Digital Transformation: Exploring Organizational Patterns at the Intersection of Society, Culture, and Technology

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ABSTRACT

Digitalization is a transformative force in today's global economy, requiring organizations to prepare for change. This research explores the challenges of digitalization, focusing on the cultural and social factors affecting the adoption of digital technology. Our findings reveal that only a limited number of organizations, such as the Ministry of Finance, Information and Communication Technology, Passport Department, and National ID Cards (e-Tazkira) project, have embraced digital development. Understanding the cultural and social impact is crucial to achieving effective digital transformation. The study underscores the potential effects of digitalization on Afghanistan's economic, social, and environmental spheres. However, for these benefits to materialize, society must enhance its digital skills, awareness, maturity, and growth of its mindset and adapt to technology while considering cultural and social aspects. Therefore, Improving digital literacy and utilization across society is recommended. This study documents five organizational patterns observed during the transformation of traditional systems into digital systems, describing their sequence and explaining the development of a pattern language from these patterns.

CCS CONCEPTS

• **Software and its engineering → Patterns**.

KEYWORDS

software engineering, organizational patterns, public awareness, cultural and social impact, digital transformation

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1 INTRODUCTION

Digital transformation represents the fundamental reinvention of organizations, driven by technological advancements. It involves reimagining and optimizing operations to maintain competitiveness in an ever-evolving digital landscape. This transformation is a critical catalyst for innovation and growth in the modern world.

Digital transformation has become a focal point for researchers and practitioners in recent decades. This transformation, empowered by digital technologies such as artificial intelligence, big data analytics, the Internet of Things, blockchain, and other technologies, digital transformation encompasses the profound changes happening in every aspect of society, organizations, and industries [19]. Over the past two decades, Afghanistan has witnessed the emergence of diverse organizations encompassing various directorates, departments, and similar entities. These organizations have evolved to deliver essential information resources and services to the public and society during times of necessity. Digital organization and virtual organization describe the extensive information people must access remotely. Societies must enhance their knowledge and familiarity with technology, while organizations should embark on digitizing their systems. This highlights the increasing significance of digitalization. As technology advances, organizations have shifted towards digital systems, yet this transition presents challenges, including workforce management and its social impact. The digital era has rendered traditional methods insufficient due to resource constraints and time limitations, necessitating organizational paradigm shifts. Although digital organizations have become integral, they face challenges such as skill shortages, resource allocation, cultural adjustments, social awareness, and budget considerations.

This study explores the effect of digital transformation, shedding light on the path toward a more digitally integrated society and organizational landscape. It aims to identify recurring challenges and organizational aspects of digital transformation, drawing from practical experience, academic literature, and lessons learned from digital transformation frameworks. These insights are presented in the form of organizational patterns. This study further dissects the multifaceted impact of digital transformation, delving into three key dimensions: the hybrid approach, people, and society.

Hybrid Approach. As technology rapidly advances, organizations and society encounter challenges in adopting advanced technologies in the evolving landscape of technological progress. The current trend emphasizes a hybrid approach, acknowledging the

coexistence of digital and traditional methods to cater to a diverse workforce. This inclusivity addresses the preferences of both older generations, rooted in traditional methods, and the tech-savvy current generation reliant on electronic formats. While debates persist on a complete shift to digital, concerns about job displacement and preserving physical organizations are voiced. However, many organizations recognize the physical visits of a dual approach, transitioning from manual to digital processes while navigating the opportunities and challenges presented by networking. Integral to the success of this hybrid approach is the acceptance of digitalization within society. Education and community involvement play pivotal roles in fostering acceptance. Public awareness campaigns, workshops, and inclusive strategies contribute to removing the gap between traditional and digital operations. Recognizing the diverse needs of society is crucial, requiring comprehensive training programs and accessible resources to address concerns about adopting digital practices. Moreover, cultivating a culture open to change and emphasizing digital services' advantages are essential to achieving society acceptance.

People. Traditionally, organizations relied on manual processes, with individuals physically coming to the workplace to perform their tasks. However, with the rapid advancement of technology, particularly on a larger scale, organizations have recognized the vital role of people in driving innovation and efficiency. Consequently, they have embraced a combination of traditional and digital services to harness the strengths of both approaches. By valuing the contributions of people, organizations can better cater to their needs and preferences. As a society, we recognize the importance of fully accommodating traditional and digital approaches to leverage people's capabilities in technology-driven environments. Nowadays, organizations on a larger scale have adopted both traditional and digital services, and we cannot ignore the significance of both aspects in modern economic activities. Developed countries like the US, UK, and Europe, including countries such as Germany, have implemented various traditional and digital services for different reasons, considering people's diverse preferences and abilities. This inclusiveness extends to older individuals who may face challenges utilizing electronic formats effectively. By acknowledging the central role of people in technological advancements, we can create a more inclusive and user-friendly landscape where technology complements and enhances human capabilities. Striking the right balance between traditional and digital approaches enables organizations to serve their workforce and the broader community better, fostering an environment that promotes continuous progress and growth.

Society. The digitalization of society profoundly impacts organizations and the broader societal landscape, encompassing environments, business vitality, and the country's strength. However, this transformative process also necessitates significant changes in organizations' cultures, environments, and ethical standards to adapt to the digital era effectively. In this context, the digital transformation of employee workflows is crucial in shaping an organization's overall culture and driving successful digital adoption. As leaders navigate this digital landscape, managing an organization's activities and employees becomes a challenging yet rewarding aspect of their responsibilities. Within this sphere, managers face the considerable challenge of effectively managing their employees, a task recognized as one of the most significant challenges in today's society. To handle these challenges and harness the benefits of digitalization, effective management necessitates ongoing training to cultivate a digital-first mindset among employees. By nurturing this mindset, organizations can align with the rapidly evolving digital landscape and effectively implement digital processes. Moreover, supporting employees with their personnel management responsibilities becomes essential to foster a cohesive and digitally empowered workforce. Integrating digital practices into the societal fabric presents an opportunity for organizations to succeed and positively impact the broader society. By embracing digital transformation and fostering a digital-savvy culture, organizations can contribute to the advancement of society while navigating the dynamic challenges of the digital age.

Digital transformation is a constant and complicated process that significantly alters an organization and its operations. It involves the comprehensive modification of an organization's business processes. In this approach, technology is leveraged to transition from traditional business methods to a digital form; we call this process a digital transformation [3]. It's not just about technology or organizational changes; it impacts the entire process (workflows, tasks, methods, constraints), people (culture, skills, capacity), and the organization's infrastructure. Regardless of the enterprise or company, digital transformation encompasses aspects related to changes in value creation, structural changes, technology use, and financial factors [6]. It is revolutionizing all aspects of life worldwide, including technology, education, business, and the international economy. Developing countries have yet to experience this global revolution fully. They encounter many challenges in transferring and adopting digital transformation, including government policies, inadequate infrastructure, training, business processes, lack of expertise, insufficient capacity building, and cultural differences. This research emphasizes the significance of digital transformation using a single company as an example. It highlights the pressing need for similar advancements in government agencies, private companies, universities, hospitals, and other organizations in today's society.

The rest of this paper is structured as follows. Section 2 explains the benefits of organizational change. Section 3 presents the story behind the patterns. Sections 4–8 present the patterns we discovered. Section 9 discusses the results. Section 10 explains related work. Section 11 concludes the paper.

2 THE BENEFITS OF EMBRACING ORGANIZATIONAL CHANGE THROUGH DIGITAL SOLUTIONS

Organizations and their employees have reaped the rewards of technological advancements. With global spending on technology zooming across all industries and organizations in recent decades, companies have rapidly embraced innovative technologies, primarily through the Internet. Technological progress has heightened efficiency, improved product quality, expedited product delivery, and enhanced communication among organizations and communities. It can also broaden employee skill sets, refine communication, cut costs, and fuel innovation. Specific benefits may vary based on

the type of technology being implemented. For example, organizations like the electronic National Identity Document (eNID) and the passport issuing department can benefit from adopting cutting-edge technology. This technology assists them in analyzing large data sets swiftly and efficiently. Implementing a technological solution enables them to automate system testing, boost productivity, and enhance the efficiency of their products.

Remote work is one-way technology enhances participation and involvement among employees working remotely. Sharing databases, intranets, and information across organizations or countries can increase project involvement. Technology now enables remote employees to contribute from anywhere in the world, overcoming the limitations of physical distance. Employees can work at their convenience while collaborating and communicating with team members.

Organizations can also stay ahead of their markets with cutting-edge technology. Today's businesses must adapt to rapidly changing economic situations and meet client expectations. Organizations must retain client needs and market changes to maintain their competitive advantage. Furthermore, keeping up with updated technology enables a company to leverage previously undiscovered business opportunities and prospects. Information technology helps organizations analyze their competitive position, manage strategic goals, monitor supplier connections, and gain deeper insights into their customers. Transitioning from manual to digital systems offers numerous advantages, including:

Increased efficiency. Automating many manual processes reduces the time and effort required to complete tasks, allowing employees to dedicate their time to higher-value tasks. Digital systems also reduce error risks and improve data accuracy compared to manual processes.

Improved cooperation. Digital systems enable teams to work together more easily, regardless of location, and can facilitate better communication and coordination among team members.

Increased mobility. Digital systems often offer web or mobile access, allowing employees to work from anywhere, on any device, increasing their flexibility and productivity.

Better data management. Digital systems provide a centralized, secure repository for data, making it easier to manage and analyze data to inform decision-making.

Scalability. Digital systems can more easily expand to meet the growing needs of an organization as it expands, helping bridge the knowledge gap between digital transformation and traditional operations within the context of 'Exploring the Intersection of Society, Culture, and Technology.

Cost savings. Digital systems offer the possibility for substantial cost reductions by eliminating expenses related to manual processes, including those associated with paper and printing, while concurrently enhancing overall operational efficiency.

Enhanced customer knowledge. Digital systems can enhance the customer experience through faster and more convenient services, including automated appointment booking, reduced wait times, timely responses to their needs and demands, and overall improvements in the customer experience.

Improved security. Digital systems can provide better security for sensitive data than manual processes, with built-in security features, such as encryption and user authentication, that can help protect data from unauthorized access and theft.

Real-time data access. Digital systems can provide real-time data access, allowing organizations to quickly respond to changing conditions and make informed decisions.

Better data analysis. Digital systems can store large amounts of data and provide advanced analytics tools to help organizations better understand their operations and make informed decisions.

Increased accountability. Digital systems can provide a clear audit trail, making tracking changes easier and ensuring accountability for making decisions and actions.

Enhanced sustainability. Digital systems can reduce the use of paper, reducing an organization's carbon footprint and helping to preserve natural resources.

Increased competitiveness. Digital systems can provide organizations with a competitive advantage by improving operational efficiency, enabling faster and better decision-making, and enhancing the customer experience.

Ultimately, transitioning from manual to digital systems can profoundly impact an organization's ability to develop a strategic vision, resulting in a competitive edge over its rivals. A strategic vision can help focus an entire business on its goals and tasks, leading to better deals, profits, and market share. Additionally, a strategic vision benefits employees by describing where the organization is heading and how technology can enable them to achieve those goals.

Technology generally undergoes development, execution, and application in varied ways across different countries. The procedures and digital frameworks within which they operate also influence the adoption and evolution of technology. The context of development and application is particularly interesting, which involves technology fostering interconnectedness and breaking down isolation.

A new wave of communication technologies creates fresh challenges for developing nations as depicted in Figure 1. These arise due to differing levels of preparedness, risks, and response capabilities between developing and developed countries, necessitating unique approaches to technology implementation. Based on observations and literature review, it's evident that certain organizations prioritize digitalization and its ethical aspects. However, in Afghanistan, digitalization presents significant hurdles. These include cultural barriers, limited resources, absence of digital infrastructure in government entities, shortage of technical personnel, low awareness of technological advancements, and inadequate employee facilities. This goes beyond common project management challenges [16–18, 23, 24].

Recent restrictions on mobility have spurred the adoption of digital-driven business models. This shift compels organizations to adapt, aligning with evolving market dynamics and consumer expectations amidst constrained mobility and development opportunities. This shift was particularly pronounced in Afghanistan, where individuals isolated themselves, necessitating a shift towards

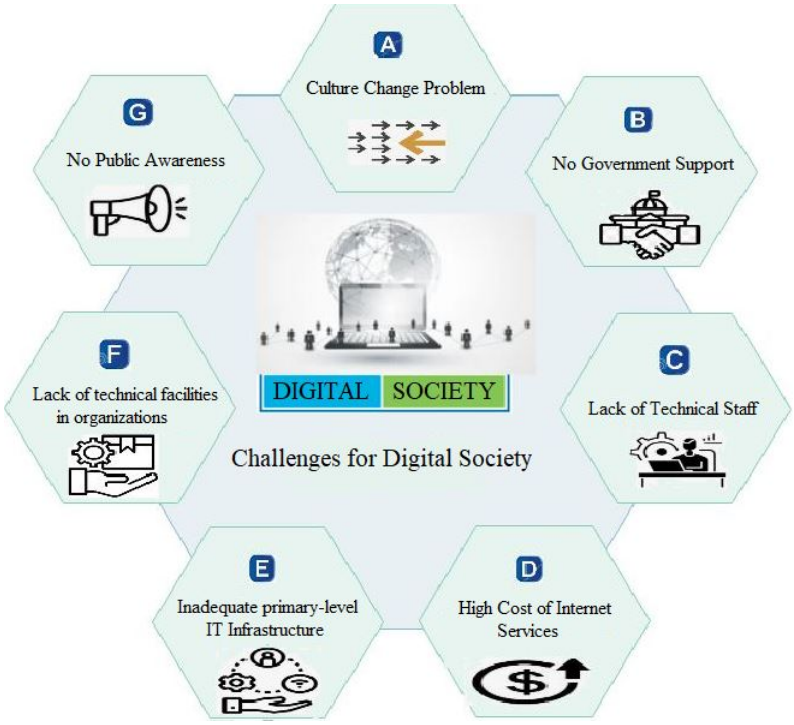

Figure 1: Challenges for digital society.

digital communication and business processes. Many organizations faced closures and needed more digital infrastructure, exacerbating the challenges. Consequently, there has been a notable transition towards electronic formats in information and business processes. While existing studies primarily focus on ethical concerns related to the public domain our research delves into the ethical implications of transitioning from traditional to digital organizational structures and societal norms. Given their profound impact on human life, we specifically observed public sectors like the education system. Our findings underscore the urgent need for digitizing the education system and public institutions, particularly as educational entities were compelled to pivot to remote activities. This shift necessitated the conversion of teaching materials, resources, lectures, and assessments into digital formats to facilitate remote learning effectively. Implementing facilities for online teaching, conducting online exams, and adopting an AIS system for the entire organization have emerged as essential components to simplify operations and enhance efficiency in the digital era. The primary purpose of our work was to explore the ethical aspects of traditional society's transformation into a digital culture, considering the environmental aspect and addressing the challenges and threats associated with transforming into a digital society in terms of ethical implications.

3 THE STORY BEHIND THE PATTERNS

We will share a brief story about a business company in Afghanistan, which we will refer to as OB-Service (not its actual name for privacy reasons). This company is located in Kabul, the capital of Afghanistan. The story behind the patterns is authentic and practical. While the company's name has been changed for privacy reasons, everything else in this narrative is based on real events. This story refers to the corresponding organizational patterns in parentheses. OB-Service strategically focuses on market proximity, offshore development, and operational efficiency and operates offices in various provinces of Afghanistan and several Asian countries. In 2019 and 2020, the company encountered technical challenges, including remote or online communications for interactions with customers and partners. The company's leadership sought online transactions and communication facilitated by computer applications, corresponding systems, and a proficient training team equipped with cutting-edge technologies to enhance business operations with user-friendly accessibility.

To evaluate employees' capacity, the development team conducted employee evaluations (Perform Employee Evaluation). Some employees needed to recognize the significance of software projects and technology. Consequently, the technical team provided training to empower employees to become domain experts in their respective roles (Domain Experts In Roles) and digitally literate employees (Digitally Literate Employees). In the training workshop, trainers collaborate directly with employees, pairing each novice with an experienced colleague. This promotes a constant learning and skill enhancement culture, utilizing the (Developing in Pairs). Additionally, the technical team reminded employees that they are the actual users and owners of the systems, emphasizing their contribution to the system's success and the potential benefits necessary for fostering employee confidence (Promoting Employee Confidence). The technical team designed prototypes and shared them for employee

satisfaction (Building Prototype). We carefully listened to employees and assured them of their upgrade and promotion. Subsequently, the technical team decided to build expertise among employees and engage them in learning the use of technologies, enhancing their capacity alongside the technical team (Engage Customers). In a training workshop, the trainers worked with employees, and experts trained each new employee to keep them continuously learning (Day Care and Promote Continuous Learning culture).

A need for an improved circular communication platform arose in multiple regions of Afghanistan and other countries. Developing additional technology-mediated communication tools (Technology-Mediated Communication) became essential to fulfil each task and offer simultaneous access to an enhanced, technology-based circular communication platform for all participating organizations. Consequently, the organization received high-quality software on time, and their employees underwent training. This story involves some known and some newly discovered organizational patterns. Figure 2 the diagram illustrates a comprehensive set of interconnected patterns to drive the organization's successful digital transformation.

We present our pattern language of digital transformation, and we document five organizational patterns; we observed real projects of digital transformation in the OB-Service company (highlighted blue in Figure 2), in which the first author of this paper was personally engaged.

We expressed the patterns in Coplien and Harrison's pattern format [5]. The problem is expressed as a conflict of the two most prominent contradicting forces in the *but* form, as proposed by Vranić and Vranić [21].

The format is written in the following structure:

<Pattern Name>

…The context in which the pattern occurs.

✣✣✣

The text in bold describes the actual problem as a conflict of the two most prominent contradicting forces. The rest of the text explains it further.

Therefore:

Here, the text in bold describes the solution. The rest of the text explains it further.

4 PERFORM EMPLOYEE EVALUATION

…A team of developers and trainers has been engaged to create software for an organization's employees. Yet, a notable need for domain knowledge and technical proficiency is evident within the organization and its employees.

✣✣✣

Inadequate technological expertise, collaboration difficulties, and a lack of domain knowledge impede effective software development and implementation, hampering the organization's goal achievement, but overcoming these obstacles is essential for successful task completion and goal accomplishment.

The administration urgently pushes for rapid digitalization with high quality, but they need help identifying employees with the necessary expertise and skills. The development team needs employees with strong communication and collaboration skills for project efficiency and effectiveness, but they encounter the challenge of finding such individuals within the organization.

Therefore:

Conduct a thorough needs assessment workshop to identify skill gaps and create a tailored capacity-building plan. Evaluate employees' understanding of technology, business processes, and ability to provide precise requirements within specified time frames. Utilize the plan to guide software implementation and provide targeted employee training, enhancing project efficiency and effectiveness. This pattern has been successfully implemented by the Ministry of Education and the Department of MIS to implement a better Certificate Management Information System.

5 DIGITALLY LITERATE EMPLOYEE

…In today's digital age, fostering digital literacy among employees is crucial. This empowers them to enhance their daily activities and communicate effectively using technology, enabling organizations to realize the full potential of digital tools.

✣✣✣

For enhancing organizational performance, it is critical for its employees to grasp the digital culture and use modern tools effectively, but the presence of cultural and unsupportive obstacles makes this endeavor particularly challenging.

Possessing technological skills is essential for successful digital transformation. Employees need motivation to harness these skills, creating new opportunities and driving positive organizational change. However, top-level management must gain the necessary skills to support and encourage them effectively.

While employees know the need for technological skills crucial for successful digital transformation, they fear job displacement due to technology. However, they require reassurance from organizations that their value will stay the same.

Therefore:

Encourage employees to develop and apply essential digital skills for innovation. Promote a digital mindset among employees, linked to higher job satisfaction and success. Leadership should embody a digital mindset, fostering a digital culture.

The Ministry of Higher Education has successfully implemented this pattern at Nangarhar University in all faculties. Initially, they provided training to the administrative staff on using the (HEMIS) higher education management information system and subsequently created a HEMIS system for all faculties to upload students' marks.

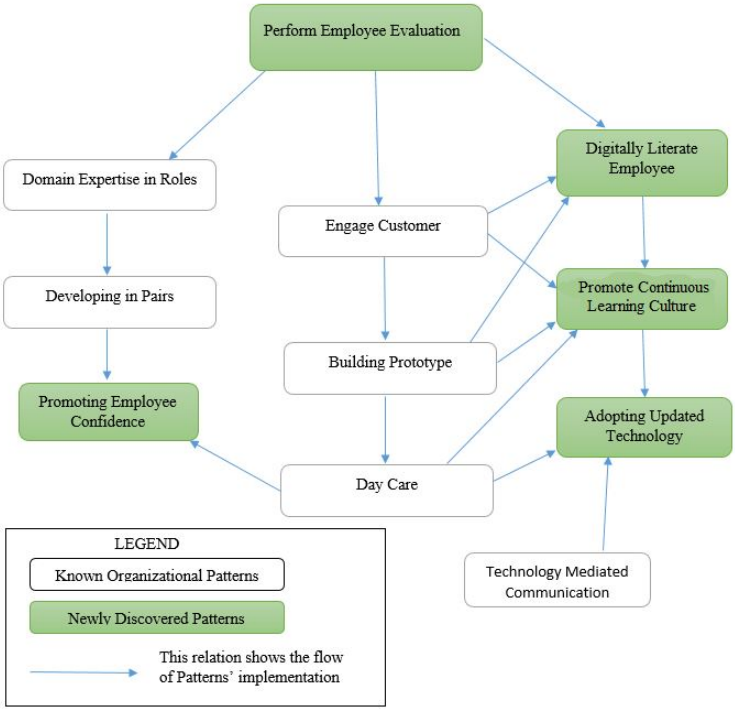

Figure 2: Organizational patterns of digital transformation.

6 PROMOTE CONTINUOUS LEARNING CULTURE

…The organization needs to shift to digital solutions, emphasizing a cultural change in the digital environment. Promoting a culture of continued learning is crucial for navigating this change, supporting transformation efforts, and equipping employees with the necessary digital skills are needed.

✣✣✣

The organization faces challenges as not all employees are tech-savvy. Providing training for everyone is crucial, but resource constraints and potential disruptions are significant obstacles

Not all employees are tech-savvy, creating a need for comprehensive training. But resource limitations and potential disruptions present considerable obstacles.

The organization requires a skilled and adaptable workforce for digital transformation. But the need for more relevant educational resources poses a significant challenge in promoting a continuous learning culture.

Therefore:

Adopt cutting-edge technologies that enable efficient communication to reach all employees with relevant knowledge. Cultivate a culture that encourages employees to collaborate and engage during digital transformation, fostering knowledge-sharing and a sense of ownership. Promote a digital culture that fosters collaboration across teams and departments to adapt to the evolving digital landscape effectively. Ensure easy access to learning resources through online platforms, enabling employees to develop and enhance their skills continuously.

This pattern has also been successfully implemented by the Ministry of Education and the Department of (MIS) Management Information System, to implement a better Certificate Management Information System.

7 PROMOTING EMPLOYEE CONFIDENCE

…During digital transformation, enhancing organizational confidence becomes a primary goal. Employees develop confidence through experience with digital technologies and require organizational support. Fostering employee confidence is crucial for successfully navigating the digital landscape.

✣✣✣

The organization seeks to build employee confidence to navigate the digital landscape and enhance overall well-being. However, current employees require more confidence and organizational support. Existing structures and practices hinder confidence development, and employees need motivation to embrace new digital technologies effectively.

A supportive work environment, where employees receive motivation and assistance, can boost their confidence. However, this requires an existing organizational culture that promotes and nurtures employee confidence.

Gradually empowering employees by entrusting them with increasing responsibility can foster their confidence. However, the initial lack of confidence can help skilled employees reach their full potential.

Therefore:

Organizations should implement a comprehensive approach to boost employee confidence. Gradually empower employees with increasing responsibilities while providing the needed support and guidance. Implement personalized learning and development programs to address areas where confidence is lacking, tailoring support to individual needs. Recognize employee achievements and create a supportive work environment encouraging risk-taking and learning.

8 ADOPTING UPDATED TECHNOLOGY

...Organizations must proactively adopt the latest technology to remain competitive in our rapidly evolving tech landscape; they need a culture of continuous knowledge and strong support systems to enable employees to seamlessly integrate new tools and stay at the forefront of the ever-changing tech world.

Organizations need assistance adopting updated technology as some employees with prior technology knowledge hesitate to adopt cutting-edge tools due to safety concerns. However, they must enhance their skills to remain competitive in the fast-changing tech landscape.

An organization must constantly innovate and improve to survive and thrive in a competitive market, but there is no professional and skilled staff. When organizations introduce new technology or process changes, employees may experience discomfort and resistance. However, overcoming this resistance and providing support during the transition is essential to successfully adopting updated technology and fostering organizational growth.

Therefore:

To effectively adopt the latest technology, implement a tailored training program. Assess employees' experience and skills, the complexity of the changes, and time requirements. Consider organizational needs and personnel requirements for a targeted and successful training initiative that equips employees with the skills to embrace the latest technology.

9 DISCUSSION

Introducing digitalization into a traditional organization and society is a complex process that requires addressing proper and ethical data storage, transmission, and handling of cultural issues and legacy systems. Also, it'd be important to emphasize the appropriate electronic data processing, training, and capacity building. One of the significant challenges lies in the uncertain effects of digitalization on organizations and society and their capacity to adapt to quick changes. In Afghanistan, digital transformation levels vary across social and economic domains, with only a few sectors, such as electronic national identification documents (eNIDs), the passport department, and the Ministry of Information Technology, fully embracing digital enhancements. However, the government and the people need help in these sectors due to the large quantities of data that need to be stored and processed. Conversely, other fields have implemented a relatively small amount of digital technology, with virtual meetings, communication among organizations, and training sessions becoming increasingly common in education, health, business, and other sectors. Digitalization can have various negative social consequences, impacting the human environment with issues such as digital inequality, inauthenticity, degradation of individuality, and formulaic thinking.

The levels of digitalization also vary across regions and organizations. However, it has enabled more accessible and effective environmental change monitoring, benefiting sectors like education, wholesale and retail trade, and chemical and manufacturing industries through sensors, microprocessors, and satellite data. On the other hand, European countries' transport and construction industries are slower in adopting IT, while the oil and gas industry, medicine, and education have achieved full digitalization [4].

Digital transformation, a significant trend in the 21st century, aims to enhance environmental sustainability through digital technology, effectively reducing natural resource waste. Although large international companies are developing strategies to underrate their negative effect on the environment, such approaches have yet to gain widespread popularity. Many companies need to be made aware of the importance of sustainable development for natural ecosystems, even in the digital age. The study focuses on the effectiveness of digitalization in promoting ethical norms, sharing information, and benefiting society and individual awareness. It delves into information processing, transmission, storage, and utilization ethics. The challenges of digital awareness, attitude development, and cultivating a digital transformation culture emerge as critical ethical issues during digital changes. Risks are associated with sociocultural identities and the growth of addictions related to specific activities. Recent outrageous limitations of people movement accentuated the challenges society and organizations face due to insufficient digitalization. Proactive measures are essential to address these challenges and promote ethical awareness and a digital culture among employees and society at large. The government and private sectors must accelerate digital transformation efforts within the country, considering the ongoing challenges posed by the digital precipice of 2019.

This study aims to provide an exploratory overview of how to understand digital transformation within traditional organizations and society. If traditional organizations are to implement digital transformation initiatives successfully, they have much to learn from technologically native organizations. According to the study, management must be aware of critical perspectives, such as technology-centric, employee-centric, organizational-centric, and strategic-centric views, to successfully carry out digital transformations. Developing a clear digital strategy and plan is crucial. A society must have a well-defined digital strategy that outlines its goals, objectives, and priorities for digital transformation. This will ensure that the efforts and resources invested in digitization are aligned and focused. Investing in technology infrastructure and resources is also paramount.

Implementing digital initiatives requires hardware, software, and technology infrastructure investments. This includes implementing reliable and secure networks, data centers, and cloud computing. Fostering a culture of innovation and technology adoption is the key. The success of digital transformation also depends on the willingness and ability of individuals and organizations within a society to embrace and adopt the latest technologies. This requires creating a culture that supports innovation and experimentation. In addition to the increasing use of technology, there are rising concerns about data privacy and security. Society and organizations must have strong data protection policies and regulations to protect personal and sensitive information. Ensuring workforce training and upskilling is critical. The workforce must have the necessary skills to use and implement cutting-edge technology effectively. This involves providing training and upskilling opportunities for employees and ensuring that the education system prepares future generations with relevant digital skills.

Building partnerships and collaborations with technology providers is another key aspect of successful digital transformation. Digital transformation often requires cooperation and partnerships with technology providers, startups, and innovation hubs. This can help ensure that society has access to the latest technology and expertise.

Evaluating the success and effectiveness of digital initiatives is an ongoing process. To ensure that digital initiatives deliver the desired outcomes regularly, monitoring and assessing their impact is essential. This includes tracking metrics such as productivity, efficiency, and customer satisfaction. Continually adapting to changing technology trends and developments is crucial. The pace of technological change is rapid, and it is critical for a society to constantly adapt and evolve its digital strategy in response to new trends and developments. This requires a willingness to experiment and continuously improve its digital initiatives. The process illustrated in the diagram in Figure 3 provides a detailed description of The global network of OBS- Company and its branches in different countries.

Figure 3: The global network of OBS- Company and its branches in different countries.

10 RELATED WORK

Digitalization represents a profound shift in today's global economy, necessitating organizational readiness for transformative change. This study delves into the intricacies of digitalization challenges, particularly focusing on the cultural and social dynamics influencing technology adoption. Understanding the cultural and social impact is crucial for effective digital transformation. Improving digital literacy and utilization is recommended to facilitate broader societal adaptation to technology.

Numerous earlier studies have focused on documenting and analyzing the role of digital transformation in organizations, employing various methodologies and techniques. These studies underscore that digital transformations have become vital to our daily lives and business processes. With digitalization, everyday communication, business activities, and numerous other daily tasks would be virtually impossible in the modern era. A profound understanding of the domain is essential to achieve successful digital transformation. Furthermore, clearly defining the roles within organizations, businesses, and daily activities can significantly enhance the effectiveness and efficiency of the digital transformation process, as demonstrated in a study conducted by Benavides et al. [2].

A research study by Momand et al.[13] Digital transformation is crucial for sustainable development, impacting society significantly. Challenges include limited awareness, mindset shifts, and ICT skills. Governments must establish policies and support research to address these issues. This study highlights six organizational patterns observed during transformation, contributing to developing a pattern language.

A study conducted by Vasilev et al. [20] aims to specify the level, problems, and prospects for the development of digital competencies in higher education organizations in Russia. The authors used the methods of sociological survey and statistical information processing. A study by Kutnjak et al. [11] explores a case involving digital transformation, explaining how companies can integrate business processes, create new business opportunities, innovate products, reduce costs, and create new business models. This will enable them to maintain a competitive position on the global market.

Digital transformation is a new approach recognized as a future way to improve business and address the challenges of the future. A research conducted by Hansen et al. [9] emphasizes the need for organizational leaders to adapt existing approaches to digital transformation quickly. However, it is challenging to adopt new approaches without a shared mindset between IS and business leaders.

Patterns were applied in software development and its organization, offering a well-proven and versatile solution within these domains [5]. Patterns had existed before and were developed by Alexander to solve the challenge of building towns and construction [1].

There are many challenges companies face when managing their digital transformations in terms of key actors; based on a survey of Slovenian companies, discover six organizational patterns, recommendations, and possible evolutionary paths within each pattern; the patterns provide information about companies' current positions, while the evolutionary paths help companies decide which

path to follow based on their current scenario. A research study by Štemberge et al. [10].

Digital technology plays a key role in the organization and function of socio-economic relations day by day. A research study by Mamakhatov et al. [12] highlights that developing countries in Africa must invest more in human capital, especially digital skills, and create the necessary infrastructure for citizens to access digital transformation. It also suggests that this investment will help build up the human capital development of these nations. The research results show a negative correlation between the electronic data interchange (EDI) ranking and the human capital index (HCI). That is, if there is an increase in HCI, then EDI rankings would decrease accordingly.

A study by Ebru Gökalp et al. [7] introduces the DX-CMM, a novel maturity model for digital transformation (DX). Through chemical and machine manufacturing case studies, it proves effective in assessing DX maturity and guiding improvement efforts. The DX-CMM offers organizations a holistic approach to reshaping processes, maximizing the benefits of DX.

A study conducted by Fadwa Zaoui et al. [25] offers a concise overview of digital transformation (DT) by analyzing existing literature and proposing strategic roadmaps. It emphasizes the need for a holistic approach beyond IT-centric views and outlines key pillars: evaluation, strategy definition, and implementation. Through categorizing DT phases and highlighting essential steps, the paper provides valuable guidance for companies embarking on their transformative journey.

A research study by Vesna Bosilj Vukšić et al. [22] found digital transformation as an emerging topic, with organizations recognizing its importance and implementing initiatives. Case studies from 2010 to 2018 show a growing interest, especially after 2016. It highlights the multifaceted nature of digital transformation, covering technology, strategy, and integration challenges.

A study conducted by Torsten Gollhardt et al. [8] proposes a tailored digital transformation maturity model for IT companies, addressing gaps in existing models. It identifies five dimensions and criteria, collaborating with an energy sector IT company to develop the framework.

A research study by N V Morze et al. [14] examines digital transformation's impact across sectors and stresses the importance of tech proficiency for societal progress. It reveals a lack of awareness among Ukrainian educators, prompting the need for increased understanding. Additionally, it proposes a unified model for enterprises and educational institutions based on extensive research.

A study conducted by Ilias O. Pappas et al. [15] finds responsible digital transformation to be crucial for sustainability and societal progress, emphasizing collaborative efforts and value creation beyond economics. Ongoing research, especially in Responsible AI (RAI), aims to guarantee ethical technology advancement. Effective social media strategies play a vital role in driving both business and societal change towards sustainability. Responsible digital transformation holds the potential to reshape our world for the better, making it paramount for sustainable societies.

Previous studies have extensively explored the critical role of digital transformation in organizations and society, emphasizing its significance in daily life and business operations. Successful digital transformation requires in-depth domain knowledge, clear role definition within organizations and activities, and the assessment of digital skill levels among employees and society. Furthermore, it involves finding solutions to enhance digital skills and fostering a culture of digitalization within society and all organizations. A comprehensive literature review has identified five organizational patterns derived from practical experiences across various organizations and societies. When integrated with relevant practices from the literature, these patterns form a cohesive pattern language. The challenge of digital transformation is pertinent to both organizations and society, and this paper strongly advocates the adoption of digital systems over manual or traditional approaches for the betterment of society. Our primary focus is on promoting digital transformation and fostering its continued development for the benefit of society.

11 CONCLUSIONS

This study aimed to analyze the advantages and drawbacks of digitalization, shedding light on associated challenges, limitations, and best practices. The results indicate that digitalization positively impacts organizations, business operations, and society. It enhances flexibility and continually improves products compared to traditional methods. However, challenges like the need for specialists, sufficient resources, and limited internet access in remote areas hinder digitalization in Afghanistan. These issues can be effectively addressed with government support at local and regional levels. The Ministry of Information and Communication Technology, Finance, and some government sectors have partially embraced digitalization to different extents. Recent global limitations on people's movement accelerated digitalization, including remote work, e-business, and e-learning, but Afghanistan needs further preparation for these changes. As technology evolves, ethical considerations must guide social interactions and digitalization.

Recommendations for implementing digitalization should be integrated into Afghan universities and organizations to facilitate a successful digitalization journey. The benefits of digital transformation for society are extensive and impactful in daily life. It improves access to information and services, making them more accessible to people regardless of location and facilitating education, healthcare, and financial services. Digital transformation fosters increased connectivity, breaking geographical barriers and creating a more interconnected global community. It also generates new job opportunities in the tech and digital sectors, driving economic growth. In healthcare, digital technologies revolutionize patient care through remote consultations, digital record-keeping, and improved monitoring. Moreover, digital transformation enhances environmental sustainability by reducing carbon footprint and paper usage and improving supply chain efficiency. Overall, digital transformation brings numerous benefits to society, improving lives in meaningful ways.

To address these challenges, we offer a pattern language consisting of five organizational patterns for digital transformation, relating them to well-known practices documented during our hands-on experience tackling genuine digital transformation challenges. A narrative detailing the experiences of active organizations serves as the foundation for this pattern language. Further investigation

is necessary to digitize select public and private entities, drawing on qualitative research to unveil additional patterns.

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