The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

PRIORITIZING RESEARCH MANAGEMENT PLANNING STRATEGIES FOR DIGITAL REPOSITORY DEVELOPMENT: A CASE STUDY IN YEMENI UNIVERSITIES

AFRAH ALI S. AL-AMARI

Department of Educational Administration and Planning, Faculty of Education, Sana'a University, Sana'a, Yemen.

BASSAM A. ABDULQADER

Department of Computer Science, Faculty of Education, Humanities, and Applied Sciences, Sana'a University, Sana'a, Yemen. Department of Engineering and Computer Science, Queen Arwa University, Sana'a, Yemen.

ADEL A. NASSER*

Department of Information Systems and Computer Science, Faculty of Sciences, Sa'adah University, Sa'adah, Yemen. *Corresponding Author Email: adel@saada-uni.edu.ye

ZAMZAM S. AL-KHAWLANI

Zamzam Foundation for Scientific Research and Entrepreneurship, Sana'a, Yemen.

Abstract

Contemporary digital repositories enhance research management by providing centralized platforms for storing, organizing, and accessing research output. However, the establishment of institutional repositories in the Arab world, including Yemen, has been slow, limiting accessibility and hindering progress. This study aims to address this gap by identifying planning priorities for successful repository development in Yemen, enabling universities to keep pace with global advancements and improve research dissemination. The research methodology involved several key steps to tackle the problem of slow digital repository development in Yemen. Firstly, a comprehensive literature review was conducted to gain insights and inform the development of a questionnaire. Expert assessment was then carried out, involving feedback from specialized arbitrators and experts to refine the questionnaire. The validity and reliability of the questionnaire were tested using various approaches. Validated questionnaires were distributed to a deliberate sample of individuals in Yemeni universities, and the collected data was analyzed using statistical software. The analysis included frequency calculations, correlation coefficients, and means to gain insights into research management and institutional digital repositories. The analysis highlights the top priorities for addressing slow digital repository development in Yemen. These priorities include establishing a research information management system (avg. rating: 4.65, 93% agreement), preparing a digital library database of research outputs (avg. rating: 4.59, 92% agreement), and establishing a refereed electronic scientific journal (avg. rating: 4.51, 90% agreement). These findings underscore the importance of prioritizing these actions to enhance research management and academic output dissemination in Yemeni universities. This study also provides a detailed prioritization and recommendations. By addressing the slow development and embracing these priorities, Yemeni universities can enhance research management and facilitate knowledge exchange, benefiting the academic community and the country as a whole.

Keywords: Digital Repositories, Research Management, Institutional Repositories, Yemen, Planning Priorities, Repository Development.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

I. INTRODUCTION

Contemporary digital repository systems have become indispensable for effective research management in universities, offering a wide range of benefits and addressing various challenges. These advanced systems provide centralized platforms that store, organize, and facilitate access to research output, including publications, datasets, and scholarly materials [1]. One crucial advantage of these digital repository systems is the enhanced visibility and accessibility they provide to research output [2]. By offering a centralized and easily searchable repository, these systems enable researchers, students, and the wider academic community to easily discover and access the latest findings and knowledge [3]. This accessibility fosters collaboration, encourages interdisciplinary research, and facilitates the dissemination of research outcomes to a broader audience. Additionally, digital repositories contribute to the preservation and long-term accessibility of research output [4]. They incorporate robust data management and preservation mechanisms, ensuring that valuable research materials are securely stored and available for future reference. This not only safeguards intellectual property but also promotes the continuity and reproducibility of scientific research. Digital repository systems also play a vital role in supporting compliance with funding agency and institutional policies concerning open access and research data management [5]. They enable researchers to adhere to mandates requiring the sharing and archiving of research data, leading to increased transparency and accountability in the research process. Furthermore, these systems facilitate the tracking and measurement of research impact. By providing usage statistics, citation metrics, and alternative metrics, digital repositories allow researchers and institutions to assess the reach and influence of their scholarly work [6]. This aids in performance evaluations and funding applications. However, despite the advantages of open access mechanisms and the availability of freely accessible systems for creating digital repositories, the establishment of institutional digital repositories in the Arab world, including Yemen, is characterized by individualism and slow progress [7]. Observations reveal a significant absence of electronic archiving for scientific theses and intellectual productions in Yemen [8]. This deficiency in archiving hampers the effective utilization and dissemination of scientific and intellectual output, hindering Yemeni universities and research centers from keeping pace with technological advancements and the globalized era. Consequently, Yemeni universities and research centers, which face growing demand for postgraduate studies and play a crucial role in scientific and intellectual production [9], experience performance limitations due to the lack of institutional digital repositories and electronic archiving practices [10]. The absence of efficient archiving practices leads to the wastage of research output, hindering the optimal utilization of knowledge and impeding their ability to meet the challenges of a rapidly evolving academic landscape [11]. In light of the global trend of international universities adopting digital repositories for open access, it is imperative for Yemeni universities and research centers to address this issue. The establishment of robust institutional digital repositories and the implementation of effective electronic archiving practices would enhance the monitoring, documentation, and dissemination of scientific and intellectual output, both locally and globally [12]. This would facilitate convenient access to research materials and contribute to improved performance in the face of technological advancements and the knowledge

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

explosion. However, the development of digital repositories for open access in each country requires careful planning, organizational actions, and leadership priorities [4]. It is not a simple task that can be undertaken without considering various factors. Planning involves identifying the specific goals and objectives of the digital repository, determining the scope of content to be included, and establishing the technical infrastructure required for its implementation [4]. Without proper planning, organizational support, and leadership commitment, the development of digital repositories may face significant challenges and fail to achieve the desired impact on research performance. Furthermore, the determination of planning priorities is of paramount importance as it directly influences the success of developing digital repositories and the research performance of universities [13], [14]. Setting clear priorities helps in defining the key focus areas and allocating resources accordingly. This includes identifying the types of research output to be prioritized for inclusion in the repository, such as scholarly articles, theses, or datasets, based on their relevance and impact. Planning priorities also involve considering the needs and expectations of researchers, students, and other stakeholders, ensuring that the repository aligns with their requirements [15]. By carefully determining planning priorities, universities can optimize the development of digital repositories, enhance research visibility and impact, and improve overall research performance [16]. Therefore, the research objective of this study is to fill the existing research gap by conducting a comprehensive national study on the planning priorities needed for successful digital repository development in Yemen. This study aims to examine the unique considerations and requirements of the Yemeni context, including available resources, research focus areas, institutional policies, and technological infrastructure. The findings of this research will provide valuable insights into the challenges, opportunities, and best practices for establishing and managing digital repositories tailored to the needs of Yemen. By conducting this study, policymakers, researchers, and university administrators will be able to make informed decisions and develop effective strategies that align with the specific planning priorities of Yemen. Ultimately, the research aims to enhance the success of digital repository initiatives in Yemen, improve research performance, and contribute to the optimal utilization and dissemination of scientific and intellectual output in the country.

II. RELATED WORKS AND LITERATURE REVIEW

A. The Role of Institutional Digital Repositories for University Performance and Research Management Success

In recent years, institutional digital repositories have emerged as powerful tools that significantly impact the performance and research management success of universities. This section of the literature review explores the role of digital repositories in enhancing university performance, facilitating research management, and improving scholarly outcomes.

1.1 Enhancing Research Visibility and Accessibility

One key role of institutional digital repositories is to enhance the visibility and accessibility of research output [17]. By providing a centralized platform for storing and organizing scholarly materials, digital repositories enable researchers, students, and the wider academic community

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

to easily discover and access the latest findings and knowledge. Researchers can showcase their work, making it more discoverable and increasing its potential for collaboration and impact. Additionally, digital repositories promote interdisciplinary research by facilitating the exploration of diverse research outputs across different disciplines. This accessibility fosters collaboration, encourages knowledge exchange, and facilitates the dissemination of research outcomes to a broader audience [18].

1.2 Preservation and Long-Term Accessibility of Research Output

Digital repositories also play a vital role in the preservation and long-term accessibility of research output [17]. By incorporating robust data management and preservation mechanisms, these repositories ensure that valuable research materials are securely stored and available for future reference [19]. This not only safeguards intellectual property but also promotes the continuity and reproducibility of scientific research [1]. In contrast to physical storage, which is prone to loss, damage, or deterioration, digital repositories offer a reliable and sustainable solution for preserving research output. This preservation function is particularly crucial in the face of technological advancements and the rapid evolution of knowledge, as it ensures that research findings remain accessible and usable over time.

1.3 Compliance with Open Access and Research Data Management Policies

Digital repositories contribute to supporting compliance with funding agency and institutional policies concerning open access and research data management [4]. Many funding agencies and institutions now require researchers to share and archive their research data, promoting transparency and accountability in the research process [5]. Institutional digital repositories provide a platform for researchers to adhere to these mandates by enabling easy sharing, archiving, and access to research data. By facilitating compliance, digital repositories help universities and researchers meet the requirements of funding agencies, enhance research integrity, and promote open science practices.

1.4 Addressing Challenges and Constraints

In addition to the positive contributions, digital repositories also help address challenges and constraints in research management. They streamline the process of organizing and accessing research output, reducing the time and effort required to search for relevant materials [19]. Digital repositories provide a centralized platform for managing diverse types of research output, including publications, theses, datasets, and multimedia content [20]. This consolidation simplifies research management and promotes efficiency in academic workflows. Overall, institutional digital repositories have a significant role in enhancing university performance and research management success. They provide a centralized and easily accessible platform for researchers, students, and the wider academic community to discover, access, and collaborate on research output. These repositories support compliance with open access and research data management policies, ensuring transparency and accountability in the research process. Additionally, digital repositories enable the tracking and measurement of research impact, aiding in performance evaluations and strategic decision-

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

making. By addressing challenges and constraints, digital repositories streamline research management processes and contribute to the overall efficiency of academic workflows.

B. Planning Priorities in Developing Digital Repositories and Streamlining Research Management Processes

Effective planning priorities play a crucial role in the development of digital repositories and the streamlining of research management processes. The following sub-section discusses the importance of these planning priorities in establishing institutional digital repositories and enhancing research management efficiency.

1. Establishing a Research Information Management System

Developing a research information management system aligned with plans, policies, and ethical standards of scientific research is essential [21]. Such a system enables efficient collection, organization, and dissemination of research information within the institution. By implementing standardized processes and workflows, it ensures the integrity, accuracy, and accessibility of research data. A well-designed research information management system supports effective decision-making, enhances collaboration, and promotes transparency in research activities [22].

2. Determining Community Needs and Future Plans

Identifying the needs of the community and aligning them with future plans is critical for the success of digital repositories [23]. Understanding the requirements of researchers, students, and other stakeholders helps in designing repository features and functionalities that cater to their specific needs. By considering available capabilities and resources, institutions can prioritize development efforts and allocate resources effectively. This ensures that the digital repository meets the expectations of users and provides maximum value to the community.

3. Identifying Priority Research Areas

Involving representatives from universities and various sectors of society in identifying priority research areas is vital [24]. This collaborative approach ensures that the digital repository focuses on research outputs that have high societal impact, contribute to national development goals, and address pressing challenges. By prioritizing specific research areas, institutions can allocate resources strategically, encourage interdisciplinary collaboration, and promote research that aligns with national priorities [25].

4. Creating a Digital Library Database

Establishing a comprehensive digital library database of scientific research outputs in Yemeni universities is a fundamental planning priority. This database serves as a centralized repository for storing and accessing scholarly articles, theses, conference papers, and other research outputs [17]. It facilitates easy discovery, retrieval, and dissemination of knowledge, fostering collaboration and enhancing the visibility of research conducted within Yemen. A well-organized digital library database ensures the preservation and long-term accessibility of research output, contributing to the overall advancement of knowledge [26].

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

5. Electronic Linkage Between Yemeni Universities

Electronic linkage between Yemeni universities, as well as regional and international institutions, is crucial for knowledge exchange, collaboration, and research networking. Establishing communication channels and creating a network of connected institutions enables the sharing of research output, resources, and expertise [27]. This connectivity enhances research opportunities, encourages interdisciplinary collaboration, and facilitates access to a wider pool of knowledge and expertise. Electronic linkage strengthens the research ecosystem and promotes the internationalization of research conducted by Yemeni universities.

6. Establishing Scientific Observatories

Creating scientific observatories for each college within universities, electronically linked to the larger institutional network, contributes to research management success [28]. These observatories serve as platforms for monitoring and analyzing research activities, trends, and impact within specific disciplines. They facilitate the collection of data, development of research indicators, and assessment of research performance. By providing valuable insights, scientific observatories aid in strategic decision-making, resource allocation, and the promotion of high-quality research.

7. Providing Electronic Copies of Research Outputs

Ensuring the provision of electronic copies of research outputs to beneficiaries is crucial for knowledge dissemination and utilization [5]. By making research outputs readily accessible in digital formats, institutions enable wider dissemination and utilization of knowledge by students, researchers, policymakers, and the wider community. Electronic copies support open access initiatives, enhance research visibility, and promote the application of research findings in various sectors, including industry, healthcare, and policymaking.

8. Establishing Communication Channels with Relevant Institutions

Establishing communication channels between universities and relevant institutions, such as industry, government agencies, and the labor market, is essential for aligning research with practical needs [29]. By fostering collaboration and engagement with external stakeholders, institutions can ensure that research conducted within their digital repositories addresses real-world challenges and contributes to socioeconomic development. Effective communication channels enable knowledge transfer, facilitate technology transfer, and support the translation of research findings into practical applications.

9. Establishing a Refereed Electronic Scientific Journal

The establishment of a refereed electronic scientific journal dedicated to publishing the outputs of scientific research conducted in universities is a valuable planning priority [30]. Such a journal provides a platform for researchers to disseminate their findings, share knowledge, and contribute to the scholarly community. A refereed electronic journal ensures rigorous peer review, maintains high-quality standards, and enhances the reputation of research conducted within Yemen. This journal becomes an integral part of the digital repository ecosystem, promoting academic excellence and research impact. By prioritizing these planning

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

considerations, institutions can effectively develop digital repositories, streamline research management processes, and enhance the overall efficiency of academic workflows. These planning priorities contribute to the successful implementation of digital repositories and create a supportive research ecosystem that fosters collaboration, innovation, and the generation of knowledge.

III. METHODS AND MATERIALS

The current study utilizes the descriptive survey method to collect, classify, organize, and present information and data in both quantitative and qualitative forms. This method aims to derive conclusions and generalizations that aid in understanding the phenomenon under investigation [31], [32], [33]. Descriptive research design combines qualitative and quantitative data to gather information for making accurate predictions about a specific problem or hypothesis [34], [35]. It is particularly well-suited for survey research as it produces statistical results that can be easily analyzed and interpreted by researchers. Moreover, the data collected through descriptive research can serve as secondary data for future research studies. Descriptive survey research is a quantitative approach that focuses on describing the characteristics of a phenomenon rather than explaining the reasons behind it [36]. The survey-based descriptive research method involves creating questionnaires or polls and distributing them to respondents, who then provide answers to the questions, typically a combination of open-ended and closed-ended questions. Surveys are considered the simplest and most cost-effective means of obtaining feedback on a specific topic.

A. Literature Review

The literature review stage aimed to comprehensively describe, analyze, and model the research problem related to the development of digital repositories and their impact on streamlining research management processes. This phase involved conducting a thorough review of existing literature, and previous studies conducted at the local, and international levels. The purpose was to gain insights, identify best practices, and inform the development of a questionnaire. The literature review encompassed a wide range of sources, such as academic journals, conference proceedings, books, and reports. Access to these diverse sources facilitated a comprehensive understanding of the subject matter and provided a foundation for building the questionnaire and drafting its content. Through the literature review, the number of 11 planning priorities in establishing institutional digital repositories and enhancing research management efficiency were collected and reviewed for duplication and redundancy. This process ensured that the identified priorities were based on a solid foundation of existing knowledge and insights obtained from the literature.

B. Data collection tool

To identify the most important planning priorities, a survey technique was employed in this study, involving a panel of 20 experts, including 17 university professors and three senior educational officers specializing in the subject of study. The questionnaire was structured based on previous studies, incorporating the 11 planning items identified through a literature review.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

Their valuable feedback and opinions were carefully considered, resulting in modifications such as deletions, additions, and revisions of certain sections of the questionnaire. The final version of the questionnaire comprises a 9-item measure (See table 1).

Table 1: Framework of Study - The Selected Planning Priorities for the Study

F	Planning factor
1	Establishing a research information management system in accordance with the plans, policies, and ethical standards of scientific research
2	Determining the needs of the community in alignment with future plans, considering the available resources.
3	Identifying priority research areas through the involvement of representatives from universities and various sectors of society
4	Creating a digital library database to store and organize the scholarly research outputs from Yemeni universities
5	Establishing electronic connections between Yemeni universities and fostering regional and international collaborations
6	Developing scientific observatories within each college that are electronically linked to Yemeni universities
7	Providing research beneficiaries with electronic copies of publications for their utilization.
8	Facilitating communication channels between Yemeni universities and relevant institutions to address the demands of the job market
9	Establishing a peer-reviewed electronic scientific journal to disseminate the findings of scientific research conducted in Yemeni universities

To ensure the validity of the measurement tool in accurately assessing the intended phenomenon, this study employed various validity measures. First, Face Validity was assessed by evaluating the tool's appearance as a valid measure of the concept or variable under study through expert and specialist evaluations. The scale or tool was presented to 20 experts, and their feedback was thoughtfully considered and incorporated, leading to necessary amendments. Through this iterative process, the questionnaire reached its final form.Criterion Validity, specifically the "Consistency" aspect, was assessed by examining the relationship between each item's score and the total score of the corresponding domain using the Pearson correlation coefficient. The results revealed a statistically significant correlation coefficient of .905** at the 0.01 level, affirming the validity of the tool. The Stability of the Resolution was evaluated by administering the scale repeatedly to the same group under the same conditions. Cronbach's Alpha Coefficient was utilized to assess stability, yielding a value of 0.89, indicating a high level of stability and supporting the reliability of the tool. Once the validity and stability of the questionnaire were verified, the researchers proceeded to distribute the questionnaires to an intentional sample of academics and administrators in Yemeni universities.

C. Study Community

The study sample consisted of a deliberate sample of 160 individuals, including 108 academic leaders and 52 administrative leaders, from various universities in Yemen. The distribution of individuals across the universities is as follows: Ibb University had 7 participants, Al-Andalus University had 8 participants, the University of Science and Technology had 12 participants,

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

Al-Hikmah University had 3 participants, Al Razi University had 6 participants, Taiz University had 15 participants, Hadramout University had 6 participants, the University of Aden had 14 participants, Amran University had 8 participants, and Sana'a University had the highest number of participants with 81 individuals. This selection of participants reflects a diverse representation from both public and private universities across different regions of Yemen. The demographic characteristics of the study sample are presented in Table 2.

Table 2: Demographic Characteristics of the Study Sample

Demographic Characteristics		Number		Percentage	
Gender	Male	119	160	%74.4	%100
	Female	41		%25.6	
Job	Professor	19	160	%11.9	%100
	Researcher	5		%3.1	
	Head of Department	50		%31.3	
	Dean of the College or Dean of the Center	16		%10	
	General Manager/Deputy General Manager	23		٪14.3	
	Director	29		%18.1	
	Vice Chancellor	6		%3.8	
	Vice Dean and Vice President of the Center	12		%7.5	
Specialization	IT	3	160	1.9٪	%100
	Information Systems	8		5.0٪	
	Computer	1		0.6٪	
	Management	37		23.1٪	
	Engineering	5		3.1٪	
	Libraries	32		20٪	
	Other	74		46.3٪	
Years of Experience	5 Years and Under	19	160	%11.9	%100
	6- 10	31		19.3٪	
	11-15	42		26.3٪	
	16 and more	68		42.5٪	
Qualification	Diploma or less	5	160	%3.1	%100
	Bachelor	55		%34.4	
	Master	16		%10	
	Ph.D	84		%52.5	
University	Ibb University	7	160	4%	%100
	Al-Andalus University	8		5%	
	Sana'a University of Technology	12		8%	
	Al-Hikma University	3		2%	
	Al Razi University	6		4%	
	Taiz University	15		9%	
	Hadramout University	6		4%	
	University of Aden	14		9%	
	Amran University	8		5%	
	Sana'a University	81		51%	

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

D. Statistical Analysis

After the completion of the questionnaire collection process, the collected questionnaires were unpacked and coded. Subsequently, the data was entered into the computer using the Statistical Package for the Social Sciences (SPSS) software, specifically SPSS-26. This software played a crucial role in facilitating the data analysis phase of the study, enabling the researchers to derive meaningful insights from the collected responses.

The researchers employed the following statistical methods to answer the study's questions and achieve its objectives:

- Frequency and Percentage: The frequency and percentage (valid percent) were calculated to understand the distribution of the study sample in terms of the respondents' general characteristics. This included demographic variables such as gender, job position, specialization, years of experience, academic qualification, and the entity or institution they belonged to.
- Cronbach Alpha Correlation Coefficient (Cronbach Method): The researchers utilized the Cronbach Alpha Correlation Coefficient to assess the stability of the study tool and determine the credibility of the opinions provided by the study sample. This coefficient indicates the internal consistency and reliability of the questionnaire.
- Means, Standard Deviations, and Percentages: These measures were used to analyze the average responses, variability, and distribution of data. The means provide the average scores, standard deviations indicate the dispersion of scores, and percentages offer additional insights into the distribution of responses.

IV. RESULTS AND DISCUSSION

The study's results are presented in Table 3, which displays the rankings and agreement levels for each planning action.

Factor 1, emphasizing the importance of establishing a research information management system aligned with plans, policies, and scientific research ethics, obtained the highest rank. It had an average rating of 4.65, a standard deviation of 0.73, and 93% agreement among the participants. This indicates a strong consensus within the sample that scientific management should prioritize the establishment of a research information management system in accordance with plans, policies, and ethical guidelines. The high agreement on this issue implies that such a system is seen as crucial for promoting efficient and ethical scientific research practices. It would help manage and organize research data, facilitate collaboration, ensure compliance with regulations and policies, and enhance the overall quality and integrity of scientific endeavors [36].

Paragraph 4, focusing on "Preparing a digital library database of scientific research outputs in Yemeni universities," closely followed in second place. It received an average rating of 4.59, a standard deviation of 0.73, and a percentage agreement of 92%. This indicates a high level of agreement among the study participants regarding the importance of establishing a digital

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

library database to archive scientific research outputs from Yemeni universities. These findings emphasize the significance of a digital library database for improving accessibility, fostering collaboration, increasing visibility and impact, and supporting national development through evidence-based decision-making [37, 38].

Factor nine achieved the third rank with an average rating of 4.51, a standard deviation of 0.83, and a percentage agreement of 90%. It highlights the importance of establishing a refereed electronic scientific journal to publish the outputs of scientific research conducted in Yemeni universities. This indicates a strong consensus on the significance of such a journal for disseminating knowledge, ensuring quality assurance, gaining recognition and visibility, fostering research culture and capacity building, and promoting collaboration. The establishment of such a journal would be a significant milestone in showcasing research excellence within Yemen's academic community and beyond [39].

Factor 2, which states, "Determining the needs of the community in light of future plans according to the available capabilities," moved to the fourth position. It received an average rating of 4.47, a standard deviation of 0.64, and a percentage agreement of 89%. This indicates a strong consensus among the respondents regarding the importance of considering the community's needs in line with future plans and available capabilities.

In the fifth place is factor number 5, which highlights "Linking Yemeni universities electronically with each other and with other universities regionally and internationally." It achieved an average rating of 4.46, a standard deviation of 0.81, and a percentage agreement of 89%. This indicates a very high level of agreement on the significance of establishing electronic connections between Yemeni universities and other institutions, both regionally and internationally. Factor number 3, which emphasizes "Identifying priority research with the participation of representatives from universities and various sectors of society," secured the sixth rank with an average rating of 4.38, a standard deviation of 0.76, and a percentage agreement of 88%. This suggests a very high level of agreement regarding the importance of involving representatives from universities and different sectors of society in identifying priority research areas.

In the seventh position is factor 8, which highlights "Establishing communication channels between Yemeni universities and relevant institutions to meet the needs of the labor market." It received an average rating of 4.32, a standard deviation of 0.93, and a percentage agreement of 86%. This indicates a very high level of agreement regarding the importance of establishing communication channels between Yemeni universities and relevant institutions to align research with the needs of the labor market.

The 6th factor, focusing on "Establishing a scientific observatory for each college that is electronically linked to Yemeni universities," received a ranking of eighth with an average rating of 4.26, a standard deviation of 0.96, and a percentage agreement of 85%. This suggests that the study sample agrees that the establishment of electronic scientific observatories connected to Yemeni universities for each college is considered of lower importance compared to other factors evaluated in the study. The 7th paragraph, which states "Providing the

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

beneficiaries of research with electronic copies to benefit from them," received a ranking in the last position. The average rating was 4.26, the standard deviation was 0.97, and the percentage agreement was 85%. This indicates that the study sample agrees that the importance of providing entities with electronic copies of research outputs is ranked lower compared to other factors evaluated in the study.

Table 3: Statistical Analysis Results

Factor	Order	Average	Standard deviation	T	Degree of freedom	Significance level	Percentage of average	Semantics
1	1	4.65	0.73	28.65	159	0.00	93٪	Very high
2	4	4.47	0.64	28.87	159	0.00	89٪	Very high
3	6	4.38	0.76	22.93	159	0.00	88٪	Very high
4	2	4.59	0.73	27.64	159	0.00	92٪	Very high
5	5	4.46	0.81	22.90	159	0.00	89٪	Very high
6	8	4.26	0.96	16.55	159	0.00	85٪	Very high
7	9	4.26	0.97	16.33	159	0.00	85٪	Very high
8	7	4.32	0.93	17.86	159	0.00	86٪	Very high
9	3	4.51	0.83	23.00	159	0.00	90٪	Very high

VII. CONCLUSION

In conclusion, this study aimed to examine the considerations and requirements specific to the Yemeni context for establishing and managing digital repositories. The findings highlight the importance of establishing a research information management system, creating a digital library database, and establishing a refereed electronic scientific journal. Additionally, involving representatives from universities and various sectors, considering community needs, and fostering electronic connections between Yemeni universities are recommended.

Based on the analysis and rankings provided, the study offers several recommendations. Firstly, prioritizing the establishment of a research information management system is crucial, as it received high agreement and a top ranking. This system will facilitate the effective organization and streamlining of research data. Secondly, creating a digital library database of scientific research outputs is recommended, considering its second-highest ranking. This will enhance accessibility and knowledge dissemination. Thirdly, establishing a refereed electronic scientific journal, as emphasized by its high agreement and ranking, will contribute to the recognition and visibility of Yemeni research. Other recommendations include considering community needs in alignment with future plans, fostering electronic connections between Yemeni universities, involving representatives from universities and various sectors in identifying priority research areas, establishing communication channels with relevant institutions, establishing electronic scientific observatories for each college, and providing electronic copies of research outputs to beneficiaries. Implementing these recommendations will strengthen research management systems, promote collaboration and visibility, and address community needs, and advance science and technology in Yemen. The study's findings have practical applications for policymakers, researchers, and university administrators in Yemen. They provide insights into the unique considerations and requirements of the Yemeni context,

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

informing the development of effective strategies and decision-making processes for establishing and managing digital repositories tailored to Yemen's specific needs. These applications include policy development, research planning, and institutional management.

However, it is important to acknowledge certain limitations of this study. Firstly, the focus was primarily on evaluating planning factors related to digital repositories and did not extensively address other dimensions or aspects. Future research could explore additional dimensions such as technical infrastructure, user engagement, and long-term sustainability. Secondly, the study did not discuss the suitability of multi-criteria decision-making (MCDM) techniques for evaluating the proposed framework. Future studies could delve into the applicability and effectiveness of MCDM techniques for assessing and prioritizing planning factors. Lastly, the study did not extensively address the practical application of the proposed framework within universities. Further research could focus on real-world implementation, considering institutional context, available resources, and potential challenges. Considering these limitations, future research endeavors should aim to broaden the scope of evaluation, assess the suitability of MCDM techniques, and explore practical applications within universities. By addressing these aspects, researchers can enhance the comprehensiveness and applicability of the study's findings, contributing to more robust planning and management of digital repositories in Yemeni universities.

References

1) M. Zervas, A. Kounoudes, P. Artemi, and S. Giannoulakis, "Next generation institutional repositories: The case of the cut institutional repository KTISIS," in Procedia Computer Science, vol. 146, pp. 84-93, 2019.

2) S. Brown, E. Alvey, E. Danilova, H. Morgan, and A. Thomas, "Evolution of research support services at an academic library: specialist knowledge linked by core infrastructure," in Positioning the Academic Library within the University, Routledge, 2021, pp. 129-140.

3) J. Schöpfel and O. Azeroual, "Current research information systems and institutional repositories: From data ingestion to convergence and merger," in Future directions in digital information, Chandos Publishing, 2021, pp. 19-37.

4) D. Lin, J. Crabtree, I. Dillo, R. R. Downs, R. Edmunds, D. Giaretta, ... & J. Westbrook, "The TRUST Principles for digital repositories," in Scientific Data, vol. 7, no. 1, p. 144, 2020.

5) D. Moher, L. Bouter, S. Kleinert, P. Glasziou, M. H. Sham, V. Barbour, ... & U. Dirnagl, "The Hong Kong Principles for assessing researchers: Fostering research integrity," in PLoS biology, vol. 18, no. 7, p. e3000737, 2020

6) M. K. Anser, M. I. Tabash, A. A. Nassani, A. M. Aldakhil, and Z. Yousaf, "Toward the e-loyalty of digital library users: investigating the role of e-service quality and e-trust in digital economy," in Library Hi Tech, vol. 41, no. 4, pp. 1006-1021, 2023.

7) Omar, Eman Fawzi (2011), "Open digital repositories as a source of acquisition for research libraries: An analytical study", Unpublished doctoral thesis, Faculty of Arts: Jilwan University, Egypt.

8) U. A. Burkan Hawash, Z. M. Yusof, M. Mukred, and W. Ali, "Intention to adopt electronic records management system in the oil and gas sector in Yemen," International Journal, vol. 9, no. 5, 2020.

9) I. A. H. Humied, "Key determinants and strategies for cybersecurity education in Yemen," Journal of Digital Educational Technology, vol. 3, no. 2, 2023.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

10) M. Mukred, Z. M. Yusof, W. A. Al-Moallemi, U. A. A. Mokhtar, and B. Hawash, "Electronic records management systems and the competency of educational institutions: Evidence from Yemen," Information Development, vol. 38, no. 1, pp. 125-148, 2022.

11) R. T. Buxton, E. A. Nyboer, K. E. Pigeon, G. D. Raby, T. Rytwinski, A. J. Gallagher, & D. G. Roche, "Avoiding wasted research resources in conservation science," Conservation Science and Practice, vol. 3, no. 2, p. e329, 2021.

12) T. M. Masenya and C. T. Chisita, "Futurizing library services in a technology-driven dispensation: Reflections on selected academic libraries in Zimbabwe and South Africa," in Innovative technologies for enhancing knowledge access in academic libraries, IGI Global, 2022, pp. 1-21.

13) A. Gawer, "Digital platforms' boundaries: The interplay of firm scope, platform sides, and digital interfaces," Long Range Planning, vol. 54, no. 5, p. 102045, 2021.

14) A. R. Alsoud and A. A. Harasis, "The impact of COVID-19 pandemic on student's e-learning experience in Jordan," Journal of Theoretical and Applied Electronic Commerce Research, vol. 16, no. 5, pp. 1404-1414, 2021.

15) T. L. Smith, K. Redd, S. Nusser, R. Samors, and E. R. Miller, "AAU APLU guide to accelerate public access to research data," AAU APLU, 2021.

16) H. Harini, D. P. Wahyuningtyas, S. Sutrisno, M. I. Wanof, and A. M. A. Ausat, "Marketing Strategy for Early Childhood Education (ECE) Schools in the Digital Age," Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, vol. 7, no. 3, pp. 2742-2758, 2023.

17) S. Asadi, R. Abdullah, Y. Yah, and S. Nazir, "Understanding Institutional Repository in Higher Learning Institutions: A systematic literature review and directions for future research," IEEE Access, vol. 7, pp. 35242-35263, 2019.

18) M. Kakai, "Management and accessibility of open access institutional repositories in selected universities in East Africa," Doctoral dissertation, Makerere University, 2020.

19) A. A. Bilyalova, D. A. Salimova, and T. I. Zelenina, "Digital transformation in education," in Integrated Science in Digital Age: ICIS 2019, Springer International Publishing, 2020, pp. 265-276.

20) R. Okon, E. L. Eleberi, and K. K. Uka, "A web based digital repository for scholarly publication," Journal of Software Engineering and Applications, vol. 13, no. 4, pp. 67-75, 2020.

21) M. Rafiq, S. H. Batool, A. F. Ali, and M. Ullah, "University libraries response to COVID-19 pandemic: A developing country perspective," The Journal of Academic Librarianship, vol. 47, no. 1, p. 102280, 2021.

22) S. John and A. K. Nayak, "Information Access and Transparency in Local Governance: Empowering Citizens for Informed Decision-making," Journal for ReAttach Therapy and Developmental Diversities, vol. 6, no. 9s (2), pp. 1378-1383, 2023.

23) M. Fischer, F. Imgrund, C. Janiesch, and A. Winkelmann, "Strategy archetypes for digital transformation: Defining Meta objectives using business process management," Information & Management, vol. 57, no. 5, p. 103262, 2020.

24) J. M. Barrueco and M. Termens, "Digital preservation in institutional repositories: a systematic literature review," Digital Library Perspectives, vol. 38, no. 2, pp. 161-174, 2022.

25) A. K. Maiya and P. S. Aithal, "A Review-based Research Topic Identification on How to Improve the Quality Services of Higher Education Institutions in Academic, Administrative, and Research Areas," International Journal of Management, Technology, and Social Sciences (IJMTS), vol. 8, no. 3, pp. 103-153, 2023.

26) M. M. Tapfuma and R. G. Hoskins, "Adoption of Institutional Repositories Towards Realization of Digital Libraries: The Southern African Perspective," in Innovative Technologies for Enhancing Knowledge Access

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10077574

in Academic Libraries, IGI Global, 2022, pp. 156-175.

27) M. O'Dwyer, R. Filieri, and L. O'Malley, "Establishing successful university-industry collaborations: barriers and enablers deconstructed," The Journal of Technology Transfer, vol. 48, no. 3, pp. 900-931, 2023.

28) J. Del Río Fernández, S. Gomáriz Castro, J. Olivé i Duran, and A. Mànuel Làzaro, "Knowledge Transfer in Higher Education Institutions Focused on Entrepreneurial Activities of Electronic Instrumentation," Knowledge, vol. 2, no. 4, pp. 587-617, 2022.

29) M. M. A. Saleh, O. A. Jawabreh, S. A. H. al-Amro, and H. M. I. Saleh, "RETRACTED ARTICLE: Requirements for enhancing the standard of accounting education and its alignment with labor market requirements a case study hospitality and industrial sector in Jordan," Journal of Sustainable Finance & Investment, vol. 13, no. 1, pp. 176-193, 2023

30) A. M. Alqoot, "Trends in distance education research published in scientific journals in Saudi universities from 2010 to 2020," Pegem Journal of Education and Instruction, vol. 13, no. 4, pp. 260-273, 2023.

31) A. Nasser, N. K. A. Al Ansi, and N. A. Al Sharabi , “On The Standardization Practices of the Information Security Operations in Banking Sector: Evidence from Yemen,” Int. J. Sci. Res. in Computer Science and Engineering, Vol 8, No. 6, pp 8-18, 2020.

32) Abdualmajed A. G. Al-Khulaidi et al., “Information Security Gap Analysis: An Applied Study on The Yemeni Banking Sector's Technology and Innovation Practices,” Seybold Report journal, vol. 17, no. 10, pp. 2493–2519, 2022.

33) A. A. G. Al-Khulaidi, M. M. Y. Al-Ashwal, Adel. A. Nasser, and N. K. Al-Anesi, “Information Security Risk Management in Yemeni Banks: An Evaluation of Current Practices,” International Journal of Engineering Trends and Technology, vol. 71, no. 4, pp. 225–237, Apr. 2023, doi: 10.14445/22315381/ijett-v71i4p220.

34) Abdualmajed A. G. Al-Khulaidi et al., "Information Security Governance: An Exploration Study of Yemeni Banks' Information Security Management Systems,” Seybold Report journal, vol. 17, no. 10, pp. 133-153, 2022.

35) A. A. Nasser, “Information Security Gap Analysis Based on ISO 27001: 2013 standard: A case study of the Yemeni Academy for Graduate Studies Sana’a Yemen,” International Journal of Scientific Research Multidisciplinary Studies, vol. 3, no. 11, pp. 4-13, 2017

36) H. Javed, "Challenges and requirements of heterogeneous research data management in environmental sciences: A qualitative study," Doctoral dissertation, Master thesis, University of Oulu, 2023. [Online]. Available: http://jultika.oulu.fi/files/nbnfioulu-202306292783.pdf

37) L. Himanen, A. Geurts, A. S. Foster, and P. Rinke, "Data-driven materials science: status, challenges, and perspectives," *Advanced Science*, vol. 6, no. 21, article 1900808, 2019.

38) T. Kalusopa, P. Zibani, R. Kanguti, and A. Leonard, "Research productivity, visibility, and impact at the University of Namibia: building a framework for open access and research data management," in *Handbook of Research on Connecting Research Methods for Information Science Research*, IGI Global, 2020, pp. 489-516.

39) A. Flanagin, T. Frey, S. L. Christiansen, and AMA Manual of Style Committee, "Updated guidance on the reporting of race and ethnicity in medical and science journals," *JAMA*, vol. 326, no. 7, pp. 621-627, 2021