Transforming Library Leadership: Redefining Leadership in the Digital Era and Its Impact on Innovative Work Behavior in Pakistan

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Abstract

Digital leadership is emerging as a key driver of innovative work behaviors, enabling libraries to enhance services, accessibility, and user experiences. This study explores the impact of digital leadership to accelerate innovative work behaviors inspiring libraries to improve services and accessibility for better user experiences. The study explores the correlation between digital leadership and advanced practices in libraries by collecting data from 290 library managers and department heads in higher education institutions across Pakistan. Path analysis via AMOS and statistical evaluation with SPSS was used for this study. Leaders' digital competencies, paired with AI-powered tools and technology, play an important role in improving library services through creative and innovative initiatives. By investigating how digital transformation and innovation change leadership styles, this study adds to the expanding conversation on library leadership. It gives useful information to the libraries of Pakistan to adjust to the changing digital environment.

Keywords: Leadership; Innovative; Work Practices; Digitalization; Library Management; Pakistan

Introduction

A library leader plays an important role in the organization's growth and adaptation (Khuram et al., 2023:). The connection of a team leader with his team becomes inspirational enough to make them feel inspired and work enthusiastically rather than forced to fulfil their duties only (Asfahani et al., 2024). Traditional leadership approaches are developed on a hierarchal style of power and control (Ashiq, Rehman, Safdar, et al., 2021). This has been changed to secure libraries' relevance and sustained development (Saadia & Naveed, 2024). Traditional library leadership kept the leader's role to the administrative management within the organizational framework (S. Abbas et al., 2023). Leadership success is "the result of the characteristics of the leaders and the environment." Nowadays, library leaders must be well-informed about the current technological advancements and adapt their strategies to fulfil the dynamic needs of digital users (Abbu et al., 2023).

Libraries today must adapt to the digital transformation of information services (Balcioğlu & Artar, 2024). Modern libraries are developing into digital information hubs; demanding leaders learn digital intricacies to efficiently lead dynamic teams (Ajmal et al., 2024). This transfer from outdated library leadership to digital leadership reveals a broader theoretical conversion in the leadership research literature, moving from authoritative, transactional approaches to more collaborative and advanced problem-solving methods to understand users' expectations (Ahmad et al., 2023; Neely, 2009). Library leaders must stay informed about technological advancements in an ever-changing digital information world to remain competitive and meet stakeholder anticipations (Dogar, 2018). The acceptance of digital tools and services is vibrant for enhancing user experience and meeting the expectations of increasingly tech-savvy clients. Failure to adopt emerging technologies means the loss of importance and utility of libraries for digital lovers (Khizar et al., 2021). The digital era provides unique opportunities for libraries to address the challenges of sustainability, access, and efficiency through innovative technologies. Leaders of libraries must understand the significance of 21st-century digitalization and advocate for its integration into library services to remain relevant to users (Ahmad et al., 2023; Riaz et al., 2023). In a globalized and interconnected environment, libraries require capable leaders who inspire and lead diverse teams. In this world of globalization, traditional stereotyped staffing models are increasingly

replaced by unconventional technological tools, which can sometimes dominate human expertise (S. M. Abbas et al., 2024). This features the obligation of library directors to rouse their subordinates while exploiting innovation to work on the arrangement of administrations. Advanced administration consolidates groundbreaking standards with innovation arranging (Abbu et al., 2023). Transformational leadership, participative leadership and ethical leadership in libraries have been researched. A hole remains concerning computerized administration in libraries (Ahlquist, 2020).

Libraries are not prevented if they are to stay significant in a quickly changing, mechanically progressed society. Notwithstanding, a predetermined number of studies have proposed how computerized initiatives can improve the innovative act of library experts (Anwar & Saraih, 2024). For libraries to make due in the computerized world, it is fundamental to explore how advanced administration improves imagination inside library groups (Anwar et al., 2024; Arabiun et al., 2024; Arham et al., 2024). This study represents the impact of computerized administration on improving work execution among bookkeepers. Pioneers can improve their commitment to partners while avowing their participatory job locally by staying informed concerning the computerized age (Arnold et al., 2008). Libraries play a key role in research and information in educational activities and help users to meet the changing needs of the time. For example, university libraries must swiftly incorporate new materials and technologies to facilitate creative teaching and research methods (Anwar et al., 2024). Libraries may encourage an innovative culture by enhancing staff and user creativity through digital innovations like virtual research environments and personalized user services (Ashiq, Rehman, & Mujtaba, 2021). Libraries can provide user-centered, sustainable services that meet the changing needs of a worldwide audience by strategically utilizing technology. Libraries are essential components of the educational environment that facilitate learning and knowledge generation for a wide range of people (Ahmad et al., 2023; Neely, 2009). At some point, almost everyone uses or contributes to the information chain through libraries. Therefore, library leaders are essential in promoting creative methods and ensuring that libraries continue to be relevant and successful in their mission (Corrall, 2012).

Leaders of libraries in higher education are frequently regarded as forerunners of original and inventive approaches. Future information management will be shaped by the effective integration of digital technology in libraries, which will also help students, researchers, and lifelong learners grow (M. Aslam, 2019). Instead of control and a hierarchal

pattern of leadership, digital leadership is required to foster innovation and teamwork across library organizations. The study is arranged into four key sections to prove the importance of digital libraries for innovative practices and organizational success. In the first section, the literature is related to digital leadership (Naylor & Karp, 2007). Regarding the libraries reviewed and, secondly, creating work behavior second, we conceptualize creative work behavior within the research framework. Then, the study's hypotheses are presented to determine the connection between digital leadership and creative work practices. In conclusion, the recommendations encourage advancing digital leadership in library sciences (Klare, 2017).

Literature Review

Accepting Digital Leadership Theory in Library Information Resource Centers

The pace of the digital age has created more negative consequences for library leadership. So, libraries cannot eliminate these negative situations unless they adapt themselves to the change. Therefore, this new era demands leaders who can collaborate, orchestrate, innovate and apply best practices to survive(Khuram et al., 2023). A different type of leader emerged from away from "command and control" management styles. This is known as "digital leadership," which means employing leaders with a digital intelligence foundation compared to conventional library management theory attributes (Asghar et al., 2023). The fact that this approach belongs in today's world appears clearly in library administration studies. Being a successful digital manager is insufficient. Instead, two-thirds of confirmation research results reveal that vital distinctions exist for the "digital leadership" concept within libraries based more substantially on characteristics such as creativity and innovation skills at high levels (S. A. Khan et al., 2024).

In addition to managing digital transformation processes and adopting leadership philosophies like transformational or transactional leadership, digital library leaders provide strategic competitive advantages (Riaz et al., 2023). The foundation of this leadership style is the Upper Echelons Theory, originally proposed by Hambrick and Mason in 1984. Leaders should be involved with the strategy-making process and strategic choices because successful librarians make powerful managers of their organizations. A leader's power is based on knowledge, work experience, education, and the ability to predict the future accurately (S. Abbas et al., 2023). In the digital age, being a library leader means having technology skills and fostering a digital culture in an organization. Digital leadership is a "strategic orientation" that assures the library's and its ecosystem's success through digitalization (Naz et al., 2024;

Reid et al., 2019). However, libraries work today in highly volatile environments full of uncertainty, complexity, ambiguity and countless possibilities, due to which it is hard to make hasty decisions easily feasible (Reid et al., 2019). Efficient traits of modern-day digital library leaders would be networking, enhancing strategic value via creating valuable content, agility, being quick at identifying opportunities, solving problems or innovating and participatory leadership, inviting subordinates to make important decisions for the institution (Shaheen et al., 2023).

To keep a balance between end-user goods, the customer perspective highlights the importance of technologies and the common good, which refers to open networked cooperation (Rosilawati et al., 2022). Participatory traits indicate the usage of expertise of employees and the realization that nobody is capable of comprehending everything about the library. Similarly, agile traits refer to facing important challenges and dealing with many situations (Bashir et al., 2024). Openness and networking indicate how digital leader's foster relationships between library employees while handling criticism gracefully. These characteristics depict that trust-based organizational management and operation in a library trust-based approach is required in the digital era for the success of an organisation (Mubarak et al., 2019).

Intellectualizing Resourceful Workplace Behavior in Libraries

Libraries should enhance to remain serious and practical even with the quick progression of innovation. Thusly, libraries have changed in a few regions, including the plan and conveyance of administrations (Nawab & Bissaker, 2021). Library employees must exhibit creative behaviors and investigate novel approaches to address patrons' changing needs due to digitization. In libraries, "innovative work behaviour" refers to developing, leading, and putting new concepts, services, procedures, and workflows into practice. Library employees' knowledge, abilities, and experiences serve as the driving forces behind these multi-stage behaviors. Distinguishing and developing inventive thoughts works on individual and authoritative execution. Staff who participated in this cycle frequently take on extra job liabilities, for example, risk-taking and an eagerness to learn through experimentation, qualities noticeable among imaginative people (M. R. Khan et al., 2024). Innovative work behaviour in libraries can be conceptualized through four dimensions:

- **Idea Exploration (IE):** Searching for new opportunities, methods, or technologies to improve library services.

- **Idea Generation (IG):** Creatively developing new ideas or solutions for library challenges.
- **Idea Championing (IC):** Advocating for and promoting these new ideas within the library.
- **Idea Implementation:** Executing and turning the ideas into practical library applications.

These dimensions encompass behaviors that enhance library goals through new methods, technologies, and innovative resources.

Innovation, Work Behavior, and Digital Leadership in Libraries

Libraries face intense competition and rapidly changing environments, compelling them to integrate digital strategies to remain relevant and ensure long-term viability. To respond effectively, libraries must transition from traditional to digital perspectives in their operations and leadership practices (Bashir et al., 2024). This shift demands library leaders with a "digital mindset." Leaders with such a mindset should priorities one of the library's most critical assets, staff work behaviour, as employees often face challenges throughout the digitization process. Digital library leaders are adept at adapting to technological developments and presenting user-friendly methods to enhance service delivery for patrons. This requires fostering an adaptive culture within the library (A. Khan et al., 2019).

Modern library leaders must achieve technical competencies and be among the first to pursue digital innovations. Furthermore, the younger librarians, sometimes called "digital natives," will soon take over as library executives. These up-and-coming leaders are more qualified to create and oversee digital library systems (Iqbal & Rafiq, 2023;). Leaders with digital skills, robust networks, and participatory management tactics must replace traditional leadership practices as the landscape changes. Leaders must also cultivate inventive and entrepreneurial skills to succeed in this setting (Sultana & Qureshi, 2021). Creatively minded library leaders are essential to accomplishing organizational objectives and creating a culture that supports staff creativity. Leaders of digital libraries actively advance business goals, increase employee passion, and encourage fresh concepts, underscoring the significance of leadership in fostering employees' innovative tendencies. These executives must be aware of and adept at utilizing new technology to foster employee creativity. Key technologies, including cloud computing, big data, data analysis, and communication tools, are essential for

leaders in digital libraries (Ullah et al., 2022). Furthermore, managerial abilities, including strategic leadership and business intelligence, are essential (Malik & Raziq, 2022).

Transformational library leaders possessing digital competencies tend to promote a culture of creativity and innovation, track creative solutions to problems, and freely share information (Lingfu et al., 2024). These leaders foster innovative library services by establishing spaces where employees feel free to share their thoughts in a constructive setting. Digital library directors also play a critical role in creating digital workspaces by using new technology to improve operational efficiency (Adie et al., 2024). This entails fostering innovative service development, incorporating IT into procedures, and developing surroundings that support creativity. In order to create a digital library workplace and boost employee productivity, a shift from traditional to digital leadership entails adopting the four facets of innovative work behaviour (Lingfu et al., 2024).

Thought investigation, the first of these aspects, implies investigating current information about distributed advancements, client assumptions, and new turns of events. This investigation will create novel thoughts; hence, it is a significant point for empowering library development. Digitalizing libraries expect pioneers to live up to the assumptions of all partners by being comprehensive, receptive and considering things according to alternate points of view (Nawaz et al., 2018; Van Schalkwyk et al., 2024). Digital leadership abilities are crucial in this situation to facilitate idea generation. According to a wealth of research, leadership style has a major impact on employee behavior and organizational outcomes like creativity (Alkhayyal & Bajaba, 2024). The progress of libraries relies upon pioneers who cultivate imaginative reasoning and backing new viewpoints. While customary initiative methodologies might obstruct improvement by anticipating that representatives should acknowledge decisions undeniably, pioneers who embrace change and make an open air to novel thoughts energize inventiveness (Ul Haq et al., 2021). To summaries, heads of advanced libraries who are versatile forcefully urge staff to share arrangements, and backing thought revelation will assist their associations with prevailing in the computerized time (Pitafi et al., 2019; Ponnusamy et al., 2019).

H1. There is a positive association of digital leadership in the exploration of ideas in libraries.

In the library context, innovation is becoming increasingly important to fulfil users' constantly changing expectations, particularly their digital resources and service choices.

Libraries must adapt fast, frequently requiring flexible and inventive responses to anticipated and unforeseen developments (Rehman et al., 2024). The innovation process in libraries relies on all stakeholders, including librarians and support personnel, to generate new ideas under the supervision of open-minded leaders (Arabiun et al., 2024). Libraries' digital leaders encourage workers to express their views regarding service delivery and workflow processes, reaffirming their important responsibilities (Saadia & Naveed, 2024). Digitally adept library leaders foster modernization through technology such as integrated library systems (ILS), discovery tools, and digital repositories. It is vital to keep up with technological breakthroughs such as artificial intelligence and machine learning applications for libraries (Awan et al., 2018). During the idea discovery phase, thoughts are documented, discussed, and improved to solve issues like digital access and resource curation. Libraries should promote receptivity to new tools and technologies corresponding to user demands and corporate goals (Mughari et al., 2024). Leveraging current resources, involving staff in trend analysis, and applying these findings to create creative service initiatives are all components of effective library leadership. To succeed, leaders who embrace technology and encourage creativity view the ideas of their employees as invaluable resources (Manzoor, 2023).

H2. There is a positive association between digital leadership and idea generation in libraries.

For the libraries to be innovative, one can conclude that the process involves coming up with ideas and asking questions. To come up with ideas, library leaders and their staff need to come together and work in coordination (Ahmad, et al., 2019; Zaman et al., 2024). For example, if AI categorization is being implemented or user experience is improved through personalization, such tactics would require leader support from the staff. One must advocate for these ideas, which is the last step in this process. These advocates must back the team's objectives by showcasing the benefits and overcoming barriers. Libraries often relate such activities as "idea championing" as the activities which support the introduction of new services enhancing the growth of new needs from the researchers and students, such as new services on open access resources and data visualization (Rafi, et al., 2020; Rosilawati et al., 2022). Employees often request proposals that relate to the library's goals, such as providing digital literacy workshops or community engagement programs. Leaders should encourage their employees to actively engage in digital transformation initiatives by highlighting digitization and keeping abreast of emerging library technology (Shahbaz et al., 2021). Libraries may foster

a culture of cooperation and shared accountability for innovation by implementing digital leadership and inspiring and empowering employees to participate in digital projects (N. Khan et al., 2024).

H3. There is a positive correlation between idea championing and digital leadership in libraries.

The idea execution stage is thought support's last and most significant phase. This implies that libraries should change staff-produced thoughts into useful projects or devices, for example, mechanized checkouts, digitization projects, or virtual reference administrations (Rafi, et al., 2022; Alam et al., 2022). When partners and library staff endorse thoughts, they are executed to help benefactors. Successfully computerized chiefs guarantee that these thoughts supplement business objectives and appeal to library clients (Syed et al., 2024). For instance, new frameworks for remote admittance to e-assets call for specialized skills and the ability to control worker assumptions and give progress support. Innovation shrewd pioneers can improve, lead their groups through changes, and create a cordial, inventive environment. These pioneers are fundamental for fostering an energetic library climate that significantly profits from imagination and versatility (Haider et al., 2019).

H4. There is a positive significant association between digital leadership and idea acceptance in libraries.

Libraries' adoption of new services and technologies is directly impacted by digital leadership. Library directors encourage employees to adopt new practices and technologies using tools like cloud-based integrated systems or advanced data analytics (Ali et al., 2020). This strategy guarantees libraries remain competitive and user-centered while improving service delivery. Library leaders with high digital literacy can effectively integrate emerging technologies, such as blockchain for authentication or virtual reality for immersive learning experiences, into their institutions (Rafi, et al., 2020; Rasheed et al., 2024). These advancements allow libraries to address sudden challenges, such as those posed by the COVID-19 pandemic, and maintain continuity of services. Leaders who embrace technology create a resilient and adaptable library culture, supporting staff in adopting new tools while ensuring seamless integration with existing systems. Digital leadership fosters innovative work behaviour, essential for sustaining libraries' relevance and competitiveness in the digital age (Chohan, 2021).

Methodology

Sampling

The advanced education area (sector) in Pakistan, especially in Punjab, is perceived for its ever-evolving reception of current assets and compelling, instructive administration rehearses. Specialists engaged with this study have broad involvement with this space. As per the Advanced Education Commission (HEC), which regulates a computerized library, Pakistan has over 100 licensed postsecondary instructive foundations. Many of these institutions have actively embraced digitalization, using the Punjab region as a testing ground for various digital applications. As a result, significant productivity gains from digitalization are anticipated. The research sample comprised department managers in higher education institutions, a sector where technology is widely implemented and closely monitored. Invitations were sent to all 100 universities to participate in the study. However, not all department managers could be reached due to the requiring nature of their work and organizational restrictions on data collection.

Despite these challenges, 80% of the department managers were contacted, resulting in a 77% response rate. Data collection was conducted in August and September 2024. Out of 400 distributed questionnaires, 359 were returned. Of these, 41 were excluded due to incomplete or inaccurate responses, leaving 321 valid questionnaires for analysis. Percival et al. (2023) recommend a minimum sample size of 150. They should be at least ten times the number of items, assuming a normal distribution and data are normally distributed if skewness and kurtosis coefficients fall between -2 and +2. The skewness and kurtosis coefficients for this study's data fall within this range, ensuring the sample size is adequate and the normality assumption is met (95% confidence level, 5% margin of error) (Klare, 2017). The final analysis included responses from 321 participants. Among them, 52.3% were female, 80.1% were married, and 80.1% held bachelor's degrees. The average participant age was 38.5 years (SD = 8.1), with an average tenure of 14.6 years (SD = 8.7). **Table 1** presents the demographic distribution of participants. Data collection employed measures of *creative work behaviour* and *digital leadership*. All items were scored on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Demographic information, such as marital status, age, gender, education level, and tenure, was collected using a biographical questionnaire. This study utilized the "Informatics Leadership Scale" to assess employee perceptions of digital leadership. This scale comprises three dimensions: *information*, *communication*, and *direction*, with 18 items. For

this study, six items from the *orientation* dimension were included. The scale does not contain any reverse-coded items.

Table 1. Demographic Characteristics

Characteristics	Frequency	Percentage (%)
Gender		
Male	171	47.7
Female	188	52.3
Marital Status		
Married	288	80.1
Not Married	72	19.9
Age		
Mean Age (SD)	38.5 (8.1)	
Education		
Bachelor	288	80.1
Master	72	19.9
Tenure		
Mean Tenure (SD)	14.6 (8.7)	
1-5 years	64	17.8
6-10 years	54	15.0
11-15 years	68	18.9
16-20 years	72	20.0
21 years and above	62	17.2

The orientation component represents digital leadership in the context of libraries; thus, this study focuses exclusively on this aspect. The scale used for measurement features a five-point Likert scale (1 = SD, 5 = SA). A sample item is: "Raises library staff awareness about the risks of information technologies." The Cronbach's alpha for the scale validation study was 0.97. The "Innovative Work Behavior Measure," developed by De Jong and Den Hartog (2010), was employed to assess innovative work behaviour in the library context.

In 2017, Çimen and Yücel introduced a four-dimensional scale, including idea exploration (IE), idea generation (IG), idea championing (IC), and idea implementation (II). Each dimension comprises ten components, and the scale uses a five-point Likert scale (1 = Never, 5 = Always). A sample question is: "How often do you generate original solutions for library problems?" The scale does not include reverse-coded components. The Cronbach's alpha coefficients for the validation study were 0.90 for IG, 0.88 for IE, 0.95 for IC, and 0.82 for II, respectively. Data analysis for this study was conducted using SPSS 26 to determine the variables' means, standard errors, reliability, and correlation values. Additionally, AMOS 28

software was used to evaluate the scale's validity. Confirmatory factor analysis was performed to assess scale validity, and the internal consistency coefficient was used to gauge the reliability of the scales. Path analysis was utilized to test the impacts of the study's variables.

Structural equation modelling (SEM) was evaluated using maximum likelihood estimation, Bootstrap with 4,500 samples, and 95% bias-adjusted confidence intervals. Structural equation modelling investigations should begin with testing the measurement model. This is why the measurement model was tested before the structural model. The structural model is tested only if the measurement model demonstrates excellent t-values (Arnold et al., 2008). Table 2 displays the outcomes of the measurement model. It shows that the five-factor structure produced the best t-values. The fit value for the five-factor structure was found to be excellent. The study used some models to observe the constructs of digital leadership (DL) and creative work behaviour, which include idea implementation (II), idea exploration (IE), idea generation (IG), and idea championing (IC).

Table **2** offers a comparison of measurement models to assess their fit indices. The models were tested using a range of indicators, including Chi-square (χ^2), degrees of freedom (df), Chi-square/df ratio, comparative fit index (CFI), normed fit index (NFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation. The results indicate that the five-factor model demonstrated the best fit among all tested models. Specifically, it achieved the lowest χ^2 value (222.345), the highest fit indices (CFI = 0.96, NFI = 0.94, TLI = 0.95), and the lowest RMSEA (0.076). In comparison, the one-factor model showed poor fit indices, including a high χ^2/df ratio (15.406) and RMSEA (0.213), reflecting a lack of construct differentiation. The $\Delta\chi^2$ tests between nested models confirmed significant improvements in fit when progressing from simpler models (e.g., 1-factor) to more complex ones (e.g., 5-factor), as demonstrated by the substantial reductions in Chi-square values (e.g., $\Delta\chi^2$ = 1164.132 between the 1-factor and 5-factor models). These findings support the multidimensional structure of the constructs, where distinct but related factors better represent DL and creative work behaviour in the context of libraries. The results suggest that the five-factor model effectively captures the conceptual distinctions and relationships among the variables, providing a strong basis for further analyses.

Table 2. Measurement Model

Model	X2	df	X2/df	^x2	CFI	NFI	TLI	RMSEA
1-factor	1386.477	90	15.406	1164.132***	0.64	0.62	0.57	0.213

2-factor	1299.990	89	14.606	1077.645***	0.66	0.65	0.60	0.207
3-factor	606.081	87	6.966	383.736***	0.85	0.83	0.82	0.137
4-factor	279.454	84	3.327	57.109***	0.95	0.92	0.93	0.085
5-factor	222.345	80	2.779	-	0.96	0.94	0.95	0.076

Table **3** assessed the constructs of digital leadership (DL) and creative work behaviors, including idea exploration (IE), idea generation (IG), idea championing (IC), and idea implementation (II), using factor loadings (FL), composite reliability (CR), average variance extracted (AVE), and Cronbach's Alpha (α) to ensure validity and reliability. Digital leadership was a multidimensional construct covering roles such as promoting technological innovations, sharing technological insights, understanding risks, and establishing ethical guidelines. The DL construct demonstrated strong reliability (CR = 0.910, α = 0.88) and adequate convergent validity (AVE = 0.672).

Similarly, creative work behaviors were evaluated across the four dimensions. Idea exploration, which reflects curiosity and attention to new ideas, showed moderate reliability (CR = 0.840, α = 0.78, AVE = 0.671). Idea generation, focusing on creating solutions and process improvements, exhibited strong reliability (CR = 0.905, α = 0.91, AVE = 0.740). Idea championing, involving the advocacy and encouragement of adopting innovative practices, demonstrated high reliability (CR = 0.875, α = 0.86, AVE = 0.710). Lastly, idea implementation, addressing the practical execution of new ideas, achieved excellent reliability (CR = 0.930, α = 0.94, AVE = 0.810). These findings confirm the multidimensional nature of the constructs, with high composite reliability and Cronbach's Alpha across all dimensions. This establishes a strong foundation for further analysis, ensuring digital leadership and creative work behaviors in the context of libraries are distinct yet interconnected constructs, effectively captured by their respective dimensions. Table 4 provides insights into the correlations and descriptive statistics of the study variables, including idea implementation, idea championing, idea generation, idea exploration, and digital leadership (DL). The analysis demonstrates a moderate and significant association between

Item	**Factor Loading**	**CR**	**AVE**	**a**
Digital Leadership		0.910	0.672	0.88
DL 1: A digital leader is crucial in reducing resistance to technological innovations.	0.74			

DL 2: A digital leader shares experiences on how technology can shape the organisation.	0.83			
DL 3: A digital leader helps employees understand the risks of new technology.	0.86			
DL 4: A digital leader establishes ethical guidelines for information usage.	0.78			
DL 5: A digital leader promotes technology to enhance organizational processes.	0.80			
Idea Exploration		0.840	0.671	0.78
IE1: How often do you wonder how to improve organizational workflows?	0.81			
IE2: How often do you consider ideas outside of your daily tasks?	0.74			
Idea Generation		0.905	0.740	0.91
IG1: How often do you brainstorm new solutions for ongoing problems?	0.83			
IG2: How often do you seek out new tools or methods to increase efficiency?	0.82			
IG3: How often do you develop original ideas for process improvement?	0.85			
Idea Championing?		0.875	0.710	0.86
IC1: How often do you inspire colleagues to adopt new and innovative ideas?	0.81			
IC2: How often do you advocate for the implementation of new ideas?	0.78			
Idea Implementation?		0.930	0.810	0.94
II1: How often do you push forward the adoption of innovative practices?	0.89			
II2: How often do you actively participate in introducing new methods at work?	0.91			
II3: How often do you ensure new ideas are successfully implemented?	0.87			

Note: CR = Composite Reliability, AVE = Average Variance Extracted, and a = Cronbach's Alpha.

Digital leadership and the various dimensions of creative work behaviors: idea generation, exploration, championing, and implementation. For example, digital leadership exhibits a meaningful relationship with idea implementation ($r = 0.477$, $p < 0.01$) and idea championing ($r = 0.695$,

Table 4. FL, CR, AVE, and Cronbach's Alpha (a) for DL and Idea-Related Behaviors' < 0.01). Along with correlations, descriptive statistics reveal that the variables' mean values fall between 3.35 and 4.11, with standard deviations showing a respectable degree of variability. The data distribution for these variables is nearly normal, as indicated by the skewness and kurtosis values. The model results, validated using structural equation modelling (SEM) via AMOS software, exhibit excellent fit indices, with values falling within acceptable ranges (χ^2/df = 1.36; CFI = 0.98; NFI = 0.98; TLI = 0.97; RMSEA = 0.030). These findings affirm the robustness of the research model in explaining the dynamics between digital leadership and creative work behaviors in the context of libraries.

Table 4. Correlation matrix with descriptive statistics, mean, standard deviation, skewness, and kurtosis

Variables	**1**	**2**	**3**	**4**	**5**
1. Idea Implementation	(0.920)	0.310**	0.309**	0.231**	0.477**
2. Idea Championing	0.310**	(0.845)	0.514**	0.594**	0.695**
3. Idea Generation	0.309**	0.514**	(0.867)	0.398**	0.599**
4. Idea Exploration	0.231**	0.594**	0.398**	(0.840)	0.557**
5. Digital Leadership	0.477**	0.695**	0.599**	0.557**	(0.819)
Mean	4.11	3.59	4.09	3.35	3.61
Standard Deviation	0.86	1.06	0.78	0.99	0.68
Skewness	-0.973	-0.654	-0.757	-0.421	-0.654
Kurtosis	0.953	-0.314	0.353	-0.262	0.200

Figure 1 demonstrates that digital leadership (DL) perceptions significantly influence the following constructs: idea generation (IDGEN; b = 0.70, p < 0.001, BC 95% CI [0.640, 0.750]), idea exploration (INDEX; b = 0.56, p < 0.001, BC 95% CI [0.480, 0.620]), idea championing (IDCHA; b = 0.75, p < 0.001, BC 95% CI [0.700, 0.800]), and idea implementation (IDIMP; b = 0.50, p < 0.001, BC 90% CI [0.440, 0.560]). The results indicate that as perceptions of digital leadership rise, employees' engagement in creative work behaviors, such as generating, exploring, championing, and implementing ideas, also improves substantially. Consequently, hypotheses H1, H2, H3, and H4 are supported.

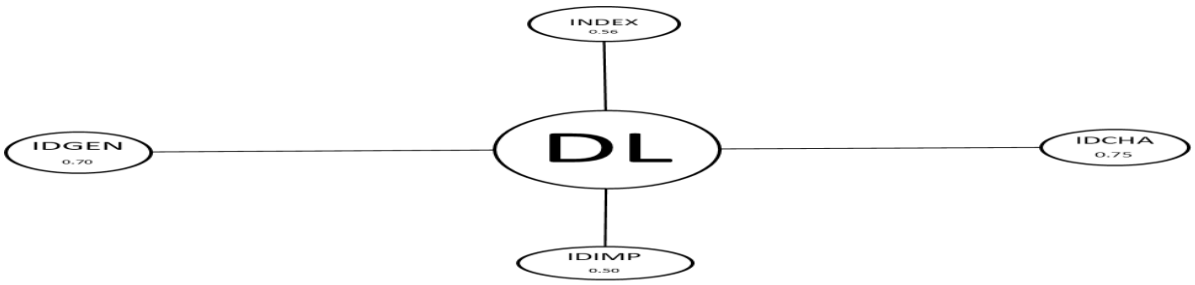

Figure 1. Results of Structure Model

Table 5 describes the structural model results examining the relationships between digital leadership and four key aspects of creative work behaviors: idea exploration, idea generation, idea implementation, and idea championing. Strong and statistically significant findings support each hypothesis (H1 to H4). For **H1**, digital leadership significantly impacts idea exploration (B = 0.58, β = 0.60, C.R. = 12.154, p < 0.001). Similarly, **H2** confirms that digital leadership positively influences idea generation (B = 0.50, β = 0.54, C.R. = 11.300, p < 0.001). **H3** demonstrates a meaningful relationship between digital leadership and idea implementation (B = 0.52, β = 0.55, C.R. = 10.890, p < 0.001). Finally, **H4** highlights the strongest relationship in the model, showing digital leadership's substantial effect on idea championing (B = 0.82, β = 0.68, C.R. = 16.500, p < 0.001). These findings highlight the critical role that digital leadership plays in promoting multifaceted creative work practices.

Table 5. Structural Model

Hypotheses	Relationship	B	B	C.R.	P Value
H1	Digital Leadership__ Idea exploration	0.58	0.60	12.154	***
H2	Digital Leadership__ Idea Generation	0.50	0.54	11.300	***
H3	Digital Leadership__ Idea Implementation	0.52	0.55	10.890	***
H4	Digital Leadership__ Idea Championing	0.82	0.68	16.500	***
Hypotheses	Relationship	B	B	C.R.	P Value
H1	Digital Leadership__ Idea exploration	0.58	0.60	12.154	***
H2	Digital Leadership__ Idea Generation	0.50	0.54	11.300	***
H3	Digital Leadership__ Idea Implementation	0.52	0.55	10.890	***
H4	Digital Leadership__ Idea Championing	0.82	0.68	16.500	***

Notes: **p p<0.001; β: Standardized estimates B: Unstandardized estimates; C.R.: Critical ratio*

Discussion and Conclusion

The current review investigates what library experts see computerized authority and means for their imaginative work conduct. The discoveries unveil that the view of advanced administration profoundly influences imagination and development in library settings.

Previous research studies (Abdulmuhsin et al., 2021; U. Aslam et al., 2018; Bari & Alaverdov, 2021; Basheer et al., 2022; Huang et al., 2024; Muhammad et al., 2021; Qureshi et al., 2022; Rehman et al., 2024; Syed et al., 2024) has shown how various leadership styles affect innovative work performance. This study focuses on the connection between advanced authority and creative practices inside libraries (Arnold et al., 2008). As the information Centre points out, libraries require consistent improvement and headway to stay significant in the advanced age (Rauf et al., 2024). This study highlights that extraordinary contemplations are the wellspring of progression, and library bosses who stay up with the latest with modernized designs are more open to doing cutting edge methods and developments inside their affiliations. The results are steady with prior research, exhibiting that computerized authority encourages imagination and helps in the advanced change drives of libraries (Arnold et al., 2008). The meaning of automated advancement has been moreover included by the Covid pandemic, which has persuaded libraries to change following moving circumstances to see and meet sponsor presumptions (Asghar et al., 2023; Chohan, 2021; Klare, 2017; Ul Haq et al., 2021).

The review's speculation affirms that computerized authority influences imaginative work conduct in libraries, the essential ramifications of embracing novel advances, and supporting a development-driven culture to affirm authoritative maintainability and expert movement (Abbu et al., 2023). Library pioneers should address partner issues, motivate their groups, and embrace arising advancements to affirm authoritative development (S. M. Abbas et al., 2024). Computerized authority likewise gives library pioneers an enterprising outlook, essential for driving development and acquiring an upper hand in helping conveyance (Qutab et al., 2022). To check authoritative supportability and professional success, the review's speculation approves that advanced administration impacts imaginative work rehearses in libraries, the essential repercussions of carrying out innovation, and the improvement of a development-driven culture (Ponnusamy et al., 2019; Syed et al., 2024; Zaman et al., 2024).

Implications

The findings of this research were restricted to libraries. This can be improved to cover other aspects, such as academic, public, or special libraries, in future studies. Perhaps longitudinal studies could enhance this by looking at the extent and effect of digital leadership in fostering library creativity over some time. Future studies on this topic could also include additional measurements regarding organizations ‘digital transformation, such as firm health, employee satisfaction, and extra-role performance. Although this research indicates that digital

leadership is beneficial for promoting innovative work practices, more research should be conducted regarding such variables as emotional intelligence, organizational culture, or engagement levels that influence the relationship between the two variables. Moreover, qualitative approaches could assist in understanding how digital leadership impacts library staff behaviour and the organization's performance. As such, these areas could enable future research to take a more in-depth understanding of the role of digital leadership in the future of libraries.

Limitations & Future Directions

The shortcoming of this research was its restricted reach to libraries. This can be improved to cover other aspects, such as academic, public, or special libraries, in future studies. Perhaps longitudinal studies could enhance this by looking at the extent and effect of digital leadership in fostering library creativity over a stretch of time. Future studies on this topic could also include additional measurements regarding organizations 'digital transformation, such as firm health, employee satisfaction, and extra-role performance. Although this research indicates that digital leadership is beneficial for promoting innovative work practices, more research should be conducted regarding such variables as emotional intelligence, organizational culture, or engagement levels that influence the relationship between the two variables. Moreover, qualitative approaches could assist in understanding how digital leadership impacts library staff behaviour and the organization's performance. As such, these areas could enable future research to take a more in-depth understanding of the role of digital leadership in the future of libraries.

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