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Article

Role of technology development, organizational development and individual development on knowledge sharing in developing country

Ikramuddin Junejo[1,*], Liaquat Ali Rahoo[2], Md Billal Hossain[3], Faisal Ejaz[4], Sarmad Ejaz[5], Csaba Bálint Illés[6]

[1] Department of Management Sciences, SZABIST University, Hyderabad campus, Hyderabad 71000, Pakistan
[2] Mehran University of Engineering and Technology, Jamshoro 76060, Pakistan
[3] Business Management and Marketing Department, School of Business and Economics, Westminster International University in Tashkent (WIUT), Tashkent 100047, Uzbekistan
[4] School of International Relations, Minhaj University Lahore, Lahore 54792, Pakistan
[5] Department of Management Sciences, University of Okara, Okara 56300, Pakistan
[6] Doctoral School of Management and Business Administration, John von Neumann University, Budapest 1117, Hungary
*** Corresponding author:** Ikramuddin Junejo, ikramuddin.junejo@hyd.szabist.edu.pk

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Abstract: The purpose of this research study is to identify the factors of knowledge sharing among library professionals of higher educational institutions of Pakistan. There are very few studies on the knowledge exchange between library professionals in Pakistan's higher education institutions. In this study model which has all the elements used to examine the knowledge sharing, in the study researcher investigate the impact of technological, organizational and individual on library professionals' knowledge sharing behavior. The study adopted a descriptive survey design as research design and quantitative as type of research type. Questionnaire was adapted and used to collect data from 240 librarians through Google form survey in the higher educational institutions. The population of study is higher educational institutions of Pakistan. Convenience sampling techniques was used for data collection. The data were analyzed through the measurement model and structural equation model (PLS-SEM). The results of the study technological development, organizational development and individual development are significant for knowledge sharing in higher educational intuitions in Pakistan. This study gave new insights through to policy makers for the future polices to higher authorities.

Keywords: technological development; organizational development; individual development; knowledge sharing factors; higher educational institutions; PLS-SEM; library professionals

1. Introduction

Knowledge sharing among librarians in higher education institution libraries is critical in promoting the effective dissemination of information and enhancing the quality of academic services. Various factors can influence knowledge sharing within this context, and understanding these factors is essential for optimizing library staff's performance and ensuring quality services to students and researchers. Here are some critical factors that can impact knowledge sharing among librarians in higher education institution libraries. The perception of information based on comprehension is known as knowledge (Ahmad et al., 2021). It usually focuses on understanding, considering, and providing a suitable response to a topic. Knowledge is contained in both documents and people's thinking, as well as in their attitudes and behavior. Knowledge cannot be detected in the human mind. Despite this, information can be preserved. In the literature, explicit knowledge and implicit knowledge have been defined. Implicit knowledge is knowledge that has been

learned subconsciously and is transferrable through observation and application. It is based on behavioral patterns acquired through training and job experience (Jain et al., 2007). There is no perfect agreement among scholars on what knowledge sharing means because of the strong presence of many diverse viewpoints, such as information collaboration, knowledge market, education, and communication perspectives.

The idea of knowledge has evolved in the modern era to be applied to improving information. As a result, knowledge evaluation methodology has improved. Knowledge is one of the strategic sources; thus, organizations that want to execute and reach a high level of performance while remaining competitive must give their strategic resources greater attention. Information is the key to competencies for organizational effectiveness (Al-Delawi, 2019; Raewf and Thabit, 2015). According to Zahari (2014), information is a vital resource that can be leveraged to obtain a competitive advantage. It is required for semi-permanent organizations in both the public and commercial sectors. Knowing information can be applied to make things much more straightforward and produce accurate results. Additionally, observations, understandings, and valued skills are crucial tools that enable people to determine intelligence (Omotayo, 2015). In addition, the financial world's focus has switched from labor to supplementary data (Ngah and Patriarch, 2010).

There are many problems developing countries have to deal with as they try to improve their social and economic situations and achieve sustainable growth (Leal Filho et al., 2019). Sharing and using information well is one of the most essential things to help them move forward. Sharing knowledge is a crucial part of boosting creativity, output, and competitiveness, and it can also make a big difference in boosting economic growth and social progress (Arsawan et al., 2022). However, developing countries often need help with particular problems and restrictions that make it hard for people to share information within their societies and groups (Egger et al., 2021). Knowledge sharing and spread can be slowed down by needing more access to new technologies, inadequate organizational systems, and people who need more skills and abilities. Many developing countries still need access to reliable and cheap technology, making it harder to share information effectively (Chen et al., 2021; Salvarli and Salvarli, 2020). Also, businesses cannot share important ideas and experiences as quickly as possible because their knowledge management tools are not working well, and there are not enough resources to encourage people to share their knowledge. Lastly, from an individual point of view, not having enough schooling and training chances, not understanding how important it is to share knowledge, and cultural differences can make it hard for people to be able to and want to take part in knowledge-sharing activities (Elumalai et al., 2021).

In previous studies, knowledge sharing is an essential part of many company areas, such as productivity, cost management, sales growth, income, and how people work together (Abbas et al., 2019; Stock et al., 2021). Knowledge sharing depends on the actions and skills of workers and significantly affects how well a company is, how creative it is, how happy its employees are, how successful it is, and how much it produces (Azeem et al., 2021; Sonmez Cakir and Adiguzel, 2020). It is even more critical and cost-effective for coworkers to share their knowledge and ideas during

emergencies like the COVID-19 pandemic. For the success of businesses and organizations, it is crucial to stress how important and urgent it is to improve workers' ability to share knowledge (Ingusci et al., 2021; Montani and Staglianò, 2022). Knowledge sharing that can be used in any crisis, not just the COVID-19 pandemic. Nevertheless, even though these factors are essential, there has yet to be a lot of study into how they affect each other. Because of this study gap, people may have behaved and done things differently in the workplace before, during, and after the pandemic.

Knowledge must be shared outside the organization. It is easier to govern knowledge-related actions when information is dispersed and embedded in people, facilities, or procedures. With a robust knowledge-sharing program, it will be more probable for an organization to inherit the skills that its members have acquired and shared. The staff members who need to know about the information must be informed of its existence before it is of use (Raewf and Mahmood, 2021; Thabit and Jasim, 2017). The study aims to identify the impact of technological, organizational, and individual among library professionals of higher educational institutions in Pakistan.

Therefore, the research objectives of present study are:

RO1: To examine the impact of technology development on knowledge sharing among library professionals of higher educational institutions in Pakistan.

RO2: To identify the impact of organizational development on knowledge sharing among library professionals of higher educational institutions in Pakistan.

RO3: To study the impact of individual development on knowledge sharing among library professionals of higher educational institutions in Pakistan.

The study of information-sharing behavior and motivation in organizations has dramatically benefited from applying these theories. However, using all ideas to explain the value of information sharing would be insufficient. It is challenging to pinpoint a paradigm that addresses this problem from operational, business, sociological, psychological, and technical views due to the multiplicity of components at play (Krok, 2013). To fit the hypothesis using the same theory, various investigations prefer to use different variables (Liang et al., 2008).

2. Review of literature

2.1. Theoretical framework

According to the Theory of Reasoned Action (TRA), what people do is mainly based on their goals, which are affected by their views and personal standards (Tsai et al., 2012). Attitudes and subjective norms affect people's decisions to share knowledge (Obrenovic et al., 2022). A person is more likely to have a positive attitude toward knowledge sharing and be more likely to engage in knowledge-sharing behaviors if they think sharing knowledge is helpful, like improving their professional reputation or helping their organization succeed (Nguyen et al., 2021). People are more likely to share their knowledge if they think their coworkers, bosses, or social networks value and support it (Laitinen and Sivunen, 2021). This makes them feel like they have a social responsibility to do so, making them more likely to do so.

Another thing that the Theory of Planned Behavior adds to the TRA is something called observed behavioral control. The TPB says how people feel about their behaviors and how much control they have over them affect how they plan to behave and what they do (Ajzen, 2020). When TPB talks about sharing knowledge, they say that what people think, their standards, and how well they think they can share information affect their choice to share (Przymuszała et al., 2023). When it comes to sharing knowledge, it depends on how sure people can do it, how easy it is for them to get the tools and technologies they need, and how they see the things that help or hurt sharing knowledge. People who feel they have power over the information are likelier to share it. They also have the skills and tools to do so.

According to the TRA theory (Jolaee et al., 2014), people have moral principles, and behavioral attitudes, societal expectations, and behavioral intents influence their actions. The concept of purposeful actions holds that behavior is preceded by a conscious intention to take some action, which is influenced by a person's inclination for that activity, cultural norms, and the desired behavioral outcome (Mahmood and Raewf, 2019). However, TRA and TPB are used to predict and describe human behavior instead of chance events brought on by an unknowable variable (Krok, 2013). Furthermore, according to Bousari and Hassanzadeh (2012), the theory of expected behavior could be used to investigate the factors impacting information-sharing behavior. However, further aspects and variables should be provided and considered in addition to the theoretical factors to evaluate the criteria for successful behavior. A lack of facilities and sufficient operational, cultural, and financial resources may also prevent people from sharing their expertise, which they might otherwise want to do (Bousari and Hassanzadeh, 2012).

In the previous literature, several social and behavioral theories describe the factors that affect knowledge sharing in various organizational contexts. The latest version of the Behaviour Theory of Planned Behaviour (TPB) and Fishbein and Ajzen's Theory of Reasoned Action (TRA) are two behavioral models that have been used to study the interchange of intelligence (Jolaee et al., 2014; Jameel and Ahmad, 2020; Krok, 2013). According to TRA, most human behavior can be characterized by specific beliefs and behavior (Lin, 2007).

2.2. Hypothesis development

2.2.1. Technology development

According to Massoudi and Hamdi (2017), organizational concerns can be divided into philosophy, incentive programs, management support, policies, and strategies. These are crucial for information sharing because they must be sent via various channels and networks (Malone et al., 2020). Two technological issues are the availability of IT resources and the use of social media (Massoudi and Hamdi, 2019; Bousari and Hassanzadeh, 2012). It is described as sharing or sending private information within an organization. Furthermore, new knowledge will be developed by interacting and disseminating existing information (Al-Delawi and Ramo, 2020; Krok, 2013). In this context, Grunfelder and Hartner (2013) noted that conveying information between entities and transferring information through written documents are two separate ways of moving knowledge across organizations.

Therefore, the following hypothesis is developed.

H1: Technological development has a significant impact on knowledge sharing among library professionals.

2.2.2. Organizational development

A literature review indicated that the principle of information sharing needs to be better understood. Academic researchers in the field have characterized knowledge sharing in several ways. Academics or researchers approach information sharing from various perspectives, including knowledge sharing, education, the knowledge market, and networking, according to Zahari et al. (2014). According to Lin, knowledge sharing is also a social networking culture that involves exchanging ideas, experiences, and skills across departments and organizations. Knowledge sharing occurs when workers are willing to work well together, exchange information, and actively include peers in learning from it, claims Lin. Methods for sharing knowledge are also provided, both at the individual and organizational levels. At the organizational level, the sharing of knowledge collects, organizes, re-uses, and shares experience-based expertise that is already present within the enterprise and makes the knowledge accessible to others in the company (Attard and Cortis, 2023; Lin, 2007).

In addition to this, companies that want to foster a culture of knowledge sharing must provide their employees with the tools necessary to do their tasks more effectively as a team, collaborate more effectively, and share organizational information more effectively (Al-Delawi, 2015; Jain et al., 2007). Better knowledge sharing among individuals has developed into a strategic necessity for organizations, according to Antunes and Pinheiro (2020), Gaal et al. (2015). Implementing information exchange among staff will, therefore, assist the firm in achieving its goals. Only a few prior studies have addressed information sharing from the standpoint of interpersonal interaction inside an organization, and more work must be done to concentrate on this (Cheng et al., 2009). According to Cheng et al. (2009), knowledge management systems were initially used in profit-driven businesses; as a result, most research on knowledge management and information sharing is focused on corporate organizations. Therefore, the following hypothesis is developed.

H2: Organizational development has a significant impact on knowledge sharing among library professionals.

2.2.3. Individual development

Knowledge sharing has been a popular subject at academic institutions as a result of the recent application of knowledge management methodologies to educational institutions and other information-based companies. Academics not only conduct research but also instruct, counsel, and teach (Jolaee et al., 2014). They are characteristics that have internal motivations. After all, it starts with the person (Cheng et al., 2009). Individual traits include intelligence, self-efficacy, confidence, interpersonal relationships, personal preferences, and the need to communicate. These are aspects of an organization that are external to the employee. They are external causes that may be caused by the environment or someone else to promote the knowledge-exchange mindset (Cheng et al., 2009). To improve the quality and quantity of their own knowledge, develop new knowledge, and improve the

university's overall success, librarian must share their expertise. In an academic atmosphere, especially in universities where all employees frequently connect with knowledge, sharing knowledge is essential (Trehan and Kushwaha, 2012). According to some academics, educational institutions have a lower motivation or capacity for information sharing than profit-driven organizations do in order to accomplish common objectives (Kong, 1999). Cheng (2009) acknowledged that the sharing of documented information rather than intelligence is more typical in academic settings. Knowledge exchange between academics is assumed to be limited to specific subjects or concentrated among those with related expertise within academia (Harjan et al., 2016). University biologists, for instance, will exchange their knowledge with their peers in the same department and with researchers from other natural science departments, including chemistry, physics, or the medical faculty (Tripp and Shortlidge, 2019). Therefore, the following hypothesis is developed.

H3: Individual development has a significant impact on knowledge sharing among library professionals.

Based on above theoretical framework and literature review following research framework is proposed. (See the **Figure 1**)

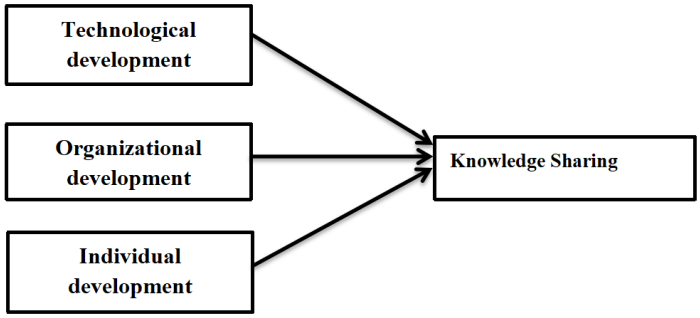

Figure 1. Research framework.

3. Methodology

3.1. Research design

The study adopted a descriptive survey design as the research design and a quantitative research type. The questionnaire was adapted in two parts: in the first part, demographic information of respondents, and in the second part, questions related to variables. Google forms was used to collect data from 240 librarians through email in the higher educational institutions of Pakistan. Library professionals were the study's target population all over Pakistan. Convenience sampling techniques were used to select the respondent from higher educational institutions in Pakistan. Surveys were conducted through Google from library professional's higher educational institutions in Pakistan. The PLS-SEM was used for data analysis.

3.2. Operational definitions and research instrument

Knowledge sharing can be defined as, "A subset of knowledge management encompassing the exchange of knowledge (information, skills, experiences, or expertise) within and across organizations (Hislop et al., 2018)."

Technology development can be defined as, "Technology development means strategically focused research aimed at developing investment-grade technologies essential to market competitiveness (Zhuplev, 2018)."

Organizational development meaning is "organization development (OD) is an effort that focuses on improving an organization's capability through the alignment of strategy, structure, people, rewards, metrics, and management processes (Smither et al., 2016)."

Individual development can be defined as, "Personal development, refers to the process of improving oneself in various aspects such as knowledge, skills, personality, and growth (Hasan et al., 2015)."

The knowledge sharing nine items are taken from the study of (Atif and Bilal, 2015). Research items are, "I express ideas and thoughts in organizational meetings, I engage in long term coaching relationships with junior, I keep others updated with personal conversations, I have online chats with others to help them with their work-related issues, I meet with community member for innovation works, I ask good questions that discuss in team meeting, I participate fully in Brainstorming sessions, I make presentation in organizational meetings and I keep others updated with personal conversations."

Technology development also nine items are taken from the study of (Atif and Bilal, 2015; Nguyen et al., 2019). Research items are, "Work related information and knowledge are stored, classified and updated in a scientific and regular manner, the organization's IT system provides valuable and useful information/data for my work, the organization's IT system facilitates the sharing of knowledge and information among members, I always feel comfortable that right things will happen when I use technology, I am totally confident working with technology, having the legal backup of legal statues and process make me feel secure in using technology, I believe that most technologies are effective at what they are designed to do so, I usually trust technology until it gives me a reason not to trust it and technology has the functionality I need."

Organizational development seven research items are taken from (Nguyen et al., 2019). Items are, "My manager always set a good example in sharing his knowledge with others, my manager supports me in sharing knowledge with colleagues in other departments, my manager allows me to share my knowledge with my colleagues even though it may influence the present job process, my manager instructs us on how to share our personal knowledge within the department, sharing my knowledge with colleagues should be rewarded with a higher salary, sharing my knowledge with colleagues should be rewarded with a higher bonus and sharing my knowledge with colleagues should be rewarded with a promotion."

Individual development also seven items are adopted from the study of (Nguyen et al., 2019). Research items are given. "I completed more work than the expectations of the manager, I can finish all the work earlier than the assigned plan, I can reduce the time required to complete my daily work, the results of my work always exceed the work goals assigned by managers, I have ideas and useful suggestions for the university, I always meet the wishes of learners, I have never had any delays in my work or caused anything to do with my carelessness, I have never

received any complaints about poor performance and the manager is always satisfied with my results."

4. Results and discussion

4.1. Demographic information

The male respondents were 62.50 and females 37.50 participated; the maximum library assistant was 39.58, assistant librarian 20.83, deputy librarian 18.75, additional librarian 18.75, senior librarian 10.42, chief librarian 4.17, and lastly, any other 2.08 respondents have participated in this study. In the qualification variable, the maximum number of participants who have graduated 16 years is 77.92, MS/M.Phil. 5.42 Ph.D. 2.08 respondents. Lastly, for the type of higher educational institutions, the maximum participation from the public sector was 54.58, and 45.42 private sector respondents participated in this research study. Please the **Table 1** shown below.

Table 1. Demographic information.

Characteristics	Values	Frequency	Percentage
Gender	Male	150	62.50
	Female	90	37.50
	Total	240	100.00
Designation	Library assistant	95	39.58
	Assistant librarian	50	20.83
	Deputy librarian	45	18.75
	Additional librarian	10	4.17
	Senior librarian	25	10.42
	Chief librarian	10	4.17
	Any other	5	2.08
	Total	240	100.00
Qualification	Diploma PGD	35	14.58
	Bachelor/master (16 years)	187	77.92
	MS/M.Phil.	13	5.42
	Ph.Ds.	5	2.08
	Total	240	100.00
Type of HEIs	Public	131	54.58
	Private	109	45.42
	Total	240	100.00

4.2. Measurement model

The measurement model defines the relationships between the latent constructs and their observed indicators. It specifies how the latent variable(s) and observed variables are related. In structural equation modeling (SEM) and confirmatory factor analysis (CFA), standard statistical techniques used for measurement modeling, the model is often represented using path diagrams and equations. The measurement

model describes how the observed variables "load" onto the latent constructs (Hair et al., 2017). The findings can be noticed given in the **Figure 2** below:

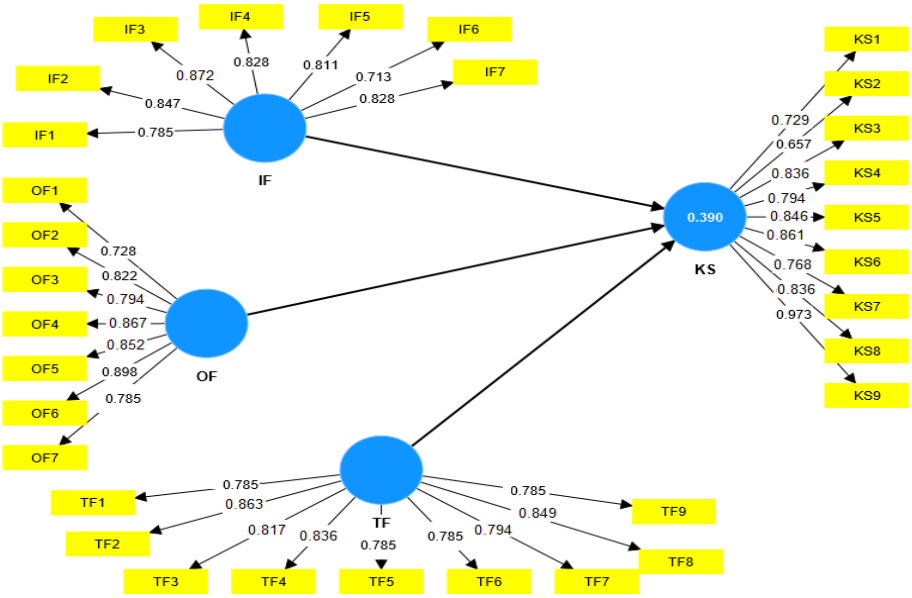

Figure 1. Factor outer loading.

According to the test results in **Table 2**, the skewness statistics of all variables ranged from −2 to 2, the kurtosis statistics ranged from −3 to 3, and the standard deviation ranged from −2 to 2. As a result, the research data were discovered to be regularly distributed.

Table 2. Normality test.

Variables	Number	Skewness (statistic)	Skewness (SD)	Kurtosis (statistic)	Kurtosis (SD)
Individual development	240	0.473	0.273	0.532	0.541
Organizational development	240	−0.348	0.273	0.407	0.541
Technological development	240	−1.324	0.273	0.834	0.541
Knowledge Sharing	240	0.657	0.273	1.648	0.541

The extracted average variance (AVE) should always be greater than 0.4, the composite reliability (CR) value should always be more significant than AVE, and Cronbach's alpha should be greater than 0.7 for all variables. This analysis thus proves the dependability of the research variables. The model's quality and dependability are acceptable because quality indices should always be positive. **Table 3** shows the reliability and validity of the variables and other relevant indices.

Table 3. Convergent validity and reliability tests.

Variables	Items	Cronbach's alpha	AVE	CR	CVR	CVC
Individual development	7	0.899	0.621	0.904	0.482	0.482
Organizational development	7	0.886	0.523	0.889	0.291	0.291
Technological development	9	0.878	0.580	0.889	0.507	0.507
Knowledge Sharing	9	0.825	0.258	0.839	0.385	0.385

4.3. Structural model

The structural model explains the latent variables' relationships with one another. The coefficient of determination (R^2) and hypothesis testing are two crucial techniques suggested to be looked at to assess the structural model. **Table 4** and **Figure 3** present the results, and data analysis demonstrated that hypotheses H1, H2, and H3 were confirmed by empirical evidence.

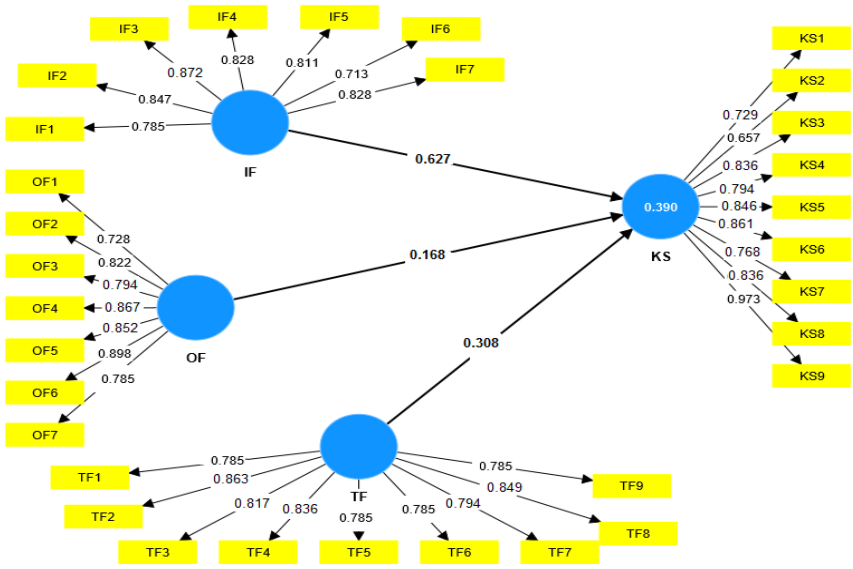

Figure 3. Path coefficient.

Table 4. Hypotheses testing.

Hypothesis	Relationship	Path coefficient	t-statistics	Result
H1	TD→ KS	0.308	2.834	Confirmed
H2	OD→ KS	0.168	2.751	Confirmed
H3	ID→ KS	0.627	8.131	Confirmed

The bootstrapping approach, which is regarded as a reliable tool for evaluating mediation effects, was utilized in this work to confirm the mediation influence using 5000 bootstraps (Singh, 2010). The findings supported hypotheses H1, H2 and H3 positively on knowledge sharing among library professionals of higher educational institutions.

A common method for evaluating the structural model's predictive power is to look at its R^2 value. By explaining 0.384 of the variation in the motivation to share knowledge, **Table 5** demonstrates the model's predictive power.

Table 1. R-square coefficient of research.

Variable	R-square	R-square adjusted
Knowledge Sharing	0.384	0.360

4.4. Discussion on results

H1, the statistical study shows that technological development significantly affects knowledge sharing, as shown by the beta value of 0.308 ($p < 0.05$) and the

t-value of 2.834, which supports hypothesis H1. This finding aligns with an earlier study that showed how technology can help people knowledge sharing (Caputo et al., 2019). People and businesses can access, make, and share information more easily with the help of technology like the Internet, digital platforms, and collaborative tools (Chandna, 2022). It breaks down boundaries of time and place so that people can communicate, work together, and share knowledge more quickly and effectively. As a result, as technology improves, it makes it easier for people and groups to share information.

H2, the data study shows that organizational development significantly affects knowledge sharing, as shown by the beta value of 0.168 ($p < 0.05$) and the *t*-value of 2.751, which supports hypothesis H2. This result fits with an earlier study that showed how organizational development can make it easier for people to share information (Pratama et al., 2022). There are many parts to organizational development such as implementing effective knowledge management systems, building a helpful organizational culture, and making frameworks that encourage people to talk to each other and work together (Paais and Pattiruhu, 2020).

H3, as shown by the beta value of 0.627 ($p < 0.05$) and the *t*-value of 8.131, the statistical analysis shows that individual development significantly affects knowledge sharing. This is strong evidence for hypothesis H3. In past studies that stressed how vital personal development are for encouraging people to knowledge sharing (Tønnessen et al., 2021). Individual development means improving a person's abilities, skills, and attitudes to share information more effectively (Schiuma et al., 2022). Knowledge sharing practices are more likely to happen when people have the right skills and attitudes (Yao et al., 2020).

5. Conclusion

This study looked at how technology development, group development, and personal development affect sharing information in a developing country setting. The most exciting thing about this study was that individual growth had the most significant beta value compared to the other factors. The fact that individual growth has the most significant beta value shows that it significantly affects sharing knowledge. This study shows how important individuals are in encouraging people to share information. People are more likely to participate in knowledge-sharing events if they have the skills, abilities, and a good attitude toward sharing information. So, groups and lawmakers should prioritize projects that help people grow, like training programs, activities that help people learn new skills, and making the classroom a helpful place to learn. By putting money into each employee's growth, companies can give their workers the tools to contribute and share what they know, leading to better work, new ideas, and corporate learning.

5.1. Practical implications

There are many valuable things that the results of this study can do for groups, significantly higher education institutions in Pakistan, and especially for people who work in libraries. Firstly, the study shows the importance of spending money on technology systems and digital tools that make sharing information easier. Higher

education institutions should prioritize adopting and using advanced information and communication technologies (ICTs) that make it easy for library workers to share information. One way to do this is to give people access to digital libraries, joint platforms, and communication tools that make it easy to share information and knowledge.

Secondly, it is imperative to ensure that the company has a welcoming attitude and sets up processes that make it easy for people to share their knowledge. Higher education institutions should understand how vital organizational growth is for encouraging library workers to share their information. Setting up knowledge management tools, pushing people to work together through team-building activities and cross-functional projects, and giving people a way to share best practices and lessons learned are all ways to do this. Lastly, the results show how significant personal growth is in encouraging people to share information. Higher education institutions should put money into training and career development programs for library staff, focusing on helping them get better at sharing what they know. This could include training on communicating clearly, working together to solve problems, and handling information.

5.2. Theoretical contribution

This study adds to the body of research by using two well-known behavioral models—the Theory of Planned Behavior (TPB) and Fishbein and Ajzen's Theory of Reasoned Action (TRA)—to look at how technology development, organizational development, and individual development affect sharing knowledge in a developing country. This research uses the TPB and TRA models to examine how technology, organizations, and personal development affect knowledge sharing. The research helps us understand the psychological processes and elements that motivate developing country residents to share knowledge. When planning and acting to promote information sharing, it is necessary to consider people's opinions, attitudes, and notions about social norms and how technology and organizational variables impact them. The research employs the TPB and TRA frameworks to understand how psychology affects knowledge sharing. This is useful for academics, practitioners, and policymakers who seek to promote knowledge sharing in underdeveloped countries.

Author contributions: Conceptualization, IJ; methodology, LAR and CBI; software, FE; validation, FE, SE and IJ; formal analysis, MBH; investigation, MBH; resources, CBI; data curation, FE; writing—original draft preparation, IJ; writing—review and editing, CBI and MBH; visualization, LAR; supervision, MBH; project administration, CBI, MBH; funding acquisition, CBI, MBH and SE. All authors have read and agreed to the published version of the manuscript.

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