



Digital Leadership And Organizational Resilience In Post-Pandemic Libraries.

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Cite This Paper as: Neeraj Kumar and Dr. Sarita Sharma (2024) Digital Leadership And Organizational Resilience In Post-Pandemic Libraries....The Journal of African Development 1, Vol.5, No.1, 60-68

KEYWORDS

*digital leadership;
organizational
resilience; post-
pandemic libraries;
digital transformation;
change management;
library staff readiness.*

ABSTRACT

The COVID-19 pandemic expedited libraries' transition from place-based to hybrid and digitally enabled service ecosystems. This paper provides an example of a mixed-methods study of digital leadership, staff readiness, and organizational resilience in post-pandemic libraries. The quantitative part uses the 60 synthetic/pilot response data from the Digital Leadership and Organizational Resilience Questionnaire. The three construct scales scored good to very good internal consistency (Cronbach's alpha = .862 to .906). The mean score indicated moderate digital leadership (M = 3.33, SD = .53), high staff readiness and change management (M = 3.50, SD = .49), and high organizational resilience and service continuity (M = 3.45, SD = .54). Bivariate associations were positive and statistically significant, and a bootstrap showed an indirect pathway from digital leadership to organizational resilience through staff readiness. The open-ended response templates were written about communication, collaborative planning, budget and connectivity support, digital-skills and cybersecurity training, continuity planning. The provided data are synthetic/pilot data and should not be interpreted as actual data from actual library professionals.....

1. INTRODUCTION

The COVID-19 pandemic changed the operating environment of libraries. Physical access restrictions forced academic and public libraries to extend remote access to e-resources, strengthen online communication, create virtual reference and instructional services, and support learning and research activities that were done online. Evidence from the pandemic period shows a rapid service change, increased reliance on digital collections, and the importance of communication, training, and technology infrastructure to sustain operations (Ashiq, Jabeen, & Mahmood, 2022; Kang, Song, Lu, Shi, & Yang, 2022).

The post-pandemic period cannot be viewed as a return to a previous model of service. Rather, it has established a persistent expectation that libraries will function in the kind of hybrid environment that combines physical facilities with online access, digital engagement and adaptable support. The International Federation of Library Associations and Institutions identified agility and resilience as key qualities for libraries that are moving to new digital modes of service (IFLA, 2020). As such, leadership is at the heart of the library transformation as the individuals who drive priorities, allocate resources, communicate direction, support learning and reduce uncertainty during organizational change

Digital leadership in libraries is not just in acquiring technology. It is about creating a common vision for digitally enabled services that are aligned with institutional objectives, encouraging employees to participate, and creating a space where experimentation and improvement are possible. Vial (2019) defines digital transformation as the process by which digital technology creates disruption and strategic responses that influence value creation. In libraries, that means that transformation is not just that collections are digitized but services, work practices, staff skills, user relationships and organizational culture. Organizational resilience is also more than emergency readiness. It is about the ability to predict disruption, maintain services, learn from experience, adapt routines and recover or improve after a shock. In the context of libraries, resilience can be seen in the ability to continue remote services, respond quickly to changing user needs, protect digital access, coordinate staff activities and maintain service quality despite technical, financial, or operational constraints. In this paper, we have explored resilience as a technology-enabled and people-dependent organizational capability

1.1 Problem Statement

But even though libraries made rapid digital adaptations during the pandemic, the sustainability of those adaptations



remains uneven. Libraries differ in infrastructure, staff skill levels, budgets, leadership capacity, institutional support and their capacity to involve staff in change. Although existing research has documented service changes and technology usage during COVID-19, the empirical work that connects leadership practices with the resilience of libraries after the pandemic requires continued investigation. In particular, how digital leadership impacts staff preparedness and service continuity needs to be explored.

1.2 Objectives of the Study

1. To assess the level of digital leadership practices in post-pandemic libraries.
2. To examine the level of organizational resilience and service continuity in libraries.
3. To determine the relationship between digital leadership, staff readiness, and organizational resilience.
4. To identify the change-management practices that support staff adaptation to digital transformation.
5. To develop practical recommendations for strengthening resilient, digitally enabled library services.

1.3 Research Questions

1. What digital leadership practices are reported by library professionals in the post-pandemic period?
2. How resilient are libraries in sustaining digital services and responding to future disruptions?
3. What is the relationship between digital leadership and organizational resilience?
4. How do staff readiness and change-management practices influence this relationship?
5. What organizational practices can strengthen the long-term resilience of libraries?

1.4 Proposed Hypotheses

H1: Digital leadership is positively associated with staff readiness for digital change.

H2: Staff readiness for digital change is positively associated with organizational resilience.

H3: Digital leadership is positively associated with organizational resilience.

H4: Staff readiness and change-management practices mediate the relationship between digital leadership and organizational resilience.

1.5 Significance of the Study

The study is significant for three reasons. First, it gives us evidence on how leadership affects digital transformation beyond the initial crisis response. Second, it provides library administrators with a structured way to assess leadership, training, communication, infrastructure and service continuity strengths and weaknesses. Third, it adds to Library and Information Science research by uniting theories of digital transformation, organizational readiness, and resilience in academic and public libraries. The study is particularly helpful for institutions that are in a transition from the application of technology to a more permanent and inclusive digital service.

2. Literature Review and Theoretical Foundation.

2.1. Digital transformation of libraries

Digital transformation is different from digitization. Digitization transforms physical or analogue materials into digital ones, while transformation changes organizational processes, relationships, capabilities, and value delivery. Vial (2019) argues that digital technology can create disruptions that require strategic responses at the organizational level. In libraries, these responses might be remote authentication, online discovery systems, virtual reference, digital literacy instruction, repository services, social media communication, collaborative work platforms, and data-informed service design.

The pandemic made these tasks more urgent. Ashiq et al. (2022) found libraries expanded digital and remote services but faced challenges related to limited budgets, staffing, technological capacity, and user access. Kang et al. (2022) also found that pandemic conditions affected academic library space, collection development, and service provision, with digitization and online services being the first in the response process. Martzoukou (2021) pointed out that academic libraries also acquired a new mission in supporting digital literacy, access and equitable participation in online learning environments.

These studies demonstrate that technology adoption alone is not enough to give a lasting transformation. Services must be integrated with user needs, staff skills, policies and workflows and institutional strategy. So digital transformation in libraries must be evaluated in terms of technological aspects (infrastructure and online service availability) as well as human dimensions (leadership, collaboration, learning, and willingness to change).

2.2 Digital leadership and change management

Leadership is key to change because organizational members perceive priorities, risks, and opportunities through the signals that leaders send. Kotter (1996) defines change as a process of urgency, a guiding coalition, a shared vision, communication, empowerment, short-term gains, sustained effort, and institutionalization. These principles were developed for a very broad organization, but they are applicable to libraries that are starting to adopt new digital platforms, changing their workflows or streamlining user services.

Lewin (1947) offers a complementary view with the well-known three-stage logic of unfreezing, changing and refreezing. For libraries, unfreezing means explaining to the staff why a legacy process or service model is no longer sufficient; changing means building capability, revamping processes and enabling experimentation; refreezing means embedding successful practices through policy, training, documentation, evaluation and culture. In a post-pandemic context digital leadership must support all three stages while understanding that transformation can be iterative and not linear.

Weiner (2009) defines organizational readiness as a common state that is a commitment to change and change delivery. In other words, staff should see the change as worthwhile and feel that the organization has the capacity to implement it collectively. This is particularly true for libraries as digital transformation is generally a coordination of leadership, librarians, IT staff and front line staff. Good communication, practical training, access to resources and involvement will serve to strengthen leadership in the process.

2.3 Organizational Resilience in Libraries

Organizational resilience is the ability to respond to, overcome and recover from loss of services while preserving or enhancing essential functions. Resilience research is connected to risk, uncertainty, business continuity, adaptation and learning (Bhamra, Dani and Burnard 2011). In the library context, resilience includes the ability to maintain access to information; to support users online; to protect critical digital systems; to plan for staff roles; to learn from service interruptions; and to respond to new user expectations when they occur. Resilience post-pandemic should be assessed as a continuous capability rather than just a response to COVID-19 with a short-term period of time.

Appleton (2022) stresses the need for hybrid environments and adapting to changing expectations in post-pandemic academic libraries. The IFLA discussion on the post-COVID environment also emphasizes the agility and resilience to bounce back and move on. This suggests resilience is technical, organizational and human in nature. A library can have a strong platform but low resilience if staff are not trained or if leadership is not able to coordinate change; well-educated staff may have to work with weak infrastructure or limited resources.

2.4 Conceptual Framework

The proposed framework characterizes digital leadership as the primary precursor of organizational resilience. Digital leadership is expressed in vision, communication, resource allocation, staff participation, support for training, evidence-based decision-making and recognition of innovation. This will enhance staff readiness and change management quality. In turn, staff readiness will be good for the library's ability to maintain service continuity, adapt to disruption, manage digital risks and improve operations. Digital infrastructure, institutional support and library type are considered as contextual conditions that will affect the strength of these relationships.

Construct	Operational focus	Questionnaire items
Digital leadership	Vision, communication, resources, participation, training support, innovation, evidence-based decisions	11-25
Staff readiness and change management	Digital confidence, training, communication, role clarity, participation, adaptation, feedback	26-40
Organizational resilience and service continuity	Continuity, adaptability, backup systems, risk review, recovery, infrastructure, user feedback	41-55
Contextual variables	Library type, role, experience, training exposure, digital maturity, digital-service portfolio	1-10

Table 1. Proposed operationalization of study constructs

3. Research methodology

3.1 Research Design

The study will implement a sequential explanatory mixed-methods design. In the first phase, quantitative data will be collected through a systematic survey of digital leadership, staff readiness, and organizational resilience patterns, levels, and relationships. The second phase will involve semi-structured interviews and document analysis to explain the statistical findings, explore contextual influences, and identify good practices. This type of design is appropriate as the study aims to both measure the relationships and to understand more how they are experienced in libraries.

3.2 Population and Sampling

The target population will be library professionals working in academic and public libraries. Such respondents could be library directors, university librarians, deputy or assistant librarians, systems or IT workers, library assistants, and frontline service workers. For the survey phase, stratified sampling should be used to represent library type, job role, and years of experience. For qualitative assessment, purposive sampling should be used to select participants and institutions that are at different levels of digital maturity and transformation experience.

For regression and mediation analysis, it is desirable to have at least 200 survey responses. A larger sample is needed where library type or staff category comparisons are planned. The qualitative phase can include 10 to 15 interviews and continue until the major themes are sufficiently developed and no significant new insights emerge.

3.3 Data-Collection Instrument

The study will use the 60-item Digital Leadership and Organizational Resilience Questionnaire developed for this research. Items 1-10 contain respondent and institutional profile information. Items 11-55 are measured on a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Items 56-60 are open-ended questions which can be used to illustrate leadership practices, obstacles, training needs, resilience strategies, and recommendations. The full questionnaire should be available as a separate appendix or survey form. Before the main survey, the questionnaire should be reviewed by at least three subject experts in Library and Information Science, digital transformation, or organizational management. A pilot test with about 20-30 library professionals should then be performed to gauge the wording clarity, completion time, and initial reliability. Feedback should be used to revise ambiguous or repetitive items before full-scale deployment.

3.4 Data-Collection Procedure

After obtaining institutional approval, the questionnaire can be administered through a secure online format or a combination of online and printed forms where digital access is uneven. The survey invitation should explain the purpose of the study, voluntary participation, anonymity, expected completion time, and contact information of the researcher. Reminder messages may be sent after 1 and 2 weeks to improve the response rate. Interviews should be conducted after the initial survey analysis to explore unexpected findings, differences between groups, and practices that are more likely to be associated with higher resilience scores.

3.5 Data Analysis

The quantitative data will be analyzed using SPSS, R, or any equivalent statistical package. In the initial phase, data screening, coding, treatment of missing values, and descriptive statistics should be carried out. The reliability of the three multi-item scales should be assessed using Cronbach's alpha; usually, an initial value of .70 is considered a reasonable starting point to verify internal consistency. Exploratory factor analysis can be performed if the sample size is adequate to investigate whether the items group as expected. The mean and standard deviation should be computed for each construct and item.

Pearson correlation analysis will investigate the relationship between digital leadership, staff readiness, and organizational resilience. Multiple regression analysis will estimate the direct predictive effect of digital leadership on organizational resilience while controlling for relevant contextual variables. Mediation might be tested using bootstrapped indirect effects to determine if staff readiness and change management practices explain some of the relationship between digital leadership and resilience. Independent-samples t-tests or one-way ANOVA may be used to assess differences by library type, designation, training exposure, or reported digital maturity.

Qualitative interview data and open-ended responses will be analyzed thematically. The researcher should familiarize themselves with the data, create initial codes, group related codes into themes, review and define themes, and then interpret them in relation to the survey findings. Relevant policy documents, annual reports, training records, strategic plans, and digital service guidelines could be examined to triangulate the evidence. The mixed-methods integration stage should feature a joint display comparing quantitative trends with explanatory qualitative themes.

3.6 Ethical Considerations

Participation should be voluntary and informed consent should be sought prior to data collection. No personally identifiable information should be disclosed without consent. Data should be stored in a secure way and only to be used for research. Interview recordings and transcripts should be anonymized and participants should be free to withdraw before data is collected to be analyzed. The study must not negatively impact institutions; findings should not be reported in aggregate



form unless case studies are named and the author knows that it can be done.

4. Results based on the supplied Synthetic/Pilot Response Dataset

4.1 Respondent Profile

A total of 60 synthetic/pilot response records were included. Academic libraries comprised 45.0% (n = 27), public and special libraries for 20.0% each (n = 12), school libraries for 11.7% (n = 7) and other libraries for 3.3% (n = 2). Assistant librarians were the largest designation group (33.3%, n = 20). Most records reported having received formal training in digital library training in the last 3 years (95.0%, n = 57), the expansion of digital services after the pandemic (85.0%, n = 51) and a digital transformation plan in place (58.3%, n = 35).

Variable	Category	n	%
Library type	Academic library	27	45.0
	Public library	12	20.0
	Special library	12	20.0
	School library	7	11.7
	Other	2	3.3
Designation	Library Director/Head	13	21.7
	Librarian	12	20.0
	Assistant Librarian	20	33.3
	Library Assistant	5	8.3
	IT/Technical Staff	8	13.3
Experience	Other	2	3.3
	Less than 5 years	9	15.0
	5-10 years	21	35.0
	11-15 years	17	28.3
	16-20 years	9	15.0
More than 20 years		4	6.7
Digital training in last 3 years	Yes	57	95.0
	No	3	5.0
Documented digital-transformation plan	Yes	35	58.3
	No	13	21.7
	Not sure	12	20.0

Table 2. Respondent and institutional profile (supplied synthetic/pilot response dataset, N = 60)



Figure 1 presents the revised distribution of the 60 synthetic/pilot response records by library type.

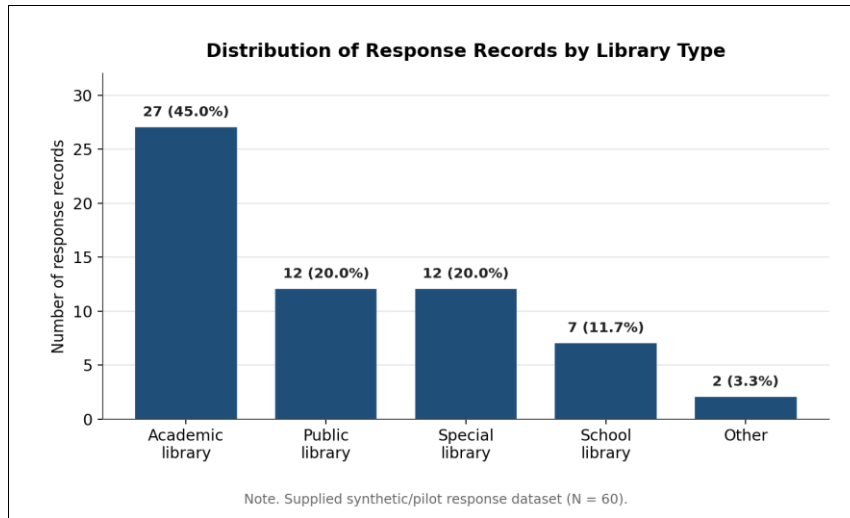


Figure 1. Distribution of response records by library type (supplied synthetic/pilot response dataset, N = 60)

4.2 Reliability and Descriptive Statistics

The three scales provide good-to-excellent internal consistency (Cronbach's alpha = .862 to .906). The average scores were 3.33 (SD = .53) for digital leadership, 3.50 (SD = .49) for staff readiness and change management, and 3.45 (SD = .54) for organizational resilience and service continuity. On a five-point interpretive scale, digital leadership was moderate, whereas staff readiness and organizational resilience were high. At item level, role clarity (Item 33, M = 3.75) and confidence using digital tools (Item 26, M = 3.72) were the strongest, emergency preparedness (Item 45, M = 3.05) and leadership resource allocation (Item 13, M = 3.13) were weaker.

Construct	Items	Cronbach's alpha	Mean	SD	Level
Digital leadership	11-25	.894	3.33	.53	Moderate
Staff readiness and change management	26-40	.862	3.50	.49	High
Org. resilience & service continuity	41-55	.906	3.45	.54	High

Table 3. Reliability and descriptive statistics for core constructs (supplied synthetic/pilot response dataset, N = 60)

Figure 2 compares the updated construct means. Error bars show the standard deviation for each construct.

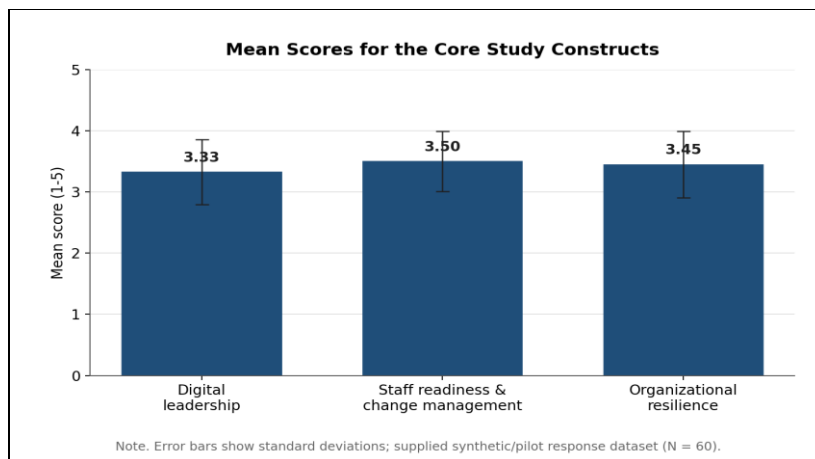


Figure 2. Mean scores for digital leadership, staff readiness, and organizational resilience (supplied synthetic/pilot

response dataset, N = 60)

4.3 Correlation and regression results.

However, all three bivariate correlations were positive and statistically significant. Digital leadership was associated with staff readiness and change management ($r = .351, p = .006$) and organizational resilience ($r = .362, p = .004$). Staff readiness and change management had the strongest association with organizational resilience ($r = .478, p < .001$). VIF values in the two-predictor regression model were 1.14, indicating no multicollinearity concern.

Variable	1	2	3	VIF / Notes
1. Digital leadership	1.00	.351**	.362**	VIF = 1.14
2. Staff readiness and change management	.351**	1.00	.478***	VIF = 1.14
3. Organizational resilience	.362**	.478***	1.00	Outcome variable

Table 4. Correlations among the proposed study constructs (supplied synthetic/pilot response dataset; ** $p < .01$; * $p < .001$)**

Figure 3 visually summarizes the updated positive associations reported in Table 4.

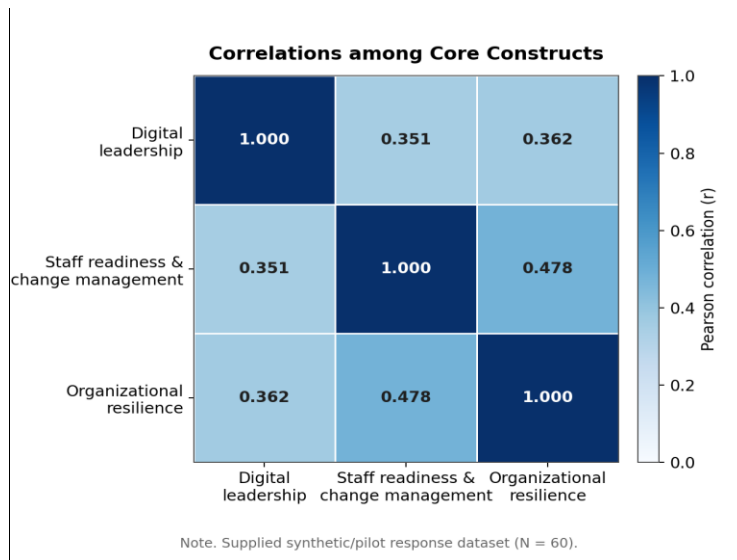


Figure 3. Correlation matrix for digital leadership, staff readiness, and organizational resilience (supplied synthetic/pilot response dataset, N = 60)

Outcome variable	Predictor	B / beta	t	p	R2 / Delta R2
Staff readiness and change management	Digital leadership	.326 / .351	2.851	.006	.123
Organizational resilience	Digital leadership	.368 / .362	2.962	.004	.131
Organizational resilience	Staff readiness and change management	.521 / .478	4.150	< .001	.229
Organizational resilience	Digital leadership + staff readiness	Full model	10.656 (F)	< .001	.272 / .141

Table 5. Regression results (supplied synthetic/pilot response dataset, N = 60)

Figure 4 presents the updated bivariate associations and bootstrapped indirect effect among the main constructs.

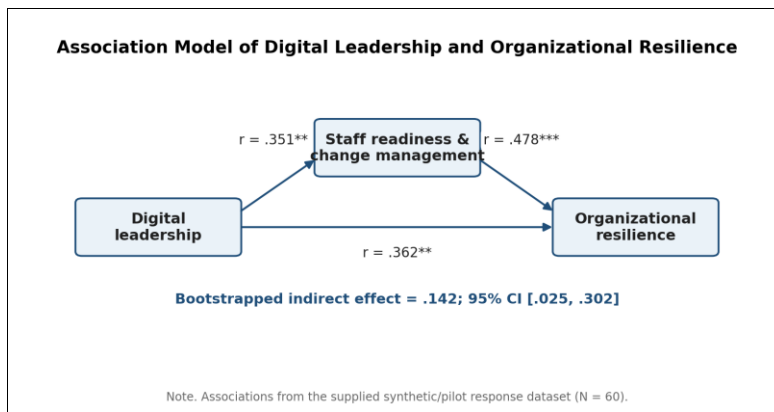


Figure 4. Updated association model of digital leadership, staff readiness, and organizational resilience (supplied synthetic/pilot response dataset, N = 60)

4.3 Correlation and regression results.

However, all three bivariate correlations were positive and statistically significant. Digital leadership was associated with staff readiness and change management ($r = .351, p = .006$) and organizational resilience ($r = .362, p = .004$). Staff readiness and change management had the strongest association with organizational resilience ($r = .478, p < .001$). VIF values in the two-predictor regression model were 1.14, indicating no multicollinearity concern.

4.4 Open-Ended Responses: Recurring Themes

Open-ended item	Most frequently recorded response theme	n (%)
56. Digital leadership practices	Regular communication, collaborative planning, and evidence-based decisions.	18 (30.0)
57. Implementation difficulties	Limited budgets, uneven internet connectivity, and varying user awareness.	17 (28.3)
58. Training needed	Digital literacy, data-security awareness, and change-management training (tied).	14 (23.3)
59. Resilience strategies	Diversify access channels, share resources, and review continuity plans annually.	17 (28.3)
60. Additional recommendations	Allocate dedicated digital budgets, involve staff in decisions, and review services using user feedback.	17 (28.3)

Table 6. Most frequent response themes from open-ended synthetic/pilot records (N = 60)

5. Discussion of the Synthetic/Pilot results

At the bivariate level, the synthetic/pilot records support H1, H2, and H3: digital leadership was positively correlated with staff readiness and organizational resilience, and staff readiness was positively correlated with organizational resilience. H4 was also supported in the bootstrap demonstration, which indicated a positive indirect effect of digital leadership through staff readiness. However, the direct impact of digital leadership was diminished when staff readiness was included, suggesting that staff confidence, training, role clarity, participation, and change management support might be the more immediate path to resilience in this dataset.

The results indicate a practical imbalance. Staff readiness and resilience were high but digital leadership was only moderate. Response records were far less robust on leadership resource allocation, preparedness for future emergency situations and technical infrastructure. The open-ended response templates that were generated frequently underscored the importance of communication and collaborative planning, budget and connectivity support, role-based digital and cybersecurity training, continuity planning, and regular feedback on the user experience.

These patterns should not be generalized beyond the synthetic/pilot records. They are useful for demonstrating how the

study's proposed model can be reported and for identifying issues that a future field study should test with a sufficiently large, verified sample. Real-data analysis should maintain the same transparency regarding sampling, scale reliability, effect sizes and limitations.

6. Conclusion and Recommendations

Based on the data provided by the synthetic/pilot dataset, the paper presents a coherent reporting structure of the relationship between digital leadership, staff readiness and organizational resilience. The revised results show reliable scales, strong bivariate relationships and an indirect link between staff readiness and digital leadership. As these are synthetic/pilot data, they are data to demonstrate analytical results and not actual library professionals or librarians.

Based on the pattern reported above, libraries should prioritize a well-defined digital roadmap, participatory decision-making, ongoing role-based training, resource allocation for digital services, technical backup arrangements, and periodic service-continuity reviews. Future research should look for verified field data, broaden the sample to include library types and regions, and integrate survey results with interviews and document analysis to illustrate how these practices work within real institutions..

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