly, PUSTAKA has started to function as "Bridging Invention to Innovation" towards a prosperous people through various findings and innovations made by the Ministry of Agriculture.

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Address

Keynote

Paper

Management of social media in libraries: A study on social media management among special libraries in Jakarta, Indonesia

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Abstract

Although social media has been believed to exist in the 1970s, but the modern social media actually has only started between the last decade of 20th century and the early 21 century. Classmate and SixDegree were considered the first social media and currently there are many social media applications available for anyone, besides few others. Social media plays an important role to communicate, to inform, to share ideas, and other activities that others may need to know. This qualitative study analyzed 6 special libraries in Jakarta concerning with their social media management during the pandemic of covid-19. The result showed that special libraries in Jakarta varied in making use of social media. Two libraries were very active in social media posts in order to be visible to their users and colleagues, while there is one library that did not make use of social media often. Responses to the picture posts were mostly from librarians from other libraries, while video posts were viewed by both library users and librarians. Types of posts and formats affect people's responses to the library's response. Librarians should analyze the types of information the users expect in social media, otherwise users will not respond to their information.

Keywords: Social media, special libraries, libraries, visibility, user awareness

1. Introduction

Social media emerged in the last decade of 20th century when Classmate, SixDegree, and Blackplanet, to name a few, appeared in public. At that time, users can use the social media to create profiles and add friends. Later, in the early 2000, Friendster attracted users when it was launched in 2003. It was then followed by MySpace and Facebook to launch in 2004, and Youtube 2005 andTwitter in 2006. While most social media are for social networking, LinkedIn appeared in 2003 as a professional social media. Many people use LinkedIn as a professional and business purposes. Carr and Hayes (2015, p. 50) defined social media as "internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction with others." Meanwhile according to King (2015),

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social media at least have several functions, such as listening, making connections, getting responses, taking advantage of mobile technology, and extending reach.

Social media will help understand what the library users as well as the community actually think about the library. Social media also can help the library learn the needs and wants of the users. Joo, Choi, Baek (2017) emphasized that social media have been the popular tool to communicate with library users.
Social media can also connect the library to its users by way of sharing information about the facilities, the collections, and activities. Meanwhile, the library can also learn from users through social media. By asking questions to the social media users, actually the library will get ideas from them. This is a good way to fulfill what the users actually want and need. The pandemic has caused libraries to close the library services for some time, then they reopen the services with the new regulation. It is this pandemic that has pushed the libraries to optimize the online services and therefore, librarians need to learn the benefits of online media to meet, to inform, and to serve the community better.

Social media have emerged as one of the media to increase the visibility of a library as well as to keep the users informed about the library and their services. In time of covid-19 pandemic, people have moved from onsite to online as the library is only visible online. Neog (2020) stated that social media areappropriate for information dissemination especially during the covid-19 pandemic and further stated that social media are crucial to deliver information.

Libraries also play a role in providing right information and fighting against fake news in the pandemic time as people need right information.Based on this idea, it is very relevant to consider the importance of moving all information about the library and its resources and facilities online. This change requires planning, strategies, and actions. For libraries that have practice online promotion, they find no problem with regard to informing the users online. however, for those that mostly onsite, they may not be familiar with the tools and activities. However, there may be other factors that affect a library to provide online services.

According to American Library Association (ALA) (2021), special libraries "offer unique opportunities to work in places such as corporations, hospitals, the military, museums, law firms, advertising agencies, professional associations, private businesses, and the government"

In Indonesia, public libraries are not as many as academic or public libraries. In Jakarta, special libraries mostly are available in the ministries and parliament. Special libraries also do not always available for public at all times. However, it is important for special libraries to inform the communities regarding current issues related to their goals and objectives and it is very valuable for special libraries if they are available both online and onsite. During the pandemic of covid-19, their presence online will surely be useful for the communities because most people stay at home and need information. Whhether special libraries can perform well for public, that would be an interesting question.

2. Objective

This paper analyzes how special libraries perform online to inform users and public in general during pandemic time and how they will do this in the future.

3. Methodology

This is a qualitative study on the use of social media among special libraries, in this case, the government's libraries especially the parliament and ministrial libraries. The study was conducted by analyzing the social media account of the special libraries, in this case, Instagram account. Instagram was chosen because in Indonesia, most special libraries have accounts. Meanwhile,

interviews with the management of those libraries were also conducted in order to get further and deeper understanding about their social media management.

4. Discussion

Six (6) Instagram accounts belonging to six (6) government institutions were analyzed in this study, namely Parliament Library, Ministry of Education Library, Ministry of Health Library, Ministry of Social Affairs Library, and Ministry of State Secretary Library, and Ministry of Religious Affairs.

No.	Name of Institution	Posts	Followers	Following
1	Parliament Library (Parliament)	252	933	46
2	Ministry of Education Library (MOE)	709	35500	107
3	Ministry of Health Library (MOH)	32	5255	14
4	Ministry of State Secretary (MSS) Library	277	661	35
5	Ministry of Administrative and Bureaucratic Reform (MABR) Library	23	41	8
6	Ministry of Religious Affairs (MRA) Library	504	2783	915

Table 1. list of posts, followers, and following of the special library accounts in Instagram

As seen on the above table, the overall number of posts among the libraries vary from 23 to 709. Meanwhile the number of followers also vary from 41 to 35500, while they follow between 8 to 915 Instagram accounts. According to the head of library of Ministry of Education, although they have 35,500 followers, it does not mean that they always respond to the posts by Ministry of Education Library. The same case also happen for Ministry of Religious Affairs Library. Meanwhile during pandemic of covid-19, the posts they did also varied. Here is the data of the posts they did during the pandemic of covid-19.
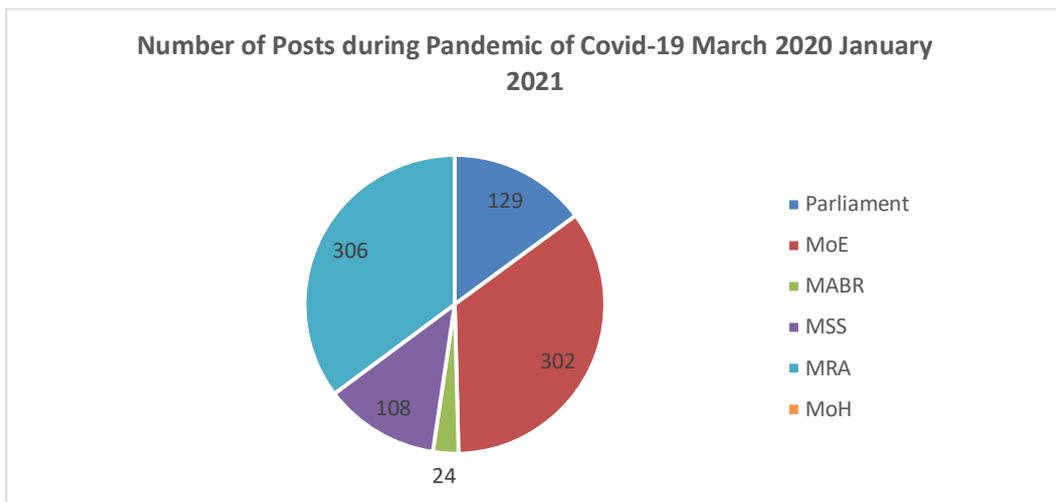

Chart 1. Number of Posts among special libraries

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

It is interesting to note that between March 2020 until January 2021, the library of Ministry of Religious Affairs posted the most (306) among all six libraries, followed by Ministry of Education Library; Parliament Library; and Ministry of State Secretary Library. Meanwhile Ministry of Health (MoH) posted only 1 during the pandemic of covid-19. This seems to be strange to see that Ministry of Health Library did not post information especially in relation to health and pandemic of covid-19, but this is due to the inavailability of specific staff to manage Instagram account.

Both libraries of Ministry of Education and Ministry of Religious Affairs actually have many followers, but those who responded to their posts were mostly librarians from other libraries, instead of their users. This means that the communication between the libraries and their users have not been achieved. It also shows that there is strong relationship among librarians in Indonesia, but between librarians and the users. Meanwhile the number of videos posted can be seen in the following chart 2. What is interesting is that the video posts have more viewers compare to the pictures. Indeed unlike picture posts, video posts enjoyed much by the followers, both library users and librarians. Very probably, because videos are much enjoyed and preferred as information instead of pictures. While picture posts (by Ministry of Education Library) were liked by up to 822 Instagram users; video posts (by Ministry of Religious Affairs) were liked by up to 2686 Instagram users during pandemic time (March 2020-January 2021).
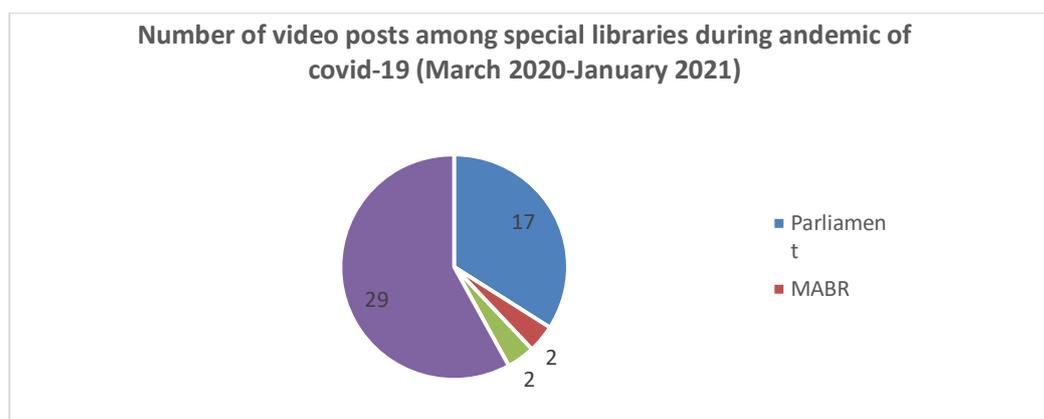

Chart 2. Number of video posts among special libraries

The results show that most special libraries in Jakarta are aware of their presence in the social media and try to maximize their social media in order to increase their visibility and welcome users and new ones. They also use the social media to inform users about their activities and existence. Meanwhile some other libraries do not consider social media as urgent and important during pandemic. They provide services if they get request from their users. However, due to the pandemic, some libraries do not reopen their services but they do greet their users online. This has shown that libraries are always try to reach their users using any possible means. Besides posting pictures and videos, special libraries hold activities such as webinars both on librarianship and other topics including health. The webinars are not only for librarians but also for public as the topics varied. In addition, they actively provide other information for the users. They use social media to invite participants to join webinar and the result of webinars are usually also shown through social media so that people may still be balbe to get information from the webinars although it is not live.

Meanwhile there are some special libraries that did little online during the pandemic of covid-19. They update information about the library and its activities irregularly. Lack of staff, no

activities, and closing of office due to pandemic have made them unable to provide information physically and on social media.

5. Conclusion

It is important for libraries to keep their users informed about the libraries, especially during the pandemic of covid-19. Social media can be the best media of communication between librarians and library users. Librarians can share their information; they can even listen to the users about the users' ideas about the library, their needs and wants; and the libraries may also build closer interaction. Meanwhile, as the picture posts were mostly liked by other librarians; while video show were enjoyed by both libray users and librarians, special libraries should consider the format of information to share as the special libraries in Jakarta varied in optimizing the use of social media to communicate with their users. It seems that the libraries did not communicate with their users a lot.

In short, we can use social media to communicate with the users. Creating online information and activities, informing users about library facilities, and services are some of the keys for libraries to interact with users.

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Research Data Librarians as Research Support Systems
for Covid-19 During and Post-Pandemic:
a case study of the Indonesian Institutes of Sciences

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Abstract

As the guardians of knowledge and information professionals, librarians have held numerous service approaches in responding to the pandemic situation. With their core service to be the research support systems, research data librarians face a paradigm-shifting from face-to-face consultation to a remote arrangement, which is a relatively new proposition for all service providers. When a pandemic occurs, all in-house services have to stop because most researchers work from home. It halts face-to-face library services. But on the other hand, a pandemic has turned out to be the basis for research data management to develop in Indonesia. The Indonesian National Scientific Repository (RIN Dataverse) as a data storage system is increasingly needed to support an online work approach. This study focuses on how research data librarians in the Indonesian Institute of Sciences successfully communicate and collaborate with researchers from different institutions to make an adequate environment in providing data-driven policies for stakeholders, especially during pandemics. We use a qualitative method with literature reviews and observations based on case studies. We also exercise a SWOT analysis to determine the scheme's opportunities and challenges implemented by research data librarians to be part of the research ecosystem. Based on this study, the librarians' roles are gradually changing following the demand for research assistantship during pandemics. It means that the interlink coordination between librarians and researchers within RIN Dataverse, as a platform, will help the collaboration be more asserted. These activities will also be a fundamental understanding in designing strategic implementation for a post-pandemic situation.

Keywords: research data librarians; research support systems; covid-19; Indonesian Institutes of Sciences

1. Introduction

Librarians have held numerous service approaches in responding to the pandemic situation. This health crisis phenomenon provides innovative opportunities for information professionals to maximize digital technology use in giving a better remote-service, such as library support for

knowledge management (Ayatollahi, 2020; Chakraborty, 2020), research productivity (Bharati, 2020; Shettar, 2020), and mental health (Cox, 2020). Some challenges did come up when librarians tried to adapt to the dynamic situation, for instance, health protocols implementation (Johnson, 2020; Yuvaraj, 2020) and technology innovations services for information dissemination (Ali, 2020; Hamzat, 2020; Hornung, 2020). With their core service to be the research support systems, research data librarians face a paradigm-shifting (Matthews, 2020) from face-to-face consultation (Anderson, 2020) to a remote arrangement, which is a relatively new proposition for all service providers (Mandrekar, 2020). When a pandemic occurs, all in-house services have to stop because most researchers work from home. It halts face-to-face library services.

But on the other hand, a pandemic has turned out to be the basis for research data management to develop in Indonesia. The Indonesian National Scientific Repository (RIN Dataverse, www.rin.lipi.go.id) as a data storage system is increasingly needed to support an online work approach during a pandemic. Because most researchers work from home, requests for data and information are made online, including research data services. This study focuses on how research data librarians in the Indonesian Institute of Sciences successfully communicate and collaborate with researchers from different institutions to make an adequate environment in providing data-driven policies for stakeholders, especially during pandemics. The platform used is RIN Dataverse, an open research data repository in Indonesia, and it promotes FAIR Principles. This repository is one exemplification of how Indonesia supports the open data movement.

2. Literature review

This paper discusses the concept of how research data librarians are providing research data services on library patrons, which are mostly researchers. The literature review was divided into two topics: research data librarians' current definitions and roles and their innovation in providing research data services during pandemic Covid-19.

2.1 Research Data Librarian

Research Data Management has been actively applied in the Indonesian Institute of Sciences (LIPI) since 2019. Librarians have undergone a significant change in role with the implementation of this data management research. Referring to Riyanto (2016), most librarians at LIPI are still struggling with cataloging activities. Librarians at LIPI should provide more services that support research at LIPI because it is an institute that has a significant focus on research activities. Services that support research activities are mentioned by Duffield (2018) that librarians in academic libraries are required to support the activities of researchers during the entire scholarly communication life cycle. Furthermore, Semeler (2019) states that data librarians must contribute by providing organization, treatment, and preservation services for research data. Data librarians are concerned with the proposition of data management and curation services in academic libraries and other research organizations.

The condition of the COVID 19 pandemic that has occurred has also encouraged librarians to develop as a research data librarian. Librarians can utilize the policy of working from home for researchers to provide literature needs from e-resources and managing research data at RIN.

2.2 Research Data Services during Pandemic Covid-19

Markovic (2020) and Patin (2020) proposed a resilient library design in the short term and long term for a post-covid situation. The Coronavirus pandemic has forced almost all libraries to be innovative and creative to continue serving the library patrons with digital content and community support (second responders for emergency). Markovic stated that the library as a public space needs to consider cleanliness, spacing, and traffic, and increased demand for "third places" - the place for social interaction. Global Workplace Analytics in Markovic (2020) also predicts that there will be a 25-30% increase of remote working from "home" or third places. This also relates to the mental health and well-being of library patrons. In Cox (2020), UK academic libraries provide student support activities during pandemics. It transforms into a new vision of services while building new relationships with library patrons (Tammaro, 2020). They mainly use online services, especially in providing authentic information resources (Chakraborty, 2020). In Ireland, Hornung (2020) experienced being a solo librarian and faced some challenges while doing remote services.

Greenberg (2020) and Jones (2020) discuss librarians' and archivists' roles during the pandemic based on its long history, from Black Death to HIV/AIDS, as it seems that each event produces information overload. For instance, The National Library of Medicine, National Institute of Health Maryland used a web archive to record materials on 'Global Health events.' And they also see how a professional group: Librarians, Archivists, and Museum Professionals in the History of the Health Sciences (LAMPHSS) gathered to discuss the procedure of material collection and sharing. Knowledge management could improve the quality of performance in an organization, especially in a research institution. Ayatollahi (2020) stated four factors influencing its implementation, especially in healthcare organizations: organizational culture, information technology, organizational structure, and performance evaluation and measurement. Librarians could be considered knowledge brokers between health care organizations and health care staff in supporting the knowledge management initiatives in their workplace.

Moreover, Hamzat (2020), Kasa (2020), Mandrekar (2020), and Neog (2020) investigated the use of social media for emergency information dissemination in Nigeria and India. They found that various social media have been used during the pandemic, and librarians playing an active role in informing the public about Covid-19. However, some medical terms are considered not familiar enough to be known by laypeople. So, Daqing He (2020) used the case of those difficulties and found that the terms could be more understandable by using the National Library of Medicine's Consumer Health Vocabulary. The access to CORD-19 (COVID-19 Open Research Dataset), which contains over 280,000 scholarly articles about the novel coronavirus for use by the global research community, would be easier to retrieve by using the Search engine for Laypeople to access the COVID-19 literature (SLAC).

There was also an issue proposed by Ifijeh (2020) and Igere (2020) about the paradigm shift in the role of librarians in supporting teaching methods at the Nigerian university since Covid-19. The shifted environment to virtual teaching and learning is considered as a notable change. Librarians should support the transition by providing an adequate ICT infrastructure and a blended librarianship model in serving library patrons. Meanwhile, as health information professionals, they could work together with health professionals to map their information needs, disseminate knowledge, and support digital and health literacy (Johnson, F., 2020). However, the service transition from physical to online mode has made librarians and users experiencing a

digital divide, information anxiety, lack of digital literacy skills, slow internet speed, budget constraints, and licensing issues (Rafiq, 2020; Yousuf, 2020; Radecki, 2020; Naeem, 2020). On the other hand, there are many opportunities to offer during COVID by librarians and information personnel, such as virtual assistants, AI Robotics, Big Data, COVID Altmetric readership, infodemic, virtual conference, and Higher Educational Commission digital resources.

In the context of global perspectives, many international organizations put updated initiatives on their website, from ALA, ALIA, IFLA to CILIP UK (Yuvaraj, 2020; Sulaiman, 2020). Major journal publishers are also made articles on COVID-19 available to the world. As stated by Ali (2020), librarians could support the research teams to the updated and relevant studies published in medical journals. In conclusion, during many historical emergencies that have happened before, libraries continue to evolve and shift, highlighting their value on people, place, and platform (Jones, 2020).

2.3 Indonesian Institute of Sciences

In Johnson, P. (2020), The International Coalition of Library Consortia (ICOLC) issued a "Statement on the Global COVID-19 Pandemic and Its Impact on Library Services and Resources," which considers open access to Covid-19 materials to facilitate research and public health response. Most scientific works related to Covid-19 are stored in preprint servers, such as bioRxiv and medRxiv. In this case, the Indonesian Institute of Science uses RIN Dataverse to store the raw data of Covid-19 research. It supports data deposit, preservation, citation, analysis, and sharing. Researchers, publishers, and affiliated institutions will receive academic credit and web visibility. This program is in line with the Indonesian National System of Science and Technology Policy, Law No. 11.2019. Specifically, in article 40, it explains deposit data requirements, highlighting the primary use of RIN Dataverse in Indonesia.

3. Method

This study uses a qualitative method with literature reviews and observations based on case studies in the Indonesian Institute of Sciences. This paper also exercises a SWOT analysis to determine the scheme's opportunities and challenges implemented by research data librarians to be part of the research ecosystem. For the literature review, we put specific search strings (Ayatollahi, 2020) below and evaluate the result for the SWOT analysis additional material.

1. Scopus, Number of papers **10**
   "librarian" AND "research support" AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020)) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (EXACTKEYWORD, "Research Support") OR LIMIT-TO (EXACTKEYWORD, "Librarian") OR LIMIT-TO (EXACTKEYWORD, "Research Data Management")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j"))

2. Science Direct, Number of papers **9**
   "research support" AND "librarians" AND "data management", Year: 2020-2021

3. Wiley, Number of papers **2**
   "librarian" in Title and "research support" anywhere and "data management" anywhere and "pandemic" anywhere and "covid" anywhere, publication date: March 2020 - January 2021, publication type: Journals

4. Taylor and Francis, Number of papers **9**

   [Publication Title: librarian] AND [All: research support] AND [All: data management] AND [All: pandemic] AND [All: covid] AND [Publication Date: Last Year]
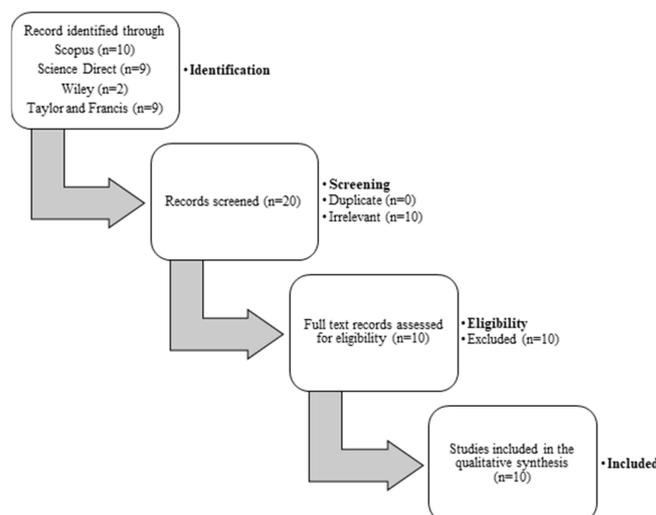

Figure 1. Article selection (Primary data, 2021)

4. Results and discussions

Based on this study, the librarians' roles are gradually changing following the demand for research assistantship during pandemics. Table 1 shows the literature review result based on Scopus, Science Direct, Wiley, and Taylor & Francis's findings.

Tabel 1. Literature Review

No	Author, Year, Country	Title	Journal	Objective	Methods	Results
1	Johann Van Wyk, Theo Bothma and Marlene Holmner, 2020, South Africa	A conceptual virtual research environment model for the management of research data, a South African perspective	Library Management	An overview of a Virtual Research Environment (VRE) conceptual model for managing research data at a South African university.	Qualitative (critical literature review and case studies)	VRE conceptual model in different research settings/disciplines. The role of VREs throughout the research lifecycle. The guidelines for setting up a conceptual VRE model.
2	Charissa Odelia Jefferson, Katrina Stierholz, Kristin Fontichiaro & Lynette Hoelter, 2020, USA	Considering data literacy using Kuhlthau's Information Search Process: Implications for librarians and data providers	Journal of Business & Finance Librarianship	Through students' research phases, data literacy instruction experiences determine synergies and intervention points that both librarians and data providers can leverage.	Qualitative (Kuhlthau's ISP model)	Kuhlthau's Information Search Process: a framework that provides specific areas where librarians and data providers can each support users in their data searches.
3	Mayank Yuvaraj, 2020, India	Global responses of health science librarians to the COVID-19 (Coronavirus) pandemic: a desktop analysis	Health Information & Libraries Journal	Significant initiatives by health science librarians to meet the needs of library users in the COVID-19 health crisis.	Qualitative (desktop analysis)	Librarians are playing crucial roles, such as: • generating awareness, • filtering fake information, • supporting researchers and faculty members to provide reference and document delivery services.

#	Author	Title	Journal	Focus	Methodology	Findings
4	Eleanor Barker and Veronica Phillips, 2020, USA	Learning how to teach unfamiliar subjects: developing training on writing for publication and presentation of research for health libraries	Health Information & Libraries Journal	The techniques used by the library's teaching staff to gain an understanding of written communication. The new courses' impact discusses the next steps and provides advice for other librarians wishing to develop similar systems.	Qualitative (dissemination stage of the research life cycle)	There is a demand for further training and support in writing for publication and the research cycle. The library could add training and increase its visibility in research support.
5	Hilary Bussell, Jennifer Schnabel & Amanda K. Rinehart, 2020, USA	Meeting graduate student needs: an exploration of disciplinary differences	Public Services Quarterly	How disciplinary differences impact individual and collective outreach efforts within a subject librarian model of engagement.	Quantitative (survey, open-ended questions)	Discipline-specific library instruction may be more relevant than large, in-person orientations. The trend of situational challenges.
6	Winner Dominic Chawinga & Sandy Zinn, 2020, South Africa	Research Data Management in Universities: A Comparative Study from the Perspectives of Librarians and Management	International Information & Library Review	(1) What is the role of librarians in research data creation? (2) How competent are librarians in RDM? What are the gaps? (3) What is the status of research data infrastructure at the universities? (4) What are the challenges affecting librarians' involvement in RDM?	mixed methods (questionnaire & interview)	RDM remains a new and emerging concept. Librarians involved in some very basic RDM activities. Generally, university affiliation does not affect the key factors affecting RDM initiatives.
7	Winner Dominic Chawinga & Sandy Zinn, 2020, South Africa	Research data management at an African medical university: Implications for academic librarianship	The Journal of Academic Librarianship	Current status of research data management at a medical school in a developing African country. Four aspects of research data management: generation; preservation and backup; competencies; and challenges.	mixed methods (questionnaire & interview)	A better understanding of research data management perspectives amongst health researchers in a developing country.
8	Elizabeth Sterner, 2020, USA	Science/STEM Librarianship in 2020: Opportunities and Insight	Science & Technology Libraries	An updated snapshot of current science/STEM opportunities in 2019/2020.	Quantitative (survey)	Most of the positions are for research librarians with liaison duties in medicine/health science, mathematics, engineering, chemistry, and physics.
9	Alice Read, Andrew Cox, 2020, UK	Underrated or overstated? The need for technological competencies in scholarly communication librarianship	The Journal of Academic Librarianship	Investigation of SC librarians' own perceptions of the importance of technical skills in their work.	Qualitative (thematic analysis of in-depth semi-structured interviews)	SC librarians need soft skills and specific positive orientations to technology rather than practical technical skills. It could be through learning on the job and through communities of learning. A concept of socio-technological competence is proposed to encapsulate this skillset.
10	Colin Nickels and Hilary Davis, 2020, USA	Understanding researcher needs and raising the profile of library research support	Insights	A two-year study to help inform the development of outreach strategies to enable new research engagement opportunities to scale and transform the model of research support strategies and engagement.	Qualitative (semi-structured qualitative interviews)	A solid grounding for building our awareness of researchers' behaviors, expectations, and workflows as well as presenting a unique picture of both unmet and unarticulated needs. Shared recommendations for evolving library research support and enhancing outreach strategies to provide an easier starting point for different types of researchers to discover relevant research assets provided by libraries.

This study also uses the implementation of the National Health System Consortium for Pandemic as the case study. This consortium utilizes RIN Dataverse for collaborations, and research data librarians accommodate the process. Many institutions were exchanging current research about Covid-19 in different aspects, such as social, economic, and infrastructures. The Research and Innovation Consortium Covid-19, Ministry of Research and Technology/National Agency for Research and Technology is a collaborative scientific activity forum in order to strengthen the Indonesian National Health System in the context of a pandemic/endemic disaster. In collaboration with the Knowledge Sector Initiative (KSI), the Deputy for Social Sciences and Humanities - Indonesian Institute of Sciences (IPSK LIPI) initiated a series of routine discussion activities starting April 23, 2020, until October 2020 (around six months). At each discussion, there were representatives from institutions or individuals in the consortium who discussed the activities or research carried out by each of these institutions, along with the important findings that were produced. Furthermore, the synthesis of the series of discussions and collaborative scientific activities resulted in a policy paper which is expected to become material for advocacy

that has a real impact on strengthening the Indonesian National Health System that is resilient to health disasters in Indonesia.
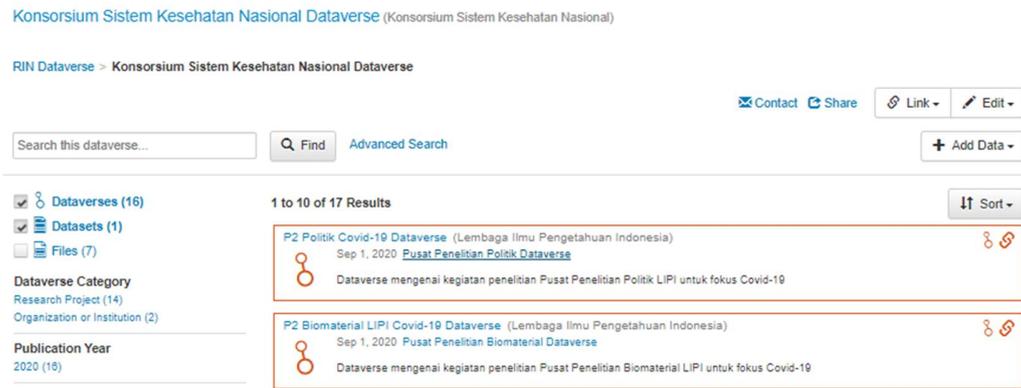

Figure 2. The example of the Indonesian National Health System Consortium Dataverse (RIN, 2021)

Based on Figure 2, the use of RIN Dataverse to document any research activities in the National Health System Consortium for Pandemic is shown. There are 16 Dataverses, one dataset, and seven files that have been up in RIN Dataverse, while some of the on-going data are still in close access. The role of librarians in the consortium is to carry out advocacy on research data deposit and to assist researchers in implementing research data management. However, because researchers lacked time to manage data, librarians were asked to help researchers. They help them by storing the data on the RIN Dataverse system, starting from filling in metadata, determining data access policies, and advocating for data licenses according to researchers' needs. Research data librarians in the consortium are actively engaged with the researchers from different institutions to gather the current and updated dataset files. However, as it is on-going research, the documentation process is done periodically.

Referring to the literature review and case studies above, we could conceptualize how research data librarians could support the research activities, especially during a pandemic and post-pandemic, in Table 2 below in the SWOT analysis form.

Tabel 2. SWOT Analysis

Strength	Weakness
Research data librarians have exceptional experience in providing service about researchers' information needs, for instance, Virtual Research Environment (VRE) or discipline-specific library instruction.	Research data librarians need to upgrade their skills in Research Data Management (RDM), liaison duties, writing publications, and socio-technological competence.
The library is a trusted place where publication management is conducted.	The research culture in depositing data is not yet built.
Opportunities	Threats

Research data librarians in the academic and research institutions in Indonesia have not implemented the RDM policy.	Research data librarians are not involved directly in the research activities.
Researchers understand that research data is an asset but are not aware of the importance of data deposit.	Research data about COVID-19 is not well-stored and well-preserved.

5. Conclusions

Based on this study, the librarians' roles are gradually changing following the demand for research assistantship during pandemics. From the findings and SWOT analysis, we found that research data librarians have enough experience in supporting researchers. However, they need to build more skills in data management and its implementation. Researchers are also under an obligation to upgrade their literacy about data deposit and preservation. It means that the interlink coordination between librarians and researchers within RIN Dataverse, as a platform, will help the collaboration be more asserted. Research data librarians will guide them through the lifecycle of research activities, from planning, storing, sharing to reusing the research data. These activities will also be a fundamental understanding of designing strategic implementation for a post-pandemic situation (Johnson, 2020: Jones, 2020). Simultaneously, there is always room for improvement to provide a better research ecosystem by research data librarians.

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Research Trends in Central Funded Technical Institutes (CFTIs)in India during 2011-2020

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Abstract

Centrally Funded Technical Institutes (CFTIs) in India are the Institutions of National Importance under the Ministry of Education, Govt. of India. This study analyzes the research trends in Engineering, Science and Technology in CFTIs in India for the period from 2011 to 2020 of the publications indexed in the Scopus Citation Database. The study is limited to IITs and NITs and elaborates the trends, strengths, dynamics of research across institutions, and international collaborations. The paper analyzes 249543 publications, indexed in Scopus database using scientometrics and MS Excel, with a total of 48113 (19.28%) of publications collaborated across different countries. The research growth trend was found to be continuously increasing, with three times in the year 2020 comparing the publications of 2011. Based on the number of publications, IIT Kharagpur is on the top with a maximum of 23776 publications, and IIT Bombay is on the top in the number of internationally collaborated publications with 6502 papers. IIT Hyderabad is at the tenth position by the number of publications, and at fifth, based in international collaboration. It has been found that more than 50% of research publications have international collaboration. The paper also analyzes sponsors of funding and subject areas of research. The study could be useful to those interested in exploring the research trends in Science, Technology, Engineering, etc., especially in the CFTIs.

Keywords: Scientometrics; Bibliometrics; CFTIs; Indian Institutes of Technology; National Institutes of Technology; Mapping Research.

1. Introduction

India has an impressive history of higher education, dating back to ancient times. The Nalanda, Takshashila and Vikramashila universities were world-famous centres of learning, attracting scholars from around the globe. Since independence from the British colonization, the country has witnessed astonishing growth in the infrastructure in higher education. In 1947, India had

only 20 universities and 500 colleges, which have now increased to over 993 universities, 39931 colleges and 10725 stand-alone institutions.

Prior to independence, the country had very few engineering colleges, where only the graduate-level education in the field of basic engineering was popular, i.e. Civil, Electrical and Mechanical Engineering. After 1950, India entered in the era of establishing the engineering and technological institutes at national, state and regional levels. Early four decades of engineering education were on the pattern of Americans and Britishers. After 1990, the boom of engineering education took place throughout the county. Currently, more than 6793 colleges and institutes are affiliated to AICTE in the field of Architecture and Town Planning, Architecture and Planning, Architecture, Planning, Design, Town Planning, Engineering and Technology, MCA with intake capacity of 2.6 million students and 0.47 million faculty members and with about 97 CFTIs, i.e., IISc, IITs, NITs, IISERs etc.

Bibliometric analyses of academic and research output can be used as a yardstick for measuring the trends and challenges in a subject. This provides an insight into the dynamics of the subject leading to better information handling and management. This study analyzes the research trends in Engineering, Science and Technology in CFTIs in India during the period from 2011 to 2020 using quantitative and qualitative analysis of the publications indexed in Scopus Citation Database. The study elaborates on the trends in Engineering, Science and Technology, strengths, dynamics of research across institutions, and international collaborations.

The analysis may help gain a better understanding of collaborative trends, subject area with the highest research concentration, and other scientometric aspects of literature based on co-occurrence of terms. The findings of the study will be useful to the teachers, researchers, planners, policy-makers and funding agencies for gaining macro insights into the research output in Engineering, Science and Technology, and also the trends in the CFTIs in India and will assist them in strategy formulation to fill the gaps.

2. Review of Literature

Raghuraman, Chander, & Madras (2010) in their study while comparing the research performance of Indian institutions based on the h-index and p-index with other international institutions and ranked, found that the institutions of national importance contributed the highest in terms of publications and citations per institution. Prathap (2013) in his paper, "benchmarking research performance of the IITs using web of science and Scopus bibliometric databases" tried to showcase the performance of IITs. Hasan and Singh (2015) evaluated the research output of five top-ranked IITs based on data extracted using Web of Science for a period of five years from 2009 to 2013. A total of 2,15,019 records were retrieved for India, which is 2.72% of the global records for the period 2009-2013. Siddaiah et al. (2016) analyzed the publications of eight new IITs as covered in Scopus for the period 2010-2014, which show the growth of the average publication with 38.78% and average citations as 4.63. Pradhan and Ramesh (2018) analysed the publications of six old IITs as indexed in Scopus, which indicates the relative citation impact of IIT Roorkee and Bombay. Shettar & Hadagali (2020) analysed the research productivity of the National Institutes of Technology for the period from 2009 to 2018 which ranks the NITs based

on TP, TC, ACPP, h-index, Impact of Collaboration, Impact of Internationally collaborated publications, authorship pattern, etc.

3. Objectives

The main objective of the paper is to analyse the research productivity of NITs and IITs for the period from 2011 to 2020, i.e. to identify the growth of publications, most productive institutes, funding sponsor bodies and international collaboration pattern of the CFTIs.

4. Methodology

Scopus is the largest abstract and citation database of peer-reviewed literature: scientific journals, books and conference proceedings, etc. Delivering a comprehensive overview of the world's research output in the fields of science, technology, medicine, social sciences, and arts and humanities; Scopus features smart tools to track, analyse and visualise research. The study elaborates on the trends in Engineering, Science and Technology, its strengths, dynamics of research across institutions, and international collaborations. A list of CFTIs was Collected from the Ministry of Education, Government of India portal for the purpose. However, the scope is limited to NITs and IITs only. The data was collected from the affiliations using the Scopus database with the publication years from 2011 to 2020 only. A total of 249543 publications were analyzed using excel and scientometric techniques.

5. Analysis and Findings

5.1 Growth of publications in CFTIs
The publication trend has been found continuously increasing each year by more than 1%. In the year 2016 and 2018, it is more than 1.5% and 2%. The research growth in a span of 10 years increased by almost three times from 13568 (5.44%) in 2011 to 38496 (15.43%) in the year 2020. This is due to the increasing number of newly established CFTIs and more research publications are due to international ranking and collaborated research. Based on this growth study, it can be predicted that research publications of CFTIs may grow four times in the next decade.

Table 1. Growth of publications in CFTIs

S.No	Year of Publication	No. of Publications	Percentage
1	2011	13568	5.44
2	2012	14925	5.98
3	2013	16576	6.64
4	2014	19307	7.74
5	2015	21338	8.55
6	2016	25107	10.06
7	2017	28823	11.55
8	2018	34083	13.66
9	2019	37320	14.96

S.No	Year of Publication	No. of Publications	Percentage
10	2020	38496	15.43

5.2 Most prolific institutions

Table 2 lists the top 10 most prolific institutes based on the number of publications. It is found that, Indian Institute of Technology Kharagpur published the highest number of papers, 23776 (9.55%), followed by Indian Institute of Technology Bombay, 23009 (9.22%), Indian Institute of Technology Madras, 22667(9.08%), Indian Institute of Technology Delhi, 21706 (8.70%) and Indian Institute of Technology Roorkee 17447 (6.99%). Other institutes those are in the top ten positions have been given in Table 2. Table 2 also ranks the institutes based on the number of internationally collaborated publications, and publications collaborated with authors affiliated to the institute/university across countries. Indian Institute of Technology Bombay has the highest collaborated publications, 6502 (28.26%), followed by Indian Institute of Technology Madras 5959 (26.29%) and Indian Institute of Technology Kharagpur 5050 (21.11%). Under the top ten positions of CFTIs, there are 10 IITs and 1 NIT. Indian Institute of Technology Hyderabad is in the tenth rank based on a total number of publications and fifth in position based on internationally collaborated publications.

5.3 Preferred language for research publications

Table 2. Most prolific institutions

S.No	Name of Institute	Total			International Collaboration		
		No. of Publications	%	Rank	No. of Publications	%	Rank
1.	Indian Institute of Technology Kharagpur	23776	9.53	1	5020	21.1	3
2.	Indian Institute of Technology Bombay	23009	9.22	2	6502	28.3	1
3.	Indian Institute of Technology Madras	22667	9.08	3	5959	26.3	2
4.	Indian Institute of Technology Delhi	21706	8.7	4	4618	21.3	4
5.	Indian Institute of Technology Roorkee	17447	6.99	5	3292	18.9	7
6.	Indian Institute of Technology Kanpur	15373	6.16	6	3966	25.8	6
7.	Indian Institute of Technology Guwahati	13324	5.34	7	2527	19	9
8.	Indian Institute of Technology - ISM	9933	3.98	8	1230	12.4	10
9.	Indian Institute of Technology - BHU	9313	3.73	9	3064	32.9	8
10.	National Institute of Technology Rourkela	9313	3.73	9	1157	12.4	11

S.No	Name of Institute	Total			International Collaboration		
		No. of Publications	%	Rank	No. of Publications	%	Rank
11.	Indian Institute of Technology Hyderabad	7685	3.08	10	4029	52.4	5

There are a total of 249543 research publications, out of that 249502 (99.98%) were published in English language and a very small fraction of 41 (0.02%) in other languages, like French, Polish, German, etc. This clearly indicates that the authors of CFTIs prefer the English language to showcase their research works.

5.4 Document type of publications

Figure 1 presents the researchers with various type of documents during the last one decade from CFTIs. The study shows that there are 249543 publications during the period from 2011 to 2020. It indicates that the research articles are 162345 (65.06%), followed by conference papers 70854 (28.39%), book chapters 6601 (2.65%), reviews 6021(2.41%), other types of documents, i.e editorial, erratum, book, letter, note, data paper, short survey etc. are just 1.49%. The study shows that the highest number of documents were published as research articles as preferred by the authors.

Fig.1. Graphical representation of document type of publications

Document type of publications

- Article: 162345 (65.06%)
- Conference Paper: 70854 (28.39%)
- Book Chapter: 6601 (2.65%)
- Review: 6021 (2.41%)
- Editorial: 1375 (0.55%)
- Erratum: 738 (0.30%)
- Book: 445 (0.18%)
- Note: 414 (0.17%)
- Letter: 310 (0.12%)
- Short Survey: 86 (0.03%)
- Data Paper: 61 (0.02%)
- Retracted: 45 (0.02%)
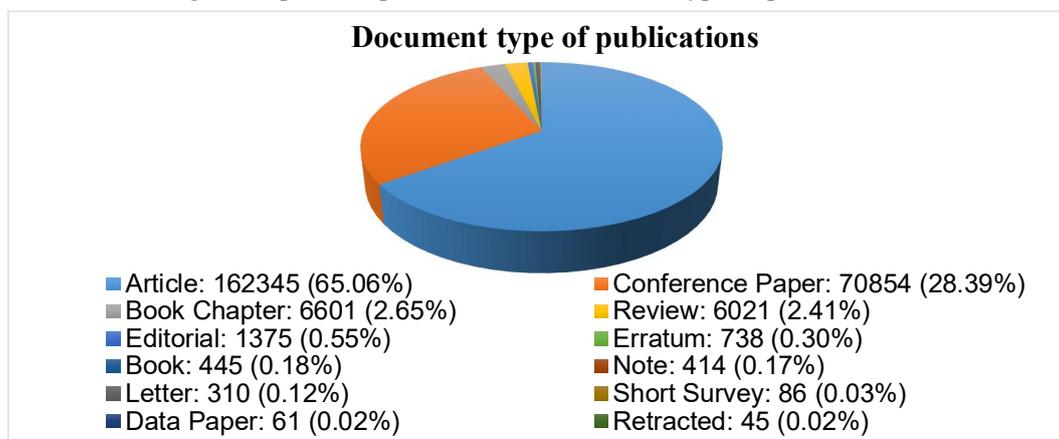
5.5 Geographical distribution of International Collaborations

A total of 249543 publications were contributed by the authors affiliated to CFTIs. Out of 249543 publications, 48113 (19.28%) were collaborated by the authors affiliated to the institutes/universities/organizations from 158 countries worldwide. Top Countries with the highest collaborated publications are given in Table 3. The USA is in the first rank with 15217 (6.10%), followed by Germany with 5875 (2.35%), the United Kingdom with 5676 (2.27%), China with 3971 (1.59%), South Korea with 3869 (1.55%), and other countries in top ten list are given in Table 3. The study clearly shows that 1/5th of the publications of CFTIs have international collaboration. The research trend in Indian is attracting more global collaborations.

Table 3. Geographical distribution of international collaborations

S.No	Country	No. of Publications	Percentage	Rank
1.	United States	15217	6.10	1
2.	Germany	5875	2.35	2
3.	United Kingdom	5676	2.27	3
4.	China	3971	1.59	4
5.	South Korea	3869	1.55	5
6.	France	3568	1.43	6
7.	Australia	3538	1.42	7
8.	Japan	3103	1.24	8
9.	Italy	2949	1.18	9
10.	Canada	2906	1.16	10

5.6 Distribution of publications in different subject areas

Table 4 and Figure 2 deals with the pre-dominant subject areas of research as covered in the publications of CFTIs during the last one decade. It has been observed that Engineering was the most preferred area of research with 107617 (43.13%) publications, followed Computer Science with 63771(25.56%), Material Science with 55818 (22.37%), Physics and Astronomy with 53692 (21,52%), Chemistry with 34634 (13.88%), Mathematics with 29133 (11.67%), Chemical Engineering with 25483(10.21%), Energy with 24657 (9.88%) and publications in other subject areas are given in Table 4. It is revealed from the study that Engineering, Computer Science, Material Science, Physics and Astronomy are the major subject areas of research.

Table 4. Distribution of publications in different subject areas

Subject Area	No. of Publications	Percentage
Engineering	107617	43.13
Computer Science	63771	25.56
Materials Science	55818	22.37
Physics and Astronomy	53692	21.52
Chemistry	34634	13.88
Mathematics	29133	11.67
Chemical Engineering	25483	10.21
Energy	24657	9.88
Environmental Science	17535	7.03
Biochemistry, Genetics and Molecular Biology	13124	5.26
Earth and Planetary Sciences	12012	4.81
Social Sciences	8916	3.57
Medicine	6959	2.79
Business, Management and Accounting	6699	2.68
Agricultural and Biological Sciences	6217	2.49

Subject Area	No. of Publications	Percentage
Decision Sciences	5957	2.39
Multidisciplinary	3504	1.40
Pharmacology, Toxicology and Pharmaceutics	3395	1.36
Economics, Econometrics and Finance	2503	1.00
Immunology and Microbiology	2100	0.84
Arts and Humanities	1648	0.66
Neuroscience	858	0.34
Health Professions	746	0.30
Psychology	584	0.23
Nursing	205	0.08
Veterinary	82	0.03
Dentistry	56	0.02

Figure 2. Graphical representation of research publications in the different subject areas

5.7 Top 10 most funding sponsor bodies to research

Table 5 lists the top 10 funding sponsor bodies based on a number of publications. It is found that the Department of Science and Technology, Government of Kerala, India funded project papers are 9199 (3.69%), followed by Science and Engineering Research Board, India with 8233 (3.30%) and Department of Science and Technology, Ministry of Science and Technology, India with 6652(2.67%). Other funding sponsor bodies in the top ten are given in Table 5.

Table 5. Top 10 most funding sponsors bodies to research

S.No	Funding Sponsor Body	No of Publications	Percentage
1.	Department of Science and Technology, Government of Kerala, India	9199	3.69
2.	Science and Engineering Research Board, India	8233	3.30
3.	Department of Science and Technology, Ministry of Science and Technology, India	6652	2.67
4.	Ministry of Human Resource Development, India	5586	2.24
5.	University Grants Commission, New Delhi, India	4545	1.82
6.	Bangladesh Council of Scientific and Industrial Research, Bangladesh	4015	1.61
7.	Council of Scientific and Industrial Research, India	3735	1.50
8.	National Science Foundation, United States	2371	0.95
9.	Department of Science and Technology, Government of West Bengal, India	2264	0.91
10.	Department of Biotechnology, Government of West Bengal, India	1752	0.70

6. Conclusion

The study provides a landscape of research activities of CFTIs in quantitative terms for the period from 2011 to 2020. The growth of research publications is in continuously increasing order with an average of 1%, and in just one decade, the growth is three times in the year 2020 compared to the year 2011. Based on this growth study, it can be predicted that research publications of CFTIs may grow four times in the next decade. Engineering was the most preferred area of research with 107617 (43.13%) publications, followed Computer Science with 63771(25.56%), Material Science with 55818 (22.37%), Physics and Astronomy with 53692 (21,52%), Chemistry with 34634 (13.88%), Mathematics with 29133 (11.67%), Chemical Engineering with 25483(10.21%) and Energy with 24657 (9.88%). The top ten positions in CFTIs have been

occupied by 10 IITs and 1 NIT. Indian Institute of Technology Hyderabad is at tenth rank, based on a total number of publications and at the fifth position based on international collaborated publications with a ratio of more than 50%. The findings of the study will be useful to the teachers, researchers, planners, policy-makers and funding agencies for gaining macro insights into the research output in Engineering, Science and Technology, and also the trends in the CFTIs in India and will assist them in strategy formulation to fill the gaps. The findings can also be advantageous in making judicious use of funds by helping the institutions in the selection of only relevant areas of research.

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Researcher's Perception on Research Ethics Amid Covid and post-covid: A Study of Indian Higher Educational Institutions

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Abstract

In the year 2020 the whole world is suffering with a virus that primarily affects the lungs of human body. It has cause numerous problems and at the same point appeared as opportunity too. The present study is in the same context that how it has affected the research work and how the ethical activities are maintained while conducting research in this scenario. The research ethics represents some practices in research work that must be followed by a researcher, for the sake of the research as well as for the community. For the study, research scholars of selected higher educational institutions of capital city of Uttar Pradesh in India will be taken. A survey was conducted using online and offline questionnaire as the tool for the collection of data. It reveals that the COVID has appeared as hurdle for the research activities but at the same time, the research scholars have managed in an efficient manner that it become opportunity for them.

Keywords: Research Ethics, Pandemic, COVID-19, Researcher, Research Ethics, Higher Educational Institutions

1. Introduction

The virus that gets exposed to the common society from the laboratory of Wuhan, China has not affected the routine life of the public but, the researcher's community is also adversely suffering from it. The COVID-19 pandemic is also an adverse effect of some research work, that may be avoidable if the measures were taken carefully. Research ethics is not just a thought. It is much more than it. It helps to guide the researcher community to fulfil their work in logical

manner and up to a level that will be universally accepted. This also suggests that research should meet its ultimate objective which is to serve to the society.

Literature review

Marino et al. (2020) discussed the various aspects that a researcher has felt during COVID period and also encouraged thr researchers to conduct their work ethically.

Frunza (2020) argued in the article that in spite of so much difficulties, there should follow the ethical guidelines.

Ma et al. (2020) discussed the problems concerned with the ethics during the pandemic. The article also described the characteristics of researcher in pandemic. They suggested that there is need for the updating in guidelines related to the research ethics.

Objective

1. The study will be an attempt to examine whether the pandemic is an opportunity for the researchers or not.
2. In which manner it has affect them and their study
3. How the researcher has maintained the ethical conducts in their research work.
4. The views of researchers are also observed regarding the research ethics during pandemic.

Research Methodology

The survey method has been used for conducting the study. A structured questionnaire was designed for the study and distributed online and offline among the research scholars on random basis. Further, the collected data input into an excel sheet and then analyzed.

Scope and Limitation

The research scholars of the higher education institutions that are running in the Capital city of Uttar Pradesh, India are taken for the study. They are Babasaheb Bhimrao Ambedkar University, Lucknow, Dr. Ram Manohar Lohiya National Law University, Lucknow and University of Lucknow, Lucknow, Uttar Pradesh, India.

Data Analysis and Interpretation

Table 1: Questionnaire

| Questionnaire	Distributed	Received
Response	600	462

Figure 1: Questionnaire
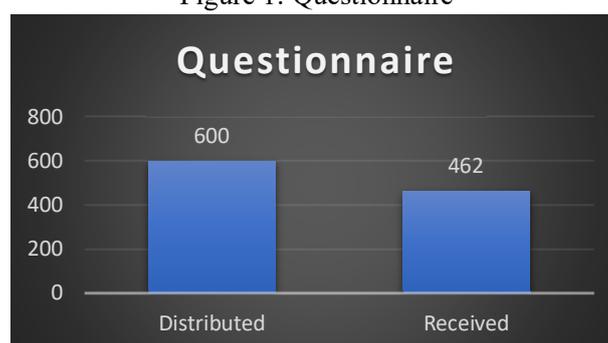
There was total 600 questionnaire were distributed, via online using email and offline to the research scholars of the various institutions. Out of that only 462 were received.

Table 2: Institute-wise response

| Name of Institution	Research Scholar Responded
Babasaheb Bhimrao Ambedkar University, Lucknow	238
Dr. Ram Manohar Lohiya National Law University, Lucknow	17
University of Lucknow, Lucknow	207

Figure 2: Institute-wise response
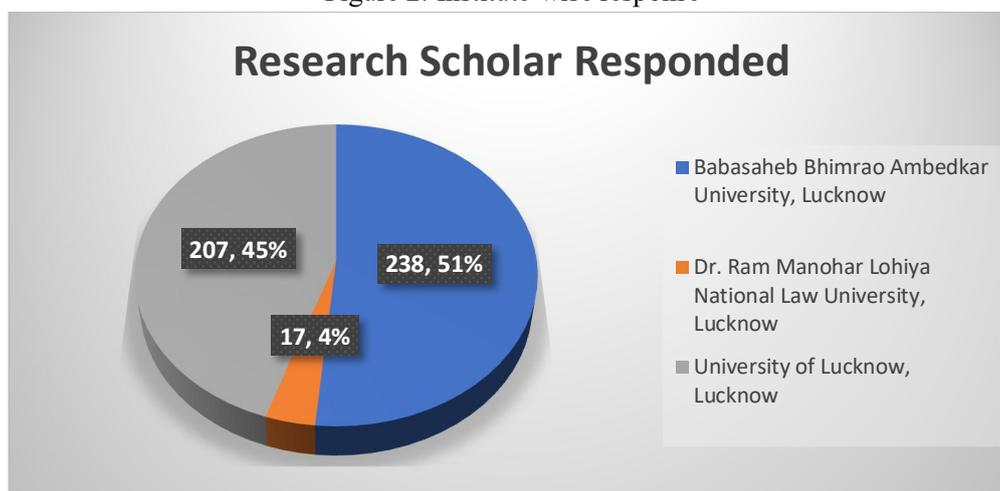
From the above table and figure 2, it can be concluded that the highest percentage of respondents were from the Babasaheb Bhimrao Ambedkar University, Lucknow. After that the University of Lucknow holds second position with 207 respondents which makes 45% of the total and there were only 17 response received from the Dr. Ram Manohar Lohiya National Law University, Lucknow.

Table 3: Age group

Age group	Less than 25 year	25-36 year	37- 48 year	49- 60 year	More than 60 year
Responded	70	392	00	00	00

Figure 3: Age group
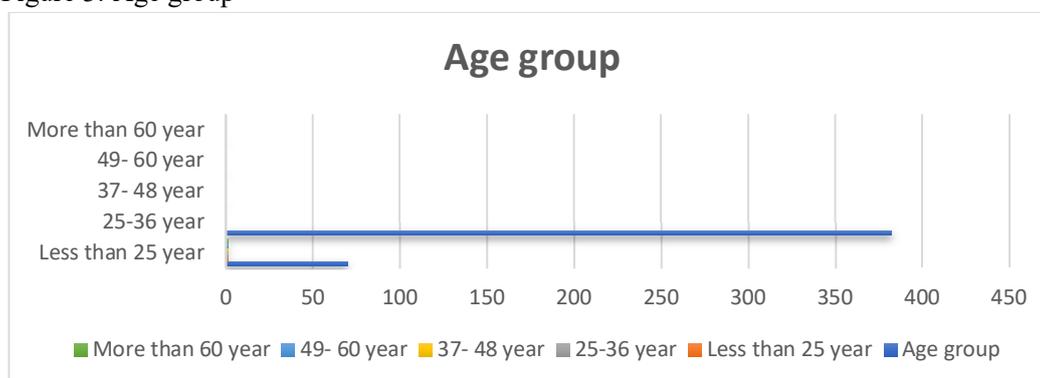
It was found that the most of the research scholars were falls under the age group of 25- 36 years. Rest of the scholars were of less than 25 years.

Table 4: Work Stage

| Work Stage	Initial Stage	Middle Stage	Final Stage
Response	137	241	84

Table 4: Work Stage
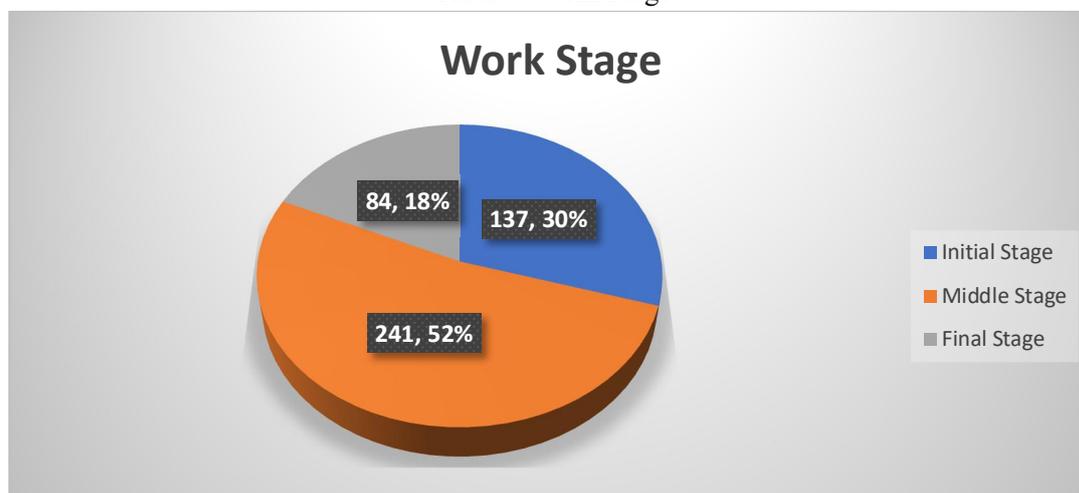
From the table 4, we can find that the 30% of respondents, which is 137 were on the initial stage of their research. Majority of them were on middle stage and only 18% of them at the final stage of their research work. Figure 4 is representing the data very well.

Table 5: Research Ethics awareness

Awareness level	Highly Aware	Aware	Partially aware	Not Aware
Awareness	112	167	182	1

Table 5: Research Ethics awareness
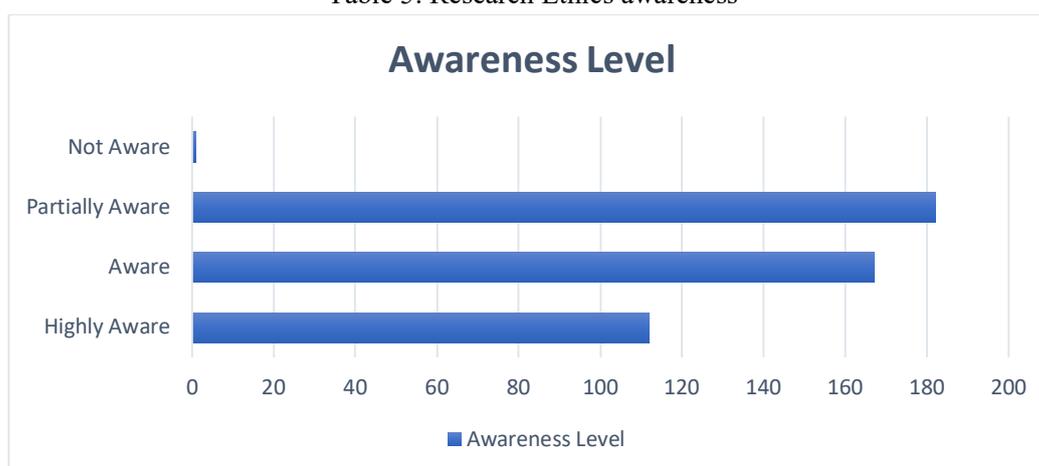
With the help of objective type questions, the awareness level of the researchers regarding Research ethics was analyzed. It reveals that 112 respondents were highly aware, 167 were aware,

182 were partially aware and only 1 respondent was not aware of that what the research ethics covers. It is clearly indicated in the table 5 and figure 5.

Table 6: Affected body part from COVID-19

COVID- 19 affects on	Kidney	Lungs	Heart	Liver
Response	00	462	00	00

Table 6: Affected body part from COVID-19
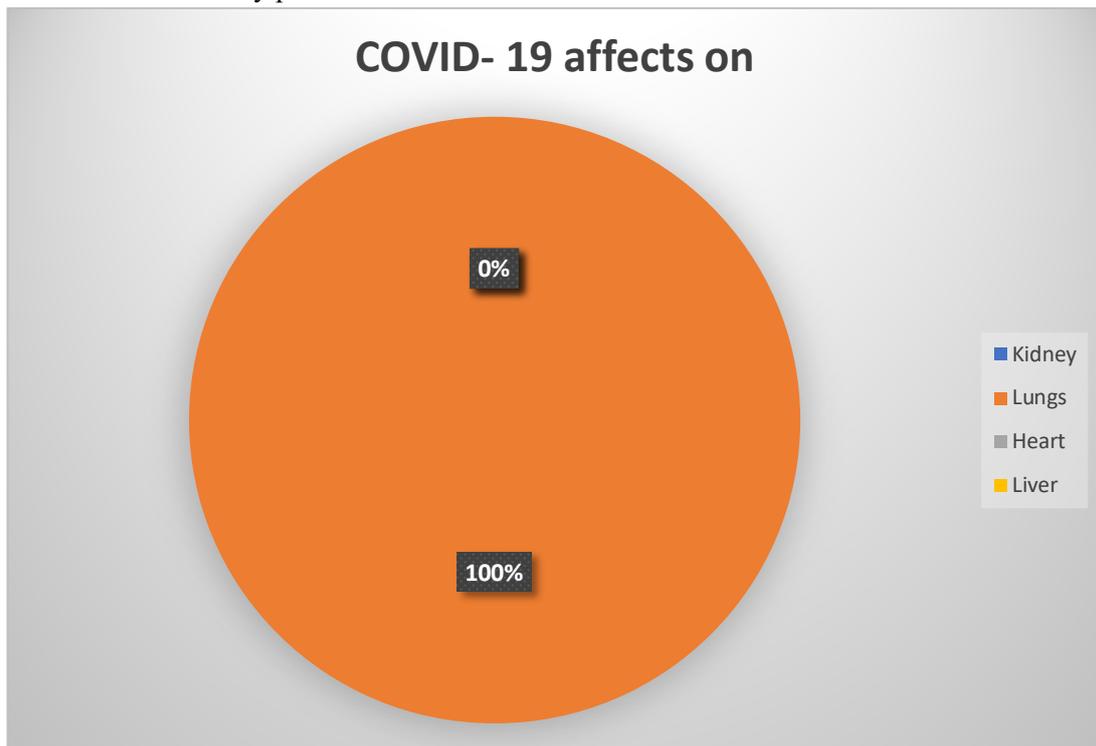
A question was asked from the research scholars to know whether they are familiar with the COVID-19 is or not. All the respondents were aware that the virus of COVID-19 primarily affects the Lungs of a human body.

Table 7: Role of Research Ethics amid COVID-19

Role of Research Ethics amid COVID-19	Very important	Neutral	Not important	Can't say
Response	392	42	0	28

Figure 7: Role of Research Ethics amid COVID-19
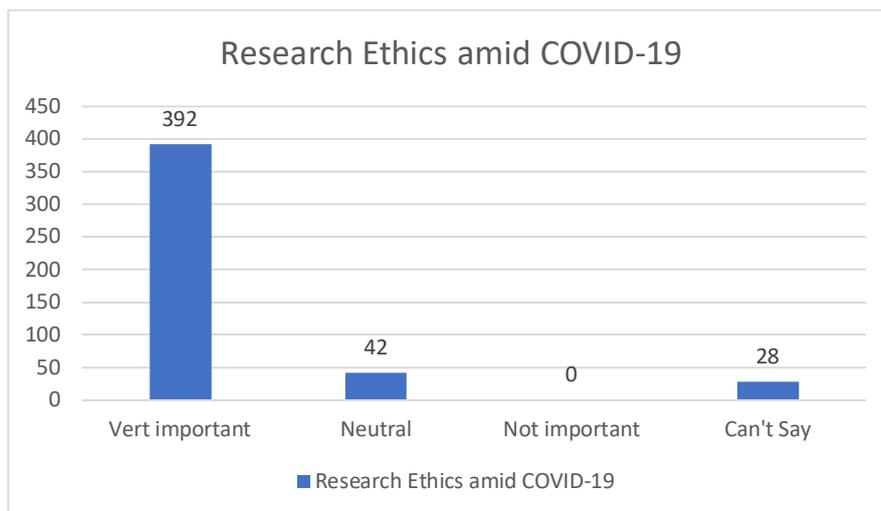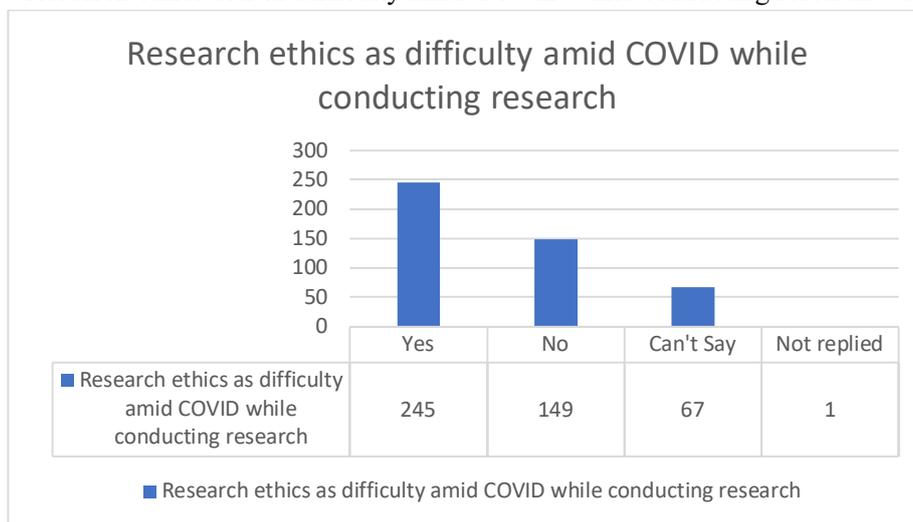
Research Ethics amid COVID-19

Table 7 and figure 7 is displaying the opinion of respondents for the role of Research Ethics amid COVID-19. 392 respondents feel that its role in very important, 42 feels neutral and 28 respondents were not sure about it.

Table 8: Research ethics acts as difficulty amid COVID while conducting research work

Research ethics as difficulty amid COVID while conducting research	Yes	No	Can't say	Not Replied
Response	245	149	67	01

Figure 8: Research ethics acts as difficulty amid COVID while conducting research work


The table 8 and figure 8 shows that the 245 respondents feels that research ethics is acting as difficulty for them amid COVID while conducting research work. 149 respondents do not feel like that. While 67 were not confirm about it.

Table 9: Difficulties feel amid COVID for the formal conduct of research

Difficulties	Pressure of deadline	Loss of opportunities	Unable to collect primary data for the study
Response	131	154	203

Figure 9: Difficulties feel amid COVID for the formal conduct of research
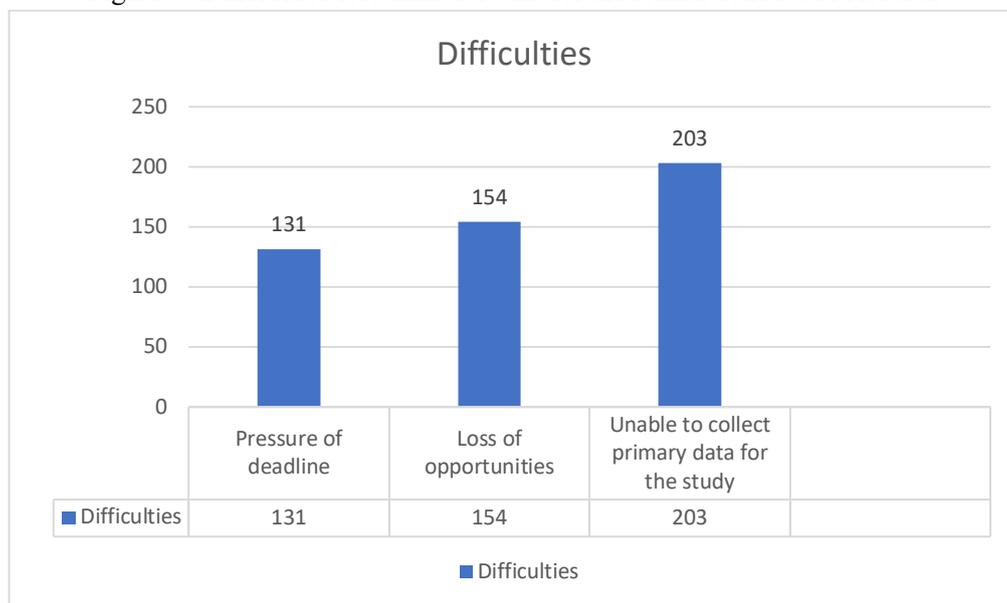
The table 9 reveals that most of the respondents were not able to collect primary data for the study. After that the researchers feels the that the COVID becomes a reason for the loss of opportunities.

Table 10: Affect of COVID-19 on research

| Affect of COVID-19 on research	It has appeared as Hurdle	It has appeared as Opportunity	Both
Response	357	168	01

Table 10: Affect of COVID-19 on research
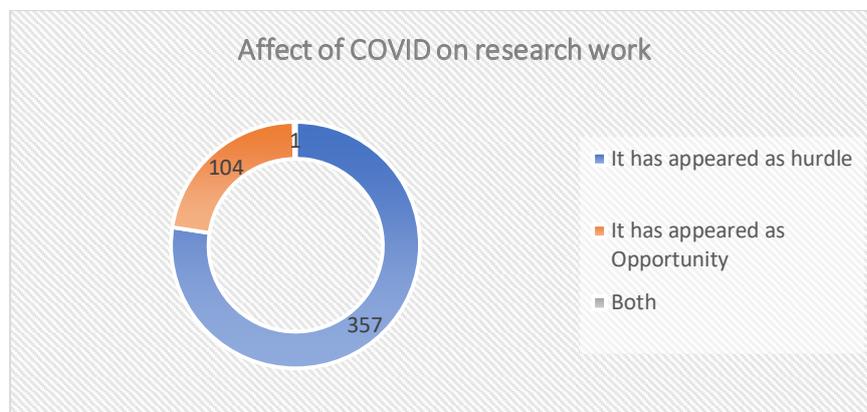
The study reveals that the out of 462 as per the 357 respondents, COVID is appeared as hurdle while 104 feels that it has bring opportunity along with. 1 respondent opt for both, means COVID has appeared as hurdle but also at the same time as opportunity too.

Table 11: Transformation of pandemic as opportunity

Transformation of pandemic as opportunity	By studying as much literature as possible	By publishing research paper in high impact factor journals	By conducting research studies online using email questionnaire
Response	276	111	98

Figure 11: Transformation of pandemic as opportunity
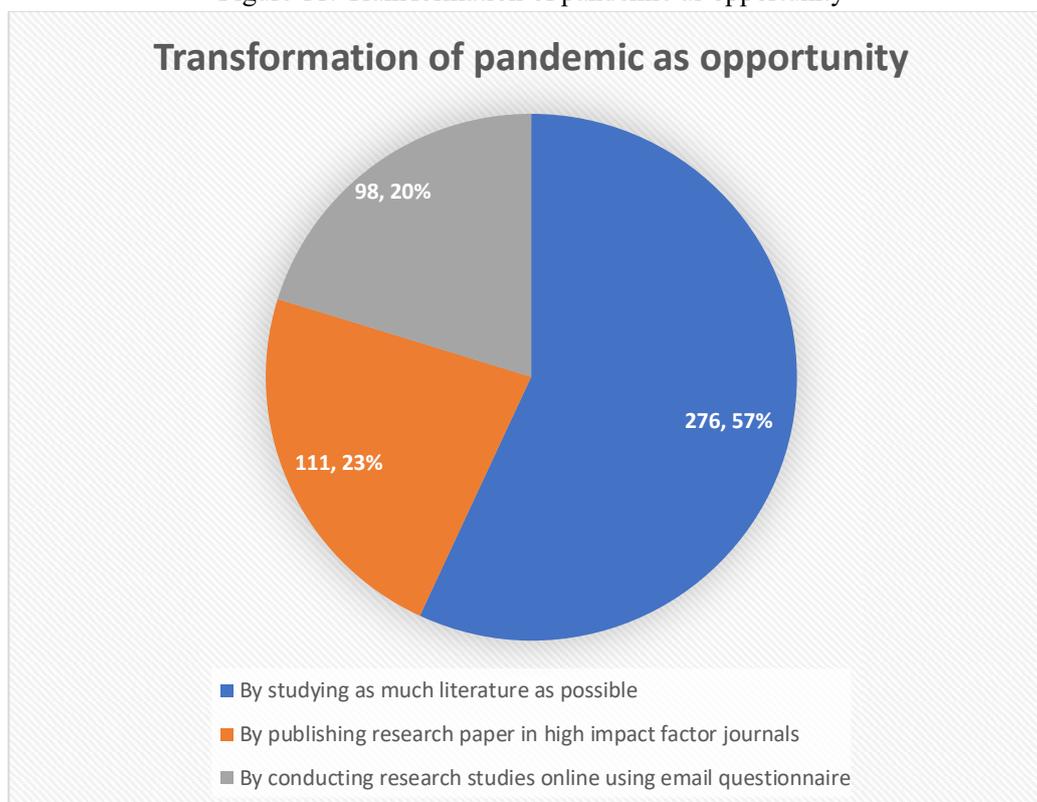
The table 11 shows that about respondents has voted maximum to the act of studying as much literature as possible to transform the pandemic as opportunity. After that they opted that they were utilizing that period by publishing research paper in high impact factor journal and minimum vote i.e. 98 was given to conducting research studies online using email questionnaire.

Table 12: Satisfaction with the role of institutional library amid COVID and post-COVID

Role of institutional library	Extremely satisfied	Satisfied	Neutral	Not satisfied
Response	122	149	115	76

Table 12: Satisfaction with the role of institutional library amid COVID and post-COVID
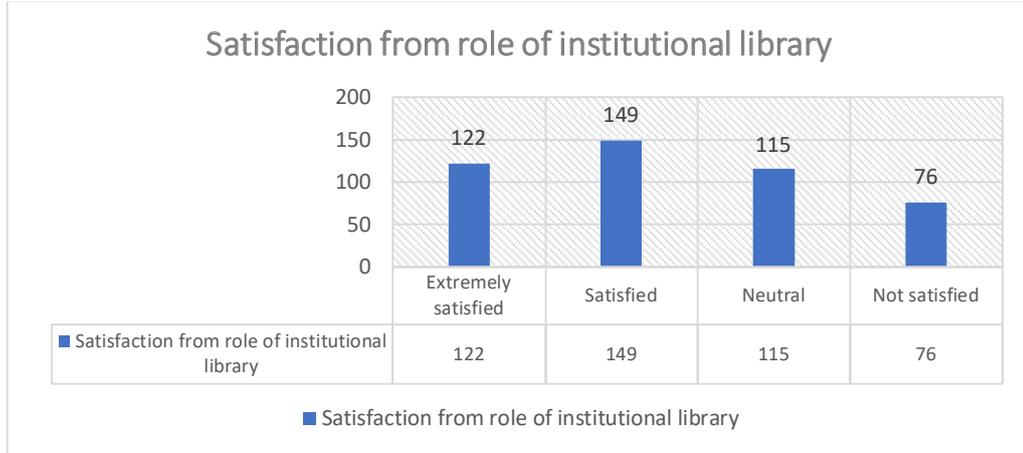

The study was conducted to took the views of researchers regarding the role of Library of their organization. Out of 462 respondents, only 122 respondents were extremely satisfied with the role of library of the institute amid COVID and post-COVID. 149 were satisfied, 115 responded neutral and 76 were not satisfied with their library. The table 12 and figure 12 is revealing this clearly.

Table 13: Measures to conduct the research ethically

Measures to conduct the research ethically	Taking help of respected supervisor	Conducting research work ethically	Attending online webinars/ onferences
Response	137	93	285

Table 13: Measures to conduct the research ethically
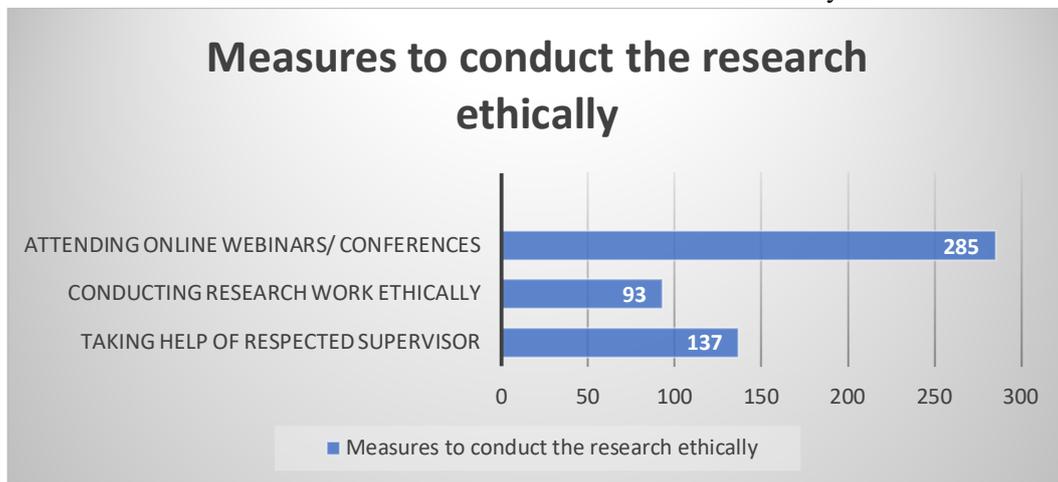
The respondents ranked first to the attending online webinar/ conferences for the measure taken by them to conducted the research work ethically. Second rank was given to the statement that they are taking help of their respected supervisor to conduct research work ethically.

Table 14: Views on Research Ethics and COVID

Views on Research Ethics and COVID	It should be flexible for some time	It should be followed in same manner as earlier
Response	314	148

Figure 14: Views on Research Ethics and COVID
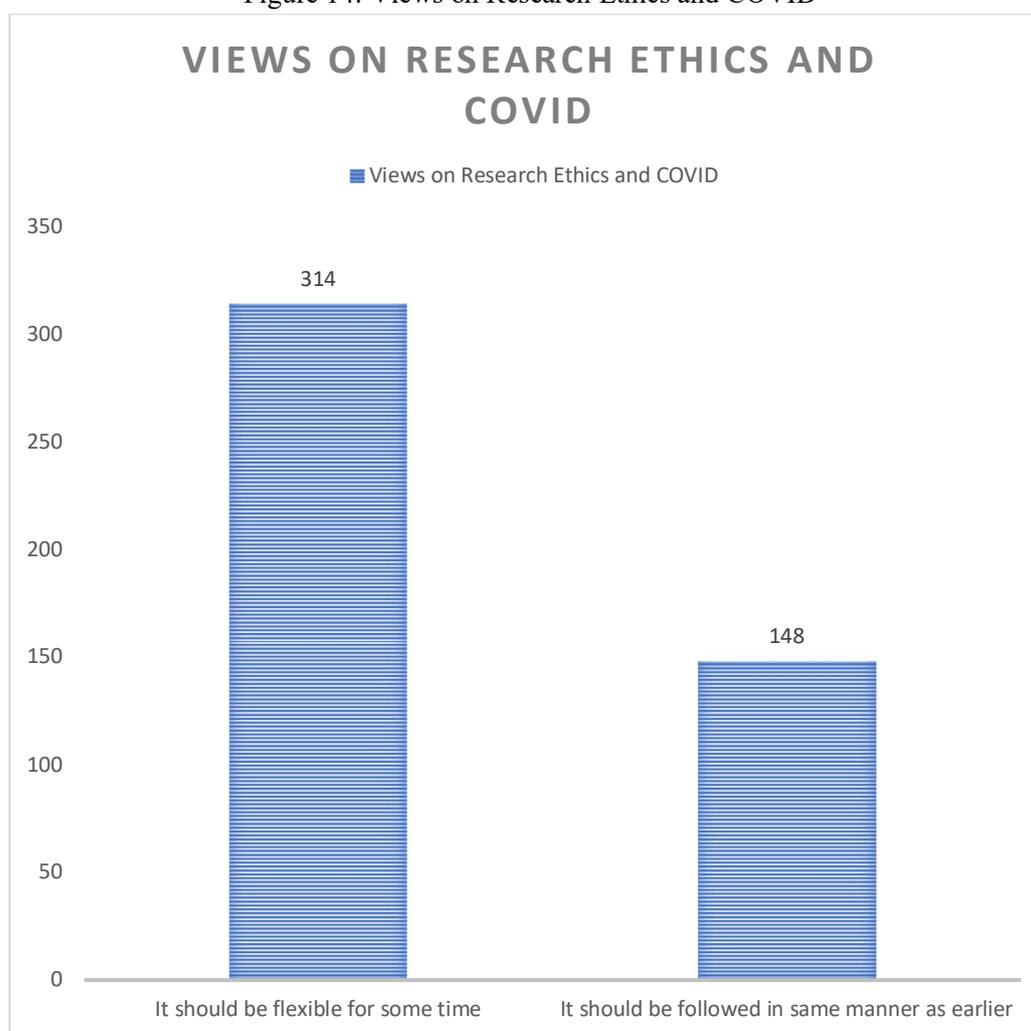
The table 14 and figure 15 is showing the views of the research scholars regarding COVID and Research ethics. Out of 462, most of the respondents i.e. 314 were in favour to that the Research ethics should be flexible foe some time. 148 respondents were in favour that it should be followed in the same manner as it was earlier.

Table 15: Research studies during COVID period will be harmful or not

Research studies during COVID period will be harmful or not	Yes	No	Can't say
Response	163	268	31

Figure 15: Research studies during COVID period will be harmful or not

Impact of Research studies during COVID period will be harmful or not

- Yes — 163, 35%
- No — 268, 58%
- Can't say — 31, 7%
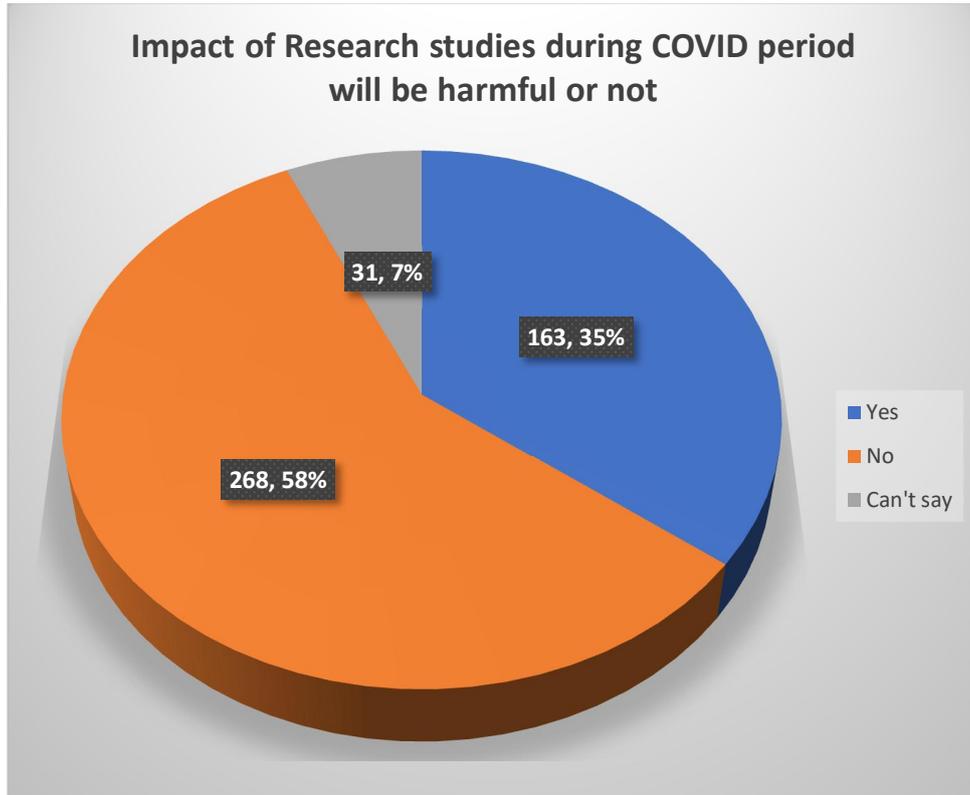
In the above table 15 and figure 15 the views of respondents are interpreted. It shows that the in opinion of 163 researchers, the research studies that are conducted during the COVID period may produce more harm than the benefit. But most of the them says that it is not true that the research studies will cause more harm. While 31 respondents were not confirmed about this.

2. Findings

The finding of the study that is conducted among the research scholars of higher educational institutions of Lucknow, Uttar Pradesh, India keeping in view the impact of COVID-19 pandemic is as following-
- Most of the respondents that have taken part in the study were at middle stage of their research work.
- Out of 462, 112 respondents were highly aware for the various aspects of research ethics. 167 were aware, 182 were partially aware and only 01 among them was not aware.
- All of the respondents were aware from the basic knowledge of COVID-19 virus that it primarily affects lungs of the human body.
- Most of respondents feel that Research ethics was acting as difficulty amid COVID while conducting research.
- Study reveals that COVID has appeared as hurdle for the research.
- The researchers have transformed the pandemic into opportunity by taking various measures.

- Among the total respondents, only 122 were extremely satisfied, 149 were satisfied and 76 were not satisfied from the role of their institutional library amid and post-COVID.
- The studies conducted in COVID period will not result in harm than the benefit.

3. Conclusion

The research is carried out keeping in the centre point the welfare of the human being and the society. For this there are some guideline that should be followed while conducting the research work. The COVID- 19 has affected the smooth functioning as its effect ranges from was lockdown to physical distance and loss of various opportunities. The libraries are the only organization that were supporting the research activities by providing quality resources via remote access. From the study it can be concluded the overall role of the libraries were satisfactory but still there is need of improvement. The study reveals that the COVID has appeared as hurdle and also brings some opportunities along with.

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Role of Online Teaching and Learning in Department of Library & Information Science in Jiwaji University, Gwalior (M.P.) in Covid-19 Pandemic

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Abstract

The whole world is experiencing the corona virus outbreak, and Covid-19 is affecting all academic institutions, businesses and public spaces. In this pandemic, Covid-19 urges teachers to rethink their traditional approaches to preparation. Computer-based learning has many advantages, as there is no real limit to higher education, has the ability to engage in learning more moderate than ordinary reviews. With so many different approaches to e-learning and teaching methodologies that can be adopted under these pandemic conditions, many other resources and university agreement mobilization exercises have begun using the guide. Every teacher and student has clarity of sound image that makes information and learning effective.

1. Introduction

Coronavirus pandemic began getting intense for advanced education after the twentieth of March 2020, when, as indicated by the information by (UNESCO, 2020) more than 1.3 billion students of all degrees of schooling in 142 nations are influenced by the lockdown. Being proactive for the approaching difficult circumstance, UNESCO asked governments all around the globe to take measures to reestablish instructive capacity to the most ideal degree. Monitoring the imbalances existing both inside social orders and among various nations, this allure concerned endeavor all the potential measures and not just the ones dependent on ICT (Information and Communication Technologies). All in all, the circumstance was considered as an emergency and a disturbance of the ordinariness and the arrangements that must be given were not answers for the arrangement of instruction as normally, but instead a reaction considered important to incorporate all methods accessible for each situation with one and

only unbiased, that is the reclamation of instructive capacity, the correspondence among educators and understudies and the congruity of learning quite far.

Given that the circumstance all around the world is notable, we incline toward not to additional notice any information on the pandemic emergency, yet to concentrate more, from one viewpoint, on advanced education.

2. Higher Education Responses to Covid-19 Pandemic Crisis in India

In India, where this specific investigation comes from, lockdown was at first nearby and begun the twentieth of March with the conclusion of the JIwaji University, Gwalior, in the more extensive locale of which the first instances of COVID-19 in Quite a while were identified. In a brief timeframe, the lockdown abandoned nearby into nation wide some time later. The State reacted promptly and gave the chance to all colleges in the nation to move showing internet, changing the legitimate system for the outstanding conditions. It is important that as per the Indian Constitution all colleges are public and the opportunities for Online training was permitted until the new emergency, More or less practically all state funded colleges oversaw in a generally brief timeframe to give practically all the courses in Online mode. For the situation we are examining underneath, the Jiwaji University, Gwalior in only multi week had the option to offer practically all the hypothetical kind courses utilizing an arrangement of Online schooling, in view of (I) simultaneous instruction upheld by a video chat programming and (ii) non concurrent training of a Model sort stage effectively accessible before emergency. This quick response and the change portrayed met with the understudies' acknowledgment.

Beginning from this idealistic situation, for example that in a moderately brief timeframe, the scattering of the infection will have been tackled and public activity and therefore Higher Education will have gotten back to ordinariness, a significant issue is the thing that will change as far as instructing at colleges. Underestimating that colleges will continue working by and large in the manner they have developed their examinations frameworks as of not long ago, the goal of the paper isn't to explore the level of ampleness of the arrangements given, since, all things considered, the circumstance was portrayed as a crisis, nor to see whether Teachers or understudies wish the total change of the advanced education foundations into Online schooling organizations. Here, we generally center around the analogs between vis-à-vis instructing and Online training modes, yet additionally on the way that the type of advanced education so far establishes a prime territory for the improvement of social aptitudes and considerably more of basic reasoning and basic reflection abilities.

In any case, we should contemplate that the openness, both of Teachers and understudies, to a particularly enormous scope experience, will clearly have reshaped their requests, assumptions and furthermore the outline they have of their examinations. The point of convergence of this paper is the exercises learned for the method of studies, the showing techniques and normally the level of entrance of the ICTs to improve the work done in study hall and eye to eye educating.

3. Positive impact of COVID-19 on education

In spite of the fact that the flare-up of COVID-19 has made many negative effects on training, instructive establishments of India have acknowledged the demands and making an honest effort to offer consistent help administrations to the understudies during the pandemic. Indian Education framework got the open door for change from conventional framework to another period. The accompanying focuses may be considered as the positive effects.

4. Move towards Blended Learning

COVID-19 has quickened appropriation of advanced advances to convey education. Instructive organizations moved towards mixed method of learning. It energized all faculties and students to turn out to be more innovation smart. Better approaches for conveyance and appraisals of learning opened enormous open doors for a significant change in the zone of educational plan advancement and instructional method. It likewise offers admittance to enormous pools of students all at once.

5. Rise in use of Learning Management Systems

Utilization of learning the board frameworks by instructive establishments turned into an incredible interest. It opened an incredible open door for the organizations those have been creating and fortifying learning the board frameworks for utilize instructive establishments.

## 6. Enhance the use of soft copy of learning material

In lockdown circumstance understudies couldn't gather the printed versions of study materials and subsequently the greater part of the understudies utilized of delicate duplicates materials for reference.

7. Improvement in collaborative work

There is another open door where collective educating and learning can take on new structures. Coordinated efforts can likewise occur among personnel/educators across the world to profit by one another.

8. Rise in online meetings

The pandemic has made an enormous ascent in remotely coordinating, virtual gatherings, online classes and e-conferencing openings
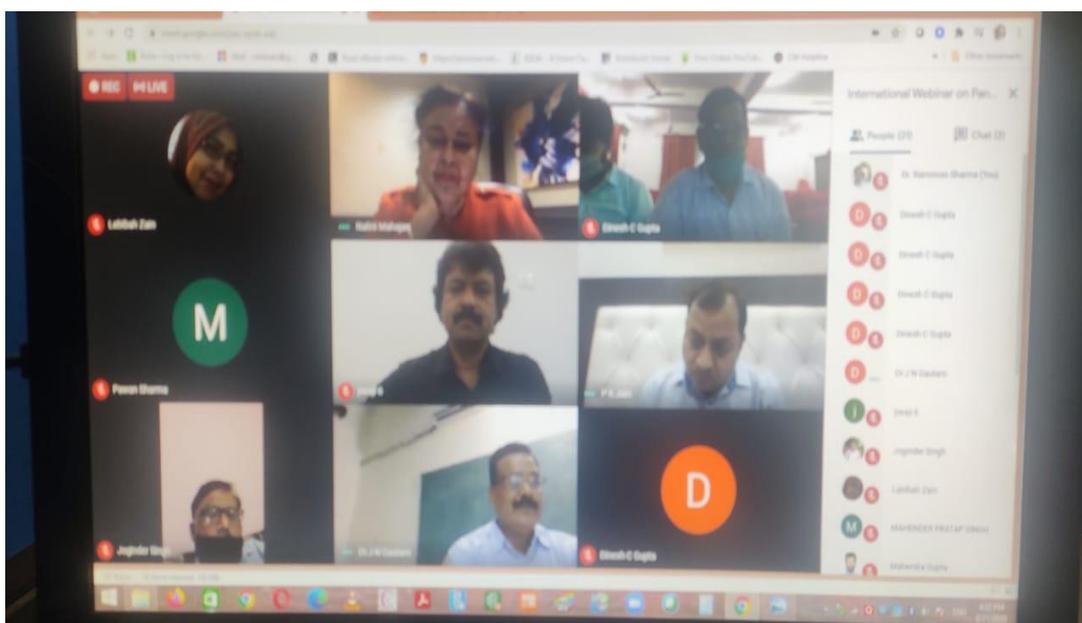
9. Enhanced Digital Literacy

The pandemic circumstance initiated individuals to learn and utilize computerized innovation and brought about expanding the advanced education.

10. Improved the use of electronic media for sharing information

Learning materials are divided between the understudies effectively and the connected questions are settled through email, SMS, calls and utilizing diverse social Medias like WhatsApp or Facebook.

11. World wide exposure

Faculties and students are getting occasions to collaborate with peers from around the globe. Students adjusted to a global network.

12. Better time management

Students are able to manage their time more efficiently in online education during pandemics.

13. Demand for Open and Distance Learning (ODL)

During the pandemic circumstance the vast majority of the understudies favored ODL mode as it energizes self-taking in giving occasions to gain from different assets and altered learning according to their necessities.

14. Negative impact of COVID-19 on education

Education sector has suffered a lot due to the outbreak of COVID-19. It has created many negative impacts on education and some of them are as pointed below:

15. Educational activity hampered

Classes have been suspended and tests at various levels deferred. Various sheets have just deferred the yearly assessments and passage tests. Affirmation measure got deferred. Because of congruity in lockdown, understudy endured a deficiency of almost 3 months of the full scholastic year of 2020-21 which will additionally disintegrate the circumstance of progression in instruction and the as understudies would confront a lot of trouble in continuing tutoring again after a tremendous hole.

16. Unprepared teachers/students for online education

Not all educators/understudies are acceptable at it or possibly not every one of them were prepared for this unexpected progress from up close and personal figuring out how to web based learning. The greater part of the educators are simply leading talks on video stages, for example, Zoom, Google meet and so forth which may not be genuine internet learning with no committed web based learning stage.

17. Access to digital world

The same number of understudies have restricted or no web access and numerous understudies will be unable to manage the cost of PC, PC or supporting cell phones in their homes, internet educating learning may make a computerized split between understudies. The lockdown has hit the helpless understudies extremely hard in India as the greater part of them can't investigate web based getting the hang of as indicated by different reports. Hence the web based instructing learning technique during pandemic COVID-19 may upgrade the hole between rich/poor and metropolitan/provincial.

18. Increased responsibility of parents to educate their wards

Some educated parents are able to guide but some may not have the adequate level of education

needed to teach children in the house.

19. Conclusion

Coronavirus has affected tremendously to the instruction area of India. In spite of the fact that it has made numerous difficulties, different open doors are likewise advanced. The Indian Govt. furthermore, various partners of instruction have investigated the chance of Open and Online learning by embracing diverse computerized advances to adapt up to the current emergency of COVID-19. India isn't completely prepared to make instruction arrive at all sides of the country through computerized stages. The understudies who aren't special like the others will endure because of the current decision of computerized stages. Yet, colleges and the public authority of India are perseveringly attempting to concoct an answer for resolve this issue. The need ought to be to use advanced innovation to make a favorable situation for a large number of youthful understudies in India. It is need of great importance for the instructive organizations to reinforce their insight and Information Technology foundation to be prepared for confronting COVID-19 like circumstances. Regardless of whether the COVID-19 emergency extends longer, there is a pressing need to take endeavors on most extreme usage of online stages with the goal that understudies not just complete their degree in this scholarly year yet in addition to prepare for the future advanced arranged climate. The idea of "telecommute" has more prominent pertinence in such pandemic circumstance to diminish spread of COVID-19. India ought to create inventive procedures to guarantee that all youngsters should have manageable admittance to getting the hang of during pandemic COVID-19. The Indian approaches should incorporate different people from assorted foundations including distant districts, underestimated and minority bunches for viable conveyance of instruction. As online practice is profiting the understudies hugely, it ought to be proceeded after the lockdown. Further itemized measurable investigation might be attempted to investigate the effect of COVID-19 on instruction arrangement of India.

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Setbacks into Comebacks: Protocols of Academic and Special Libraries during the COVID-19 Crisis in the Philippines and Some Parts of the World

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Abstract

Just like any other organizations and institutions across the globe, libraries have been badly hit by the Covid-19 emergency and confronted with disruptive incidents. Libraries were left unprepared for the crisis but ready to improvise. New services and strategies have been observed to counteract the impact of the pandemic. Though this is a pressing issue of concern, literature discussing the impact of covid-19 in libraries and information centers are still limited. In the Philippine set-up, there has been no attempt in the form of research to explore what has been enforced by libraries in the academic and special libraries sector. This is where this paper takes its motivation. The research agenda is to explore the new normal strategies being and have been implemented in the academic and special libraries during the Covid-19 crisis in the Philippines and some parts of the world. Specifically, the researchers intend to find answers to the following questions: 1) What are the setbacks encountered by the librarians in the academic and special libraries during the pandemic? and 2) What existing and new library protocols have been implemented during the covid-19 pandemic in terms of the following: collection, programs and services, library space, and personnel? This study employed a qualitative exploratory research approach primarily using asynchronous remote interviews via email. Findings of the study will be beneficial to all LIS professionals, faculty, students, and researchers for they will be able to glean vital solutions instigated by libraries to counteract the setbacks brought about by the pandemic. Additionally, the findings will serve as a benchmark in crafting new library programs, services, and strategies especially when faced with a disruptive incident like the Covid-19 pandemic. The researchers also deem that it is essential to document what libraries have been doing during the pandemic for it will undoubtedly affect the present and future landscape of the field of librarianship.

Keywords: Covid-19, academic libraries, special libraries, librarianship, Philippine librarianship

1. Introduction

Just like any other organizations and institutions across the globe, libraries have been badly hit by the Covid-19 emergency and confronted with disruptive incidents. To date, libraries and library and information science (LIS) professionals globally find themselves in either of the following circumstances: business as usual, open to the clients with some or minimal restrictions, or either forced to be closed (International Federation of Library Associations and Institutions [IFLA], 2020). Librarians tried to restructure their traditional ways by providing highly online services and resources to their service institutions and pursued two main concerns: 1) bringing the library to the community members' home and 2) taking advantage of every available tool to reach out to the community (Tammaro, 2020).

Libraries were left unprepared for this crisis but ready to improvise. New services and strategies have been observed to counteract the impact of the pandemic. Though this is a pressing issue of concern, researches discussing the impact of covid-19 in libraries and information centers are still limited and scarce (Rafiq et al., 2020). In the Philippine set-up, there has been no attempt in the form of research to explore what has been observed by libraries in the academic and special libraries sector as of this writing in November 2020. This is where this paper takes its motivation. The research agenda is to explore the new normal strategies being and have been implemented in the academic and special libraries during the Covid-19 crisis in the Philippines and some parts of the world. Specifically, the researchers intend to find answers to the following questions: 1) What are the setbacks encountered by the librarians in the academic and special libraries during the pandemic? and 2) What existing and new library protocols have been implemented during the covid-19 pandemic in terms of the following: collection, programs and services, library space, and personnel?

This paper is beneficial for the LIS professionals, faculty, students, and researchers for they will be able to glean vital solutions instigated by libraries to counteract the setbacks brought about by the pandemic. The findings will serve as a benchmark in crafting new library programs, services, and strategies, especially when faced with a disruptive incident like Covid-19. The researchers also deem that it is essential to document what libraries have been doing during the pandemic for it will undoubtedly affect the present and future landscape of the field of librarianship.

2. Methodology

This paper employed a qualitative exploratory research approach primarily using asynchronous remote interviews via email. The structured interview module is composed of three major questions grounded on the research questions presented beforehand. The researchers sent the module along with the participant information profile and consent form via email. Study participants are selected with the use of non-probability sampling, specifically the purposive sampling technique. The study covered two clusters of participants: librarians coming from the 1) academic library sector and 2) special libraries. A total of 48 email participation invites, 32 emails for academic libraries, and 16 emails for special libraries, are sent between the period of October to November 2020. A final total of 33 librarians responded and emailed back their answers.

Gathered responses are compiled, organized, line-by-line coded, and analyzed thematically in reference to Nowell, et al. (2017) phases of thematic analysis: 1) data familiarization, 2) initial coding, 3) searching for themes, 4) reviewing themes, 5) theme naming, and 6) report generation.

3. Results and analysis

3.1 Demographics

A total of 24 academic librarians (Table 1) and nine (9) special library practitioners (Table 2) from nine (9) different countries participated in the study. Most of the respondents came from the academic library sector in the Philippines and the least number came from special libraries. More than half of the respondents are currently in the top-level management position in their respective organizations.

Table 1. Profile of Participants from Academic Libraries

Academic Library (AL)	Geographic Location	Respondent's Designation
AL 1	Turin, Italy	Library Director
AL 2	California, United States of America	School/Academic Librarian
AL 3	Gothenburg, Sweden	Head of the Library
AL 4	Auckland, New Zealand	Senior Client Services Assist
AL 5	Singapore, Singapore	Reference Section Head
AL 6	Dubai, United Arab Emirates	Reference Section Head
AL 7	Nur-Sultan, Kazakhstan	Reference Librarian
AL 8	Melbourne, Australia	Library Director
AL 9	Davao, Philippines	Library Head
AL 10	Davao, Philippines	Library Director
AL 11	Butuan, Philippines	Library Director
AL 12	Iloilo, Philippines	Section Head
AL 13	Butuan, Philippines	Library Head
AL 14	Zamboanga, Philippines	Library Head
AL 15	Cagayan de Oro, Philippines	Library Director
AL 16	Ozamiz, Philippines	Library Director
AL 17	Cabadbaran, Philippines	Library Head
AL 18	Cebu, Philippines	Library Director
AL 19	Davao, Philippines	Library Director
AL 20	Manila, Philippines	University Librarian
AL 21	Manila, Philippines	Library Head

AL 22	Cebu, Philippines	Library Director
AL 23	Davao, Philippines	Library Director
AL 24	Cagayan de Oro, Philippines	Library Director

Table 2. Profile of Participants from Special Libraries

Special Library (SL)	Geographic Location	Respondent's Designation
SL 1	Manila City, Philippines	Library Head
SL 2	Quezon City, Philippines	Library Head
SL 3	Quezon City, Philippines	Section Librarian
SL 4	Quezon City, Philippines	Library Head
SL 5	Taguig City, Philippines	Library Head
SL 6	Manila City, Philippines	Library Head
SL 7	Pasig City, Philippines	Librarian
SL 8	Manila City, Philippines	Librarian
SL 9	Manila City, Philippines	Library Head

3.2 Setbacks: Where have we been?

Initial coding of data sets resulted in 22 specific themes relating to the setbacks and challenges experienced by the academic and special librarians during the Covid-19 crisis. The researchers further studied, sorted, and reviewed the pre-identified themes and removed any redundancies which brought out six general themes namely paradigm shift, technological barriers, human-related concerns, organizational problems, economic and access issues (Table 3). Many of the respondents (25%) find "paradigm shift" as their main mishap due to the fast-paced adjustment brought about by numerous factors such as the varying quarantine measures imposed by the government during the lockdown period. Library practitioners are also out of time to prepare and reconfigure their traditional library services into a highly digital one.

Table 3. Major Setbacks during the Pandemic (Multiple responses, n=33)

Key Themes	f	%
paradigm shift	19	25%
technological barriers	18	24%
human-related concerns	15	20%
organizational problems	11	15%
economic issues	7	9%
access issues	5	7%
Total Comments around Themes	**75**	100%

The next obstacle includes technological barriers (24%). Respondents posited that there exists a form of digital inequity among library personnel. Some library team members still have insufficient knowledge to navigate the digital world and lack important digital competencies and skills which are further heightened by the unavailability of internet connectivity and/or slow connection in their residence, unavailable personal computing devices i.e. laptops, and poor information technology infrastructure of the organization and/or the library. A respondent also indicated the absence of library management software in their library, as well as the challenge of providing information literacy sessions in an online platform.

Another critical issue mentioned is human-related concerns (20%). This setback is immensely associated with mental health issues. Study participants explained that the lack of direct contact to the patrons and colleagues, coupled with the long period of quarantine, isolation, and the unhealthy adoption of work from home (WFH) set-up brought extreme anxiety, depression, and paranoia which resulted in procrastination, less enthusiasm, and productivity loss. Adding up to this concern is the failure of library patrons to strictly follow quarantine protocols while inside the library premises, handling requests from demanding clients, and the lack of interest of patrons in the library's online presence.

The fourth area of concern relates to organizational problems. Most of the respondents (15%) emphasized the demanding nature of a WFH set-up which somehow implicitly requires personnel to double or triple their work outputs. Aside from the WFH set-up, various institutions have also adopted the alternative work arrangement (AWA) which poses numerous pros and cons, the cons including the lack of transportation means to go to work and the possible exposure to the virus, thereby compromising the health and safety of the personnel. Alongside, the lack of coordination, cooperation, and communication both at the national and institutional level posed a very challenging dilemma:

"I think the main setback was the lack of coordination and communication at [the] national level and at [the] institutional level, we had to face all difficulties by our own, we had very poor support from the university leadership; communication among universities was (and is) scarce: we had to tackle all the same problems in the same moments not having any possibility to do benchmarking…" - AL 1, personal response, November 2020

A respondent also stated that the bureaucratic procedures in some way slowed down their library processes:

"We need to purchase/subscribe to ebooks ASAP [as soon as possible] but bureaucratic procedures slowed us down. Sometimes, the requests received [are] needed to [be] consult[ed] [using] the materials in the library to be answered." - SL 2, personal response, November 2020

Another study participant added:

"Aside from [the] lack of budget for expensive databases, [the] procurement bottleneck is also one of the major setbacks for government libraries... There are also internal political issues, silos and power struggle within [the organization] making it more difficult to lobby whatever innovations we plan to propose." - SL 7, personal response, November 2020

Library practitioners also reported the lack of support from their mother institutions particularly in terms of budget provision i.e. lack of professional development fund and lack of budget for database acquisition, amplified with staff displacement and retrenchment, and the prejudice in the library and library services of the institution's higher-ups i.e. library services applies only in the face to face transactions.

Additionally, economic issues covered 9% of the total responses. This comprises the inability to travel and the observance of cost-cutting and budget freeze due to enrollment drop. Requisitions for the printed library resources were also deferred for the year. Lastly, 7% of the respondents indicated that they had encountered access issues when it comes to going in and out of their offices and the physical library spaces. 5% of the respondents have also pointed out the difficulty of accessing the physical collections and important office files due to various circumstances such as the varying levels of quarantine protocols and travel restrictions.

3.3 Comebacks: New Normal Library Protocols

Given the many challenges laid out earlier, library practitioners from the academic and special libraries sector have formulated various stopgap measures to continue serving the community they belong with. This portion of the research set one's sight on the ways they acted in response to the disruptions brought by the pandemic.

3.3.1 Collection

The pre-identified subthemes consisting of 11 categories under the main theme "collection" were initially coded and scaled down into nine major elements (Table 4) wherein access provision to digital resources is the common denominator among the 33% of the respondents. While there are libraries that have a strong foundation in both their physical and digital collections, there are still libraries that are in the nascent phase of developing their digital resources. Study participants indicated their extreme reliance on open access and open educational resources. What libraries are prioritizing now, as far as the collection is concerned, is access to digital resources:

"Starting this October [2020], the library has subscribed to new databases to supplement the learning of the clients. Since we only had a handful of electronic resources available at the onset of the pandemic, we see to it that new electronic resources will be procured." - AL 14, personal response, November 2020

"We did not implement new protocols, but we enriched our digital collections..."
- AL 1, personal response, November 2020

"[We] renewed all [our] online subscriptions to e-journals, e-books, e-tools, etc. to support the conduct of online education..." - AL 23, personal response, November 2020

Table 4. New Normal Responses to Library Collection (Multiple responses, n=33)

Major Themes	f	%
access to digital resources	22	33%
health and safety protocols	12	18%
digitization	11	16%
access levels	6	9%
reassessment	6	9%
increase of borrowing privileges	4	6%

borrowing suspension for printed materials	3	4%
acquisition of printed materials	2	3%
resource-sharing	1	1%
Total Comments around Themes	67	100%

Next response is the observance of health and safety protocols (18%) before lending the library materials and upon its return to the library. Returned books undergo quarantine measures ranging from three days to two weeks straight, and are isolated to a separate area to prevent the possible spread of the virus. Another 16% of the study participants started with their digitization projects to suffice the information deficiencies in their current library collections. Book chapters, theses, and dissertations, non-restricted public documents, identified publications deemed important for the institution are converted to digital copies subject to the provisions outlined in the copyright law and the intellectual property code. Differing access levels were also observed by 9% of the respondents. While some libraries have loose rules when it comes to using and borrowing printed library materials, several libraries and information centers have prohibited and restricted physical access to the physical library collection by applying the closed shelf system for the entire collection.

The pandemic has also allowed libraries to reassess their existing collection as emphasized by 9% of the participants. According to them, they have completed a major inventory of their library holdings, revisited their pick-up and delivery mechanism for printed materials, and started developing their collection development policy. Other things observed by the library practitioners on the onset, and even during the covid-19 crisis, is the increase of borrowing privileges of the patrons (6%), complete suspension of borrowing printed materials and encourage high dependence on e-resources (4%), continuous acquisition of printed materials such as textbooks and monographs (3%), and resource-sharing (1%).

3.3.2 Programs and services

Under this category, 13 key themes were deduced out of the original 15 themes (Table 5). Many of the respondents (26%) initiated and revamped their online presence by introducing and updating their virtual reference services (VRS). The respondents termed VRS in many interesting ways: Zoom Information Desk, Virtual Learning Support, Online Research and Reference Assistant (ORRA), Library Research Assistance (LiRA), Virtual Information Direct Assistant (VIDA), Virtual Desk Service, 24/7 Reference Service, Virtual Circulation Assistance (VICA), Librarian Online Helpdesk, Virtual Information Reference Assistance (VIRA), InfoVider (IVi), and many more. They took advantage of the available technology such as social media channels and open-access systems to continuously provide support to the service community.

Table 5. New Normal Responses to Library Programs and Services (Multiple responses, n=33)

Major Themes	f	%
virtual reference services	27	26%
online events, trainings, and programs	17	16%

book drop and curbside services	14	13%
access to contents	13	13%
book delivery	6	6%
cutting back service hours	5	5%
waived fines and penalties	5	5%
technology support	4	4%
marketing and promotion	4	4%
program and event cancellation	3	3%
policies and planning	3	3%
extended library hours	2	2%
community outreach	1	1%
Total Comments around Themes	104	100%

Other than VRS, 16% of the respondents have converted their regular face-to-face library events, training, and programs into an online platform such as library orientation, information literacy sessions, library instruction, and database training. They have also successfully organized online reskilling and upskilling programs for the service community like copyright training and compliance, bite-sized workshops, online book talks, and online user education. The concept of library gamification was also utilized to provide a more meaningful and exciting learning experience. The conventional library book clubs were also reformed into what they called "virtual library guild" and "virtual reading circle." The entire digital reformation has been useful and inclusive at some point as mentioned by a respondent:

"No public programs, but we have done a lot [of] programs on Zoom, and our experience is very positive, we can see an increase of attendees. The programs are accessible regardless [of] space…" – AL 3, personal response, November 2020

While this digital transformation may not be fully possible and feasible to all libraries, what other library practitioners have highly prioritized is access to content, both the physical and digital library collections. Library book drop and curbside services have been introduced by 13% of the study participants. This service allowed library patrons to request their needed library materials in advance and fetch those on a specified schedule provided by the library in a notification message. Other libraries prefer to call this type of service as click and collect, drive-thru book borrowing, click and pick-up service, virtual circulation assistance (VICA), book borrowing drive-thru via appointment system, and curbside pick-up services. To minimize physical interaction between the library personnel and patrons, a designated book drop for materials to be returned and a self-check-in machine has been put in place.

In addition to the provision of online databases and e-resources access, 13% of the library institutions have rendered online document delivery, scan-on demand, production of pathfinders, and selective dissemination of information. Other services and programs initiated encompassed the utilization of couriers to deliver book requests to the patron's residence (6%), waived fines

and penalties of the library clients (5%), technology support for faculty, staff, and students by providing connectivity and hardware support i.e. laptop loan service (4%), intensify online marketing and promotional programs (4%), and cancellation of physical programs and events (3%). The pandemic has also stirred up library institutions to devise an effective business continuity plan, emergency response plan, specific guidelines for virtual programs, and social media policy (3%). While 5% of the study participants observed cutting back of service hours, 2% of the total respondents opted to extend their service hours to better serve their patrons. Interestingly, 1 out of the 33 respondents tried to extend their service beyond merely providing information and resources, that is using their library 3D printers to produce face shields and other personal protective equipment for the community.

3.3.3 Library space

In the matter of protocols relating to library space, eight key themes were derived (Table 6). When asked what protocols have they carried out during the pandemic, most of the respondents (30%) fixated on the observance and compliance to the necessary health and safety protocols outlined by the national and local government health department. Among the most cited protocols is temperature checking before entering the institution/library premises, wearing of face mask and face shield, social distancing, mounted plastic, acrylic barriers, and plexiglass shields to service counters i.e. circulation desk, installation of hand sanitizers and alcohols, use of both manual printed form and quick response (QR) code for contact tracing, and disinfecting of spaces and high touch surfaces every hour, and installation of thermal scanners and occupancy counters to monitor the number of people within the premises.

Table 6. New Normal Responses to Library Spaces (Multiple responses, n=33)

Major Themes	f	%
health and safety protocols	22	30%
total closure of physical space	13	18%
partial closure of physical space	10	14%
emerging themes	9	12%
reduced seating capacity	7	10%
signages and marketing	5	7%
space improvement	4	5%
digital space management	3	4%
Total Comments around Themes	73	100%

18% of the study participants opted to close the entire library space while 14% have chosen to stay partially open where service counters are accessible but reading areas are totally closed for public use. Moreover, 12% of the respondents have mentioned unique emerging themes that they have implemented:

bring your own device (BYOD)	virtual library office
library as a temporary office	library Facebook page as a digital space
library as a classroom	library space as a studio
library as a record room	library as a video recording studio
one-way traffic policy	per appointment basis of library visit

Also, a portion of respondents consisting of 10%, shared that they have limited the entry of clients and reduced the library seating capacity. Signages and floor markings are also posted in strategic locations to remind and inform the public on the observance of health and safety protocols. The quarantine period was also used by 5% of the respondents as an opportune time for library housekeeping, repainting, and rearrangement of the space. Another 4% of the study participants modified and updated their digital spaces. They have included covid 19-related information and resources in their digital spaces, and prepared subject guides and infographics. Libraries which had no social media accounts and websites before have now launched their own.

3.3.4 Personnel

Aside from customer-driven programs, study participants have also noted critical initiatives and programs tailored to fit the needs of the library personnel. The researchers drew-out 8 key themes out of the initially 13 themes concerning library staff (Table 7). Most of the participants (28%) responded to the pandemic by observing different work arrangements i.e. flexible working hours, WFH, AWA, and/or skeletal workforce with designated staff groupings.

Table 7. New Normal Response to Library Personnel (Multiple responses, n=33)

Major Themes	f	%
work arrangement	22	28%
health and safety	20	25%
upskilling and retooling	13	16%
staff reassignment	6	8%
communication	6	8%
mental health wellness	5	6%
technology support	4	5%
work accomplishment	4	5%
Total Comments around Themes	80	100%

As shown in Table 7, 25% mentioned that the health and safety of the library personnel is their topmost priority. The number of sick leaves has increased. The entire library staff is strictly required to observe precautionary measures like:

"...1) proper wearing of face masks and face shields; 2) social distancing (no group eating and refrain talking with each other); 3) daily sanitation of work area; 4) frequent washing of hands with soap and water or with alcohol…" - AL 10, personal response, November 2020

"All personnel who are assigned to go to work physically should have a negative PCR [polymerase chain reaction] test result prior to going to work..."- AL 7, personal response, November 2020

Another frequently identified theme across the participants' responses is the importance of new skills acquisition, upskilling, and retooling of the library personnel (16%). The library staff were encouraged and required to attend webinars, training sessions, and other continuing professional endeavors to widen one's knowledge in navigating the online world, as well as strategies on how to support online distance learning. To further support the mother institution and adjust to the new normal circumstances, 8% of the respondents resorted to allowing library personnel to be temporarily reassigned and reallocated to other offices within the organization. Another 8% of them said that communication among and between library personnel is of prime importance. That is why they initiated regular staff online meetings, catch-up sessions, and online games i.e. online scavenger hunt, trivia questions, and the like. Equally important is the mental wellness of each of the library staff as per the 6% of the participants. Stress-relief programs, spiritual and mental health webinars have been organized too and library personnel are encouraged to participate.

In addition to the physiological and mental health support extended by the mother institution and the library per se, technological support has been evident too as revealed by 5% of the total respondents. Technological support covers lending out of computers, laptops, and even office chairs to prepare the library staff for the WFH set-up. Software such as Zoom and MS Teams were also purchased. Those with no internet connectivity at their residence were given access and connectivity allowance. The last theme that emerged under the library personnel category is the monitoring of work accomplishments by submitting either daily, weekly, and monthly individual reports.

4. Discussion and conclusion

This research is formulated to explore how academic and special libraries have responded to the challenges brought by the covid-19 global crisis. The researchers have investigated first what specific drawbacks did the libraries encounter in the onset and during the pandemic to further reveal and understand the current situation. Exposing the various strengths and weaknesses of libraries in this disruptive period will benefit the management and organization for long-term gains. From the salient findings, the researchers confirmed that paradigm shift was the topmost obstacle of library managers in the pandemic. Many are left unprepared and have left with no choice but to adapt the disruptions. While some library institutions are quick enough to have effectively designed solutions to the problems, some are still struggling with their band aid solutions. This is not surprising because the findings suggest that many libraries have just recently thought of formulating their business continuity and emergency preparedness plan, which should have been available in advance.

Access to digital resources before is just one of the many options but now, the situation requires libraries to completely pivot to electronic resources and incorporate technology across library processes and systems. The digital reformation also accompanied the demand to revamp one's skills and knowledge to effectively provide quality service to the community. Physical library spaces were also challenged as many libraries opted to shut off their entire space and focus on the enhancement of the digital library spaces. Although the goal of any organization is to thrive and be productive despite many disruptive incidents, the management must not forget to check on their people as they are an important asset of the organization. From the perspective of the study participants, mental health issues have been taking toll highly during the pandemic period. While some people can easily cope up in unexpected changes, some cannot. Regular meetings, stress-relief and spiritual programs are just a few of the helpful ways to support the people.

Another important point underscored is the ongoing digital divide among individuals, communities, and nations. There remains a big gap when it comes to access to computing devices coupled with the lack of skills and knowledge in navigating the digital arena. This was further supported by the study of Tammaro (2020), wherein she explicitly pointed out that the most challenging part of digital reformation is the digital divide. From the findings, it is apparent that whatever the status of your institution, organization, or country of origin, there still exists a digital gap which should be given a solution to produce a more inclusive and digital-ready society.

As a result of conducting this study, the researchers propose further investigations on the ways how school and public libraries responded to the consequences brought by the pandemic and how effective their solutions were from the viewpoint of their community. The crisis brought realization that what has been applicable before might not be relevant to the upcoming years. Thus, there is a need for library and information professionals to continuously learn and unlearn things to persist in this fast-changing world. One must continue to innovate and tend on his creativity and resiliency or else, fall into the trap of ceasing to exist.

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Social Media Library Service Solutions in the Pandemic Era: A Case Study of University Libraries in the Special Region of Yogyakarta Indonesia

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Abstract

Covid-19 is a new virus that has suddenly spread in several countries, even now the affected countries have reached 213, as a result. Each country issues a policy and physical distance even lockdowns on a small and large scale to break the chain of spreading the virus. This condition has made many public service agencies make adjustments, including libraries. The College Library is a place for students to carry out learning, research, and community service activities. The library then searches and presents information according to user needs. In the context of this service, there is social interaction between librarians and librarians. Different conditions occur in this pandemic era, everyone is asked to maintain distance and minimize direct physical contact. Information management institutions such as libraries need to try harder in ensuring the needs of users and must be able to guarantee the quality of access to information provided so that libraries can still be used by users wherever they are, especially from their respective homes. In the Special Region of Yogyakarta, Indonesia, many university libraries have closed their libraries but still open online services. They began to use social media applications such as whatsapp, instagram, facebook, youtube, twitter, telegram, etc. to communicate and support library services. In addition, it also optimizes digital library services and applications mobile digital library such as Ipusnas and Ijogja. From the above background, the author was moved to conduct research with the theme "Social Media Library Service Solutions in the Pandemic Era: A case study on a University Library in the Special Region of Yogyakarta, Indonesia. This study is one of the studies with a case study approach to higher education libraries in Yogyakarta. The method used is literature review. The purpose of this study is to find out obtain an overview of how the University Library services in the Special Region of Yogyakarta, Indonesia during the Covid-19 pandemic took place. The results of this study indicate that social media is one of the solutions in serving users, among others; facilitate access to library information with users, library promotion media., media to deliver student material during online learning.

Keyword: Social Media, Library Service, Covid-19 virus

1. Background

Covid-19 is a virus that has suddenly spread in the world. As a result of the very fast transmission, most countries have issued policies and physical distance, even lockdowns on a small and large scale, to break the chain of spreading the virus. This right has an impact on shifting the basic structure of life in all fields, including the field of education. Since the onset of the virus, Indonesia has imposed closure of schools and colleges, and provides for learning in networks. This condition has made many public service agencies make adjustments, including libraries as information provider services.

Libraries as social organizations, have encouraged learning and teaching through the acquisition, organization, storage, preservation and readiness of knowledge or information for use. The emergence of a new virus called Covid-19, which suddenly emerged, and the rapid spread in China in December 2019 had an impact on educational activities such as schools and lectures to be temporarily suspended in order to prevent the spread of the Covid-19 virus more widely, this also had a major impact on library services (Zhu et al., 2020).

The College Library is a place for students to carry out learning, research, and community service activities, which is better known as the Tri Dharma Perguruan Tinggi. A tradition that has been developing so far, higher education academics come to the library to access information. The library then searches and presents information according to user needs. In the context of this service, there is social interaction between user and librarians. Different conditions occur in this pandemic era, everyone is asked to maintain distance and minimize direct physical contact. Information management institutions such as libraries need to try harder in ensuring the needs of users and must be able to guarantee the quality of access to information provided so that libraries can still be used by users wherever they are, especially from their respective homes, one of which is by utilizing social media.

College libraries are less fortunate than other types of libraries such as regional, school and village libraries. At least college libraries have *repositories, ebooks and* even *ejournals* that can be accessed online which can be accessed by students in the midst of this pandemic. Especially with the addition of social media such as Facebook, Twitter, WhatsApp, Instagram, Telegram and YouTube which can be used to promote and share information needed by users efficiently and quickly.

The meaning of social media in this research is online media where it is possible for everyone to be involved in it and can invite anyone who is interested in and share details publicly. The use of social media is very influential on a person's life, especially now that the use of social media is increasingly widespread, not only among teenagers, parents and children are also increasingly using it.

Hamade says that popularity and use of social media especially among young people has increased rapidly in recent years, and this has given space to libraries for services such as pandemic conditions that can only be done online (Hamade, 2013).

In Indonesia, especially the Special Region of Yogyakarta (DIY), university libraries physically close their libraries, but still open online services using social media. Based on field

data using a questionnaire, from the total number of college libraries there are 59 respondents. The results of the initial analysis of social media ownership show that 64% have a website, Facebook 40%, Instagram 54%, Twitter 22%, YouTube 18%. College libraries largely shut down the library but keep open the online services / online, in average they began to use social media applications to communicate and support library services, optimize digital library services, and mobile digital libraries. The social media used include instagram, facebook, whatsapp, twitter, youtube, and others. These services are designed by utilizing information technology products that minimize physical interactions between librarians and patrons. This effort was made to prevent the transfer the virus of Covid-19 from user to librarians and vice versa. Thus libraries and librarians are able to contribute in reducing the number of additional suspect Covid-19.

From the above background, the author is moved to conduct research with the theme "Social Media Library Service Solutions in the Pandemic Era: A case study on a University Library in the Special Region of Yogyakarta, Indonesia. This study aims to obtain an overview of how the University Library services in the Special Region of Yogyakarta, Indonesia during the Covid-19 pandemic took place.

It is hoped that this description can be used by college libraries to make improvements and improve the quality of information services provided in the future because the pandemic period has not ended.

2. Research method:

The method used is a literature review, where literature is collected from various sources such as books, journals, scientific articles that are interrelated. Data analysis was carried out descriptively.

3. Literature Review

3.1. Social Media

Social media is best understood as a group of new types of online media, which share most or all of the characteristics namely, participation, openness, conversation, community, and relationships (Mayfield, 2008). In another opinion, social media is an internet-based application that allows the creation and exchange of content created by its users, and can be seen by various groups without limits (Kaplan, AM. & Haenlein, 2010).

Social media is online content created using publishing technology that is very accessible and scalable, from this technology there is a shift in the way people know, read and share news, and search for information and content. There are hundreds of social media channels operating around the world today, with the top three being Facebook, LinkedIn, and Twitter(Dailey, 2012). Social media also has a function to maintain organizational identity, opportunities for building relationships, the ability to control issue management and opportunities for promotion (Reitz, 2012). Therefore, libraries in this pandemic era are actively using social media to stay connected with the visitors who are in their homes. For librarians who have an entrepreneurial spirit, social media is very helpful and its existence is very much needed, in addition to interests related to libraries, this can also build related networks and expand networks (Fatmawati, 2017).

Libraries use social media to fulfill a variety of purposes, with most of them being focused on

promotion. However, communication with users can be even more intense. because currently social media is equipped with two-way communication designed to gather feedback (for example for collection development). In addition, with social media libraries can build services in *real-time* because of the involvement of the users. On the other hand, social media is also increasingly seen as a tool for collection management (Francis, 2014).

3.2. Library Services.

Library services are the provision of library materials and sources of information appropriately as well as the provision of various services and assistance to users according to the needs of library users. presenting library materials and information sources according to users, meaning that in library services, librarians need to pay close attention and ask for input from users on the needs of library materials or information (Rahayu, n.d.). Library services are services provided by libraries to users. Library activities are service activities that can be grouped into 2 groups of services, namely, technical services and library services, because of that, the good and bad of library operations depend on the satisfaction of the library users with the services provided, thus it can be said that the image and success of the library in carrying out its functions is determined by performance. library services (Rahayu, n.d.).

4. Discussion

The existence of the Covid-19 pandemic, the government made social restriction policies on a small to large scale. Therefore, libraries are transformed by changing conventional services into online services by maximizing information and communication technology, one of which is through social media. Various kinds of social media that can be used in library services, so in this study the authors limit the study by analyzing social media, including instagram, facebook, whatsapp, twitter, and youtube. There are 124 universities in DIY, both public and private, and 92 of them have joined to become members of the Indonesian Higher Education Library Forum (FPPTI) DIY.

The survey has been conducted since January 2, 2021 by looking at the library's website and social media. In addition, questionnaires have been distributed using google form to all FPPTI DIY members and as many as 75% of the members have filled in. The questions in the questionnaire included whether the member library had a website, instagram, facebook, whatsapp, twitter, youtube, and their opinion on the use of social media as a tool to support library services during the Covid-19 pandemic.

4.1. Social Media for Library Services in the Pandemic Covid-19

Librarians are currently aware of the potential of social media such as Facebook, Twitter, YouTube, LinkedIn, Skype, and Google+, and other social tools and are making efforts to integrate them into library services such as library orientation, new arrivals library resources, reference services, selective information dissemination (SDI), and customer service in general. especially in the midst of the Covid-19 pandemic, librarians must think hard and hone their creativity in providing the best service to users by utilizing various existing social media.

Social media as a channel for the dissemination of Web-based information is rapidly permeating all aspects of libraries and information services. Also, it was observed that social media is fast

becoming the most preferred means of building social / professional networks among librarians, while it is also being used to communicate with potential library users, as well as extending information services to other remote users especially in the academic community (Quadri, G.O. & Idowu, 2016).

Social media tools mostly MySpace, Facebook, Twitter, LinkedIn, Delicious, Flickr, Blogs, Wikis, Youtube, Podcasts, and Hi5 have enabled libraries to connect their users and allow librarians to adopt new roles by placing themselves on the social front with users (Ezeani, C.G. & Igwesi, 2012). By reading blogs, group posts, and message boards, librarians become active participants, able to anticipate and advise customers as needed. Social media tools also allow libraries to link various profiles of their customers which keep them abreast of their information needs (Friday & Ngozi, 2020). According to Hamade (Hamade, 2013), the popularity and use of social media, especially among students and the young population, has increased rapidly in recent years. This has provided space for utilization for the various library services that are now provided online. There is no doubt that the Covid-19 pandemic has affected libraries, especially in services that are usually carried out face-to-face between librarians and librarians, therefore libraries use social media to send information to visitors who cannot visit the library directly.

With Covid-19 and other lockdown regulations put in place by the government, the vision of libraries must go beyond physical library services to digital and convenient ways where library users and customers can be reached even in their remote locations. Here, library users and customers do not need to physically come to the library (Collins, G. & Quan-Haase, 2012). The use of social media for libraries can also improve communication between librarians and librarians and also give big changes to libraries in promoting and providing information quickly and accurately.

4.2. Adoption and social media issues for library services in the Covid-19 era The Covid-19

Pandemic virus covid-19 spreads very quickly, giving great anxiety not only in Indonesia but all over the world, the library which is one of the information service organizations is also one that feels a loss by the spread of the covid-19. Since the declaration of the Covid-19 pandemic in the world, the adoption of social media tools in libraries has become anxious. The Covid-19 pandemic has opened many shortcomings in libraries in providing efficient services to customers. For the most part, social media tools have supported library services and have increased efficiency and fast information delivery to library customers (Friday & Ngozi, 2020).

Lockdowns were introduced in several countries in an effort to reduce the level of the spread of covid-19, this is also what motivates libraries to adopt the use of social media as a means of approaching readers in the midst of a pandemic that is not known when it will end. Aharony (Aharony, 2012) revealed that library personnel can make social media adoption such as blogs to post information related to professional, personal and both issues on the same platform.

Libraries and users recognize the importance of adopting social media for personal and professional use. Hence, these social media tools have been adopted in most of the library service delivery. Since the Covid-19 pandemic, several libraries have started publishing electronic research guides and online tutorials while integrating help content and virtual reference services into their Facebook pages and Websites (Adeleke, A. A. & Habila, 2012).

5. The conclusion

Social media used by the college libraries in DIY are the website, facebook, instagram, twitter

and youtube. The use of social media during the Covid-19 pandemic is one way of service that allows librarians or libraries to be able to interact with user, in addition to helping facilitate access to library information with users, social media can be used for library promotion. Some libraries are also a medium for delivering student material during online learning.

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Strategies And Challenges In Archiving And Sharing Research Data

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Abstract

Research data management is increasing in its importance for research sustainability and the data are best if they are reusable. Collecting research data from previous research is not always easy, especially when there is no regulation concerning with research data management. Research data management is still new in Indonesia and few institutions implemented the regulation. When requesting research data to start the research data repository, the responses varied. This raised a question why researchers refused to submit their data.

This study is aimed at (1) understanding what researchers in the field of library and information science know about research data management; (2) whether they are willing to share their research data to be reuseable; (3) what are the causes affecting the data submission.

This is a qualitative research on the acceptance of researchers' data submission. The informants are researchers in the field of library and information science in Indonesia. Data were collected through an online interview with some researchers in their field.

Researchers in Indonesia are still not aware of the importance of research data management. Lack of understanding about the importance of data usability, data citation and the importance of reusage of data, lead researchers to disregards the invitation and persuasion to submit their research data. The results of the study also show that not all researchers are willing to share their data because they are afraid that the data will be used by others and they want to keep their data closed. In addition, some researchers acknowledged that they did not have valid data and they feel inconcenience if others know that their data are not valid.

Keywords: Research data management, researchers, data, data sharing, data archiving

1. Introduction

Technological advances for collecting, storing, and data analyzing have facilitated the collection of more data now than ever before in history — a phenomenon known as data

proliferation (Borgman et al. 2007; Quinn and Alexander 2008). The era of data proliferation has brought new opportunities and new challenges in areas as diverse as marketing, homeland security, and molecular biology (Spengler 2000; Shaw et al. 2001; Seifert 2004). In China recently, research data management (RDM) is in great demand of Higher Education Institutes (HEI) internationally since 2005 to 2010 (Moe, 2015). This increase in the breadth and depth of data required has encouraged the development of new data strategies to efficiently manage and share available data. The Swedish government, America and Canada has decided that in all diciplines, all research results that are funded by public funds are expected to be openly accessible by attaching research data (Borglund and Bogerud, 2020). The Policy which ensuring that research data are available in public archives is increasingly being applied in government, funding agency, and journal level. This policy is based on ideas that authors need to be the ambassadors of our data, to represent it in a way that speaks to why you made the effort to collect it and what you expect to learn from it. The idea behind open data are that it should be possible to accessible, reuse public information for free to create new ideas and innovations.

It is slightly different in Indonesia, mostly the research it is concerned only on the final result, the institutions or the HE requires to submit the contents/subject of the research only, the research data ita only for the complement (1), it is even more concerned with the administrative reports (2), The data which has been collected or processed by reseachers is only stored by themselves (3).

In practice, the data are still a consideration in research both from sponsors and research institutions, the value of the research data are still has not considered. It caused the researcher can not manage well their research data. According to Childs et al (2014) it is often that researchers store research data on media that are unreliable for preservation, easily lost of important data. Most researchers when it came to storing and archiving research data, its frequently selected on hard drive of a personal PC or laptop, or an external hard drive/USB drive or even cloud. There are some considerations and arguments given by researchers when they want to share their research data.

The absence of regulations and data management policy causes researchers to keep their data by themselves. However The Indonesian institutions are still not aware of the importance of research data management. Lack of understanding about the importance of data usability, and the importance of data reuse, lead researchers to disregards the invitation and persuasion to submit their research data. This is because most of the research data are still managed by researchers or research groups, including researchers in the field of librarianship . One of the issues in librarianship is data management in the library. Awareness about Research and data management just emerge quite recently.

Indonesian Institute of Science (LIPI) was the first intitution that started to build national research data repository (Repositori Ilmiah Nasional/RIN) in all diciplines, followed by National Library of Republic of Indonesia that built data repository in the field of librarianship. These two national institutions are leading the country for the research data management.

On the previous research on open data concludes that regulations concerning the collection and preservation of research data are unclear (Grant 2017). In addition, archival aspects are rarely taken into consideration in research projects, and there is a widespread lack of knowledge about how to preserve research data over time. With regards to Indonesia, research data management is still new and needs to let researchers know about this.

2. Problem statement

Good research is the one that has proper management including its data which are reuseable. In Indonesia data have not been managed well. Researchers usually keep their data by themselves. Whether the data management is good or bad, it depends on the individual researchers' ways of keeping them. When researchers are requested to submit their data, their responses vary—some are willing to share, while some others are reluctant to do so. What might be the reasons behind their willingness and reluctance have not been analyzed. This research is to find out whether the researchers know about research data management, the benefits of research data management, and research data sharing

3. Literature Review

3.1 The importance of Research data and RDM

Data are usually collected or produced as part of the research process and is now being generated in ever-increasing volumes and in a variety of digital formats that are often rapidly being replaced. (Berman and Cerf, 2013; Borgman, 2012; Pryor, 2012). Research data can be in any format in which it is created, for examples: text, numeric, audio-visual, models, computer code, discipline-specific, instrument-specific. Data are divided into two types, namely, (1) primary data (data that are collected for the specific research problem, using procedures that fit the research problem best. (2) secondary data (data that have been collected by others, for another purpose but relevant to your research needs). Complementing this practical need is a changing perception of the value of research data: it has been seen as an asset that must be managed in order to maintain its value (Higgins, 2012; Lavoie, 2012).

According to the Whyte, A., Tedds, J. (2011) "Research data management is concerned with organizing data, from inputting the data to disseminating and archiving valuable results. It aims to ensure reliable, up-to-date and innovative verification of results to build on existing information." In managing data, we have to consider the process, which are: the creation of data and its plan to use (1) Organization, structure, and data name, should be secure and access is provided, (2), storing data and back them up, (3), and sharing data with research collaborators and more broadly, publishing and get the data cited (4). The focus is on what is needed for validation and re-use.

3.2 Why sharing data?

Good management of data should consider research data lifecycle as it allows researchers to analyze and reanalyze data in order to verify the results and replicate studies to train new generations of researchers, to create new ideas and innovations (Bertagnolli et al. 2017). Data sharing has benefit for many reasons: first, without sharing data it is impossible to verify the results of research, this is a good principle of great science (Borgman, 2012). However, it can improve the r euse, visibility of the author, collaboration and research integrity. In addition it also reduces risks of data loss (1), data leak (2), Copyright infringement (3), and Breach of contract (4). Indonesia has some of institutions and some of guidance.

Unfortunately, Indonesia is not quite familiar with research data management. Due to the absence of national or institutional policies, data are generally managed by researchers with

limited access indicates the weaknesses of RDM services are lack of skill, lack of research data policy (Marlina, Purwandari. 2019)

The research data lifecycle model describes and identifies the steps to be taken at the different stages of the research cycle to ensure successful data curation and preservation. There are several stages in the research data lifecycle, e.g. data creation, data processing, data analysis, etc.
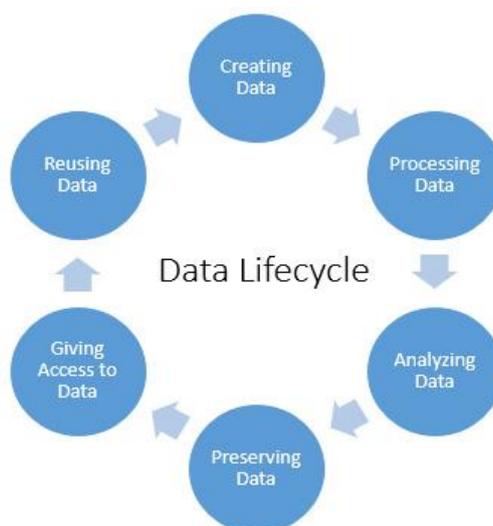
Pict 1: research data lifecycle
(source: https://www.reading.ac.uk/RES/rdm/about/res-rdm-lifecycle.aspx)

There are a few models that one can make use to plan the data management activities, for example, DCC Curation Lifecycle Model. The diagram above illustrate the lifecyle in six stages. The research data cycle needs to be considered by institutions in implementing RDM policies and services, which include: (1) Create; it is included research design, create the framework collecting data and metada (2) Process; data entry, validation, description and storage (3) Analyse; interpretation, derivative of data, and publication (4) Preserve; metadata, documentary and archiving (5) Share; metadata back-up, storage, sharing, accsess control, copyright, and promotion (6) Reuse; Data that are available for discovery and access may be re-used by other researchers

Data are an important economic resource in any of aspects, in any discipline including biomedical research (Downey and Olson 2013). Data can be shared and reused in infinite mode without being "consumed" or reduced in availability (Pronk et al. 2015). Research data management is useful for possible future research but not all researchers are willing to share their data and some take the data for granted or leave the data deteriorating and lost. Regulation concerning with data management in an institution should be implemented in order to make aware of the importance of data repository and data management among researchers. Sadly, in Indonesia most of researchers, the large majority, never receive any training in how to share and communicate about their data, even to their peers. In fact, there are many potential benefits of good research data management, other researchers, and the wider community: Increase impact of research through knowledge transfer (1), Efficiency and ease of data control, reduced easy loss

data (2), Research develops through the reuse of data by a wider range of researchers (3), Compliance with funder and institutional policies and expectations (4), Demonstration of research integrity and verify of research results (5) (Markowetz (2015) Genome Biol 16, 274).

4. Methodology

This is a qualitative research to find out their understanding of research data management, acceptance of researchers' data submission, and willingness to share their data. The informants are Indonesian researchers whose backgrounds are librarianship. Data were collected through online interviews with **25** researchers in their field.

5. Disscussion and Finding

Researchers in Indonesia are still not aware of the importance of research data management. While the National Science Agency (LIPI) has launched the Research Data Repository for all research in Indonesia, most institutions have not implemented any regulation regarding research data submission in their institutions. This also exists in the subject-based research data management, such as Library and Information Science research data management. All othe respondents were also varied from different institutions, such as from higher education, library and other institutions. Due to the limitations of city differences, interviews were conduct by online through video call, phone call and by an email.

Of the 25 researchers contacted, due to busy schedule and other factors, 15 researcher indicated willingness to participate in the survey. Indeed this is in contrast with the data hierarchy in which data reusability is of the highest value. Some researchers state that they use the data for once and they leave the data deteriorating.

In terms of levels of awareness of policies the researchers showed low levels of awareness. Among the researches who archived their data, it is only 5 of them did it for their own re-use. They can organize, Keep it, make it secure, provide access, store and back it up.

What is also surprising of 3 researchers who refuse to share data because they do not want to share. In addition, some researchers acknowledged that they did not have valid data and they feel inconcenience if others know that their data are not valid.

One informant stated as follows:

 "*Aku takut datanya nanti dipake orang dan bisa dimanipulasi*" because they are afraid that the original data can be manipulating by some others.

The other one stated as follows

"*Peneliti selanjutnya bisa mencari data yang lebih baik dari punyaku*" the next researcher can find the better data, than mine. In short, they think that data should be keep by the researcher only.

On the other hand, of the 10 researchers were willing to share the data, but most of them were lost the data or they forgot where they keep it. They are not managing it well enough to make sense of it. They assumed that the lack of attention to storing research data has the impact of not good at manage their personal data management, they just focused on the result of the research. This then causes data loss. Although they are willing to submit their data, but they cannot find their data anymore. Furthermore, the researchers did not consider their research material as public,

but as complementary.

Among the researchers who contacted, the rest of 7 they responded the interview but in the end they did not submit the data.

7. Conclusion

Data sharing can increase the return of research projects by permitting other researchers to perform secondary collect data, doing further study with their own exploration. Based on the study, Indonesian researchers varied in their view of research data management. From the above discussion, it seems that only some researchers understand the importance of sharing data, while others consider data as private ownership. What is suprising is that some researchers consider that sharing data may enable other researchers manipulate the data.

Regulations and policies are important and need to be socialized first so that researchers understand the importance of RDM for sustainable research. The unclear regulations for sharing data make researchers reluctant to provide data (1) There is no regulations from the research institute (2). It is related to this, the authors provide several recommendations to managers of scientific journals, research institutions, funders, and policy makers. (1) For this reason, there is a need for socialization of the data sharing movement both in research institutions and higher education.

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Strategies and Challenges in Archiving and Sharing Research Data: Few Practicing examples from JNU

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Abstract

The strategies and practices in archiving technologies have been considered digital solutions to support the researchers in education and learning. The inclusion of digital technologies for archiving and facilitating the research in various streams has been in vogue in most of the academic libraries worldwide. The awareness of archiving tools and technologies among the library staff to provide support in delivering the information services to the researchers and other educational users has been analyzed from time to time. The present study shares the current practices in context with archiving techniques and higher education through a literature review (rapid-review method) and a case study method. Incorporating accessibility in various information products and services with a wide range of learning tools among the researchers is highly in demand. The vast amount of data generation, sharing, storing and exchanging, etc., are in practice. The inclusion of data collection and storing technologies has been inevitable and necessary to allow easy access to vast amounts of information resources for research students.

There are experiences for sharing best practices, and various open tools support partnerships with communities of support for all aspects of data archiving preservation workflow. These processes involve the transfer, processing, and various activities related to data description and preservation. The current practices and support mechanisms have evolved with the moving times. Significant examples of collaborative initiatives are observed: digitization, maintaining digital collections, virtual collection repatriation, etc. A growing community is available for data-related collaboration to provide data resources for planning and executing digital preservation programs. The processes, such as transcription, including authority research, have been developed rigorously with community support. The paper will also discuss the archival policies and data management tools used in libraries for archiving and for the research support to its users.

1. Introduction

Academic and research libraries are witnessing the proliferation and significance of Research Data. There have been speculations and guidelines from the funding agencies to enforce various policies regarding the archiving of data and its availability. Enhancing the knowledge, it is essential to understand the intricacies of data as:

Defined by the United States Office of Management and Budget (http://www.whitehouse.gov/omb) "Research data is defined as the recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples)".

It is significant to discern that the research data do not include a few items such as Trade secrets, commercial information, personnel, medical information, etc. For a deeper understanding and practical context in libraries, it is essential to decide the nature and set of files and information related to validating the research findings. Due to limitations in storage and technological aspects, prioritizing the subset of r data is necessary as everything cannot be saved or stored. Sometimes, few raw data files may be useful at a particular step, which may be redundant later on. It is crucial to estimate the kind of data that would be useful to reproduce the research results.

2. Data Archiving & Preservation

With the overlapping steps and practices, sometimes, backing up and archiving seems similar to many people. It is significant to differentiate the concepts such as "backup" and "archiving" which are often applied interchangeably in saving the file or some information. It is necessary to realize that both are entirely different processes as the 'backup' process is meant for making multiple copies of various files keeping the variation in mind. The archiving is intended for" preservation of files based on 'as-is'. , as a final) record" (source: DataONE education module).

Planning of preserving the data involves the local archive storage (local server, network or any digital repository). There are various public data repositories meant for multiple subject areas in www.re3data.org, for example. Most of the time, digital repositories in universities (called "institutional repository") function as an archive and a platform to share the data/information. This data/information is often accompanied by DOI, and discoverable through Google, etc.

Significant components for archiving data include; understanding the file formats for long term access, the data and research documentation at various steps, data retention policy for no less than the minimum retention period, the use of human subjects, and device research. The additional data sharing and archiving necessities are comprised of issues such as Ownership and privacy in the context of copyright and IP ownership and ethical requirements like privacy and confidentiality. There are few other significant issues such as retention, distribution, and control of the data.

3. Data Archiving, Integrity and Sharing at University Level Environment

The fragile and susceptible nature of digital data always demands precautions and measures like refreshment and replication. Software Obsolescence is another major issue while archiving

the final version of dataset(s) to fully access the future. It is advisable to store the data in a proprietary format with the provisions to ensure access to older datasets, followed by migration of older datasets or emulation using a suitable virtual machine. The best practice may include converting data to an open format for extended preservation, exchange, and sharing. For data storage and backup, for example, The UK Data Archive (http://www.data-archive.ac.uk/create-manage/storage) has provided the guidelines:

- Usage of data formats for storage strategy with long-term availability and at least two other storage and location forms by maintaining three copies (original copy, external local copy and a remote copy)
- Checking data integrity and updated knowledge of institutional strategy, data retention policies in the context of funding agencies, publisher/ aggregators, and the organization

Data management plans in university libraries contemplate expanding increased public access for government-funded research. To improve research data sharing, digitally formatted data should be stored and made available for research and retrieval. This is possible by applying various strategies such as improving public access by protecting privacy and confidentiality etc., ensuring the creation of data management plans for long-term preservation, including cost-effectiveness and profitability. It is crucial to keep the merits, strategies, and mechanisms of data management plans consistent with organizational policies to promote data submission to increase public access. This also includes aspects such as interoperability, standardization of data citation/attribution approvals, training for library staff, relevant depositors, and long-term preservation goals. There are conditions under which data must be shared! Some community standards and funding agency guidelines, and data-sharing mandate express few variations. These variations are governed by discipline type and data type, and the procedures include: data sharing should take place "within a reasonable time frame," depending on the nature of the research project, for further policy development. This further envisages the following terms of embargo periods in the context of factors such as political nature/ educational purposes / commercial ventures / intellectual property rights.

The above discussion leads to observation that the research data and other resources need reliable digital storage at various higher education scenarios. In this context, archiving process, Data Management Plan can include the documentation of Ownership and responsibility for the data with the support of "Memoranda of Understanding" (MOUs); authorized access and restriction measures, along with backup copies, distributed over a length of time at decided locations in relevant formats with adequate descriptive metadata (Smithsonian Libraries and Archives - Natural History Building, 2021).

4. Background

The considerable amount of data, sharing, storage, and sharing etc., is in practice. The content of data collection and storage technology is inevitable and necessary to provide research students with easy access to large amounts of data. There is an experience of sharing best practices and various open tools working with communities that support the entire data collection and retention workflow. These processes include multiple operations related to the processing, description, and protection and transportation of data. This study shares current archiving methods and practices in university libraries through the literary review (rapid review method) and the case study method.

It is complicated to adopt, and Incorporating access to a wide range of information products and services, including a wide range of learning tools, is highly demanding among researchers. This study is divided into two aspects: review of the literature and a case study of JNU Library.

5. Review of Literature

The present study has applied the Rapid review method due to time limitations and observes the most recent practices (literature from the past two years' 2020-2021 publications). Rapid reviews are a form of knowledge synthesis in which the systematic review process components are simplified or omitted to produce information promptly (Khangura, Konnyu, Cushman, Grimshaw, & Moher, 2012). Yet quick reviews might be susceptible to biased results due to streamlining the systematic review process (Kumar & Sharma, 1998)(Ganann, Ciliska, & Thomas, 2010) (Watt et al., 2008). The following working definition, "a rapid review is a type of knowledge synthesis in which components of the systematic review process are simplified or omitted to produce information in a short period"(Khangura et al., 2012).

Areas for the rapid reviews: the present paper has focused upon the following areas:
- Data Archiving & Preservation processes and knowledge content
- Research data and information sharing
- Knowledge users, techniques, and services

Some of the important studies under the rapid reviews are elaborated below:

T Balogun and T Kalusopa published how web archiving of indigenous knowledge (IKS) can be done through institutional repositories in South Africa. The authors provided a framework for Web archiving IKS-related websites in South Africa (Balogun & Kalusopa, 2021)

A Mkadmi in his book Archives in the Digital Age: Preservation and the Right to be Forgotten published the key concepts of digital archives, its methods and Strategies, how archives are done in the age of Digital Humanities. The author also explained the role of big data in digital archives and finally how right to be forgotten relates to the preservation of archives (Mkadmi, 2021).

A Slavic, R Siebes and A Scharnhorst in their book Linking Knowledge explained what the Need for Knowledge Organization is and how to classify Open Data Linked for Knowledge Organization. What are the Challenges and Opportunities of Linked Open Data and publishing a Knowledge Organization System as Linked Data (Slavic, Siebes, & Scharnhorst, 2021)

Faten Hamad, Maha Al-Fadel and Aman Al-Soub in there paper Awareness of Research Data Management Services at Academic Libraries in Jordan discussed the roles, responsibilities and challenges. The author elaborated that RDM services requires Library professionals with new skills and collaboration for working with researchers and library users so that they can manage their research data. The paper elaborated the requirements and challenges in academic libraries in Jordan to provide RDM services (Hamad, Al-Fadel, & Al-Soub, 2021)

A Young Yoon, Angela P. Murillo and Paula Anders McNally examined the digital preservation course content through an analysis of course syllabi to understand what is taught in library schools related to the Data Archiving and Preservation Process (Yoon, Murillo, & Anders McNally, 2021)

LC Gleim and S Decker in their paper Open Challenges for the Management and Preservation of Evolving Data on the Web discussed the challenges and propose data persistence layer for data

management and preservation, paving the way for increased interoperability and compatibility (Gleim & Decker, 2020)

Anjana R. Bunkar and Dhaval D. Bhatt discuss the role of library in towards Research Data Management System and identified the perception of Researchers & Academicians of Parul University. The paper concluded that researchers and academicians in library are more concerned about their intellectual property rights while sharing the data on the public domain (Bunkar & Bhatt, 2020)

M Ashiq, MH Usmani and M Naeem did a systematic literature review on research data management practices and services. In the literature they found that an active collaboration is required and combination of measures is required to better manage research data among stakeholders and university services departments to identify the challenges and issues (Ashiq, Usmani, & Naeem, 2020).

How libraries are support the Research data management is explained by Fernanda Gomes Almeida and Beatriz Valadares Cendon. The authors have surveyed the literature to propose taxonomy of services to support research data management. The paper gives the guideline for institutions or professionals who wish to develop RDMS (Almeida & Cendón, 2020).

6. Case study of JNU Library

Dr B R Ambedkar Central Library, Jawaharlal Nehru University (JNU) promotes Data sharing so that the research data is available to a broader audience, and thus further promotes the long-term preservation. The staff of the JNU Central Library provides the help to faculty, researchers and students with support on long term management of data and curation services. This helps the users to preserve their research data into the future in a trusted repository. The suggested repository can be discipline specific data repository or centre of it can be National or International Repository. Similarly data preservation and archiving are also need by the publishers for publication in journal or other publications, but these are generally added in non-curated repositories by the users.

The concept of data sharing started with users sharing the data on personal or lab websites, Electronic Lab Notebooks (ELNs), wikis, and similar tools. Since these platforms and sharing mode are not secured and authentic, the libraries came in forefront to provide the best solution that ensures that data is discoverable, accessible, and preserved over the long term. JNU Central Library is regularly helping and guiding its researchers and users to select an appropriate repository, data journal, or other strategy for sharing data.

7. Discussion

The repository option to deposit the data depends on the Repository and its policies and the term and conditions like how the data will be accepted, what are the requirement of submission and is there any cost or fees for depositing the research data. The detailed long term preservation policy needs to be studied by the user before submitting the data.

The role of data management for archiving and sharing is not limited to providing the data collaboration and sharing tools to the users and researchers but also involve helping them with the data collection and analysis. The libraries around the world are providing the data

management services which also includes support of high performance computing and guiding with Copyright and Intellectual Rights of the data. Data management is incomplete without Metadata Services, Security Support, Storage, Backup and Data Recovery Services.

8. Conclusion

The Strategies in Archiving and Sharing Research Data need to be ethical and there is legal obligation when archiving and sharing research data of the researchers and the users. The data need to be secured and access need to be authentic. All the data at receiving and giving end need to be as per the license agreement. Sharing of data helps the researchers to validate their data and reuse if for further research. The data can be reused for teaching and even commercial purposes. Since the data can be part of research project and can he have the commercial and financial value. While sharing the data libraries need to secure the data and sort the challenges of ethics, legal, financial, cultural and technological nature.

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The Changing Experiences of Researchers in the Pandemic: Survey on Research Behavior during the COVID-19 Pandemic at the National Library of Korea

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Abstract

At the end of February 2020, the National Library of Korea was closed, and it was just the beginning of long and tiresome repeats of shutdown and reopening of the library in order to prevent spreading of COVID-19 like many other libraries. This paper aims to clarify the current situation that researchers face which caused by the COVID-19 pandemic and what it means for future strategy. 138 RINK (Research Information Services at National Library of Korea) researchers were requested to answer 13 survey questions regarding their experiences during the pandemic and 39 unique responses were analyzed. The main obstacle during the shutdown appeared to be the limited access to digital contents including e-journal articles, e-books and web-based resources since most of them are highly dependent on online resources. Therefore the usage of online resources was increased remarkably comparing to the same period of the last year. At the same time, they showed strong needs for physical research space while some of researchers expressed the fear of infection which is the reason they hesitated to come back to the library reading rooms. The results of the survey offer keys to the users' actual needs and insights on future direction under the pandemic.

Keywords: research behavior, user behavior, library services under the pandemic, research information services

1. Introduction

The National Library of Korea (NLK), founded in 1945, is a comprehensive and treasured repository of intellectual and informational resources of the Republic of Korea. The NLK has an extensive collection of domestic publications and digital materials that guarantees convenient and equitable access to useful resources for the citizens. With over 14 million collection items, we launched featured services for researchers together with the opening of a research reading room in July 2018 in order to encourage researchers to utilize this precious national collection. Since the launch of the service, about 240 research projects have been done in RINK (Research Information services at the National Library of Korea), which includes national R&D projects, dissertations, journal articles, Korean studies research projects, etc. As of December 2020, 30 projects were officially published as peer-reviewed journal articles, academic books, and dissertations. And also the NLK supports all kinds of activities of academic organizations, so over 230 meetings have been held in collaborative spaces which located in the research reading room.

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

2. Survey background

During the COVID-19 pandemic, the NLK closed all library buildings, and then shutdown and re-opened libraries repeatedly in accordance with the social distancing levels. From the first shutdown, the librarians at the RINK strived to stay connected with researchers, so they could be informed about remote accessible resources and services provided by the NLK. They were recommended to pick up personal belongings because nobody knows when it will be possible to come back to the library again.

We decided to find researchers' experiences: how they have done and how they are doing their research since the shutdown of the library; how they feel about such inevitable changes and what we can do better to improve users' experiences. We expected some findings for improving our services under the pandemic. A total of 138 researchers who are currently carrying out their research in the NLK were requested to answer 13 survey questions regarding their experiences during the pandemic.

3. Survey Results

3.1. Before the shutdown of the library

The essential benefit of being a RINK researcher is extended access to a tremendous collection of the NLK. The need for steady research space is the other top priority (Figure1). The most preferred resource type is printed books, but also they are highly dependent on online resources (Figure 2).
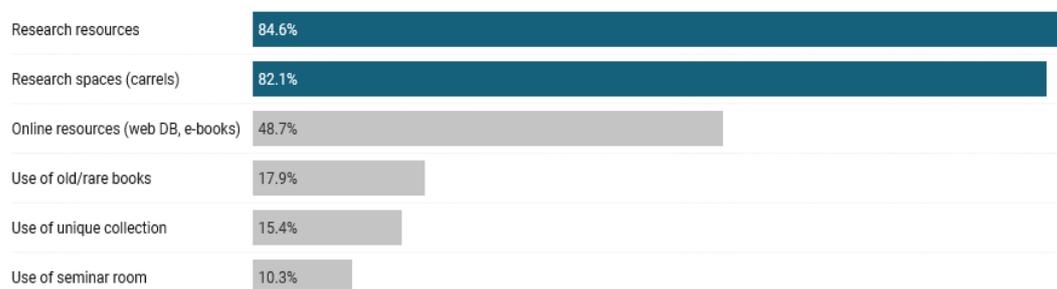
Prefered benefits of RINK (Multiple choice)

Research resources	84.6%
Research spaces (carrels)	82.1%
Online resources (web DB, e-books)	48.7%
Use of old/rare books	17.9%
Use of unique collection	15.4%
Use of seminar room	10.3%

Figure 1

Prefered resource type (Multiple choice)

Online　Offline　On/Offline

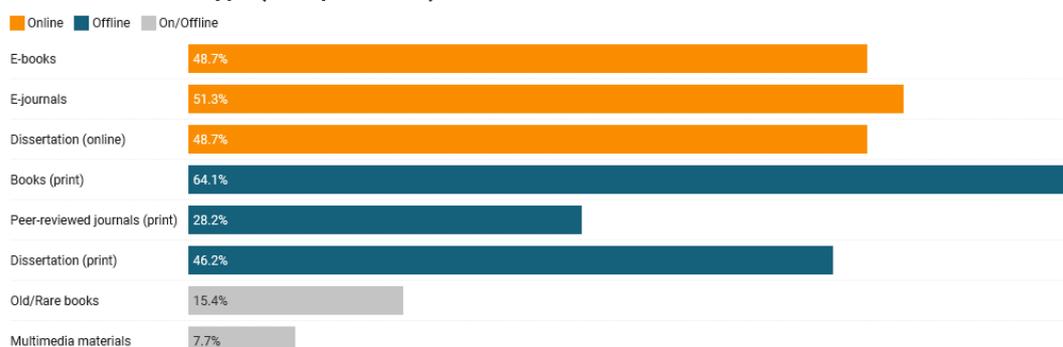|	
E-books	48.7%
E-journals	51.3%
Dissertation (online)	48.7%
Books (print)	64.1%
Peer-reviewed journals (print)	28.2%
Dissertation (print)	46.2%
Old/Rare books	15.4%
Multimedia materials	7.7%

Figure 2

3.2. Amid the shutdown of the library

The first shutdown of the library lasted for about 5 months from February 25th to July 21st of 2020. 89.7% of respondents answered that they continued their research at home while social distancing. All off-site events were cancelled or substituted by online meetings with virtual conference tools. The 2020 RINK annual meeting was on Zoom, and various online tutorials for online databases, statistical tools as well as writing classes were provided for researchers.

Undoubtedly, the most challenging thing for researchers since the COVID-19 pandemic is the inaccessibility to library materials. All of the respondents have struggled with keeping their research going because of the limited access to information resources and lack of personal research space. Many of them, especially independent researchers who are not affiliated with any institutions, seemed to highly rely on physical spaces in this library as well as information resources.

As soon as we realized that the situation would not be terminated in the near future, the NLK worked to secure better access to a variety of information resources in diverse ways. We negotiated with major publishers and vendors to ensure the barrier-free access to full texts. We also encourage national authors to permit fair use so that everybody can use digitized full texts without worrying about infringing the copyright when all libraries were shutdown. Figure 3 shows that the usage of web-based contents was highly increased compared to the same period in 2019.
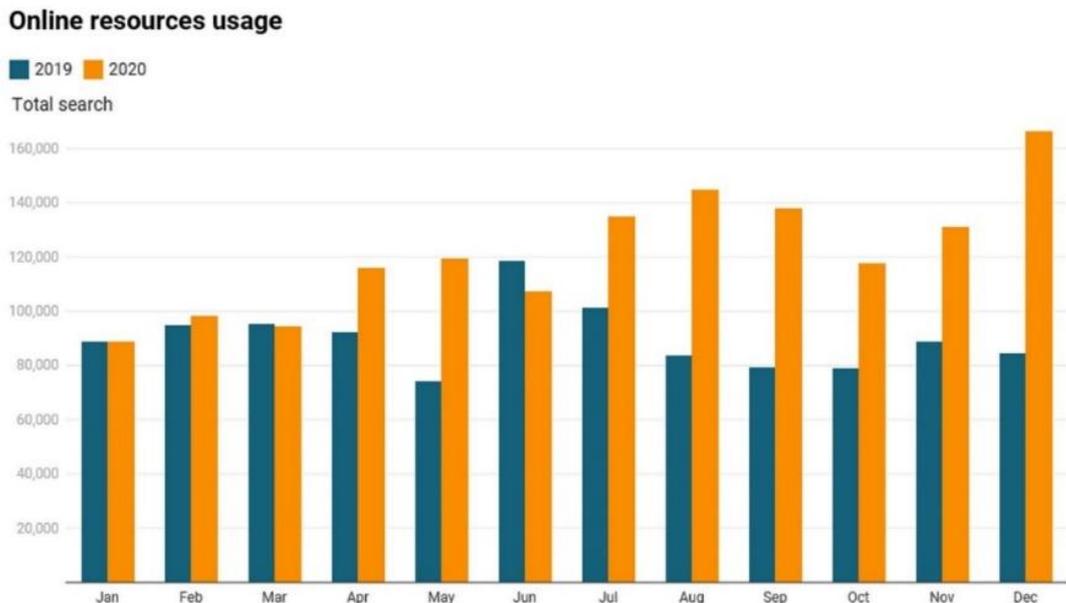

Figure 3

3.3. After reopening the library

In the summer of 2020, when the spread of COVID-19 was alleviated slightly, we decided to reopen the library after long discussions and preparations complying with the guidelines from the KDCA (Korea Disease Control and Prevention Agency), which were revised continuously.

When we reopened the library after 5 months shutdown, patrons faced completely different circumstances, requiring appointment for visit, limited seats for social distancing (30-100% of total seats upon social distancing level), shortened hours of operation in order to let them avoid

crowded public transportations during rush hour, weekends closures, etc. The collaboration rooms were also closed as the rules were applied to the total number of gathering members. They also have to follow health screening procedures, and wear masks all through their stay in the library. Figure 4 is the word cloud of keywords from written answers for the difficulties about the new operation rules.

92.3% of respondents visited the library after the reopening. Even in hypothetical circumstance that they are provided with enough access to research materials, 97.4% of respondents answered that they are eager to visit the library physically (Figure 5).

There, however, are some researchers who have never come back to the library. The main reason for hesitating to come to the library is some bothersome steps before visiting such as making prior appointments which became mandatory since the reopening. A considerable proportion of respondents (25%) expressed a fear of infection despite the strict disinfection procedures for library patrons, staffs and facilities (Figure 6).
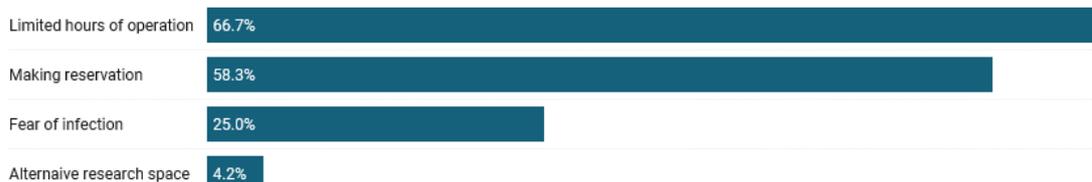

Figure 4
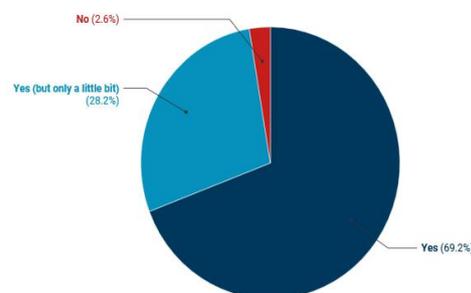
Figure 5

Figure 6

4. Findings and changes

The need for remote access to digital contents has never been higher. The information inequality issues are intensified by the pandemic. There seems to be a considerable gap between researchers with affiliations and independent ones. The affiliated researchers tend to have difficulty in keeping up their research even during the pandemic while others have trouble with finding materials and spaces. The national library is responsible for mitigating the gap.

Regarding the library space, we have been addressing the issues that we should maintain physical space even while we have more comprehensive e-resources than ever before. The researchers showed strong need for the space. Even though they are working independently, they are eager to

work in fellowship at the same time. Now we are planning to expand the research reading room with more carrels and collaborative spaces.

As a result of this survey, we clarified the needs of researchers, so we made some developments in services in order to support them better. The reservation time is extended from 5 p.m. until midnight, and we tried to make some online resources remote-accessible until the end of the pandemic with cooperation from the major vendors & publishers. We are also considering making some materials loanable while all physical materials are available only on-site at NLK. In February 2021, we will launch video chat reference service for providing researcher with customized tutorials of online DBs and user orientation sessions.

Not only users but also librarians are experiencing sudden and inevitable digital transitions derived from severe pandemic situation. We need to be more competent in dealing with digital technologies, copyright issues and even in infectious diseases in order to better support users in the pandemic era.

The Development of Library Science and Islamic Information Based on Post Chat Group Media Social Expert

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Abstract

Introduction. *Librarian must become a master at library science. Library science can be studied at educational institution, education and training that are held by library institutions and also can be gained through self-study.*

Problem. *The development of library science must be fitted with product capacity at library institution itself such as: technology, human resources, and capital utilization. The formulation of the problem is: What are being discussed by the experts about the development of library science that should be owned by the librarians.*

Research Methodology. A qualitative research using phenomology method. Phenomenology is used to analyze the document that has been posted or being the topic of discussion at chatting page at group of experts such as IFLA, Group Museum, Group of National Library in national nd international scale, Group of Librarian, Group of Scientist, and Group of International Journal's Writer.

Result of Research. The development of library science and Islamic information in technology sector should be mastered by librarians.

Key Words: Islamic Library Science, Islamic Information Science, Social Media

1. Introduction

Numerous amout of educational institutions have library room or library in building site that hire staffs at library who come from non-libraray science background. It is known that at least to be called as libarian minimally should be background in library science or librarian certification that is equal as D2. This shows that being a librarian should be taken seriously and laid on laws, rules and guidance in library science.

According to the law from Head of Republic of Indonesian Librarian Number 11 Year 2015 about technical guide functional librarian officer and credit number and techinacl guide … at

number 4. The research and development of Perpusdokinfo (Librarian, Documentatio and Information) explained that librarian in doing the development, documentation, and information must arrange the instrument, the data collection and process, the data analyses and formulate the result's research and evaluation to be completed as a report. Should all the research activity be arranged and written as a comprehensible scientific paper and could be promoted as one of professional development activity namely as writing scientific paper.

Definitely the activities in Pusdokinfo must follow the development of library science and information technology. A librarian should follow the group of experts in Pusdokinfo to know the update of information and documentation in library science. In this group, the experts discuss about the breakthrough of librarian profesioanlism and skills in digital section.

2. The Relevance of Library Science and Information and Librarian Profession

A profession is built from knowledge. Librarian is built from library science itself. Therefore a professional should work from the basic of knowledge to be labeled as an educated one. As a result, to be a professional librarian, someone at the bar minimum should have studied D2 of Library Science.

In order to preserve the existence of library science in work field, (Suharyanto and Edi Wiyono, 2020) it is needed to develop the science of library through research in library science. Library science should welcome towards the other discipline.

The followings are the research of library science development and Islamic information from the expert's discussions.

3. Research Merhodology

This research was categorized as field research which used phenomenology method. Phenomenology method used to see the actual understanding from experience and research result described by people individually.

Research Subject. The subject of this research is a group of experts in social which is librarian group at WhatsApp, Telegram, Facebook and Instagram.

Informants for Research. The infromants were subjected by laying on Moser theory where they have characterestics such as reproductive, productive and social. Therefore the research informants were experts at library science which were doing discussion about library development and professional librarian era 4.0.

Data collection method. The data were gained by chat discussions and the materials delivered by the experts in group.

Data Presentation. The data had been reduced to be in narration and equipped by the materials to be understood easily.

Conclusion. The conclusion was formulated from the the result of analysis that has been done before. The conclusion is credible because it was supported from the data that are relevant.

4. Research Results

From the survey and analysis, there are some developments of library science and Islamic information during pandemic era that should be owned by librarian which are:

4.1 Information Organization

There is an advancement of cataloging standardization of library collection from AACR2 to RDA (Resource Description and Access) According to Lilies Fardhiyah that RDA has its own advantages than AACR2 such as:

a. The structure and newly emphasizing system of collection
b. It is designed following the digital advancement
c. Flexible and easy to adapt with future
d. RDA compatibility and various metadata scheme
e. RDA is oriented to librarian
f. RDA used the benefit of FRBR model holistically

These are noticeable from the scopes of RDA standard book :

And RDA also has advantages over AACR, as shown in the image below

AACR2	RDA
Terbit hanya dalam versi cetak	Terbit dalamversi cetak dan online
Dibagi berdasarkan jenis bahan pustaka	Tidak berdasarkan jenis bahan pustaka
Tingkatan deskripsi	Tidak ada tingkatan deskripsi
Penggunaan GMD	Menggunakan Content, Media, Carrier
Ada Singkatan	Tidak ada singkatan,kecuali cm.
Rule of three	Tidak ada rule of three, tetapi bersifat pilihan
Deskripsi berdasarkan ISBD	Deskripsi berdasarkan core element

AACR2	RDA
Entri Utama	Titik Akses Kepengarangan
Pilihan Titik Akses	Hubungan FRBR
Bentuk Tajuk	Entitas FRAD

Consequently, the speaker wants to see the change in library collection process, where currently only use standard AACR2 and hopefully to be migrated to RDA because of digital advancement and librarian oriented features.

5. Islamic Information

Librarians who have an education from the General University and then work at the Islamic University library institution experience many obstacles, namely the problem of Arabic language skills because Islamic library institutions have Arabic-language collections.

This problem is especially for librarians in the field of material processing Librarians and librarians in the information services section (reference).

Agus Rifai explained that Islamic libraries are managed by library staff who are dedicated to science, scholars and students of knowledge.

SDM Perpustakaan Islam

Sebagaimana layaknya, perpustakaan-perpustakaan Islam dikelola tenaga perpustakaan yang berdedikasi terhadap ilmu, ulama, dan penuntut ilmu

Muhammad Mahir Hamadah (1981), pada perpustakaan-perpustakaan umum atau besar terdapat tiga kategori tenaga perpustakaan, yaitu *Al-Wakil* sebagai pengelola atau manajer utama (kepala), *al-khazin* sebagai pustawakan ahli (*amin al-maktabah*), dan asisten pustakawan yang disebut dengan *musa'id.*

Riwayat lain musa;id disebut juga *al-musharraf,* dan *al-munawil*

With the development of technology, the above problems can be overcome with technological developments. Librarians have language problems but are able to use online dictionaries both in Arabic and in other languages, so the librarian can process Islamic library materials and search Islamic information.

According to Agus Rifai, this change in performance is due to the impact of Disruptive technology enters the world of libraries.

Disruptive technology in Libraries

Paradigma
- Teknologi telah mengubah konsep dan teori di bidang perpustakaan

Profesi
- Teknologi mengubah cara-cara melakukan suatu kegiatan / pekerjaan

Manajemen
- Teknologi mengubah penyelenggaraan / pengelolaan perpustakaan

6. Data-Driven Collecitons Managements

Rahmi suggests that the librarian's performance should be based on Data Driven. Data driven is one approach that carried out in doing work using data as a reference or basis for the work itself,

especially in the process of analysis, interpretation, and also presenting the required data. Data-Driven, Rahmi explained that small research in the library can be used as shown in the image below:

Research opportunities:
## Data-driven collections managements

- The variety and scope of the data collected and generated by GLAM is significant
  - Transactional data on catalogue searches
  - Item check-outs
  - Log-ins to online resources and services
  - Swipe through the entrance gates
  - Manually collected statistics on space usage
  - Student satisfaction
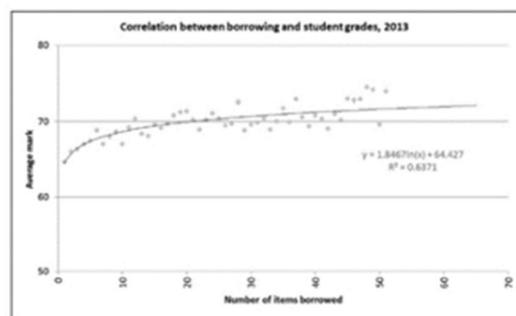 - External visitors to the library

18

The example of library analysis using data driven

Using data to demonstrate library impact and value (Showers (Ed.), 2015)

- Resource use and student performance
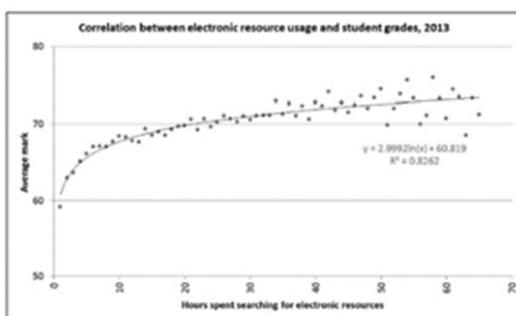
(a) Correlation between **electronic resource usage** and **student grades**

(b) Correlation between **borrowing** and **student grades**

20

Many jobs related to statistics in the form of reports are abandoned. According to librarians, the statistics are automatically presented by the library application engine. But the application engine usually presents globally and librarians need to sort out and then make in-depth reports so that researchers can use them for further study or library development.

7. Socially Inclusive-based Services

According to Adnin Bonar, libraries have a role in development, namely as a center of knowledge, a center for community empowerment and a cultural center.

Libraries must adapt in order to provide social inclusion-based library services, as shown in the image below.

As for the target for the transformation of social inclusion-based library services, Adnin Bonar explained as follows:

The following figure depicts the findings of the impact analysis of the library transformation until 2019:
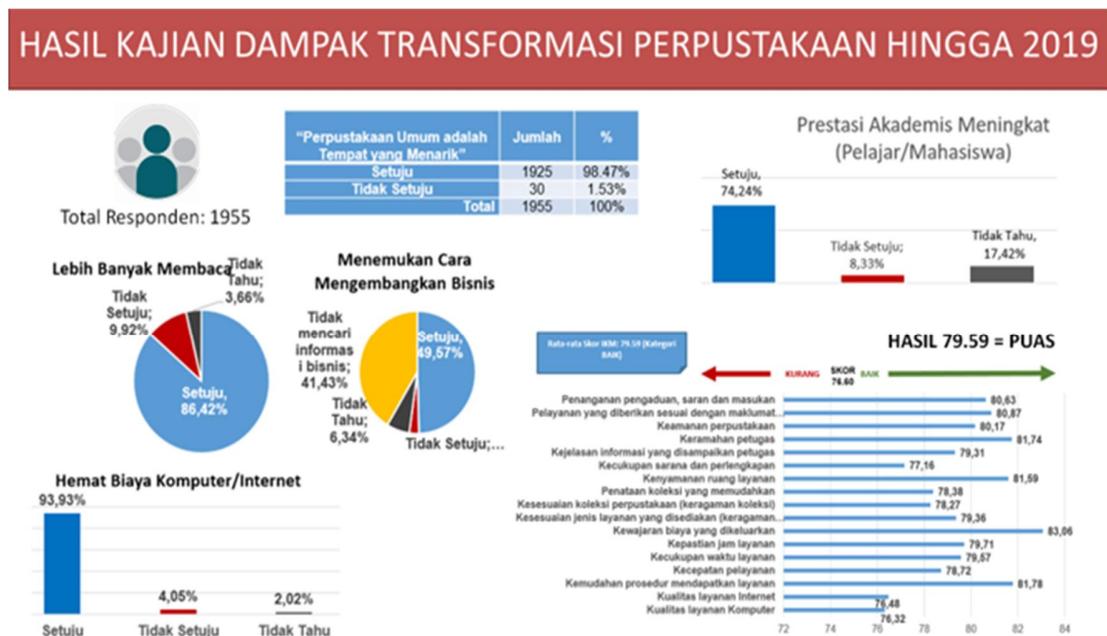
8. Big Data Onesearch

Indonesia Onesearch is a web portal for bibliographic and fulltext collections, using data gathered through harvesting methods and portal members' online repositories. OneSearch allows users to search and access all of Indonesia's electronic (digital) library collections through a single portal. Users can read, download, and watch videos, as well as learn about many topics.

Many libraries are members of OneSearch. Librarians who work in OneSearch member libraries, try to continuously add collection data to the OneSearch application because the more collection data sent, the more known our library is to the general public

9. The Society of Perpusdokinfo

Perpusdokinfo facilities include: a) Counseling, b) Publicity, and c) Exhibition In the pre-digital era, Perpusdokinfo's correctional activities (library, documentation and information) requires quite a large amount of money because this activity is related to the general public so that it requires a work team and the cooperation of various institutions. But in the digital era, this activity is so simple and sufficient with low costs but requires high skills and expertise in the field of information technology. Such as: Facebook, Twitter, Instagram Path, kaskus, Google+, MarketPlace, Blog, Email Marketing and Youtube.

10. Bibliometric, Saintometric and Informateric

Sri Hartinah explained the relationship between bibliometric, scientometric and infometric as follows

- Secara khusus, Bibliometrik adalah milik ilmu perpustakaan dan dokumentasi, Saintometrik milik ilmu sains, dan informetrik milik ilmu informasi (Brookes, 1990; Qiu et al., 2017; Wang, 1998).

- Wen dan Qiu (2006) mengemukakan bahwa ketiga metrik di atas milik disiplin superordinat yang berbeda. ; Namun, mereka **memiliki objek penelitian, indikator, dan metode yang sama**.

- Beberapa percaya bahwa tiga metrik menunjukkan hubungan yang saling silang dan tumpang tindih sebagian, tetapi yang lain berpendapat bahwa ketiga metrik tersebut menunjukkan hubungan yang inklusif. informetrics memiliki banyak arti (bibliometrik dan scientometrics(Qiu et al., 2017).

- Masa depan penelitian untuk Ilmu Perpustakaan dan Informasi bergantung pada analisis web dan analisis informasi dengan perkembangan terkini dalam analisis metrik informatika, saintometrik, webometrik dan altmetrik.

HUBUNGAN ANTARA
BIBLIOMETRICS, SCIENTOMETRICS DAN INFORMETRICS

- Ketiga istilah *bibliometrics*, *Scientometrics* dan *Informetrics* telah berkembang untuk berbagai tujuan dan memiliki banyak metode serta tools yang sama (Qiu et al., 2017)

- Ketiga metrik mengacu pada "bidang komponen yang terkait dengan studi tentang dinamika ilmu, tercermin dalam produksi literatur" (Hood & Wilson, 2001).

- Ketiga istilah tersebut sering muncul secara bersamaan, atau digunakan secara bergantian oleh penulis, misalna Konferensi Internasional. International Society for Scientometrics and Informetrics (sekarang disebut "ISSI").

In the sector of libraries, there is a trend toward librarians being able to learn bibliometrics, scientometrics, and informetrics. Librarians with expertise in this sector can utilize mathematical methods to assess the strength and accomplishments of scientific research, disclose the process of scientific advancement, and give a scientific foundation for scientific decision-making and administration.

11. Conclusion

Based on the the description above, it can be argued that library science is expanding, necessitating librarians to obtain abilities in the field of information technology, namely:

1) Data Processing at E Resources
2) Analytics of Big Data
3) Publishing on the Internet
4) Curation of digital content
5) Data Services for Research
6) Production of Digital Resources
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The Evaluation of UIN Maulana Malik Ibrahim Malang Library Physical Space Redesign as Digital Ecological Impact

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Abstract

This study investigates the level of quality changes in the function of the library's physical space to meet the user need. The research approach used quantitative with surveys methods. The instruments use the TEALS. Respondents numbered 200 students using the simple random sampling method. The results showed that overall the redesign of UIN Maulana Malik Ibrahim Malang library room had a positive impact of 76% on users of library utilization. Meanwhile, the most positive influence on quality criteria is a positive image and identity, and the least effect is flexibility and adaptability. Quality criteria that need attention and follow-up improvements are the quality criteria that get the lowest score. This is the first research in the UIN Maulana Malik Ibrahim Malang library. The study results can help improve the quality criteria of library space based on user needs.

Keywords: Academic Libraries, Library Space, Library Physical Space, Learning Environment

1. Introduction

Industry 4.0 is changing the function of space as part of the library ecosystem. The library needs to transform its function from a "book warehouse" to a place of social networking for visitors (Abbasi et al., 2012b). Recognizing this demand for change, Universitas Islam Negeri (UIN) Maulana Malik Ibrahim Malang Library redesigned its entire physical space. However, whether the change in the library space characteristics has an impacts conformity with users' needs or not is yet to be known. Therefore, the redesign of this library space needs to be evaluated to identify the utilization level and, if necessary, the follow-up improvement.

Redesigning the library space is the utilization of the ecological concept of digital information. This space redesigning combines information, IT assistance service, and flexible, formal and relaxed study rooms to be available in one place (Perpustakaan Pusat UIN Maulana Malik Ibrahim Malang, 2017). A digital ecological concept can be used as a means to reduce overlapping complexity (García-Marco, 2011).

The results of the evaluation study of library space redesign showed positive results by increasing more than 30% of students' visit to the Library (Abbasi et al., 2012b). This shows that library space redesign using a digital ecology approach has a positively impacts on increasing library utilization by users.

Based on the description above, the aims of this evaluation are:

- To find out the quality of UIN Maulana Malik Ibrahim Malang Library space redesign in meeting users' needs based on the criteria of quality within TEALS (Tool for the Evaluation of Academic Library Spaces).
- To help the library carry out the effectiveness of the library space design improvement program.

Thus, this study supports the realization efforts to develop a more planned library space of UIN Maulana Malik Ibrahim Malang Library and is expected to produce policy recommendations for the development of library space that reflects the needs of the current users. The spatial quality criteria expected by the visitors will contribute to the Library as feedback in making space development policy guidelines in accordance with the quality expected by the users.

2. Literature review

Previous studies about the overall spatial of a university library in Indonesia do not exist. Some of the results of previous studies only examined a portion of the university library layout. Meanwhile, comprehensive studies were conducted at a public library.

3. Research on library space planning at Indonesian universities

Two studies of library space were reviewed based on only the needs of users were found. The first study included research on the layout of Indonesian collection circulation in Andalas University Library, which found that the layout was less attractive (Deslina & Ardoni, 2012). The second study found results of spatial research in Padang State Polytechnic Library. The study found that the library's size did not meet the standards, reading tables were not equipped with dividers, there were no rooms of library material management, and the limited size of the building resulted in the void of conservation and preservation rooms (Wulandari & Rahmah, 2017). The two results of the studies showed that the existing library space was not meet its users' needs.

4. Research on library space in regional/public libraries

Two results of research related to the perspective of users that are relevant to this study. First, the research on comfort and health aspects in Bank Indonesia Representative Office Library in Central Java Province. This research found that visitors' perspectives to aspects of comfort and spatial health were influenced by five main factors, namely temperature, sound, colouration, lighting, and furniture (Anisatun & Jumino, 2017). Second, the research on library space planning at the Office of Maritime Affairs and Fisheries Library in Central Java Province in terms of users' perception. This study's findings indicated that space planning at the Office of Maritime Affairs and Fisheries Library is considered quite good by users (Saraswati & Jumino, 2016).

5. Library space planning in digital ecology

The development of digital information technology has an impact on changes in the function of library space. This evolution is a response to a new culture of library users in using libraries. Changes on library environment can be understood through an ecological approach to information that is the approach that emphasizes the cultural, social and psychosocial, and technology process related to the system of information and documentation (García-Marco, 2011). Therefore, the development of library space planning must understand users' needs who not only need information but also social interaction.

6. Transformation of physical space in university libraries

Changes in the ecology of digital information require libraries around the world to change the library space to be more conformable with the changing needs of users. There are four aspects that need transformation in the university library space today, namely the transformation of library from a "book warehouse" into a place of human interaction, creating a library space that is friendly and attractive, making an adequate library road map, and maximizing the creativity of spatial use (Abbasi et al., 2012b). These aspects can be understood that the current university library needs to provide space facilities not only for the collection of books but also for meetings, collaborative space, special room for researchers, relaxing room, and all spaces connected with adequate internet connection and bandwidth. Library room facilities must be designed to be attractive in accordance with the needs of millennial users.

7. Physical space redesign of UIN Maulana Malik Ibrahim Malang Library

In 2018 and 2019, the UIN Maulana Malik Ibrahim Malang Library redesigned the spaces to respond to digital information ecology changes that have influenced user culture in-library use. Based on statistics, before the redesign was carried out, the number of visitors to the library continued to decline drastically from year to year. However, the impact on the new library space changes in service improvement efforts has not been evaluated. Therefore, it is necessary to evaluate the new library space quality to determine how the impact is on the users and to know the shortcomings as feedback for future space development.

8. Evaluation of university library physical space

A good evaluation has good quality criteria (measuring instrument). TEALS (Tool for the Evaluation of Academic Library Spaces) is one of the university library spatial evaluation tools created by the School of Architecture, Deakin University, Australia. TEALS uses ten quality criteria to measure whether the library space functions properly and accommodates the users' needs. These criteria can be applied to university libraries in various contexts (Abbasi et al., 2012b). TEALS criteria were implemented as an evaluation tool to measure the library's physical space's effectiveness and utilisation in several libraries in Australia (Abbasi et al., 2012a, 2014).

The ten TEALS criteria are:

1) Positive image and identity. Criteria for library positive image and identity both in terms of interior and exterior.
2) Welcoming and inviting entry. Criteria about the design of library entrance that attracts users.
3) Functionality and efficiency. Criteria for space functionality and efficiency that adjust to the needs of users.
4) Flexibility and adaptability. Criteria for flexibility (openness) and space adaptability with information technology.
5) Variety of spaces to cater for different users and uses. Criteria for variety of spaces available to accommodate different uses and user groups.
6) Being social and people-centred. Criteria for library as a social and people-centred space.
7) A Sense of place and inspiration. Space criteria as an inspirational place.
8) Environmental comfort and sustainability. Criteria for the space atmosphere of a comfortable environment.
9) Access, safety and security. Criteria for access, safety and security provided.
10) Integration of technologies. Criteria for integration of space with technological facilities.

9. Research method

This study used a quantitative approach with a survey method. The population was all undergraduate and postgraduate students. The research sample used was *simple random sampling* (Sugiyono, 2013). Respondents were 200 students who were selected randomly when they visited the library. Data collection techniques used a questionnaire (closed-ended and open-ended questions), observation, and document analysis. The questionnaire-based on 10 TEALS criteria. Below is the table of provisions of value and percentage of respondents' answers.

Score	Percentage (%)	Remarks
0.00 - 1.00	25%	Poor
1.01 - 2.00	50%	Not good
2.01 - 3.00	75%	Good
3.01 - 4.00	100%	Very good

10. Discussion

The summary of respondents' answers to the ten criteria for evaluating the library's physical space is shown in Graph 1. Overall, respondents' average value to the ten evaluation criteria was very good with 3.05 (76%). Then, if seen from each evaluation criteria, identity and positive image has the highest value with 3.32 (81%) and the lowest is flexibility and adaptability with 2.90 (72%).

Based on this data, respondents rated very well on the redesign of the library's physical space that had shown the identity and positive image of the library. They also felt that their presence was very welcomed in the library, and the library could be used as a place to find inspiration.
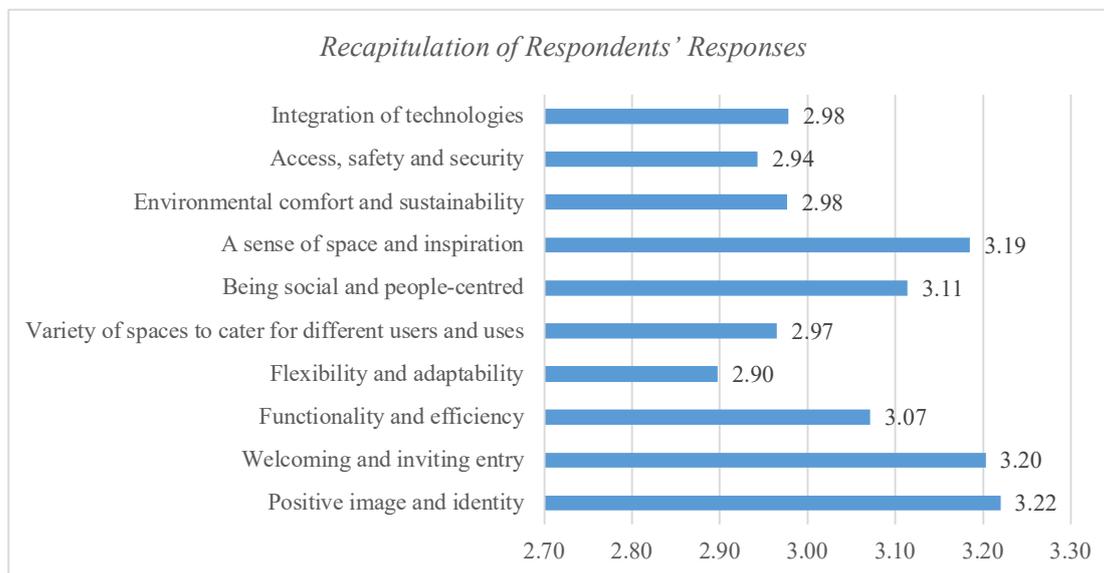
Graph 1. Recapitulation of Respondents' Responses

Furthermore, criteria with low value include flexibility and adaptability, variety of spaces to cater for different users and uses, environmental comfort and sustainability, access, safety and security, and integration of technologies. These criteria need to be addressed by library management to continuous space improvement in the future.

Evaluation of quality of library space redesign in accommodating the needs of library users

Based on this study's results, the physical library space redesign has met the majority of the library users' needs. In the majority, they stated that the redesign of first-floor space was very good. The space redesign quality of Library can be concluded as follows:

1. *Positive image and identity.* The library building and space redesign become significant factors in growing its positive image and identity. The library's proximity with a place of learning and students activities, outdoor area, and building architectural design that combines Javanese and the Middle East architectural styles are important factors that determine the library's identity as the centre of intellectual, knowledge and Islamic civilisation. Meanwhile, the library's first floor and exterior interior design is also very important in fostering a positive image of the library.

2. *Welcoming and inviting entry.* The welcoming entry design, spacious entrance, and waiting room received very good and positive responses from library users so that they became important factors in attracting them to visit the library. Through this redesign, visitors feel very welcomed by the library to impact their desire to use various facilities provided by the library.

3. *Functionality and efficiency.* The functionality of the library physical space redesign is considered to be very good. The space size is one of the most important factors in determining functionality and effectiveness. The library space size available is very appropriate to the function of the type of service and also the proximity and connectivity between the service rooms support various library functions.

4. *Flexibility and adaptability.* The space redesign is already flexible and adaptable to meet users' needs. Flexibility can be seen from the size, shape and features on furniture design that can be easily moved; the openness of space with transparent divider; and walls between library rooms made of partition.

5. *Variety of spaces to cater for different users and uses.* The redesign of the main and additional spaces was done to create various facilities that give library users choices to decide where, when, and how to use them while doing assignments, studying, and researching. The redesign and number of main rooms are very good, adequate, and comfortable. The main room includes study group rooms, individual rooms, formal collaboration rooms, and research support rooms. The number of additional rooms for social interaction is adequate.

6. *Being social and people-centred.* The library space redesign as a center for social interaction has been very good, attractive, and satisfying. This space is more often used for gathering and discussion, doing group work, relaxing, and meeting colleagues and the community.

7. *A Sense of place and inspiration.* The library space redesign also pays attention to environmental comfort. The quality of natural light, air circulation facility, and temperature humidity chamber are sufficient.

8. *Environmental comfort and sustainability.* The library space redesign also pays attention to the environmental comfort. The quality of natural light, air circulation facility, and temperature humidity chamber are sufficient.

9. *Access, safety and security.* Access, safety and security are also adequate. The lockers' availability has given visitors a sense of security in depositing their goods, and the existing service signage/information is also sufficient.

10. *Integration of technologies.* The integration of technologies in the redesigned space is adequate. This includes furniture design of tables, which is equipped with power plugs for laptop/smartphones. This furniture design is considered to support students' collaborative discussion.

11. Library space design improvement program

Based on the analysis and feedback from the library users above, the library needs to improve the quality of each of the criteria used for the evaluation, namely:

Criteria	Improvement Program
Positive image and identity	Redesign the physical space on the second and third floors.
Welcoming and inviting entry	Automatic door opening and closing system, brighter colors, and additional waiting room chairs.

Functionality and efficiency	• Noise control • Additional LCD/TV screens and lockers facility
Flexibility and adaptability	• Increase the number of power plugs for laptops on the second and third floors • A faster and more stable internet connection
Variety of spaces to cater for different users and uses	• Increase the number of research private rooms (research carrels), collaboration room, online thesis room, medical room, praying room facilities, and good restrooms. • Access road and special space for users with special needs.
Being social and people-centred	• The furniture available such as tables and chairs are limited.
A Sense of space and inspiration	• Library needs to be equipped with photographs of successful Muslims in the field of education and science, batik design models, designs in accordance with Islamic culture, soundproof rooms, music, addition of motivational writing (quote), and redesign of second and third floors.
Environmental comfort and sustainability	• The library needs to be added with air-conditioning facilities, trash bins, free drinks, music, and ornamental plants. Furthermore, the lights do not need to be turned on during the day.
Access, safety and security	• Adding CCTV facilities • Adding signage about the library facilities and services • Providing lifts for users • Making an emergency evacuation route
Integration of technologies	• Power plugs should be added in each room that is easily accessed by visitors.

12. Conclusion

Based on the discussion above, it can be concluded that the evaluation results of the physical space redesign quality of UIN Maulana Malik Ibrahim Malang Library are as follows:

a. The level of quality in the space redesign of UIN Maulana Malik Ibrahim Malang Library in meeting users' needs is an average of 3.055 (76%). This means that the library space redesign is now very good and in accordance with library space redesign criteria that has the highest quality is positive image and identity with 3.22 (81%). Subsequently, the criteria with the lowest quality are access, safety and security with 2.94 (74%), integration of technologies with 2.98 (74%), environmental comfort and sustainability with 2.98 (74%), and variety of spaces to cater for different users and uses with 2.97 (74%).

b. The analysis and feedback from library users about library space design improvement can be used as a planning program in the future. The criteria that need enhancement and quality improvement are access, safety and security; integration of technologies; environmental comfort and sustainability; and variety of spaces to cater for different users and uses.

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14. Short Biography

Mufid is a librarian in library management system, having graduated a master's program in library and information science from the University of Indonesia (2011). He has participated in the Development of Library System Management program at the University of Queensland (2015).Currently, he is the head of the UIN Maulana Malik Ibrahim Malang library (2019-present) and the chairman of the East Java Islamic College Library Association (2019-2023).

The Use of Social Media by the Library of State Islamic University Sunan Kalijaga Yogyakarta during COVID 19 Era

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Abstract

The spread of COVID 19, stated as peandemic by WHO, has affected the performances of libraries, includng that of the Library of State Islamic University Sunan Kalijaga Yogyakarta. The lockdown policy executed during the pandemic time has made the library unaccessable in an off-line way, in spite of the fact that users need library services whatsoever. As the academic activities in the State Islamic University Sunan Kalijaga Yogyakarta are done on-line, the library has to develop a particular strategy to stay supportive to the academic life, and it is for this purpose that the library has made use of the social media. This paper is intended to identify the use of social media by the Library of State Islamic University Sunan Kalijaga Yogyakarta in serving its users during the pandemic time. This research uses qualitative approach to explore the characteristics of social media contents, using observation technique, that is by observing the library's social media accounts of Instagram and of Youtube, two platforms most accessed by the users. While data analysis is done by using content analysis to classify the sorts of information posted in the social media.

The research result shows that during the pandemic time, starting from March to December, 2020, Instagram is the social media most used by the library to support its services. It is used to post information and important events happening in the library or in the State Islamic University Sunan Kalijag Yogyakarta. It is also used to make possible interactive dialogues with the users by using IG Live. There are 242 posts in the library's Instagram account, ranging from information (announcement) concerning the library, promotion (about activities, collections, and library services), Question and Answer (questions asked by the users, which are then posted in Instagram), Information of how to access the collection and services, Interactive

Dialogue, library activities sharing, information about books received as gifts, congratulatory remarks, Memories of library. At the same time, Youtube is used to post videos of the library activities. There are 25 videos posted with various contents, such as promotion, important information of the library services, information of how to access the collections, library activities records, and congratulatory remarks. In addition, Whatsapp is also used to support the library services.

1. Background

The wide-world spread of COVID 19, since March 2020, has affected our daily life. This pandemic has eventually forced most countries to make lockdown policy. The execution of this policy has significantly affected most fields of life, where academic life is no exception. Schools and universities have been closed since March, 2020, and teaching-learning activities are done on-line. This lockdown policy has also affected library services, making library collection be accessed in an on-line way only. Responding this pandemic, many libraries in the world come with the idea not only of adjusting their services but also with introducing new kinds of services in order to stay serving and communicating with their users (Koulouris, 2020). Libraries need to communicate with their users to make sure that their services during the pandemic time are known and useful for their users. There are many ways by which information of library services can be conveyed, and one of them is social media.

Social media is the forefront of all technologies that have had disruptive impacts on existing infrastructures; it provides an innovative paradigm to find solution for cultural, sociological, and technological problems (Deb Roy, Mei & Zeng: 2014). Social media with its user-generate content character is a symbiosis in the new media culture that enable the users to participate (Nasrullah, 2014: 31). This in turn will potentially become an abundant information source of the social world, which includes interactions, attitudes, opinions, and virtual reactions against all that happens in the real world (Qua-Haase, 2014). Social media usage becomes a daily routine activity for most people. It is of no surprise that the use of social media in the society increases year after year as showed in *We Are Social*. Based on the data from *We Are Social* in *Digital* 2020 (https://wearesocial.com/digital-2020), the amount of active social media users increase as many as 9.2 % from the year 2019 to the year 2020, where in the early 2020, the active social media users reached the amount of 3.8 milliards. This number may increase as the society is facing the pandemic and social media compensates the people's mobility. Social media is used not only individually but also by institutions and organizations, either for business purposes or social ones.

Library is one of the institutions that use social media, and during the pandemic time it uses social media more extensively. What has been done by public library can be an example of how social media is used by library to keep its users be informed of the changes that happen in the library, as well as to promote library services ranging from e-book, streaming media, to virtual

programming, and from virtual storytelling to online knitting group (Public Library Association, 2020, as cited by Koulouris in 2020).

The Library of State Islamic University Sunan Kalijaga, having the duty of serving the academic society, is pushed to initiate innovative services during this COVID 19 pandemic. Social media is then used as an alternative way of developing an on-line library services. This is why the library uses social media more intensively to support its services. Considering the diversity of the users, which consist of under graduate students, graduate students, researchers, and lecturers, it is important to choose the right social media. This paper aims to explore the use of social media to support library services during COVID 19 era.

2. Literature Review

2.1. Social Media and Social Communication

The birth of Internet has affected the whole aspect of social life. Internet, a product of technology most used by the society, has enabled the people to interact with each other both physically and virtually (Alyusi, 2016). It is through virtual interaction that people from different places in the world are connected; even this kind of social interaction gives the rise of what is called on-line community. With the rise of social networking sites like Friendster in early 2000s, this kind of social interaction finds its fertilizer. The term of social media actually has multiple meaning much debated among the experts as it is related to several aspects such as tools, platform, and social phenomena it causes (McCay-Peet & Quan-Haase, 2014). In a specific sense, social media is understood as a group of Internet-based application that enables people to create and exchange user-generated content (Kaplan and Haenlein, 2010). Conceptually, the term "social media" has something to do with such other terms as social networking sites (SNSs) and on-line social network (OSNs). In 2003, come into existence such websites as MySpace, Friendster, and Facebook, which are then taken as the early stage of social networking development (Deb Roy, 2014). The changing trend, in which the term "social networking site" turned into "social media," can be traced back to the years of 2009-2014 when this term was most frequently used than ever, and this changing trend is said to have relation with platforms, such as Twitter, Instagram, Pinterest, and Snapchat (McCay-Peet & Quan-Haase, 2014). According to Nasrullah (2016) a platform is considered social when it has in it six characteristics; they are, network, information, archive, interactivity, simulation of society, and content by users (user-generate content).

2.2. Library and Social Media

Social media, with its six characteristics as explained by Nasrullah, can be used in various fields, including the field of library. The use of social media even had started long time ago. Based on the research result published in 2014 (Taylor and Francis Group, 2014) we can see that as many as 70% of the total libraries in the world have had used social media for various purposes, including for promoting library services. In its early development, social media is considered unsuitable for supporting such service as reference and some other services and it cannot be used to replace face-to-face reference service (Michael Ahenkorah-Marfo, 2016). The use of Facebook and MySpace by library can be taken as examples of how library benefits from the available social media to reach its users in an on-line way. The development of social media in recent decades has

been used by libraries to support their performance, particularly for marketing their services and as communication medium as it provides them with real-time channel for communication, information sharing, and interactive dialogue anytime and anywhere, using portable mobile devices (AL Awadhi, 2018). Empirical studies on social media in various countries show that Facebook is the most used platform, followed by Twitter (Koulourish as cited in Choi and Joo, 2018).

It is undeniable that social media plays an important role in the activities of information dissemination and sharing during the pandemic time. It helps librarians to perform their obligatory tasks of sharing valid information concerning COVID 19, especially as most people are not able to come to the library during the pandemic time (Okike, 2020). At the same time, librarians as information professionals, who know well of library collections, printed or electronic, are strongly demanded to help the users to access the collections during the pandemic time. As institutional supporters, collection managers, information disseminators, internal planners, community supporters, government partners, trainers and educators, and information community builders, librarians can play their important role in disaster mitigating when dealing with an endemic or pandemic (Featherstone, 2008). Therefore, librarians with skillful ability in using the digital technology can contribute much in organising, retrieving, analysing, and sharing information (Chisita, 2020).

The increase of social media usage in the society has encouraged people to make discussion and do research on social media, both social media as platforms and social media in general. Many inter disciplinary researchers are interested in doing a research on social media and social media users, in which these researchers, who have different backgrounds, focus on their research questions (Mayr and Keller, 2014). This has initiated various approaches on social media researches. In this paper the research is aimed at answering the question of the pattern of social media usage in the library.

3. Methodology

This paper aims to identify and explore the purpose of the use of social media by the Library of State Islamic University Sunan Kalijaga during this COVID 19 pandemic. Accordingly this research can be categorized as descriptive-qualitative, although the analysis is done using quantitative data. This research focuses on the use of social media from March to December to find out:
1) The platform of social media being used
2) The purpose of using social media from March to December

3.1. Data collecting technique
Data collecting is done particularly by using observation method . The researcher observes the library's social media accounts, like Instagram and Youtube. This is done to find out the number of posts and their contents during the pandemic time, from March to the end of December, 2020. The research focuses on Instagram and Youtube, because the information the library shares in social media like Facebook and Twitter is the same information it shares on Instagram. As for

Youtube, the case is a little bit different. The information the library shares in Youtube is not always the same information it shares on Intsgram, because the library only shares information in Youtube in the form of video.

3.2. Data analysis

The collected data, taken from a number of sources, either qualitative or quantitative, are then to be analyzed using content analysis. Each post found in Instagram and Youtube will be analyzed to find out the sort of the information and the purpose of sharing it, and to identify the sharing intensity of each post.

4. Finding

The Library of State Islamic University Sunan Kalijaga Yogyakarta has been using social media for promoting its activities long before the COVID 19 pandemic happened. Social media is used by the Library of State Islamic University Sunan Kalijaga Yogyakart for a number of purposes, including for recording the activities of the library. Based on an interview with the librarians and on the result of observation on social media used by the Library of State Islamic University Sunan Kalijaga, there are several platforms that the library uses to reach its users; they are Twitter, Facebook, Instagram, and Youtube.

4.1. The Use of Instagram
The use of Instagram before COVID 19

The Library of State Islamic University Sunan Kalijaga Yogyakarta has been intensively enough using social media long before the pandemic time. It shares information in Instagram almost every day for various purposes. Based on the researcher's observation on the library's Instagram account, it can be said that the use of Instagram before the pandemic time, from January 2nd to the middle of March, 2020, is for sharing:

1) General information
2) Posts in this category include general information concerning such thing as short announcement of the working hours of the library (at what time it opens and at what time it closes), scholarship information, activities held by the library, like the dialogue held in cooperation with the Iranian Culture Consulate in Jakarta (posted on January 29, 2020), and information about user education for the new students of graduate program (posted on February 13, 2020)
3) News
4) The library uses Instgaram mostly to let people (users) know the library's activities, by posting relevant photos, like the photos of librarian discussion (posted on March, 12), of book discussion (February, 17), of Turnitin training for students, and of Mendeley training for volunteer students (27 January). In addition, Instagram is also used by the library for sharing information of important events, like when some other librarians (for example, librarians from University of Udayana Bali) visit the library, and for sharing information of the library's achievements, like the awards received by the library and its librarians, and also for sharing information of volunteer students of library science coming from other universities, etc.

5) Promotion

6) The main reason of using Instgaram for promoting library services is the fact that this social media is most used by most students of the millennial generation in such a manner that a message is easily conveyed. The library uses Instagram for the purpose of promoting its collection and services. The collections promoted by the library include new collection of magazine (January 2), collection of electronic journal subscribed by the library, new books (January 13). In addition, the library also promotes some books of its collection by sharing interesting quotes of the books in order that the users will be interested to read the books. While, for the purpose of promoting its services, the library introduces the service of Difable Corner (posted on January 11).

7) Greeting

8) The library also uses Instagram for sending congratulatory remarks, such as congratulatory remarks for the new elected rector, for New Year, and for some other important moments.

The Use of Instagram in the COVID 19 Era

The library posts information on Instagram almost every day. Based on the researcher's observation on the contents posted on the library's Instagram account, there are 9 purposes of the library's posts.

1) Announcement

There are two kinds of announcement posted on Instagram. *First*, announcement of the library's activities, like its service policy (at what time it opens and starts giving its services), its policy on fine during the pandemic time, and the schedule of off-line services from March to August. It is important to know that the library gives its on-line service, starting from March to May, and then it also gives limited onsite services, starting from June. *Second*, general announcement or information, like an invitation for a discussion on Single Tuition Fee by the university. There are 44 posts of announcement.

2) Promotion

There are 51 posts containing information of promotion. This kind of content is posted for the purpose of promoting the library's activities, such as IG Live held by the library and the activities of the Iranian corner, and also for the purpose of promoting the library's collections, such as the collection of e-book, which can be accessed for free during the pandemic time, and the new collection. In addition, the library also promotes the new services developed during the pandemic time, like Si Carik, an application for knowing the history of borrowing by the users. In order to support the university's program, this type of content is also posted for the purpose of marketing the merchandise sold by the Business Center of State Islamic University Sunan Kalijaga Yogyakarta.

3) Question and Answer

There are 24 posts of question and answer in Instagram. They contain information of questions on how to access electronic collection, operational hours of the library during the

pandemic time, procedure of borrowing and returning books, and some other new services offered by the library during the pandemic time.

4) Guidance on how to access collection and service

As the library gives on-line services, it is important that the users be familiar with them. Although these on-line services have been offered by the library long before the pandemic time, many users are not yet accustomed to them and they ask questions about these services through Whatsapp or Instagram direct message. Information of how to access collection and services is packed in an interesting animation in order that the message is easily conveyed. This type of post is sometimes intended to revise the previous contents or as an update. There are 20 posts containing the guidelines on how to access collection and services.

5) Interactive dialogue

This type of content is actually intended to send greeting remarks to the users through Instagram, asking them what they do during the pandemic time, and reminding them of the rooms of the library. Therefore, there are only two posts in this category.

6) Submission of books as gifts

The library has always tried to encourage lecturers, students, alumnae, and relations, who write books, to give away copies of their books to the library. And the library has always recorded the moments when they submit the books, and in this pandemic time this activity is done with complete health protocol. There are 10 posts showing the writers submit their books.

7) Congratulatory remarks

Posts of congratulating remarks are aimed at congratulating people in the moments of National or Islamic Days, inauguration of new elected rector, and academic achievements.

8) Memory of the library

Posts of this category express the librarians' longing for the situation when the librarians and the users make real interaction with each other, as the pandemic has made the librarians serve the users only in an on-line way for two months. There are 4 videos posted on April-May.

No	Purpose	Type of Information	Quantity		Name of Information/activity
1	Announcement	1. Information of service	41	44	Service policy, working hours, library closing, policy of fine, scheme of on site service June-August
		2. General information	3		Invitation for a discussion of Single Tuition Fee
2	Promotion	1. Library's activities	27	51	Library's activity with Iranian Corner, IG Live (Library services, library visit day, dialogue)

		2. Library's collection	20		New bookd, ebooks to be accessed for free
		3. Service	3		Si Carik, Sunan Kalijaga corner
		4. Information of product	1		Merchandise from Business Center
3	Question and Answer		24	24	accessing for the last assignment, user education,
4	Information of how to access collecton and service	1. How to access e-resouces	7	20	accessing Institutional Repository and journal
		2. How to upload scientific works	5		Uploading lecturers' articles, last assignment
		3. Service accessing	8		How to follow user education, how to borrow books
5	Interactive Dialogue		2	2	Questions for users about what they do during the pandemic, parts of the library they like most
6	Sharing the library's activities		55	55	Routine activities (coordination meeting, etc.), webinar, IG Live, user education, library visit by other libraries and university officials
7	Information of books submitted as gifts			10	Receiving books from individuals or institution, and from the writers
8	Congratulatory remarks		32	32	National and Islamic Days, lecturers' achievements, condolance, official inauguration, welcoming new students
9	Memory of the library		4	4	Videos expressing longing for the library
	Total number of posting		232	242	

Table 1. The number of Instagram use in COVID era

Out of the eight categories of post, three categories win the biggest number; they are, posts for sharing the library's activities (55 posts), posts for sharing activities held by the library (51 posts), and posts of announcement (44 posts). These three categories of post are interconnected. The library intensively gives the users information of new things in the library; therefore, it sometimes sends the same information in a different form, to make sure that the information reaches the users. When the library is preparing an event, for example, it will keep informing the users about the event before the event takes place, and when the event is about to take place, the library will send reminders to the users through Instagram. This is done to make sure that the

users will not miss the event held by the library. When the event is going on, the library records it and then shares the record on Instagram. By doing so, the library has made every effort to make important information reaches the users. Other than that, during the pandemic time, the library has to adjust its policy to the policy of the university; this has made the library keep informing the users everything about its policy, like its service hours, which have to be line with the policy of the university. The other important thing about using Instagram is that the library benefits much from it during the pandemic time; it uses Instagram to provide the users with guidelines on how to access its collection and service, and this is important for the users as they have to do the access by themselves during the pandemic time. Other than that, the guidelines are made partly because so many users ask questions about how to access the library collection and service.

In addition to the posts it makes on Instagram, the library also holds interactive dialogues with the users through IG Live. This is done very often during the pandemic time with the same purpose; that is, to send important information concerning the library's collection and services. In these dialogues, the users can ask questions to the librarians. Each librarian has his/ her own expertise, such as information system and reference service, and this enables the users to ask the right question to the right person. IG Live is also used as an alternative medium for doing the annual activity of Library Visit Day. This event is done in the form of a dialogue with the lecturers of State Islamic University Sunan Kalijaga who are pursuing their studies in foreign countries so that the users feel like being taken to the libraries in foreign countries, like the library of McGill University in Canada, the library of Chicago University in the United States of America, the library of University of South Australia, and the library of Institut National des Appliquess Centre val de Loire in France.

4.3. The Use of Youtube

Youtube is used for sharing videos of activities held by the library, such as IG Live and webinar. There are 25 videos uploaded by the library. They contain such information as the library's policies (2 videos), library service promotion (13 videos), guidance on how to access the library's collection and services (4 videos), records of the library's activities (5 videos), and congratulatory remark (1 videos). Youtube is used to complete the information posted on Instagram. While information in the form of pictures (photos) is emphasized on Instagram, information in the form of videos in Youtube helps the users to understand more of the messages.

No	Type of Infromation	Quantity	Name of Information/ Activity
1	Information (to informa)	2	Policies made by State Islamic University Sunan Kalijaga in the pandemic time, on-line service in new normal time
2	Promotion	13	Dialogue through IG Live with the librarians to introduce the library sections (circulation, reference, information, Institutional repository) and various services

3	Guide on how to access collection and services	4	Digital collection retrieval, guidlines to access e-journals, procedure of borrowing books and returning locker keys, procedure of borrowing and returning books
4	Records of the library's activities	5	Library visit day, talk show on writing and publishing
5	Congratulatory remarks	1	Ied Mubarrak Syawal 1st, 1441
Total Number of Youtube Use		25	

Table 2. The use of Youtube

4.5. The Use of Whatsapp

In addition to Youtube and Instagram, the library also uses Whatsapp application. It is used to reach the lecturer-users in particular and the other users in general. While most students use Instagram and Youtube, only some of the lecturers have Instagram account, making them miss some of the needed information from the library. This is the reason why Whatsapp application is used to send information of the library's collection and services to the lecturers. In addition, Whatsapp is also used by the users to order books they want to borrow and ask questions about the library's collection and services. During the pandemic time, the users are advised to firstly order books they want to borrow, and when the books are ready, they will be told to take the books in the library.

5. Conclusion

The Library of State Islamic University Sunan Kalijaga Yogyakarta uses Instagram intensively to support its services in two ways: by posting photos and videos containing important information and events happening either in the library or in the university, and by holding IG Live to have interactive dialogues with the users. There are 242 posts on the library's Instagram account with such contents as announcement (general information and information concerning the library), promotion (for the library's collection, services, and activities), question and answer (questions asked by the users through various applications are then posted on Instagram), information of how to access the library's collection and services, interactive dialogues, the library's activities sharing, information of books submitted as gifts, congratulatory remarks, and memory of the library. At the same time, Youtube is used to share information in the form of videos. There are 25 videos uploaded on Youtube. They contain such things as promotion, important information of the library's collection and services, information of how to access the library's collection, records of the library's activities, and congratulatory remarks. In addition to these two platforms, Whatsapp application is also used to support the library's services.

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Address

Keynote

Paper

Use of Digital Library Resources Amidst Corona Pandemic:
A Case Study of Damodaram Sanjivayya National Law University Library, India

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Abstract

Covid-19 pandemic not only effected one nation, it is affecting to the entire world and to every sector of the society. The basic aim of Libraries is to improve, expand and the Professional Knowledge. Recent technological initiatives have caused significant impact upon the online education system during the past few months. There is a dramatic change in the library administration and services based on information communication technology in the present era. The pandemic situation is the big challenge not only in front of libraries but also to the library professionals and the users. The use of E-resources has become more popular in all the disciplines, now a days almost all the University libraries are subscribing E-resources for their user community. This paper mainly highlights the digital resources and downloading data of the resources with cloud computing RemoteXs facility offered by Damodaram Sanjivayya National Law University Library during covid-19 Pandemic and this study discuss the collections, services and facilities and precautions in this University library.

Keywords: Covid-19, E-resources, Digital Library, Remote xs, Cloud computing,

1. Introduction:

We learned many lessons in the during Lock down period in society wise, individualize and organization wise and many more. In this era this situation was in Libraries throughout the world during the coronavirus pandemic. However, it is even more needed to ensure funding for the added expenses of providing more electronically accessible materials with most of the Universities. Moving online classes and submission of projects due to the coronavirus pandemic university libraries are adapting to an increased demand for online services and support. Electronic information sources are becoming more and more important and useful for the students, research scholars and faculty members in especially Law University Libraries. Law University Libraries are very specialized information resource centers.

Collaboration with KSLA, NLK, KISTI   *ICoASL 2021*

2. Scope of the study

The present study is limited to the amidst corona pandemic use of digital library resources with Cloud computing by academic community study of the Damodaram Sanjivayya National Law University Library.

3. Central Library of Damodaram Sanjivayya National Law University Library:

Damodaram Sanjivayya National Law University is a National Law University established and India constituted by the DSNLU Act, 2008. DSNLU Library developed by the wide variety of collection of books, Reference books, Bare acts, journals, Law Reports and Dissertations from the point of law students, research scholars and faculty members. There are more than 20,000 printed collections in the field of various law subjects based on the selection and recommendations by the students and faculty members. The central Library is fully air conditioned and automated with KOHA software integrated RFID technology. Web OPAC (online public access catalogue) facility is made available through KOHA library management software to know the bibliographical details and availability, along with the location of a resource. Facilities of Internet through LAN & Wi-Fi and E-resources with RemoteXs is also added to law library. RemoteXs (cloud computing system) is a single – window platform to access all the subscribed E-resources. It is a cloud-based solution that enables libraries to provide web-based access to digital resources such as E-databases, E-Journals and E-Books anywhere any time for their authorized users especially during their internships, Moot court competitions & assignments and legal research productivity. Turnitin (Anti Plagiarism Web Tool) also provided is a comprehensive plagiarism prevention system allows quick and effective checks to all research work. More over URKUND is also plagiarism Detection Software has been selected by the Centre of INFLIBNET (Inter University Centre of UGC) under the support of Ministry of HRD and is being rolled out to all the Universities / Institutions through a centrally funded scheme to improve quality and prevent plagiarism in research / academic publications. DSNLU Library has provided PRERANA for the SAP students with the necessary software and accessibility to the books, journals and online resources with LAN & Wi-Fi facility for their academic pursuits as follows "Jaws talking screen reader for the visually disabled students. Pearl Instant Reader" Portable Instant Hi-Speed Printed Text Converter/Reader cum Magnifier with Open Book for the Blind. A light-weight portable camera device that connects to a PC or Laptop uses Motion Sensor technology in combination with Open

Book software to make high speed scanning & instant reading of text in an Indian accent English voice or digitizing books fast and easy.

4. Review of Literature:

Jadhav, Hemanth Fransis (2020) in this research paper, researchers have studied in Digital Library services provided by Art's commerce and Science College Libraries of Mumbai city in Covid-19 pandemic. The study shows that Art's Commerce and Science College library has introduced ICT based information services, moreover he discussed research support services and

organized online Library orientation programs, workshops and book exhibitions. The study also shows that library websites and institutional repositories.

Amit and Swetha (2020) observed challenges and Initiatives of Digital Libraries. In this research paper, researchers have evaluated the copyright is the most significant issue in the area of digital Libraries. Moreover, they are discussed several digital library initiatives in India: Digital Library of books, Digital Library of Manuscripts, Digital Library of journals- initiatives by scientific society and publishers, Digital Library of online courseware and National digital Library of electronic Thesis & dissertation. They studied also C-DAC projects.

5. Role of Law Librarians:

"The COVID-19 pandemic provided law librarians with the opportunity to demonstrate how essential their abilities and roles are within the legal ecosphere by stepping up and becoming true leaders within their organizations," said AALL President Emily R. Florio.

"Law Librarians are technology leaders and innovators, finding the right products and solutions for onboarding new hires, training lawyers, teaching law students, and providing their users with essential legal research and a more seamless and successful process".

6. Must follow safeguards for Covid restrictions in Libraries:

-Provision of Face masks and Gloves: Their removal and Disposal,
-Pedestal Sanitizers –At Library entrance,
-Users hands to be sanitized before entering the library,
-Cleaning of counters, Offices, Door knobs and Bathrooms,
-Students sitting arrangement at 3-4 feet distance,
-Returned books may be shelving,
-Library should be sanitizing every day.

Sanitization in DSNLU Library:

DSNLU Library following the process of sanitization in the library in every day.

7. Development of Library Staff:

- Free online Professional Development opportunities to develop skills in Covid-19.
- Collaboration with other Libraries (Networks)
- Skills for online material Access.
- Improving Communication skills.
- Educating the users.

8. Damodaram Sanjivayya National Law University Library subscribed following these E-Resources listed below:

Digital Resources:
SCC Online, Heinonline, WestLaw India & International, Lexis Advance India, Kluwer Arbitration Law, Kluwer Competition Law, Kluwer IP Law, Manupatra, Taxmann, JSTOR, J-Gate, Oxford Legal Research Library, Oxford Public International Law, OCC Digital Library Subscription, Ligit Quest.

E-Books:
Cambridge University Press E-Books, Bloomsbury Collections & Hart E-Books, EBC Reader.

E-Journals:
Kluwer Air & Space Law, Magzter Gold.

RemoteXs facility in DSNLU Library:
Analysis: Due to Covid Pandemic no one is attending the libraries physically. Everyone is depending on E-Resource / Open access content available in the world wide web. DSNLU Library has been providing the E-Resources content through the cloud based computing system i.e., RemoteXs for the benefit of user community. Every user of Dsnlu library, utilizing this remote access facility for their academic purpose, project / research paper submissions, moot court competitions and other competitive examinations.

S. No	Resource	Users	Unique Sessions	Download Data (MBs)
1.	Jstor.org	737	16962	69592.72
2.	SCCOnline.com	735	15967	59342.7
3.	Heinonline.org	753	15698	56114.25
4.	Manupatrafast.in	732	15345	48475.12
5.	Westlawindia.com	728	9415	25538.7
6.	Ebcreader.com	572	5495	19603.68
7.	Lexis.com	642	8613	19167.1
8.	Cambridge.org	618	3889	11051.84
9.	Legiquest.com	658	7424	10721.32

10.	Taxmann.com	420	4240	9915.92
11.	Kluwerarbitration.com	289	1235	9115.91
12.	Ouplaw.com	609	3863	6673.51
13.	Bloomsburycollections.com	510	2164	3508
14.	Kluwerlawonline.com	134	646	1436.23
15.	Kluweriplaw.com	186	437	1321.7
16.	Kluwercompetitionlaw.com	166	399	1001.14
	TOTAL:	8489	111792	352579.84

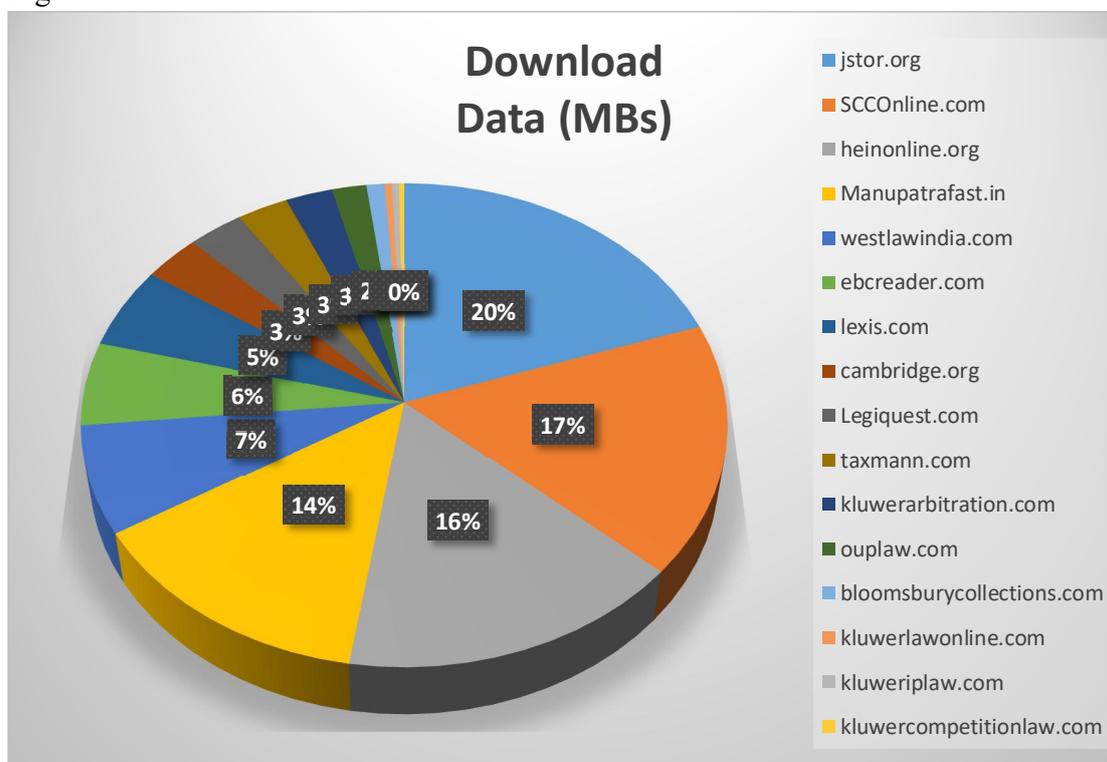Table:1 Resource wise Usage Report since April' 2020 to October' 2021

Fig:1

Table 1 shows During this Covid period (Apr'2020 –Oct' 2021) total 3,52,579.84 MB data has been downloaded by the users from different E-Resources subscribed by the DSNLU Library. 843 members have the membership to access the E-Resource content through RemoteXs platform. And the users are very much satisfied to utilize the E-Resources content provided by DSNLU Library. Most of the users were utilized the JSTOR database content, Total 69,592.72 MB data has been downloaded by the users.59,342.7MB data has been download from SCC online database.

Followed by HeinOnline 56,114.25 MB data and Manupatra 48,475.12MB data download by the users. Except Kluwer Air & Space Law journal, Kluwer IP Law & Kluwer Competition Law

Other E-resources were utilized properly for their research work as well as for their research work as well as for their academic purpose.

Table:2

S.No	User Category	Users	Logins	Download Data (MBs)
1.	2017 LLB Students	109	9791	64128.27
2.	2018 LLB Students	108	8450	53792.23
3.	2020 LLB Students	129	7361	49153.55
4.	2019 LLB Students	88	6155	37459.18
5.	2016 LLB Students	65	2735	29883.17
6.	2020 LLM Students	22	1961	24105.69
7.	Faculty	31	1196	23597.83
8.	2021 LLB Students	131	1627	20163.86
9.	2015 LLB Students	78	1218	19592.94
10.	2021 LLM Students	70	400	16798.43
11.	2019 LLM Students	12	463	13904.69
	TOTAL:	843	41357	352579.84

Table 2 shows All batch students were utilized the Library E-Resources excellently during this covid pandemic period. 2017 LLB students were utilized the E-Resources mostly and 64,128.27 data has been downloaded by this batch students.

Fig:2 User Categorywise Usage Report since April' 2020 – October' 2021
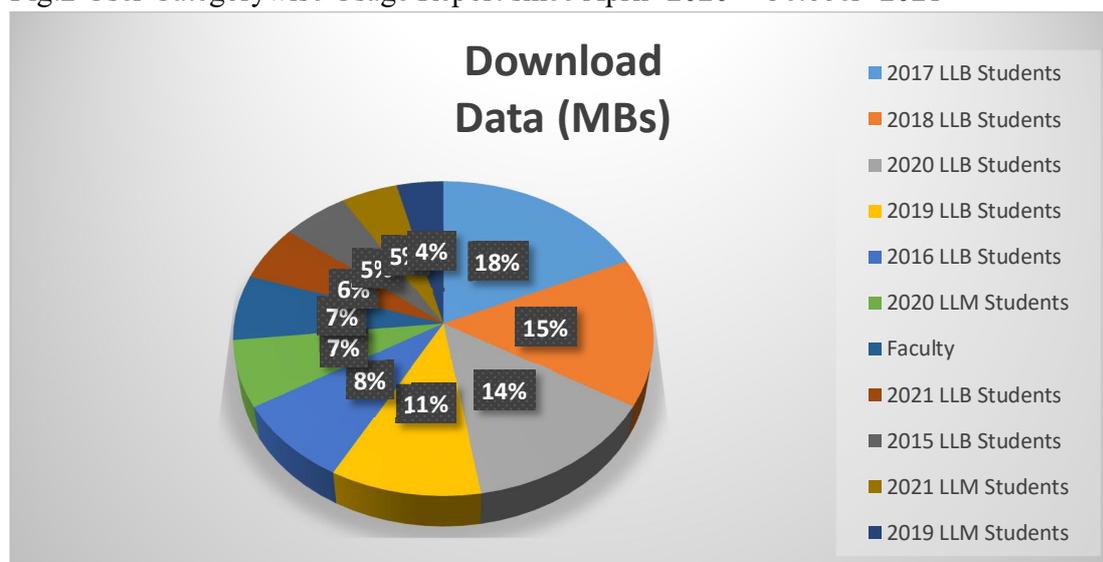
In addition to that 2019 LLM batch students were utilized the E-Resources through remotexs platform was very less. Total 23,597.83 MB data has been download by the faculty members for their class work and to prepare the course work and for study material.

9. Conclusion

The value of digital Libraries needs to be judged by their user's satisfaction. Covid-19 has fully changed in the mode of Library services. The Covid pandemic has forced the academic institutions to physically shutdown and move to online operations. In this connection this study explores that during the covid period a majority of the Students, Research scholars and Faculty members of the DSNLU used E-Resources for their research work, class works and learning purposes. RemoteXs facility is an effective source of service in any Library to access digital resources for users. In these regards users should aware of these facilities, because DSNLU library should organize more & more orientation programs for the user community for developing research tools.

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What Professional Skills Will Business Information Services (BIS) Demand in the Post-Covid-19 Era?

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Abstract

Covid-19 has created enormous uncertainty and complex issues especially for the global economy and business, and the pandemic will eventually bring unprecedented and inevitable challenges to BIS as well. Studying how BIS at international companies copes with the Covid-19 crisis and prepares for the post-Covid-19 era will yield insights into how special libraries in general may evolve in the future. The insights will also help understand how LIS education must train future information professionals in the post-Covid-19 era. LIS educators must be keenly aware of the demands from employers of information professionals, and they must strengthen their curriculum by helping students acquire soft skills via more hands-on experience opportunities. There will be a growing demand for information professionals who bring exceptional soft skills such as communications, critical and analytical thinking, teamwork, and creativity.

Keywords: business information services, special libraries, professional skills, Covid-19

1. Introduction

Among many types of special libraries, business information services (BIS) have usually been quick and innovative in terms of adapting to changes and new environments. Corporations always seek to find ways to adopt new ideas and technologies in their efforts to increase efficiency and profitability; similarly, BIS in a corporate setting must present innovative services based on organizational values and goals. For this research, BIS refers to a wide range of special libraries in the business world such as corporate libraries, knowledge centers, and information service centers. Covid-19 has created enormous uncertainty and complex issues especially for the global economy and business, and the pandemic will eventually bring unprecedented and inevitable challenges to BIS as well. Studying how BIS at international companies copes with the Covid-19 crisis and prepares for the post-Covid-19 era will yield insights into how special libraries in general may evolve in the future. The insights will also help understand how LIS education must train future information professionals in the post-Covid-19 era.

The author interviewed business information professionals at five professional firms to investigate how the Covid-19 pandemic impacted BIS at their companies. All of them are globally recognized management consulting firms, especially known for their knowledge management practices. The author interviewed those who were responsible for supervising and recruiting information professionals. The interview questions centered around the theme of how Covid-19 impacted their information services, and what changes they were envisioning after the pandemic.

2. Methods

The author initially contacted managers at management consulting firms located in the United States. The author obtained the list of top 50 consulting firms ranked by Vault.com Inc., which is a leading career advice company and whose rankings of companies are widely respected and cited. Using the member directory of the Special Libraries Association, the author identified the contact information of managers at those companies. Additionally, the author also used his personal network to contact managers of research and information services at some firms. Five managers agreed to have online interviews with me. This paper presents preliminary results from those interviews.

3. Questions

The respondents were initially asked five key questions: 1) What changes did you make during the pandemic 2) What changes do you think will take place after the Covid-19 in the areas of personnel and service profiles? 3) What skills did you see as critical and essential in providing services during the pandemic? 4) Once the pandemic is over, what new skills would you seek from new practitioners? and 5) What suggestions do you have for LIS educators in training future information practitioners?

Once the responses were collected, the author interviewed five of the respondents to probe their responses deeper via online meetings. They elaborated their answers with more contextual information. For example, they discussed the history of their BIS over the years, which helped the author compare the impact of Covid-19 with other global issues such as the Great Recession of 2018-2019 and the Dot-Com Bubble in early 2000.

4. Results

The Covid-19 pandemic brought sudden disruption in many corporate functions, and BIS is not an exception. However, the respondents all agreed that their units did not experience much change at least in 2020. BIS in the corporate sector had already been using electronic resources for their research services, and their services had also been largely been remote, requiring less physical contact with colleagues and clients than consultants would. All respondents commented that transitioning to the remote working environment was smooth and seamless. On the other hand, no respondent believed that BIS in post-Covid-19 would return to the way the services had

been delivered. They shared their opinions on some key attributes that would make future BIS successful, as the global business will have to meet the challenges of the "new normal."

To report the results, the author will describe the respondents as follows:

- Respondent 1 (R1): Manager of Knowledge Research Services at a firm with three US offices and one international office for BIS
- Respondent 2 (R2): Manager of Information Services at a firm with three US offices in the US and three international offices for BIS
- Respondent 3 (R3): Manager of Knowledge Services at a firm with two US offices and two international offices for BIS
- Respondent 4 (R4): Senior Analyst of Business Knowledge at a firm with two US offices and three international offices for BIS
- Respondent 5 (R5): Senior Researcher of Information Services at a firm with one US office for BIS

A total of nine managers at consulting firms agreed to discuss my questions. All of them wished to stay anonymous, and thus the results of interviews for this article will not contain any identifiers of the respondents and their employers.

4.1 Changes made during the pandemic

All respondents noted that they did not have to make significant changes except helping every information professional to work remotely. All information professionals and researchers had been using laptops prior to the pandemic, and thus no additional equipment had to be purchased. Three respondents also mentioned that some of their information professionals had been working from home at least on a part-time basis prior to the pandemic, so the change to remote working was very smooth and seamless.

In addition to the transition to remote working, recruiting was negatively impacted by the pandemic. Hiring was halted indefinitely, and this brought some additional stress as the volume of research and information requests surprisingly increased in most cases. R1 and R3 responded that they had an increase in the number of research requests from internal clients, and they also experienced a small increase in online meeting requests and video calls. Additionally, they continued their infrastructure-related projects such as developing new Intranet sites and upgrading their in-house research management platforms. R3 even mentioned that the last nine months have been some of the busiest during her tenure at the company. Overall, information professionals in those companies experienced only a small number of changes while they felt their productivity improved by working remotely from home.

Interestingly, there are currently conflicting views on how remote working affects workers' productivity. In its "Future of Jobs 2020 Report," the World Economic Forum (2020) reported that 78% of business leaders were initially predicting a significant reduction in productivity because of new remote and hybrid work arrangements. However, according to John Quiggin, Professor of Economics at the University of Queensland, the transition to remote work was

"remarkably" smooth (2020). Furthermore, Parke (2020) reported that productivity remained stable and even increased for many companies that transitioned to remote working during the pandemic.

4.2. Challenges experienced during the pandemic

The fact that they did not experience too much disruption did not mean that there was no challenge. Most notably, communication proved to be the common concern for all respondents, especially in the areas of training, collaboration, and client interaction.

The remote environment necessitated that information professionals be familiar with productivity software and be knowledgeable in their assigned industries. R2 commented that her company invested in providing training sessions in Tableau, SAS, Excel, and other statistics software for information professionals, so that they could become comfortable with working on an increasingly high number of data-related research projects. Without much knowledge in those software products, information professionals would experience great difficulty in understanding questions and delivering results as requested by their internal clients. R2 noted that online training on using data-driven software was more challenging than initially anticipated, compared to on-site training sessions where hands-on opportunities would have increased the interaction with the trainers and among the participants.

R4 raised some interesting points regarding online training in his remote work environment. First, online training sessions were mostly designed to be one-sided, meaning they were lectures without giving hands-on experience to participants. Second, participants almost always wished to turn their video off (either for personal or technology issues), and this contributed to the loss of interactivity as the level of engagement could not be gauged. Third, that online training sessions could be recorded helped build a database of recorded training sessions tailored to the needs of the BIS at his company specifically. Information professionals in his team could access recorded training sessions whenever necessary.

R1 and R5 expressed some concern over the lack of interactivity in problem-solving efforts. Especially new hires or those without long tenure suffered from the decreased level of mentorship traditionally provided by managers and colleagues. When co-located in the office, information professionals could easily exchange ideas and offer insights when working on difficult research questions. Information specialists often work on research projects requiring fast turnaround, and thus not being able to receive timely suggestions and coaching created resentment and possibly impacted work quality negatively.

5. Suggestions for BIS in the Post-Covid-19 Era

R2 and R3 shared great insights regarding the need for managing institutional knowledge in BIS. While the nature of their work did not change much, a remote environment may create a sense of disconnect and isolation. Unless they are self-motivated and disciplined, especially new information professionals may not be able to learn how to provide high-quality BIS in a fast-paced and remote environment without close mentoring. Re-visiting internal knowledge

management (KM) practices seem to be a great place to start. KM systems which actively create, store, and share ideas and processes will be essential in the remote environment. Since mentors and colleagues cannot offer immediate suggestions, providing a robust KM platform that helps access tacit knowledge of other information professionals promptly on time is critical. KM systems must be updated and if possible, upgraded so that information professionals can easily and quickly collaborate on research projects most of which are often time-sensitive. KM skills will be critical to sustain and grow not only BIS but other special libraries altogether.

R1, R4, and R5 discussed professional maturity including ethics, professionalism, and teamwork. Although none of them experienced any serious ethical violation, they were worried that some potential ethical issues may continue unnoticed. Also, they strongly believed that being co-located in the same office contributed to stronger teamwork and growth. They learned and gained diverse perspectives of colleagues by interacting with one another for significant hours daily. Such understanding would not come just by being trained – it must come from actual experience. They feared that a remote environment would prevent colleagues from appreciating diversity in the workplace and limit positive professional growth. How to maintain teamwork via mutual respect and high ethical standards in the new working environment must be a priority question for BIS managers.

Without frequent interaction among colleagues, teamwork may suffer, and this would eventually lead to poor productivity and quality of BIS. R3 described one of her colleagues, who was hired only two months before their team completely transitioned to remote working, expressed frustration that she was feeling isolated and disconnected from the rest of the team. It was equally difficult to monitor how each information professional was performing when everyone was working from home; senior professionals and managers were greatly concerned about the mental state of their information professionals during the pandemic, but short online meetings did not prove to be helpful. Stress management, therefore, will be a very important practice when everyone is working remotely. Assuming that remote working may continue even after the pandemic is over, BIS managers must be prepared to ensure that information professionals are not suffering emotionally by working independently most of their work hours.

Still, it is too early to assess the true impact of Covid-19 on productivity in general. Although employees may spend more time working in comfortable home environments, many of them also experience mental stress. They must struggle with the feeling of isolation and uncertainty while maintaining professional commitment becomes more challenging at home. Parke discovered that the most challenging aspect of remote working was a potential slowdown in innovation (Parke, 2020). The pandemic has forced many workers to work independently at home, and it inevitably becomes difficult to maintain company culture and workplace camaraderie. According to Parke, the loss of work cohesion during the pandemic is already leading to a decreased pace of innovation. While BIS professionals must collaboratively develop innovative service profiles in the preparation for the post-Covid-19 era, the current remote and hybrid work arrangements may hinder such efforts considerably.

Similarly, R1, R2, and R5 discussed a need for BIS to expand their service profiles boldly. If remote working becomes a norm even after the pandemic is over, then BIS would very likely be

one of the first corporate functions to be converted to remote working permanently. Thus, BIS would have to prepare strategies to remain visible throughout the organization, and proactive marketing with clear value propositions would be essential. R1 suggested that information professionals should be available to volunteer for projects that may be beyond the scope of their usual roles. In doing so, they can gain new skills quickly and, at the same time, they show agility and flexibility as to how much information-related work they can deliver. On a similar note, R2 urged information professionals to be open to new ways of providing information services, however drastic and unconventional they may seem. To do so, R5 strongly urged information professionals to be willing to learn new subjects and techniques such as database management, statistical analysis, coding, and even analytics. Continuing education or re-skilling may become an important theme not only for BIS but all special libraries.

Regarding their suggestions for educators teaching students in Library and Information Sciences (LIS), there was one clear theme: soft skills are more important than ever. All respondents emphasized that proactive communication was the key to success in the remote environment. As their clients started working remotely, information professionals began to receive more research requests via email and phone calls. Instead of participating in on-site meetings with their clients, they now provide most of their research outcomes in writing as well as online presentations. LIS educators must be mindful of such developments in the workplace, and they are asked to provide students with opportunities to demonstrate their written and video communications skills. Hands-on experience using up-to-date communication tools is critical while maintaining professionalism and work ethics in the remote environment must not be overlooked.

6. Conclusion

Due to the small size of the interviewees, this study presents opinions of a small community and thus cannot be generalized. However, given that consulting firms are one of the largest and active recruiters of information professionals and LIS students, their opinions matter significantly and help shape the future of LIS education. The preliminary results of this qualitative study offer practical and realistic views on how corporate information practitioners must adapt to the "new normal."

The pandemic has brought unexpected turbulence not only to BIS but the entire global business. In the post-Covid-19 era, only those who adapt to the new normal will survive. Most information service units have been relatively better prepared for remote working compared to other corporate functions; however, it does not guarantee that BIS will continue to thrive in the post-pandemic. Although a high degree of uncertainty still exists, BIS and other types of special libraries must be prepared to overcome challenges caused by the new normal, even if such changes seem painful and sometimes even frustrating. LIS educators must be keenly aware of the demands from employers of information professionals, and they must strengthen their curriculum by helping students acquire soft skills via more hands-on experience opportunities. There will be a growing demand for information professionals who bring exceptional soft skills such as communications, critical and analytical thinking, teamwork, and creativity.

Analyzing the pre-Covid-19 and post-Covid-19 eras, Sneader and Singhai (2021) wrote that the pandemic would expedite the adoption of digital transformation (also called "The Fourth Industrial Revolution"). All businesses and organizations must be ready to accept the new reality and quickly change the way of running their operations. BIS has been nimble in transforming information services over the decades, and new challenges are now awaiting all information professionals. New technologies such as artificial intelligence and digitization may attempt to replace information professionals' roles. One of the respondents noted that her company might restructure information services unit by placing data analytics team at the core while reducing the number of information professionals gradually. It is imperative for information professionals to search for new frontiers and seize opportunities as soon as we enter the post-Covid-19 era.

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