Comparison of Librarians' Perception on Metaverse According to their Experience in Use*

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ABSTRACT

As libraries strive to improve their services, many have expressed interest in implementing new technologies. One such technology is metaverse, a virtual-reality space that enables social activities using avatars. However, implementing this technology can be challenging when many librarians are unfamiliar with the concept. This study aimed to investigate how librarians' prior experiences with metaverse influence their expectations and potential use of the technology in libraries. Interviews with a total of 18 librarians were conducted. The study findings reveal that librarians had different conceptualizations of metaverse, regardless of prior experience. However, librarians had different thoughts on the potential use of metaverse for libraries dependent on prior experience. Regarding thoughts on potential use, the librarians who had non-experience running metaverse programs suggested ideas in expanding and trying out new services within metaverse. The librarians who had experience running metaverse programs, on the other hand, suggested focusing on transferring the existing services that are currently being provided in the library to metaverse.

Keywords: Metaverse, Library Service, 4th Industrial Revolution, Librarian Perception, Virtual Reality

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1. Introduction

The Consumer Electronics Show (CES) 2023, one of the most prestigious technology events in the world, showcased the latest developments in technology, highlighting the importance of digital transformation and innovation in modern society. From artificial intelligence to virtual reality, these emerging technologies are transforming the way people interact with each other and the world around them. In particular, metaverse, a virtual reality space that allows users to engage in social activities using avatars, has gained significant attention as a promising area of development for the fourth industrial revolution. In the field of library and information science (LIS), there has been a growing interest in exploring the potential of metaverse technology for enhancing library services and resources (Seo, & Kim, 2023). Previous studies have investigated user perceptions of metaverse (Kim & Kwon, 2022), metaverse platforms (Seo & Kim, 2021), and the use of metaverse in university libraries (Oh & Lee, 2022; Kim et al., 2022). However, while these studies have shed light on the benefits and challenges of using metaverse in libraries, they often overlook the fact that not all librarians have the same level of understanding and familiarity with this technology.

As metaverse technology is still a foreign concept to many, it is important to examine how librarians' prior experiences with the technology may influence their expectations and potential use of it in libraries. Furthermore, not all librarians conceptualize the same definition of metaverse (Kwon & Koo, 2020) and selecting appropriate platform for use can differ (Park et al., 2018). This creates a significant problem for libraries as they aim to integrate new technologies into their services as it is essential that librarians have necessary digital competencies to effectively use and implement these technologies (Noh & Hong, 2022). Therefore, this study aims to address this gap in the literature by investigating the differences in conceptualizations between librarians from the National Library of Korea, regional library and public library who have used a metaverse platform and those who have not. This study examines how librarians' perceptions of metaverse may influence the potential use of this technology in libraries, and identify potential strategies for enhancing digital competencies of librarians who are unfamiliar with metaverse. The research question is as the following:

Research Questions:

(1) Based on the use and non-use of a platform of metaverse, how did the librarians conceptualize what metaverse was?

(2) How did the librarians first encounter the concept of metaverse?
(3) For the [User-group of librarians], what is the thought process of selecting a platform for metaverse?
(4) Based on the extent of usage, what are the future service librarians wanted within metaverse?

This study contributes to the growing body of literature on metaverse and its potential use in public libraries. The findings of this study can help librarians better understand the challenges and opportunities associated with implementing metaverse technology in public library services, and provide suggestions for future directions in metaverse research in the field of library and information science.

2. Related Work

In this section, this study first states the definition of metaverse and its outlook. Next, an overview of the different usage of metaverse in libraries for both international and domestic use cases and lastly, recent studies regarding metaverse in Korea's Library and Information Science research are reviewed.

2.1 Definition of Metaverse

The concept of the metaverse has been gaining increasing attention from academics and industry experts in recent years. Despite its growing popularity, however, there is still no consensus on the exact parameters of what metaverse is. According to Wang et al. (2022, 1) one of the working definitions of metaverse is "a fully immersive, hyper spatiotemporal, and self-sustaining virtual shared space blending the ternary physical, human, and digital worlds". The idea of metaverse was first introduced in science fiction literature in the 1990s, but it has since evolved into a more concrete concept.

Scholars have also offered their own definitions of the metaverse. For example, Dolata & Gerhard (2023, 2) provides a summary of what metaverse is by analyzing the public discourse and states about as "something that transcend the physical reality described in terms of time and space". A common feature within the metaverse is that one is embodied as an avatar, and there is a shared feeling of presence in a shared space. Boellstorff (2020) discusses the concept of avatars

and presence in virtual worlds, including the metaverse. They argue that avatars serve as a crucial aspect of identity and presence in virtual worlds, and that presence is a shared feeling of being in a virtual space with others.

The concept of metaverse is often confused with virtual reality (VR), as both involve immersive virtual environments, but key difference lies in the scope and interactivity, with metaverse representing a fully-realized, interactive virtual world that extends beyond individual applications or experiences, while VR is generally limited to individual, closed-off experiences within a specific environment (Muhanna, 2015). For a more in depth definition, virtual reality (VR) is a computer-generated simulation of a three-dimensional environment that users can interact with in a seemingly real way. VR technology typically involves a head-mounted display or other immersive hardware that provides a visual and auditory experience that can be controlled by the user's movements and inputs (Choi, Jung, & Noh, 2015).

Metaverse, on the other hand, is a more expansive concept that refers to a network of interconnected virtual worlds or spaces where users can engage in a variety of activities, including socializing, gaming, shopping, and more. Metaverse is not limited to any single platform or technology, but rather is an evolving network of virtual environments that can be accessed and navigated using a range of devices, from desktop computers to virtual reality headsets. In other words, while virtual reality is a specific technology that creates immersive simulations of single environments, metaverse is a larger concept that encompasses a network of interconnected virtual spaces and experiences (Wang, Yan, & Zhou, 2021).

2.2 Metaverse and Libraries

The library and information science community has always underscored librarians' use of new digital media tools and platforms (Shank, Bell, & Zabel, 2011; Ali, Naeem, & Bhatti, 2020; Sobreira, Santos de Oliveira, & García-Peñalvo, 2020). Scholars have pointed out that while we fully do not understand how the different platforms of entering metaverse will evolve, it is inevitable to understand the future of librarianship in discussion underway (Daradkeh, 2023). Hill, Vans, & Dunavant-Jones (2018) state that there is an importance of documenting the early works of librarians of best practices for education and connecting communities as they can be used in understanding best practices in a networked digital culture. Therefore, as opposed to only including librarians who had extensive knowledge on using platforms for metaverse, we found it valuable to also include the voices of librarians who had not used metaverse as they still had much prior

knowledge in best practices for library services.

Up to date, there has been an increase in cases of different types of libraries (national library, school library, public library etc.) that have created programs using metaverse. Kim & Kwon (2022) reviewed a total of 92 public libraries (40 domestic and 52 abroad) of the different use case based on purpose. While there are many purposes, such as for entertaining and gaming, we will focus on cases that have been prevalent in recent research on LIS and metaverse (Gou et al., 2023; Seo & Kim, 2023). The various purposes for use can be summarized as for 1) education, 2) community building, 3) archiving and 4) building a digital twin.

For education, the use cases for libraries mostly focused on using the VR headsets to enter the metaverse world and to learn concepts in a 3D virtual environment. For instance, the university of Malaysia created a metaverse library in the medicine department where the students could explore anatomy models and view multimedia resources within metaverse to learn about medicine (Bakar et al., 2022). In the case of the Saint Augustine University library they provided open source code for patrons to learn how to create their own worlds within metaverse (Chase, 2022).

For community building, libraries have explored how to leverage the use of metaverse to share news such as announcements on social topics and in connecting people. For instance, the Hypergrid Resource Library is a community of librarians that was first built in Second Life in 2007 (Hill, Vans, & Dunavant-Jones, 2018). The library has continued in building more partners with existing libraries and educators for the library to become a hub that connects the digital citizens and provides the opportunity to teleport to different locations. Another use case is the Uncensored Library that was built in Minecraft which is where the library gives access to the censored articles from five different countries (Cavalcanti et al., 2023). The users are able to have active discussions within the space. Within Korea, Cheongju Heungdeok Library (Oh, 2022) and the National Assembly Library (Noh, 2021) opened a space where people participate in different events within a metaverse platform named ifLand.

For archiving, there have been libraries which have built spaces within metaverse to provide access to patrons in viewing library resources that are fragile or have been limited for access. For instance, in the case of the Stanford Library, they have built a library in Second Life where patrons are able to view the special collections in the virtual archives that have been restricted for staff only (Shanks, 2008). In another case, that was funded by the European Union (EU), LAURIN (Libraries and Archives Collecting Newspaper Clippings Unified for their Integration into Networks) was built to give a wider visibility on cultural heritage (Calvanese, Catarci, &

Santucci, 2001).

For building a digital twin (Aloqaily et al., 2022), it means that a library will build a mirror world of the physical space in the virtual world. For instance, in our review of the current metaverse examples built in libraries in Korea, the library of Hansung University was the first library within Seoul to build a digital twin library called Hansung Bookniverse within a metaverse platform Zepetto where patrons could enter reading programs through the application (Hansung University, 2021). Dongdaemun Dapsimni public library is also an example of building a digital twin library where patrons would be able to explore the current building (Kim, 2022). Seocho MetaWorld that was built from Seucho library allows patrons to participate in lectures, shows and events (Jeon, 2021).

2.3 Metaverse in Korea's Library and Information Science Research

The library community in the respected journals of library and information science in Korea (Korean Bibilia Society for Library and Information Science, Journal of the Korean Society for Library and Information Science, Journal of the Korean Society for Library and Information Management) has first used the term 'metaverse' in the year of 2022. Before the use of the term metaverse, there have been some studies conducted on virtual reality and libraries (Kwon, 2019; Lee & Chung, 2020; Kim et al., 2022). This section, however, specifically reviews research on the term metaverse and libraries in Korea.

The study by Kim & Kwon (2022) reviewed the use of metaverse in libraries both in Korea and abroad. The authors found that Zepeto was the most commonly used platform with 74.2% among the libraries reviewed, while Gather Town was used by 25.8% of the libraries. The study also identified Roblox and Minecraft as popular programming platforms. The authors also found examples from librarians who ran programs about metaverse to librarians who have built their libraries within metaverse. The authors suggested that libraries should diversify the content they provide in metaverse and explore new possibilities for engaging with patrons. Researchers have also engaged in understanding the university library use of metaverse. For instance, Oh & Lee (2022) analyzed the current status of the university library metaverse and perceptions of it to identify difficulties and requirements of running the service.

There have also been studies understanding the patron's perception of metaverse in libraries. Kim & Kwon (2022) investigated the perception of the MZ generation. The study findings suggest that metaverse can be used to provide virtual library services, such as reference assistance and

programming, and as a tool for outreach and community engagement. Seo & Kim (2021) analyzed the characteristics of metaverse platforms used in various industries and suggested that the success of metaverse relies on the interaction between users and the environment. The authors recommend that organizations using metaverse should prioritize user experience and actively engage with users to improve the platform.

For a more recent study by Seo & Kim (2023) examined metaverse cultural programs in domestic public libraries. The findings shared different types of cultural programs using metaverse platforms. The librarians in the study stated for future use how library tours, exhibitions and events could be ideal within metaverse. While the prior studies mentioned above share future directions of what possible platforms libraries can use, studies have examined mainly libraries and librarians who have already used metaverse for programming or have built their library within the metaverse. It is equally important to understand how librarians who have not yet explored the potential of metaverse perceive it in order to discuss the future of libraries more holistically.

3. Method

3.1 Data Collection

To identify our potential participants, our first inclusion criteria was to identify librarians that had opinions about digital technologies being implemented in public libraries. Therefore, our exclusion criteria was any private libraries and focused only on all stakeholders that had relationships of providing service to the public library such as the National Library of Korea, regional libraries and lastly public libraries. Next, to identify potential participants that met the criteria, a snowball sampling was used (Handcock & Gile, 2011) by first contacting the librarians in the National Library of Korea that had a list of librarians from diverse provinces. The study identified participants who had somewhat experience with the metaverse platform and the librarians who had non-experience but still felt comfortable sharing their opinions. Additionally, our study design reached out to librarians located in diverse provinces nationwide.

Our purpose for reaching out to librarians nationwide was to get a diverse view regardless of size and support from the region. After identifying potential participants, they were contacted via email and provided with information about the study. Participants who agreed to take part in the study were then asked to provide the contact information of other librarians who might

be interested in participating. Depending on preference and availability of the participant, semi-structured interviews were conducted either in-person at the library where the participants were working at, over Zoom, or through phone. The interviewers all asked permission to record the interviews, which were then transcribed using the Clova system in Naver. A total of 18 interviews were conducted, with an average length of 41.20 minutes (sd. 12 minutes).

In table 1, we share the main topics and questionnaires of the interview. The purpose of the interviews were to first understand how much prior understanding the librarians each had on metaverse and to discuss its potential use in libraries. Depending on whether they had experience on using or not using a metaverse platform in libraries the questionnaires differed. For the non-user librarian group, short video clips and demos of examples of metaverse were shown. For the user librarian group, questions asked what type of platform they used and their thoughts on the opportunities and limitations. For both groups, the final theme was on their thoughts on future application of metaverse in the library and thoughts on how it can be used.

〈Table 1〉 Table of Interview Questions

Interviewee	Themes	Specific Questions
Both groups	Background question	• What is your role in the library?
	Prior experience and perception of metaverse	• Can you tell me about your experience with metaverse? • What extent do you know about the metaverse? • How were you first introduced to the metaverse?
	(For librarians with non-experience) A short video of three types of platforms on metaverse was shown.	
	Perception of metaverse library	• Can you tell me your thoughts on building a virtual library? • What expectations do you have when utilizing existing metaverse platforms? • Can you tell me your thoughts on potential use of metaverse as a platform for public libraries?
	Developing metaverse library	• What skills are necessary for librarians to operate a metaverse library? • What support do librarians need for metaverse libraries? • What type of service would you like to provide regarding metaverse?
User group	Experience with metaverse for library service	• Can you tell me about your experience programming or building a library within metaverse? • How did you promote what you built? • What struggles did you face? • What is a limitation that arises when using existing metaverse platforms? • What was the patron's age range?
Non-user group	Purpose of non-use	• What were the reasons you did not use metaverse for library service?
	Expectations for metaverse library	• What are the expected benefits and concerns for patrons? • What struggles do you expect to face while operating a metaverse library?

3.2 Data Analysis

The transcribed data was analyzed using content analysis, a qualitative research method that involves examining and interpreting the data for patterns, themes, and categories. The analysis was conducted by four researchers, each of whom reviewed seven transcripts. The researchers collaboratively created categories based on the interview data. Excerpts and associated codes were then reviewed, discussed, and organized by all the researchers until core themes emerged and were formalized. The initial codebook included the following: 1) past experience with technology for serving patrons in the library, 2) positive and negative experience with different platforms and 3) thoughts on future application of building a library within a metaverse platform. Over the period of 3 months, we conducted a consensus process to achieve interrater reliability consistency. In order to increase reliability and validity of the research results, in addition to the researchers who analyzed and interpreted the data, a total of two experts in the field checked the analysis and interpretation. One person was from the National Library of Korea and the other expert was a qualitative researcher in Library and Information Science who was both familiar with the theoretical background and research context of this study.

Based on the feedback from the two experts in the field for the second finding section, the codes were further iterated by using a combination of two frameworks which is the Xie's User Driven Evaluation Model and the Multifaceted Evaluation of Digital Libraries (MEDal). First the Xie's model focuses on users and it is derived from empirical studies on investigating users' perceptions of digital libraries (Xie, 2008) and second the MEDal model has ten dimensions that were derived from document analysis of digital library theoretical frameworks (Xie, Joo, & Matusiak, 2018). The researchers in this study saw many connections of what was mentioned in the interview data. In qualitative research, researchers can go from the first inductive process and move to using a deductive process (Fereday & Muir-Cochrane, 2006). We compared our generated themes to the two models. Below in table 2, we share a summary of the framework.

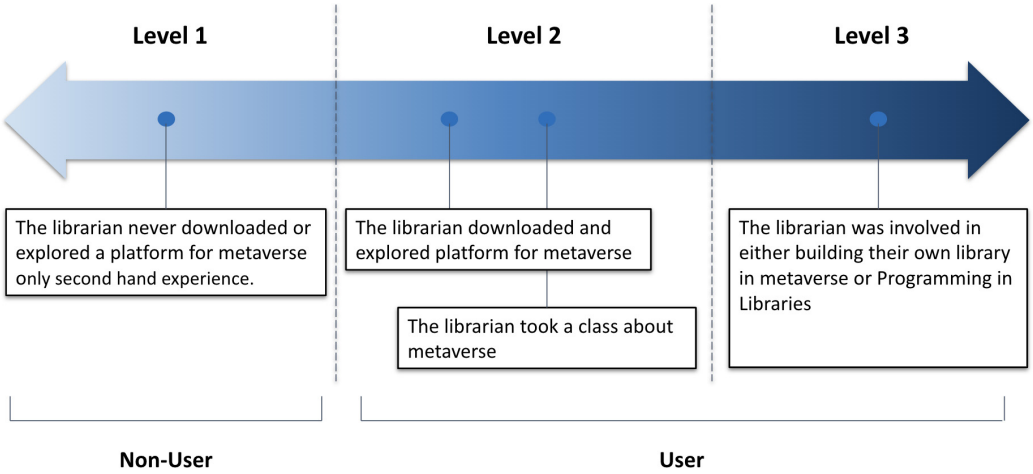
〈Table 2〉 Combination of Xie's User Driven Evaluation Model and MEDal Model

The Dimensions	Definition of the Dimension	Source
Functions and Interface Usability	To assess the types of functions that are offered and in what ways and to what extent the interface supports a user's ability to use the function.	Xie's User Driven Evaluation Model Multifaceted Evaluation of Digital Libraries (MEDal)
Visual Appeal	To assess to what extent the interface is visually attractive to the users	Multifaceted Evaluation of Digital Libraries (MEDal)
User Control	To assess to what extent a digital library allows users to manipulate its interface	Multifaceted Evaluation of Digital Libraries (MEDal)
Intuitive operation	To assess how straightforward the system is for the user to understand its operation and how easily a user can learn to operate it.	Multifaceted Evaluation of Digital Libraries (MEDal)
Service quality	To provides unique services for the intended user communities	Xie's User Driven Evaluation Model
System performance efficiency	To offer relevant and useful information efficiently	Xie's User Driven Evaluation Model

4. Finding

The initial thought was to do a comparison of librarians who have used a platform for metaverse to librarians who have not used a platform for metaverse. However, in asking the question about the experience, the study findings revealed that the extent of how much prior knowledge they had on metaverse differed. In order to show the extent of use, in figure 1, the extent of how much experience the librarian had on the platform of metaverse is provided. The darker the shade, it means that the librarian was more involved in using metaverse. The darkest shade is doing programming about metaverse in the library or creating a library within one of the metaverse platforms. The middle shade is when the librarian has received education about metaverse or explored the platform but has not executed a library program. The lightest shade is when the librarian has no or little experience about metaverse and is only learnt from second hand experience such as through the media or view of other people.

We have defined the [User group librarians] as librarians who have downloaded a metaverse platform and have experience using it. The [Non-user group librarians] are librarians who have never downloaded or explored metaverse but only have second hand experience of metaverse such as reading or watching a video or article about metaverse. The extent of usage of the librarians we have interviewed and their information is listed in Table 3.



〈Figure 1〉 Distinction of the two librarian groups based on the extent of usage

〈Table 3〉 Participant Characteristics

Use of metaverse	Extent of Usage	Name	Age	Library Type	Roles and Positions	Total minutes of interview
Non-User	Level 1	Participant 1	40s	Regional Library	Acquisition department	37'13"
		Participant 2	40s	Regional Library	Library program and events department	37'13"
		Participant 3	40s	Public Library	Reading culture program operation, collection department	24'54"
		Participant 4	30s	Regional Library	Program Department, Collection Department	30'14"
		Participant 5	40s	National Library	National Bibliography Division	60'31"
User	Level 2	Participant 6	40s	Public Library	Overall library operation	47'41"
		Participant 7	30s	National Library	Knowledge Information Service Division	39'31"
		Participant 8	30s	National Library	Human Resources Development Division	31'37"
		Participant 9	40s	National Library	International Exchange and Public Relations Team	24'43"
		Participant 10	50s	National Library	Digital Information Planning Division	24'36"
		Participant 11	50s	National Library	Children and youth information service	47'02"

User	Level 3	Participant 12	50s	Public Library	Head of Library Division	63'05"
		Participant 13	40s	Public Library	Archives, Media Manager	55'10"
		Participant 14	40s	Regional Library	System maintenance department	30'17"
		Participant 15	50s	Regional Library	Reading team leader	41'43"
		Participant 16	40s	Regional Library	Reading and Culture Room Librarian's Guide	56'58"
		Participant 17	50s	Regional Library	Library Cooperation Team Leader	45'35"
		Participant 18	50s	National Library	Knowledge Information Service Division	45'52"

The purpose of the paper is to understand the future use of metaverse in the public library. Therefore, in this study the two groups we will focus on will be librarians who used it for library programming as well as who learnt about metaverse platforms from training as [User group librarians] to librarians who have only had second hand experience of the platform as [Non-user group librarians]. The librarians who had experience using metaverse for programming purposes or received training for future programming would have more experience in the process of advertising and operating it for the patrons in the library. To make the distinction clear, the two groups will be titled as [User group librarians] and [Non-user group librarians].

The finding sections are divided into three sections. In Finding 1, we discuss the conceptualization of how the librarians were understanding the concept of metaverse and how the two groups first encountered the concept. In Finding 2, we discuss the thought process of selecting platforms for metaverse for the [User-group of librarians]. In Finding 3, we discuss the content the librarians in each group wanted to execute within metaverse for future purposes. For each section, we highlight the differences and commonalities between the [User group librarian] and [Non-user group librarians] and their extent of usage.

4.1 Conceptualization of Metaverse and Routes of First Encounter

In this section, research question 1 and 2 of how librarians conceptualize metaverse and how they were first introduced to the concept is discussed. We first share how the two groups of librarians were conceptualizing the concept of metaverse. For the librarians who never downloaded

or explored a platform, the [Non-user group librarians] findings share to what extent they know about metaverse and how they were first introduced to the concept. The findings for [User group librarians] share the purpose and motivation on how and why some librarians did programming on metaverse or created a library within metaverse whereas some librarians decided not to use metaverse platforms as a part of their library service.

When asked the question about the experience with metaverse, the findings showed how each librarian was conceptualizing the concept. Except for one librarian, the majority of the librarians, regardless of whether they were in the user or non-user group, associated the concept with particular platforms such as GatherTown, Zepeto, Roblox and Minecraft. However there was one librarian who stated about experiencing different states of metaverse such as life logging and mirror world. When asked the question on experience with metaverse they replied:

> "I heard somewhere that the metaverse is divided into four parts. Augmented Reality, Lifelogging, Virtual Reality and I forgot the fourth one. But for lifelogging, I often view Vlogs on YouTube and for Augmented Reality, I have used experienced Pokemon Go. For Virtual Reality (VR), I don't really enjoy games so I don't have much experience on that." (Participant 7)

The following quote indicates that while the majority of the librarians associated specific platforms as metaverse there was only one librarian who responded by stating four components of metaverse. On the other hand, while Participant 6 had experience using and providing Augmented Reality and Virtual Reality programs in the library, this librarian did not associate the technology with metaverse. Rather stated metaverse as a separate concept. Overall, Participant 18 stated the frustration of not understanding to what extent metaverse should be defined. Due to such loose definitions, it seemed even more difficult for participants to understand the concept.

> "I think there is a lot of ambiguity about what metaverse is. Like to what extent is metaverse." (Participant 18)

Participant 6 also made a similar response to the question on experience with metaverse replying

> "For my experience on metaverse…I guess it depends on how we are going to define metaverse but I think overall it is an extensive concept…". (Participant 6)

Both Participants 18 and 6 had experience using a platform of metaverse. However, the following quote shows that despite the fact that both librarians had experience with using metaverse as a platform for library service, they were ambivalent on to what extent they should perceive as having experience with metaverse.

The routes of first encounter: Within the [User Group Librarians] we had librarians who were able to either build a library within metaverse or did programming about metaverse. For the purpose of why they ran the program in the first place, there were librarians who made a library within metaverse from the demand of online services due to social distancing.

> "The demand for non-face-to-face services was very high due to the COVID situation, and we were wondering how much the role of the library could be expanded or how much of those roles could be taken over. So we set a direction as an IT specialized library. Currently, we mainly operate augmented reality or coding programs here. We are also continuing to operate metaverse." (Participant 12)

There were also librarians who were involved in building a library within metaverse from partnership with an industry.

> "thanks to ABC (pseudonym of the company's name) support, we were able to build a metaverse. They requested that our employees undergo metaverse education, and I participated in that education. Through that education, I experienced various platforms and learned about what the metaverse is. There are many metaverse platforms out there, such as "Gather Town" and "Zepeto." We learned about their respective strengths and weaknesses and even had a chance to experience Zepeto during an actual class. After gaining an overall understanding of metaverse, we were able to build our own metaverse. However, since we cooperated with ABC, the metaverse platform we chose is ABC's computer-based platform." (Participant 16)

In the case of Participant 18, while they have built a library within metaverse, the library was not exposed to the public. Rather it was for learning purposes and for demonstration to further understand the opportunities and limitations.

> "Last year, we created a 'Rare Book Experience metaverse,' which can be called metaverse. We are not currently providing it as a national service, but rather, students in the education department come to our library for practice. They come to practice and teach each other. We are only showing this

> to our trainees. So, we have the Rare Book metaverse and also educational conferences. We created these things and demonstrated them, so from this year, we are showing our trainees what it is to be in metaverse." (Participant 18)

The [User Group librarians] who had a chance to actively participate with projects on metaverse also stated how they previously provided technology related programs such as coding and science. Therefore, in the cases of these libraries, providing the metaverse programming was simply expanding prior services. Overall, the librarians who were able to have more active use of metaverse had in common that their library had a special department and librarians that was dedicated for the service in IT.

For the [Non-user Group Librarians] who did not have experience with running any programs regarding metaverse, they shared how they were exposed to the concept by family members, library forums and through books people were checking out about metaverse.

> "Personally, the only experience I have had with metaverse is through my kids, who are still young and currently playing a game called Roblox. So that's about the extent of my knowledge on this topic." (Participant 3)

There were librarians who were introduced to the concept due to the interest of upper management to build a library within metaverse or to do programming on metaverse. However, due to the cost of building and maintaining the platform, the librarians decided not to use metaverse for programming.

> "Someone from upper management level at our library had an interest in metaverse, so managers actively attended seminars. However, when we heard that it would cost a lot of money to produce, on the order of tens of millions of won, we just wrote it off." (Participant 4)

However, for the [User-group librarians], even though they invested high costs of building libraries in metaverse they questioned the effectiveness of the outcome compared to what they have invested.

> "I personally think that games like Roblox or Gathertown had some initial issues because they were more game-oriented, but they lacked sustainability in the long run. They were popular for a while,

> but I've also looked into it and realized that they weren't necessarily cost-effective or particularly satisfying in terms of longevity." (Participant 14)

4.2 Selecting Platforms for Metaverse

In this section, we aim to address research question 2 on the selection criteria of why certain platforms were selected by the [User group librarians]. In this section, the [Non-user group librarians] are excluded as they had little knowledge about platforms. However, in Finding 3, we state what potential platforms and contents the librarians wanted within the metaverse based on the extent of use.

The librarians who have stated to use metaverse for programming purposes used either Gathertown or Zepeto. The findings revealed the common themes of what librarians prioritized in selecting a platform. Based on the combination of Xie's User Driven Evaluation Model and MEDal Model, 'function', 'user control' and 'intuitive operation' was a higher indicator of selecting a platform as opposed to the 'visual appearance'. The following comment below states about the thought process of why Gathertown was selected as opposed to Zepeto.

> "I know that IfLand and Zepeto both allow the users to decorate their space and characters. But the reason I use GatherTown is because it allows me to easily open different lectures and I'm able to scrape different sources on the Internet into the space. But there is a disadvantage that Gathertown is not as fancy as other platforms so the interest can be reduced." (Participant 13)

A similar comment was made by another librarian of how she appreciated the different functions within Gathertown but perceived how it could be dissatisfying for the patrons. The following comment was made:

> "Yes, Gathertown has these functions where you can open meetings and share different resources but it is too 2 dimensional. So the user interface is just not interesting. So I don't think it will meet our patron's expectations." (Participant 8)

It was not just the ease of use for the librarian in preparing the space for patrons to use but librarians also stated how GatherTown was more accessible for the patrons which also connects to the dimension of 'user control' and 'intuitive operation'. A librarian stated the following:

> "In the case of GatherTown the opportunity is that patrons don't need to create an account to use the platform, even non-members of the platform can login. So I thought GatherTown was meeting the needs of the library." (Participant 5)

On the other hand, the public librarians' perceived the platform Zepeto to be more visually interesting but called out the disadvantages such as 1) advertisements, 2) limitation on functions and 3) limits on the number of people who can participate within the metaverse space which connects to the dimension of 'service quality' and 'system performance efficiency'.

First on 'advertisements' a librarian stated the following:

> "Zepeto had a very cool three dimensional interface. However, everywhere I went it was full of advertisements. I had to purchase stuff to dress the avatar. It was even hard to move around. It was visually interesting but I don't think I will be able to provide the library service I do in this space." (Participant 15)

From this quote, we can see that there is a common theme that librarians perceive Zepeto to be visually interesting but how it does not align with the needs of the library.

Second, regarding 'limitations of functions', many librarians did a comparison of how the functions within Gathertown were easier to use as opposed to Zepeto in building a space within the metaverse. A librarian who conducted library programming with the senior population stated the following:

> "I think Zepeto was not a suitable platform for programming. We had practice sessions where patrons can build their own world within the metaverse. GatherTown had easy functions where even the older people in the library could learn and use it. So in learning how to decorate the space there was higher satisfaction within the program." (Participant 16)

Lastly, as a public space for all people to use a common theme that was stated in assessing the platform for metaverse was the 'number of users the platform was able to hold'. Librarians stated in case of Zepeto there was a limit of how many people can access the platform. Librarians suggested that Zepeto could be used within reading clubs of smaller size libraries rather than larger size libraries with more patrons.

Overall, the two main platforms that were being discussed were either GatherTown or Zepeto. These platforms were either already being used in the public library or were discussed for potential

use as for programming. While there were no libraries that stated to use Roblox as a platform for library services, some [Non-user group librarians] had second hand experience with Roblox. Roblox was often associated with the term ‘gaming’ and ‘young children’. Within the interviews there were librarians who have stated to never use metaverse, but many stated how they perceived the platforms having benefits to promote the program.

> “Roblox is really like a game… so it may gain interest in the beginning. But I think regarding sustainability it won’t last long. I think people will lose interest in the long run.” (Participant 4)

Another librarian (Participant 5) commented Roblox could be a lower barrier for elementary students but also reminded some of the concerns regarding ethics.

4.3 Thoughts on potential use of metaverse as a platform for public libraries

In this section, we aim to address research question 4 of the possible content that librarians perceive suitable within the metaverse based on their extent of usage. The difference between the finding 2 is that while the finding 2 discusses the current platforms that provide users to enter metaverse, this section discusses librarians’ thoughts on future platforms and potential use of metaverse for public libraries for all three groups.

For this section, there was a difference and similarities amongst the three groups. For the same question of how metaverse can be used as a platform for public libraries, for librarians who had prior experience running the programs or using metaverse who are the [User group librarians in Level 3] associated their answers of first thinking about the existing role of the library and then brainstorming how this role can be transferred to the metaverse space.

The [User group librarians in Level 2] and [Non-user group librarians in Level 1] who did not have prior experience of running the programs associated their answers of first discussing the opportunities of metaverse and then brainstormed on how to apply such opportunities for the metaverse space to expand the current services. In addition these two groups envisioned a centralized metaverse platform that would connect all libraries and librarians together.

Below, the specific quotes are shared in the findings by first discussing the [User group librarians in Level 3] and then the librarians in [Level 1] and [Level 2].

Librarians who had experience building a library within metaverse stated how the concept was still very new to the majority of the patrons. Therefore, the librarians pointed out the importance

of first teaching the people about what it is and how to use it. In addition librarians stated the importance of providing a space that people are already familiar with such as book exhibitions for people to intuitively understand what to do in the metaverse library.

> "In our library we had a space where there were exhibitions for picture books. Within the metaverse we were able to not only do a picture book exhibition but also curated books for the patrons. The concept of metaverse is still very foreign to many people in the library. So there is a need to teach people about it. So by putting the exhibition in metaverse, we were able to have people first experience what it is like inside." (Participant 16)

From this quote, we are able to learn that metaverse is still perceived as a foreign concept to the majority of patrons in the library. Therefore, in this case, the librarian had to come up with a program that the patrons would be interested in and was familiar enough to allure the patrons to try it out for the first time.

Many librarians who had experience using metaverse for programming discussed many hardships of first learning about how to use and build the space, second on exploring on how to advertise the space and lastly having patrons continue coming to the space.

> "I had to learn by myself by buying a book about metaverse and studying after hours…It takes me even more time to brainstorm on how I am going to showcase the metaverse library our library created such as having advertisements all over the library…Eventually, many people interest fades as time past so we had to brainstorm on what to do which takes a long time" (Participant 13)

Through the above quotes, it shows how the librarians who had experience with metaverse for programming had much more struggles on first launching and sustaining the program. Therefore, in asking about what space they wanted in metaverse many of the answers are focused more on their work as opposed to new services for the patrons. In addition, [Users group librarians in level 3] response on how to use metaverse in libraries is also more on utilizing existing library services such as book curation, picture book exhibition and overall making connections to the patrons to existing services.

The librarians in [Level 1] and [Level 2], discussed taking advantage of the metaverse space that can be completely different from the physical space which could only be made from imagination. For instance, the following comment was made below.

> "I hope the library we build within metaverse is a completely imaginary one. It's another public institution, so I wonder how it needs to be different, and I've seen people thinking about these things. So, if we have to offer a way for users to access online and offline services, the question is should we recreate the real-world library as it is, or should we do something new? Personally, I lean towards the latter option of creating something completely new from imagination... I hope they don't create a library that is too much like a typical library." (Participant 9)

The specific services that were mentioned by the librarians in [Level 1] and [Level 2] were for 1) entertainment, 2) accessibility, and 3) creating more interaction opportunities amongst libraries and librarians.

First, a common theme was on entertainment, of utilizing the metaverse space for the patrons especially the younger generations to play and learn within the library.

> "I think it would be interesting to create a space that mixes a little bit of learning and play. There are teenagers who want to participate in clubs or support the library's operations, like support teams for library operations. And then there are also maker clubs, so if we create a virtual space where teenagers can gather and engage in activities related to their interests I think it would be fun." (Participant 6)

> "It has to be fun! If it is not fun people won't come visit. For instance, there should be different events where people are excited to visit and we give out some gifts for participation." (Participant 2)

> "I hope that if we build something in the metaverse it is not just a place where young people like children read books but more of a place where you can try different things out." (Participant 4)

Second, librarians discussed one of the major opportunities of metaverse for people with special needs such as having vision problems and limited motor skills as it was a virtual space where people can have more functions such as enlarging the screen or running using the avatar.

> "Within the metaverse it would be nice where you can enlarge or reduce the text size, so people with visual impairments can zoom in and view the text more easily. I think that would be a good feature." (Participant 10)

> "Especially for people with disabilities, it can be difficult to go see performances or events. Therefore,

it would be great to use metaverse content to make things more accessible for them." (Participant 3)

Lastly, librarians envisioned spaces in the metaverse where different libraries can connect and librarians can gather to help each other.

"It would be great if services and programs could be provided centrally, and go beyond a single library. In that way, people could browse local materials and even visit other libraries from different areas, which would be ideal." (Participant 1)

"I think building a community of librarians in the metaverse space would be nice. This is because libraries are spread out throughout the country, making it difficult to physically gather in one place. Therefore, in order to collaborate, we need relationships to be built but currently there is no space for that to happen." (Participant 7)

In summary, from the above quotes, we learn that many of the librarians who had built a library within the metaverse [Level 3] imagined more of a digital twin (Lakovides et al., 2022) of a library that aims to look identical to the physical library. The librarians in [Level 1] and [Level 2], on the other hand, discussed using the opportunity of the virtual space where there were no limits of what could be built to expand to more services in the library.

5. Implication

Based on the analysis results, below we share considerations and implications of how libraries can move forward with the advancement of technology such as the platforms for metaverse regardless of the different extent of use.

First, a shared narrow definition of what constitutes a metaverse in the beginning of a project may reduce the confusion. Regardless of whether the librarian was from the [User group librarians] or the [Non-user group librarians], all librarians had difficulties in stating how to conceptualize the metaverse. However, the current understanding of metaverse to the majority of the librarians were specific platforms such as Zepeto, Gathertown, and Roblox. From the interviews, we learn that the platform that is currently being used on the so-called metaverse is more similar to the virtual second life entering the world through mobile phones and computers as opposed to entering

the virtual world using multimedia technologies such as virtual reality headsets and augmented reality supporting gears. This indicates that the majority of the librarians in both [User group librarians] and [Non-user group librarians] has a narrowed definition compared to how metaverse is defined in the industry and academia (Wu et al., 2021).

Second, librarians showed the need to have a metaverse platform built that specifies the need for the unique context of the library. In the case of the [Non-user group librarians], many of the platforms they hoped to have for metaverse were platforms that were currently not available in the library. This indicates the gap between what librarians perceive as an affordance of being in the metaverse to the actual content that is being provided. Based on the evaluation using the frameworks of Xie and MEDal, the [User group librarians] findings showed that there are not yet many platforms which meet the holistic needs of the library such as 1) librarians being able to keep track of the patrons 2) a space that supports diverse group to visit and 3) tool sets to create programs that the librarians envision. However, this does not indicate that the librarians did not see the value of the technology that the metaverse has to offer. For both groups and regardless of extent of usage, all librarians had ideas and thoughts of how to leverage the technology for new services in the library.

Lastly, librarians showed the need to have a support system that connects with other libraries in successfully running the platforms. The study result shows that from the interviews with librarians, we learn from both groups of [User group librarians in Level 2] and [User group librarians Level 3] who had some use of a metaverse platform, that they confronted with many challenges such as the cost of continuing with the use of the platform and the workforce who can run the program. Comparing librarians who have used and have not used metaverse platforms further highlights the reality and expectations of what is involved in preparing, executing, and sustaining such programs. This underscores the need for creating a shared system where different libraries can create a larger network to provide collective services, as not all libraries have the resources to successfully run these programs on their own.

6. Conclusion

Overall, there is a growing interest in exploring how to use the technologies for metaverse in the library space, it is important to be aware that the understanding of metaverse differs amongst librarians. The contribution of this paper is that it shows how based on the experience of the

metaverse how their perception changes. Findings highlight three main parts. First, regardless of the use to non-use and the extent of usage the majority of the librarians had a difficult time in explaining to what extent metaverse was. Second, in selecting platforms based on the analysis of the Xie's User Driven Evaluation Model and MEDal Model, 'function', 'user control' and 'intuitive operation' was a higher indicator of selecting a platform as opposed to the 'visual appearance' which resonate to prior findings from Seo & Kim (2021) of the importance of 'resource sharing', 'presentation' and 'world building'. Lastly, in building a library within metaverse, we noticed from [Non-User group librarians in Level 1] to [User group librarians in Level 2], librarians were much more optimistic about the use with little concern of expanding the service of libraries and changing the image of the library. Whereas, librarians in [Level 3] who had the most experience, discussed building libraries in metaverse that were more used to conventional libraries such as interacting with books as that was the expectation from the patrons. By understanding the difference based on the extent of usage, we can better prepare how we want the library to look like in the virtual space and discuss the role of the future of librarianship within such space. In addition we also learn that different from other communities the library community is especially important for creating networked places for librarians to gather and share different resources to service more patrons in the library.

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