

Evaluating the Scholarly Trends on Issues, Strategies and Sustainable Development of Digitisation of Documentary Heritage: A thematic review

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Abstract

The transformation from conventional archival practices to the digitization of documentary heritage collections represents a pivotal undertaking in the safeguarding and facilitation of access to historical and cultural materials in the digital era. Digitization helps preserve precious materials, making high-quality digital images available electronically. In the context of this paper, manuscripts are categorized as valuable assets and historical documentary heritage and will be discussed in detail. The underpinning of this thematic review paper is to identify the issues that have been discussed in the digitization of documentary heritage publications from the years 2010-2021 using ATLAS.ti 8. A keyword search, followed by a filter using inclusion criteria from SCOPUS, Web of Science and Mendeley databases, identified 424 peer-reviewed journal articles and, after the inclusion and exclusion process, only 28 articles were used as the final articles to be reviewed. Findings show four distinct categories: collaboration and participation; disaster preparedness; crowdsourcing; and cultural heritage information system.

Keywords: Digital Library, Documentary Heritage, Atlas.ti 8; Thematic Review

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1.0 Introduction

Digitization has become a popular approach on a global scale. Large and small organizations around the world from many different sectors (museums, archives, libraries, art galleries, government and commercial) have been creating or converting resources into digital form for a wide range of users. Staying informed about these current practices in digitization is essential to adapt, innovate, and remain competitive in a digitally-driven world. National Preservation Office (2001) defines digitization as the conversion of analogue materials into a digital format for use in computer applications. Mesui et al., (2019) summarizes digitization as transforms materials from analogue (human-readable) formats to a format that can only be interpreted by computers (digital). He also states that digitization could help preserve precious materials, making high-quality digital images available electronically. Further, it has been said that digitization leads to the development of internet-based digital libraries as the internet is now the preferred form of publication and dissemination (Nor et al., 2018).

Despite digitization projects popularity, there is no review paper discussing the type of digitization of documentary heritage that has been implemented in the information institution. Therefore, this review was motivated by the belief that the information institution having problem in implementing digitization project in their institutions. Therefore, the underpinning of this paper is to explore the issues that

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been discussed in the digitization of documentary heritage publications from the year 2010-2021 as through the following research question:

RQ: What are the current practices on digitization of documentary heritage in the information institution discussed in the publications from 2010- 2021?

2.0 Materials and Method

The term thematic review using ATLAS.ti 8 as the tool as being introduced by Zairul (2020) is implemented because the method of this study applies thematic analysis procedure in a literature review. Clarke & Braun (2013) define thematic analysis is a process of identifying the pattern and construct themes over thorough reading on the subject. The following step is to identify the pattern and construct category to understand the trend of digitization of documentary heritage publication in the country. The selection of literature was performed according to several selection criteria: 1) publication from 2010- 2021, 2) Have at least keyword(s) digital library or documentary heritage or memory institution. The change to this analysis bias implies abandoning the exclusive dependence on technological aspects and turning attention to the subjectivity inherent to human beings, their relationships and their behavior in organizations since such behavior greatly influences information security management. Colwill (2009) points out that, even considering other equally relevant factors, overconfidence in technology will lead to unexpected results in handling a very critical internal security threat: the human element. This element poses information security risks, as people can gain legitimate access to information, know the organization, and know where valuable assets are located.

Table 1: Search strings from Scopus, Mendeley and WoS

| | | |
|-----------------|---|----------------------|
| SCOPUS | ((TITLE-ABS-KEY ("Digital library" AND "documentary heritage")) | 122 results |
| | TITLE-ABS-KEY(("information institution" AND "memory institution")) | 3 results |
| | TITLE-ABS-KEY((digital AND preservation OR future AND protection)) AND TITLE-ABS-KEY ((documentary AND heritage) AND PUBYEAR > 2010 | 2 results / articles |
| Mendeley | "Digital library" AND "documentary heritage" | 84 results |
| | "digital preservation" AND "manuscript" year:[2010 TO 2021] | 36 articles |
| WoS | TS=(digital AND documentary heritage) AND YEAR > 2010 | 138 results |
| | TS=(digi*ation AND memory institution) AND PY=(2010-2021) | 39 results |

The literature search was performed in the Scopus, WoS and Mendeley search. The initial search came out with 127 articles from (SCOPUS), 177 articles from (WoS) and 120 (Mendeley) articles. However, 299 articles were removed due to their premature results and anecdotes or were not discussing digitization of documentary heritage issues. Some of the articles were also found incomplete, or the full articles are not accessible, have a broken link and overlapped. Metadata incomplete. Therefore, the final paper to be reviewed down to 28 articles (table 1). The articles were uploaded in the ATLAS.ti 8 as primary documents, and then each paper was grouped into 1) author; 2) issue number; 3) periodical, 4) publisher, 5) volume and 6) year of publication. In doing so, the articles can be analyzed according to the year it was published and what is the discussion pattern according to the year. The total articles finalized into the final documents in the ATLAS.ti 8 is 28 documents.

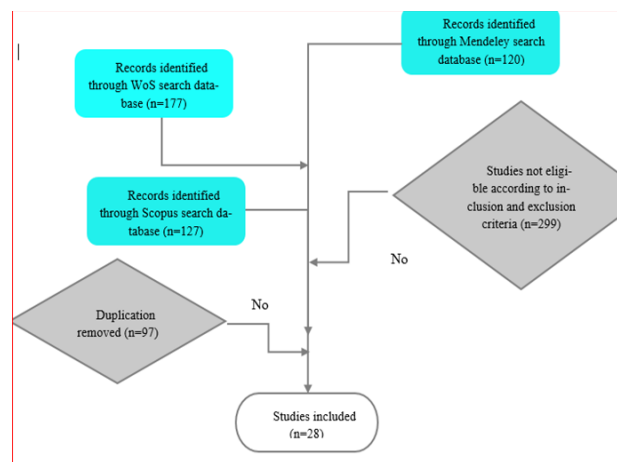


Fig. 1: Inclusion and Exclusion criteria in the thematic review

3.0 Result and Discussion

3.1 Quantitative findings

As database queries were static and the use of the phrase “DL” OR “Digital library” OR ‘Digitization’ were scarce in the libraries based education, proceedings and thesis were also included to evaluate the trends and patterns. Though the paper meant for information system or IR4.0, the journals recorded that the articles were published varies. These research strings are either directly referenced in the identified 28 articles through several periodicals namely; Advances in Library Administration and Organization, Digital Library Perspectives, Journal of Academic Librarianship, etc. (table 2). The trend of publications by years reported that the highest number of researches was published in 2020 with a total of 6 publications, followed by year 2021 which is 4 publications and year 2017 around 3 publications.

Table 2: List of periodicals

| | 2010 | 2011 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|--|------|------|------|------|------|------|------|------|------|------|------|
| Advances in Library Administration and Organization | - | - | - | - | - | - | - | 2 | - | - | - |
| Aslib Proceedings: New Information Perspectives | - | - | 2 | - | - | - | - | - | - | - | - |
| Digital Library Perspectives | - | - | - | - | - | - | - | 1 | 1 | - | - |
| Global Knowledge, Memory and Communication | - | - | - | - | - | - | - | - | - | - | 2 |
| Information Science and Technology | - | - | - | - | - | - | - | - | - | 2 | - |
| Information Technology for Development | - | - | - | - | - | 2 | - | - | - | - | - |
| Journal of Academic Librarianship | - | - | - | 2 | - | - | - | - | - | - | - |
| Lecture Notes in Computer Science) | - | - | - | - | - | - | 2 | - | - | - | - |
| New Library World | 2 | - | - | - | - | - | - | - | - | - | - |
| Online Information Review | - | - | - | - | 2 | - | - | - | - | - | - |
| Proceedings of the DigitalHeritage 2013 - Federating the 19th Int'l VSMM | - | - | 2 | - | - | - | - | - | - | - | - |
| Records Management Journal | 2 | - | - | - | - | - | - | - | - | - | 2 |
| South African Journal of Libraries and Information Science | - | - | - | - | - | - | - | - | - | 2 | - |

The finding of this review showed the trend of researches discussing about digitization of documentary heritage among information institutions which are most popular in South Africa. Publications reported from other countries such as Kenya, London, New Zealand, Sweden, United Kingdom, United States of America, India and Switzerland were also reviewed. Figure 2 elaborates more about the finding.

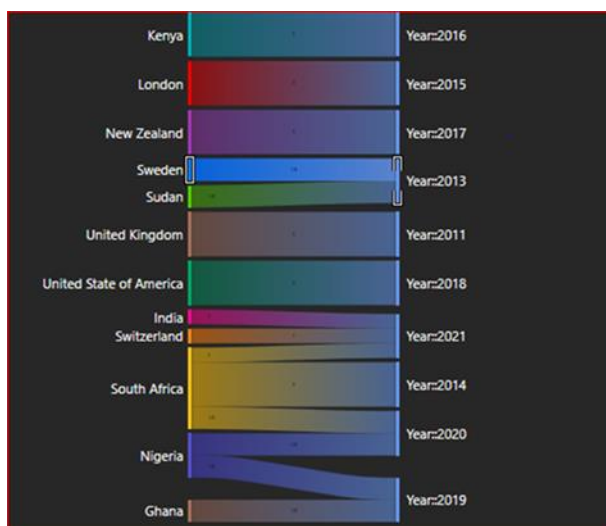


Fig. 2: The distribution of articles according to country

3.2 Qualitative findings

In the qualitative section, this paper will discuss in detail the themes that were derived to answer the research question. Year and country were being used in analyzing the pattern. The paper found that in 2021 the research focused more into collaboration and participation of information institution with a total of 4 research. As regards to the themes pattern, it fluctuates yearly basis between 1 theme in 2013, 2 themes in 2016 and 2017, and covers the whole team for 2019,2020 and 2021. The top theme was ‘collaboration and participation’ which appeared every year with 14 research, followed by ‘crowdsourcing’ 11 research. The least frequent was ‘cultural heritage’

information system' which was covered thrice in 2011, 2014 and 2021. As for record, based on Table 4, there were few papers which covered more than 1 theme in a paper.

Table 4: Documents to a theme table

| | Collaboration and participation | Crowdsourcing | Cultural heritage information system | Disaster preparedness |
|--|---------------------------------|---------------|--------------------------------------|-----------------------|
| (Deegan & Musa, 2013) | √ | | | |
| (Raju, 2014) | | | | √ |
| (Boamah & Liew, 2017) | | √ | | √ |
| (Muriithi et al., 2016) | √ | √ | | |
| (Balogun & Kaluso, 2021) | | | √ | √ |
| (Vintar & Dec, 2013) | √ | | | √ |
| (Birrell et al., 2011) | √ | | √ | |
| (Terras, 2015) | √ | | | √ |
| (Dohe & Pike, 2018) | | √ | | |
| (Thekkum Kara, 2021) | √ | | √ | |
| (Ilo et al., 2020) | | | | √ |
| (Mindel, 2021) | √ | √ | | |
| (Netshakhuma, 2021) | √ | | √ | √ |
| (Adu, 2018) | √ | | | |
| (Dancs, 2018) | | √ | | |
| (Lone et al., 2021) | | √ | | |
| (Gireesh Kumat T.K. ; Raman Nair R., 2021) | | | √ | |
| (Mutula, 2014) | | | √ | |
| (Gupta & Sharma, 2017) | √ | | | √ |
| (Zhou et al., 2021) | √ | √ | | √ |
| (Londhe et al., 2011) | | √ | | |
| (Madden et al., 1992) | √ | | | |
| (Sahoo & Mohanty, 2015) | | | | √ |
| (Masenya & Ngulube, 2020) | √ | √ | | √ |
| (Haux et al., 2021) | | √ | | |
| (Koiki-Owoyele & Alabi, 2020) | | √ | | |
| (Anyaku et al., 2019) | √ | | √ | |

3.2.1 Theme 1: Collaboration and participation

The term 'collaboration and participation' embodies a multitude of concepts which discussed by several researchers in recent years. According to Corrado and Moulaison (2014), libraries, archives and museums use collaboration strategies to assemble groups with necessary expertise to advance digital preservation work and take advantage of resources in the larger library and digital preservation community as cited by Masenya & Ngulube (2020).

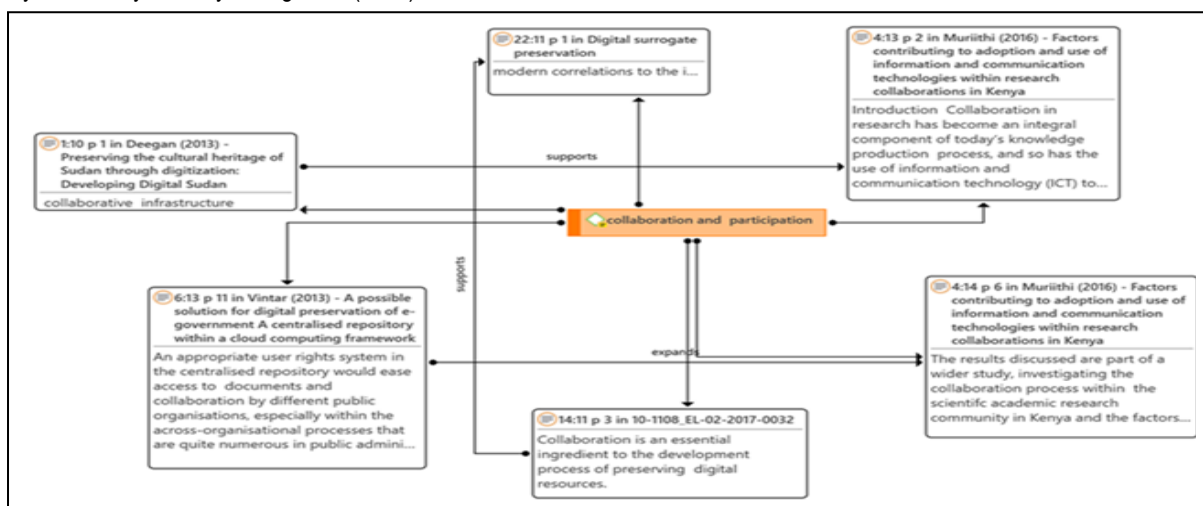


Fig. 4: A network view on collaboration and participation

On the other hand, according to the Council of Canadian Academies (2015), collaboration with private companies and academia may allow memory institutions to become involved in new activities that enhance their visibility and to undertake large projects that they could not resource on their own.

Adu (2018) emphasized the importance of collaboration as an essential ingredient to the development process of preserving digital repositories. Therefore, collaboration, participation, strategic alliances and synergy should form part of the solutions to the unending

problems of digital preservation. The percentage score for collaboration means that the future of digital preservation depends on the collaborative efforts from all the various stakeholders. Tsinopoulou (2017) highlighted the need for collaboration between organizations in safeguarding cultural heritage (Koiki-Owoyele & Alabi, 2020).

Several issues on collaboration and participation were stressed in different regions. Some authors mentioned that collaboration between librarians, archivists, and museum curators is important, but there needs to be broader administrative collaboration across political, economic, and cultural differences if the global citizenship is to consider these priceless treasure troves of human heritage as more than private property (Madden et al., 1992). In Ghana, a survey was conducted on digitization of documentary heritage among 155 records managers and ICT heads in the public agencies (Adu, 2018). Similarly, librarians from four North American institutions formed the Digital Preservation Working Group (DPWG) in 2015, a collaboration to increase digital preservation efforts across the state of Montana (Mannheimer & Cote 2017).

3.2.2 Theme 2: Cultural heritage information system

A cultural heritage information system is used for the documentation of the restoration process. In India, the scope, issues and challenges in conceptualizing a comprehensive cultural heritage information system (CHIS) and examines the feasibility of designing such a system with the support of advanced conservation strategies and technological aids was discussed by Gireesh Kumat T.K. & Raman Nair R. (2021). Developing comprehensive Indian cultural heritage information system is essential to identify the potential benefits of displaying and providing cultural heritage in a digital medium, allowing for different interactions with physical objects (Murray, 2011). The proposed cultural heritage information system (CHIS) should facilitate the machine–user interaction to support effective searching to bring the unseen aspects of cultural inheritances easily.

In South Africa, a study by Balogun & Kaluso (2021) indicated that digitization of indigenous knowledge is considered an effective tool for the defensive protection of IKS from bio piracy and it can also help to reduce misappropriation of IK without compensation. The purpose of the study is to assess the digital preservation policies and plans for long-term digital preservation in selected repositories in South Africa, with a view to develop a digital preservation framework for the preservation of Indigenous knowledge system (IKS) in South Africa.

On the other hand, a study by Gireesh Kumat T.K. & Raman Nair R. (2021) proposes integration of these data into a single system and suggests a model heritage information system based on: value-based assessment at different scales; a heritage (geo) database; and a geographic information system (Borin., 2023). The proposed cultural heritage information system (CHIS) should facilitate the machine–user interaction to support effective searching to bring the unseen aspects of cultural inheritances easily.

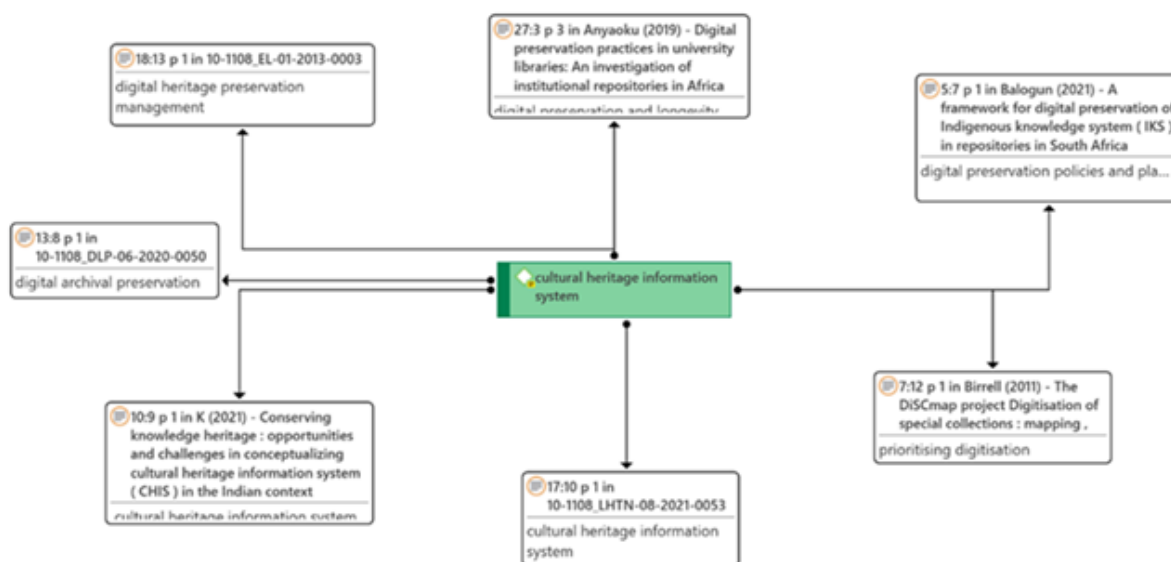


Fig. 5: A network view on cultural heritage information system

3.2.3 Theme 3: Disaster preparedness

Several issues on disaster preparedness were stressed in different regions. A study by Balogun & Kaluso (2021) identified adequate metadata, regularly scheduled backup and implementation of disaster preparedness as some of the measures for digital preservation. Furthermore, disaster planning ensures that institutions maintain trusted digital repositories. This study also reveals that digital curation, policy formulation and disaster preparedness plans to some extent are measures said to be in place for the digital preservation of IKS. One respondent stated disaster preparedness is part of one long-term digital preservation plan.

Ilo et al., (2020) suggest that adopting this broader approach to examine this phenomenon, empirically indicates that preservation activities and disaster preparedness measures are both correlated and complementary and when adequately and proactively harnessed, factors that facilitate the deterioration of library materials or portend significant danger to the library facility are minimized significantly. It

was also observed that the provision of fire extinguishers and deployment of trained personnel took the lead among the list of disaster preparedness activities in university libraries in Southwest Nigeria

In Nigeria, a study was examined librarians' perception of disaster preparedness and its effect on effective preservation and conservation of library resources, focusing on university libraries. Given that whatever form of damage that can be associated with libraries and their collections can be refer to as disaster (considering their importance to scholarship), this study theorizes that disaster preparedness approach that captures some elements of preservation and conservation of information-bearing materials would be all inclusive. The study is therefore proposing that a relationship exists between disaster preparedness and preservation/conservation of library resources as it concerns safety.

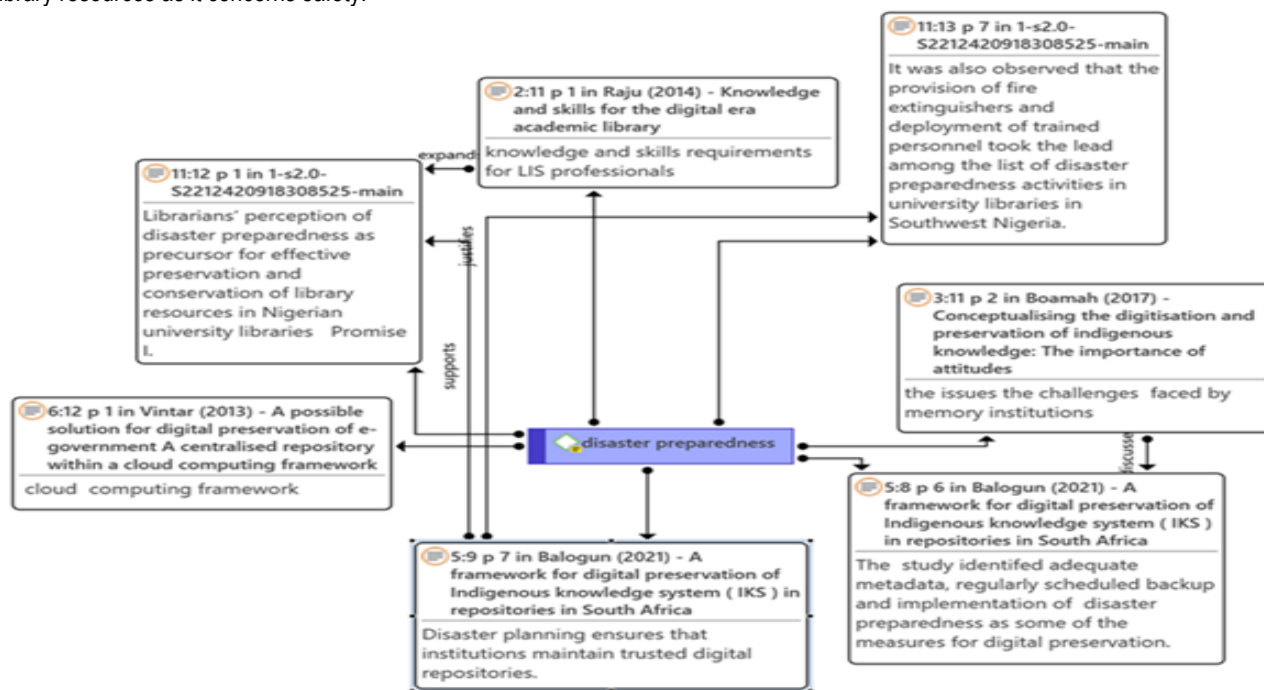


Fig. 6: A network view on disaster preparedness

3.2.4 Theme 4: Crowdsourcing

Crowdsourcing is a technique of outsourcing tasks to a broad, loosely defined external group of people called crowdsourcing (Gupta & Sharma, 2017). Crowdsourcing is a means to use talents of the crowd. Every sector of the society, namely, academic, government, social welfare, science and technology, entertainment and corporate, etc., is flourishing with the use of crowdsourcing (Dohe & Pike, 2018). The logical extension of this is the use of social media platforms in conjunction with digitized content to ask online users to help with tasks in the cultural and heritage sectors, through a process known as "crowdsourcing": the harnessing of online activities and behavior to aid in large-scale ventures such as tagging, commenting, rating, reviewing, text correcting and the creation and uploading of content in a methodical, task-based fashion (Holley, 2010) as cited by Terras (2015).

This collaboration or crowdsourcing is not a new concept; it has been used in many offline projects for hundreds of years, e.g. making of the Oxford English Dictionary and the Mass Observation Movement. In Britain, government sector first time used crowdsourcing in 1714, when British Government offered a longitude prize to the person who could devise a way of accurately measuring longitude at sea, with the awards ranging from £10,000 to £20,000 depending on accuracy (Dohe & Pike, 2018). The attributes of crowdsourcing model vary from organization to organizations, depending on their needs and objectives. Mostly, cultural heritage projects around the globe using crowdsourcing for activities like: transcribing texts and hand-written documents, OCR correction (editing), complementing collection, contextualization (wiki style platform), social tagging (classification), co-curation, describing images, collecting funds, etc., and all these projects produce positive results.

The Amsterdam City Archive was not just crowdsourcing the index for the militia registers, but it also raised funds from public to scan the documents. The libraries turned to crowdsourcing to translate the documents because few researchers who want to access the materials are fluent in Yiddish, which is written in Hebrew characters (Gupta & Sharma, 2017). A range of crowdsourcing activities are now taking place across the cultural and heritage sector, often disrupting activities which were thought to be the preserve of academics and historians, for example an array of transcription projects has been launched over the past few years that allow volunteers to read and transcribe digitized images of manuscript material to ensure that their contents are findable and reusable by others (Terras, 2015b). Crowdsourcing has helped in creating the world's greatest inventions and biggest brands (Dohe & Pike, 2018). National Library

of Scotland (NLS) in collaboration with University of Strathclyde, Glasgow, ran a pilot project and used crowdsourcing to reduce the backlog of un-catalogued items.

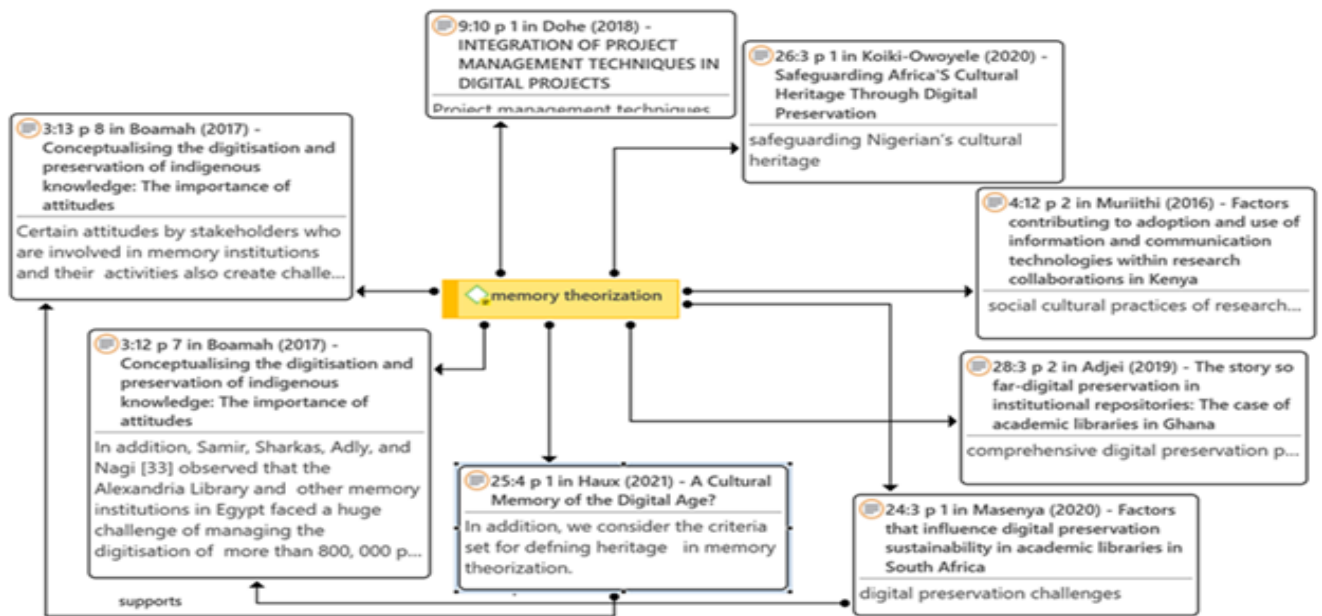


Fig. 7: A network view on memory theorization vs crowdsourcing

4.0 Conclusion

This review paper highlights the most common approaches in the current digitization of documentary heritage method in the information institutions through collaboration and participation; disaster preparedness; crowdsourcing and cultural heritage information system. There are several issues raised despite the implementation of the digitization of documentary heritage approaches in the information institutions.

Some of the elements include the modern correlations to the interdisciplinary which is rarely discussed in the librarianship education, therefore, provide a gap to establish how cooperative and collaboration increase competency among librarians in digitization of documentary heritage can be implemented.

Further, the disaster preparedness based approach in the current information institutions is lacking in term of knowledge and skills requirements for LIS professionals and very few articles mentioned how the approach is implemented and practiced in the information institutions

The study successfully addressed its intended goals and answered the research question earlier. In summarize, future studies should investigate how the technology executed in the information institutions and to produce a collaborative environment through support from technology that can help to solve real problems through inquiry learning.

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