

# AN EXPLORATORY INVESTIGATION OF THE DIGITAL ECONOMY ON FINANCIAL INSTITUTIONS IN PAKISTAN

**Dr. Sudhair Abbas Bangash**, Sarhad University of Science and Information  
Technology, Peshawar, Pakistan. Email: [sudhair.flis@suit.edu.pk](mailto:sudhair.flis@suit.edu.pk)

**Dr. Iftikhar Ahmad**, Riphah International University Malakand Campus,  
Pakistan. Email: [iftikhar.ahmad@riphah.edu.pk](mailto:iftikhar.ahmad@riphah.edu.pk)

**Dr. Salim Khan**, Riphah International University Malakand Campus.  
Email: [s.khan@riphah.edu.pk](mailto:s.khan@riphah.edu.pk)

**Mr. Shahid Iqbal**, Riphah International University Malakand Campus.  
Email: [shahid.iqbal@riphah.edu.pk](mailto:shahid.iqbal@riphah.edu.pk)

**Mr. Khwaja Naveed**, Riphah International University Malakand Campus. Email:  
[khwaja.naveed@riphah.edu.pk](mailto:khwaja.naveed@riphah.edu.pk)

**Abstract.** *The delivery of financial services was revolutionized by digitization, which compelled financial institutions to adopt technology that enables them to provide the best appropriate service at a reasonable price. However, due to recent disruption in the country's financial system, financial institutions must incorporate modern technologies to help lower ineffectiveness and improve service quality. This study investigates the impact of digital economy on financial sector competence. According to literature studies, financial organizations in Pakistan are attempting to adopt and integrate digitization into their operations. Given that a generous portion of Pakistan's population is considered digitally illiterate, the number of people who signed up for and used digital financial products was staggering. Therefore, financial institutions must incorporate their business functions with pertinent technology to maintain and improve profitability. Furthermore, they must invest in digital infrastructure and human resource training to incorporate technology in providing services. Policymakers should also strengthen data security and cybercrime laws, policies, and regulations to allow market participants for free and confident operation.*

Received 15 September 2022  
Accepted 16 November 2022

**Keywords:** Exploratory inquiry, Digital Economy, Financial institutions, Pakistan.

## Introduction

The significance of the digital economy has been recognized by academicians, economists, corporate leaders, statisticians, authors, and business owners. The effect of the digital economy on restructuring the existing economic system, reshaping customers' behaviors, business models and interactions, and all other sectors can be noted. For instance, the fourth industrial revolution, assumes that

corporate operations and production will alter as a result of the usage of robotics, artificial intelligence, and big data in manufacturing and other company activities.

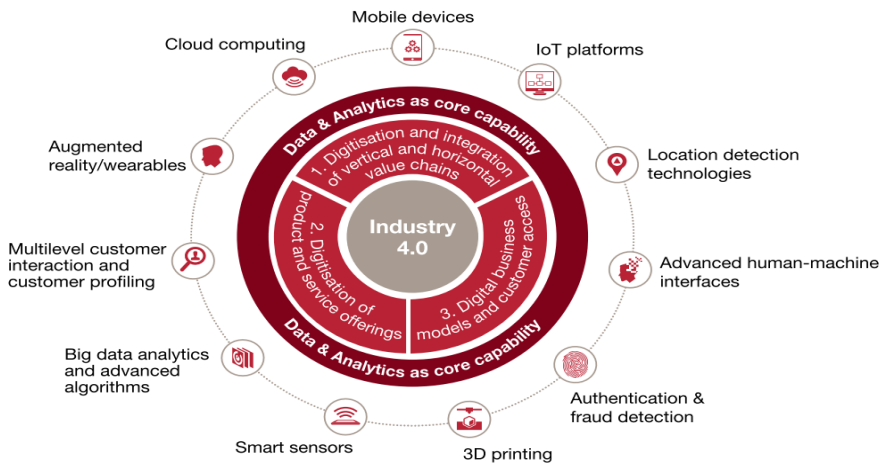


Figure 1 Industrial 4 Revolution (Geissbauer et al., 2016).

Digital technologies assist organizations to choose significant production processes, utilize newest data, minimize production expenses, develop goods quality and pledge the prompt production of goods that fulfill customer needs (Chirkunova et al., 2021).

Zhang et al. (2021) revealed that digitization is the primary driver of economic progress in emerging countries. It boosts equity, increases workforce productivity, decreases transaction expenses, and encourages country inclusion in the international market. The digital economy is becoming the primary force behind growth, competition, and innovation. Digital technology has a significant impact on the socioeconomic system. The global economy is on the verge of revolutionary change. Ongoing digitization is transforming the economy by lowering costs, storage, and data processing, minimizing the industrial chains. In addition, the rising digitization processes contribute to the warping of physical and geographical borders (Rudyk et al., 2022).

Internet and systems of communications are developing and changing quickly in digital economy, presenting novel challenges and opportunities to manage financial risk. New financial solutions for financial risk management will continue to expand, such as rising e-commerce, information sharing, and e-payment. Digital innovation is considered the heart of every organization, enhancing systems connection, internal operation, workforce performance, and business processes. It also minimizes cost and produces new and valuable data. These advancements have lowered transaction and operating expenses and led to a new business model and new entrants (Feyen et al., 2021). Information can be seen as a risk-reducing

or risk-increasing tool. Accurate information would lead to effective risk management and enhanced decision-making. As the digital economy has grown, it has become clear that individuals and organizations can quickly access more valuable and timely information regularly. Policy and decision-makers can evaluate internal information and outside market reports and receive rivals' information on their desktop.

Financial institutions in Pakistan struggle with information asymmetry, which negatively affects selection, moral hazard, and credit evaluation (Ahad & Imran, 2021). Loan default and third-party transactions are two essential issues that many financial institutions encounter. The challenge is the accessibility, validity, precision, and customer information management to guide credit-issuing choices.

It is vital to limit the issue of information overload by ensuring the appropriate use of the Internet, improving the users, and enhancing the voluntary interchange of the data may provide a better understanding of circumstances relating to the dynamic of a business or commercial connection. This enables increased detection, prevention, control, and risk management options. The organization believes that the best way is to accept that they will be exposed to risks. The optimum strategy is to become more mindful, take the initiative of the dangers, and respond more rapidly should such risks manifest.

The growth of an effective digital economy contributed to improving the position of firms, enhancing the standard of corporate governance principles, and increasing the communication and coherence of the essential structure of financial organizations. These advancements far outweigh the initial adjustments made to information and communication technologies (ICT), primarily responsible for expanding the digital economy. The changes due to the digital economy took place in every market sector: consumer preferences, competitive structure, marketing tactics, purchasing habits, internal management systems, production operation, managing supply chain, and due to promotion of global economy. Most business professionals feel that the uncertainties and dangers associated with the management of their organizations rise as a result of such changes. The key to surviving in the digital era is the ability of management to properly employ ICT to control these hazards (Ritchie & Brindley, 2005).

Although there is evidence that digital technologies are impacting the socioeconomic system, most important issues are still not sufficiently addressed (Chernyakov et al., 2019). There has been little emphasis on the impact of risk on the growth of digital potential, which may contribute to organizations' innovative development. The difficulty of business development in context of digital economy is not elaborated. The system of modern economic relations does not address the emergence of new challenges associated with digital economy.

This study examines how Pakistan's financial institutions can become more efficient by taking advantage of the digital economy. The study aims to enhance customer service, lessen waste, and keep a competitive edge. The study's explanation of 'digital economy' operationalized the application of technology in providing financial services and creating new goods and services. The following queries were the focus of this study:

1. How the digital economy accelerates financial service delivery.
2. How the digital economy helps to make financial services more affordable.
3. How digitization aids in financial deepening.

The study contributes to the body of knowledge regarding use of technology and digitization in the provision of financial matters. In addition, it demonstrates how developing nations like Pakistan handle changes in the economic landscape of the digital age.

The remaining paper is divided into four sections. Literature reviews are covered in section two, and discussion and research methodologies are covered in section three: Parts four and five covered analysis, conversation, conclusion, and recommendation.

## **Literature Review**

### **Digitization in Pakistan**

Digitalization in Pakistan is accelerating amazingly fast. The new broadband service replaced the previous dial-up connection, and 4G and recently 5G mobile internet was just introduced (Rasheed et al., 2019). With projected revenues of \$628 million in 2020 and \$6 billion in 2021, Pakistan is among the major e-commerce markets, ranking 37th ahead of Iran and behind Israel. (Statista, 2022). Pakistan's e-commerce industry progressed by 45% 2021, thereby impacting international growth by 29 percent. E-commerce revenue is expanding, new markets are developing, and established markets have room for development. Limelight.pk with a sales revenue of fifty million dollars in 2021 is the leading player in Pakistan's e-commerce sector, followed by Gulahmadshop.com with forty-eight million-dollar and Khadi.com with sales of 30 million dollars. These stores are ranked according to their income-generating potential. Bagallery.com is one of Pakistan's fastest-growing retailers, with a US \$0.1 million sales revenue in 2021, up more than 250 percent from the previous year. The digital market outlook from Statista predicts that market growth in Pakistan will persist for a while. Because of the crowded market, the compound annual growth graph for the next four years is expected to be 7%, compared to a year-over-year growth rate of 45%. Another sign of market saturation is Pakistan's 19% internet market penetration.

The ongoing digitization of service offerings may promote growth from macroeconomic dimensions. This point of view is substantiated by the recent developments and predictions for the future. For example, a McKinsey Global Institute (MGI) analysis suggests that between 2016 and 2025, an escalation in use of digital financial services (DFS) alone could increase Pakistan's GDP by 7% (or roughly 36 billion US dollars) and make a way for over four million job opportunities.

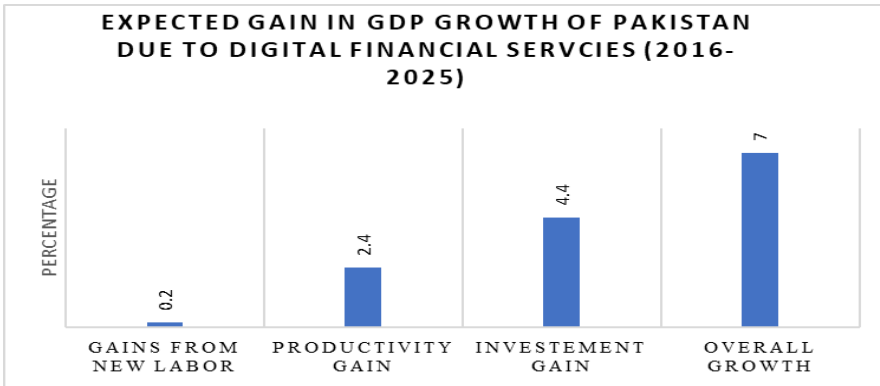


Figure 2 Expected Gain in GDP Growth (McKinsey Global Institute, 2016)

Pakistan has seen an exponential increase in financial technology (FinTech) and digitalization. Using emails, cell phones, and telephones to provide financial services contributes to economic development. FinTech is reflected in banking institutions, non-banking firms, insurance companies, and the capital market.

The chart of payment system transactions in Pakistan from 2<sup>nd</sup> quarter of 2020 to the 2<sup>nd</sup> quarter of 2021 (in a million).

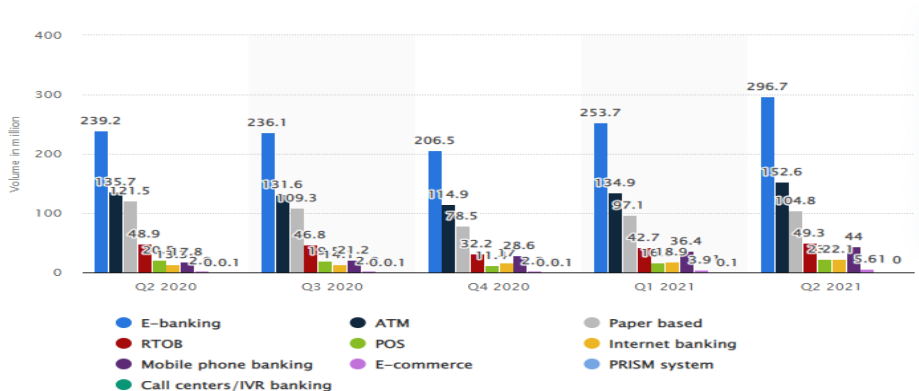


Figure 3 Payment System Transactions in Pakistan (2020 to the 2<sup>nd</sup> quarter of 2021 (in a million)).

Several online and digital platforms are being developed at the financial sector's business, industry, and regulatory levels to streamline transactions and promote financial inclusion. The country has roughly 52 self-described incubation and acceleration centers, and 7 to 15 startups graduate each year. Local startup activities are increasing, attributed to the maturing support system. As per the estimate, around 500 new businesses were launched in 2017. Co-working spaces, 11 fellowship programmes, a rise in angel investment, incubators, and accelerators, as well as establishment of regional affiliates of international programmes like Startup Cup, Startup Weekend, Startup Grind, and Lean Startup Machine all contributed to the improvement of the startup ecosystem. Domestic startup activity has increased due to opening regional chapters for The Indus Entrepreneurs (TiE) and the Organization of Pakistani Entrepreneurs (OPEN). Additionally, nationwide meetings for the Google Business Group and Google Developer Group are held regularly.

### Prominent Startup Incubators in Pakistan

 <b>Plan9</b> <small>Where ideas take flight</small> <b>LAHORE</b> <small>www.plan9.ptib.com.pk</small>	<b>PROMINENT STARTUPS</b> Groopic, HomeTown, Technolsys, XGear & BookMe
 <b>LUMS</b> CENTER FOR ENTREPRENEURSHIP <b>LAHORE</b> <small>www.lce.lums.edu.pk</small>	<b>THE FOUNDATION PROMINENT STARTUPS</b> Savaree, BizClout
 <b>LAHORE</b> <small>www.venexel.com</small>	<b>PROMINENT STARTUPS</b> KickStoro, TechJuice
 <b>ISLAMABAD</b> <small>www.invest2innovate.com</small>	<b>PROMINENT STARTUPS</b> Popinjay, 3restart
 <b>ISLAMABAD</b> <small>http://www.nust.edu.pk/INSTITUTIONS/Directories/TIC</small>	<b>PROMINENT STARTUP</b> TunaCode & Cricout
 <b>PESHAWAR</b> <small>www.basecamp.pk</small>	No prominent startups but in a short span, the space has become hub of everything related to IT in Peshawar.

### Others..



TECHJUICE

Figure 4 Sources: TECHJUICE.PK

Table 1 *Pakistan's Notable Accelerators and Incubators*

	<b>Nature</b>	<b>Major Supporter</b>	<b>Portfolio firm(s)**</b>
Plan X	Accelerator	Punjab IT Board (PITB)	Mangobaaz; BeautyHooked
Invest2Innovate	Accelerator	Dotzero; Pasha Fund for Social Innovation	Popinjay; DoctHers
10Xc	Accelerator	Planeta	Labcloud; Fix My Phone
The Nest I/O	Incubator	Google for Entrepreneurs, Samsung	Mandi Express; ConnectHear
NIC Lahore (formerly LCE)	Incubator	LUMS; Ignite; MOITT	InteraCta; AutoGenie.pk
Plan 9	Incubator	PITB	Patari; Bookme
Social Innovation Lab	Incubator	LUMS	FindMyAdventure; Tahafuz
Nspire	Incubator	Netsol	Shop desk; surge
DotZero Ventures	Incubator	Foundation for Information Technology	Deal today.pk; PerkUp
Founder Institute	Incubator		Approvers; Verifapp
Artech Hatchery	Incubator		EatOye; Shops

\* In some instances, the entities serve as both incubators and accelerators

\*\* Only one or two associated startups are mentioned. At times, a startup may be associated with multiple incubators/accelerators

### **Theoretical and empirical reviews**

The digital economic phenomenon has no generally accepted definition in the modern world. Digital economy is not just network technology and artificial intelligence. It illustrates the connection between creativity, novel economies, businesses, knowledge, and technology for the formation of social and wealth development. The book Don Tapscott wrote in 1995 highlighted the way the Internet might influence business in coming days. He was the first who mentions the concept of the digital economy. There is no analogue equivalent system in the digital economy, which only consists of the digital sector and incorporating ICTs in all zones of the economy (Bukht & Heeks, 2017). Creating and using digital technology in both the private and public sectors are included in the general definition of digital economy. The entire economy's digital dividends are captured by it.



This concept was pertinent to develop States and Sustainable Development Goals (Hanna, 2020). It sees the digital economy as an evolutionary process having focus on growing culture of digital technology across the economy. However, the explanation of the digital economy has been the most perplexing element of it. According to Barefoot et al. (2018) one fundamental issue with the digital economy is that of having single and proper definition of the notion.

According to Belousov and Timofeeva (2019), the digital economy is the activity of people that focuses on the fact that the influence of producer of products is not on the object of labor and tools but the management system of such equipment. Similarly, Schön (2017) elaborated the digital economy as the ability and execution of exchanging goods and services via e-commerce.

According to Brynjolfsson and Kahin (2002) the changing properties of information, computation, and communications are the primary drivers of economic development and social transformation. The digital economy is the application of technology to all aspects of life. It is related to digitalized technology in delivering socioeconomic activities in society. Although experts have struggled to define it, the digital economy and digitalization have significantly influenced culture. Various researchers have approached this issue from multiple angles. It applies to modern economic activities that use digital data in their operation in (IMF, 2018).

According to Jing and Sun (2019) the essence of the digital economy is informatization which has the characteristics of excessive permeability, remarkable speed, sustainability and externality. The digital economy is critical for promoting investment, consumption, and in creation of jobs (Zhao et al., 2020).

This digital economy, known as the information economy, has a dynamic nature and has significant applications for businesses and consumers. It includes artificial intelligence, sophisticated data processing, big data analysis, cloud computing, 3D printing, face recognition, and digital banking (Barefoot et al., 2018).

Elmasry et al. (2016) described the digital economy as value creation that helps boost customer involvement, firms' capabilities, and deals with all sections of commercial activities. Bukht and Heeks (2017) illustrated the digital economy as the number of industrial products developed exclusively or primarily from digital technologies. They explained that a digital economy is a comprehensive approach that covers the digital sector and major digital activities, including software and IT consulting, telecommunication, hardware manufacturing, information services, e-trade, digital services, platform economy, and sharing economy, without internalizing the notion that digitized activities are included in digital economy.



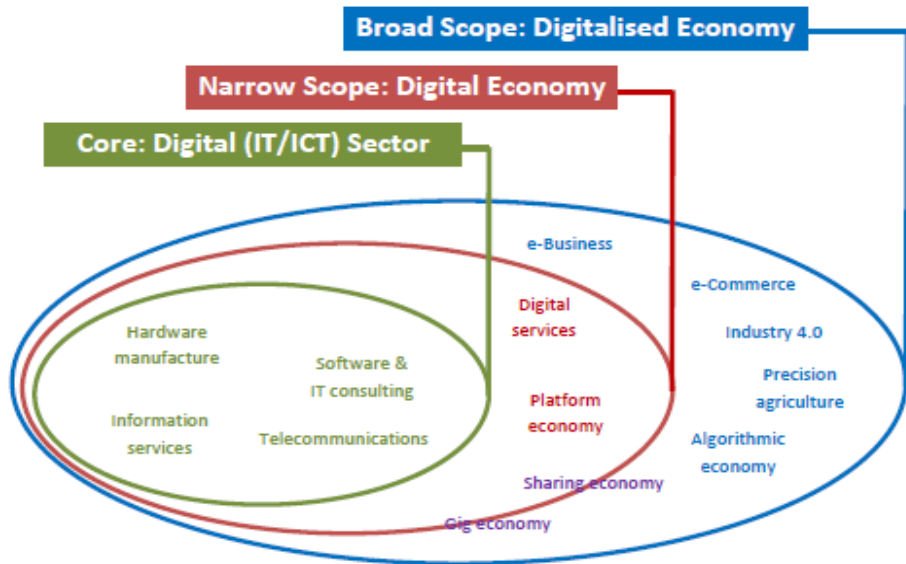


Figure 5 Types of Economies (Bukht & Heeks, 2017).

This paper defines digital economy as the use of technology and promotion of financial services, and development of new financial goods as well. The finance-growth nexus (Schumpeter, 2003) proves finance's significance as an engine of economic growth and development. Moreover, the theory of neoclassical growth presents a case for finance in forecasting economic growth by focusing on material, labor, and technology. According to researchers (Atje & Jovanovic, 1993) capital stock is divided into two, i.e., the stock market capital and non-stock market capital. This concept contends that the digital economy (technology) has a crucial role in economic growth. According to indigenous theory and the neoclassical model (Solow and Swan), technology is critical for economic progress.

The integration of digital economies with the social and economic fields is growing in both breadth and depth, having a significant impact on production and lifestyle. The influence of the digital economy on macro level not only reflected on the scale of production but also improves the quality and efficiency (Viollaz, 2019). Through network externalities, the digital economy can generate economies of scale which lower businesses' marginal costs (Chen et al., 2020). A number of studies (Afonasova et al., 2019; Myovella et al., 2020) also demonstrated the effects of technology, particularly digital economy, on economic expansion and development.

According to Wang and Chen (2019), the digital economy demonstrates dependency on electronic items, new information networks and flexible means of

production to break the conventional mass production model having its roots in techno-economic paradigm theory.

According to Chavula and Chekol (2011), digital economy is based on electronic items manufactured via electronic companies and delivered through electronic means. It is an economic activity and commercial and business transaction through information technologies. This approach recommends various business structures and techniques (Strømmen-Bakhtiar, 2019). Meanwhile, the financial market focuses on risk exposure, governance and regulatory or non-compliance requirement (Amuakwa-Mensah & Boakye-Adjei, 2015; Benson, 2019; Madugu et al., 2020; Osman, 2019). Certainly, the latest research revealed that these factors significantly impact financial institutions' performance (Awo & Akotey, 2019; Osman, 2019).

The nature of technology, systems, operations, commodities, and processes put in place to provide the financial services, are ancillary to the business's existence (Mwashuuya & Mbamba, 2020). The advent of digital economy shifted the way at which financial services are provided (Swamy, 2020). In digital economy, services related to finance are digitalized and supported by internet websites and software. The objective is to diminish operational expenditures and intensify the firm's performance. Process expenditures, employee productivity, facility costs, and, in certain situations, automobiles and transportation are all part of a financial institution's operating costs (Madugu et al., 2020).

According to Aloqab et al. (2018), risk management is viewed as managing the financial institution's activities. The managers' responsibilities are to recognize tools and develop strategies to reduce and, in certain cases, eradicate the risks. One of the most important of these hazards is operational risk. This risk arises due to insufficient or failing internal procedures, people, systems, and events such as legal risk. When these risks are not appropriately handled, they can lead to operational inefficiency, financial difficulty, and business collapse. As a result of using the conventional approach, the business would have to recruit additional individuals, raising its personnel costs. Staff expenses are a significant portion of the expenses incurred by financial organizations (Jenkins & Mathurin, 2012).

It is generally said that platforms related to finance like MOMO aids in improving approach to financial services and mobilizing savings. Financial service firms are concentrated in metropolitan areas; digitization, platforms, and mobile phones are effective means to mobilize savings. Because of its fastest service of delivery, the Internet for financial services providers has gained significant attention. Mobile and internet banking are much efficient in-service delivery than traditional banking, which reduces human contact. Online banking provides the facilities of fund transfer, digital banks statements, balance inquiry, and payment confirmation (Jakšič & Marinč, 2019).

The emergence of digitalization boosted financial innovation and creation of new products and processes. At present, at least one innovative product is available from thirty-three commercial banks and eleven micro-finance banking organizations working in Pakistan. These products offered by these institutions are somehow web or smart phone based. Likewise, other financial firms including development financial institutions, leasing companies, investment banks, modaraba companies, and Mortgage Houses, are converting to internet-based products or processes. These products are debit cards, credit cards, mobile money, electronic wallets, ATMs, mobile banking, email banking, and e-payment. Some specific accounts, such as Roshan Digital Account, are offered by various banking institutions for Pakistani nationals outside the country. These financial improvements boosted banking efficiency, operations, and performance.

One cause for the country's slow pace of technology adoption is a lack of digital literacy among a significant percentage of the population. For example, financial institutions were required to encourage their consumers to do more online transactions to lower the number of operations in banking area. However, more financial transactions still take place in banks using and required manual processes.

The digital economy showcased financial institutions to national and global service providers. For example, internet banking provides facilities for the worldwide consumers to manage and retain their saving and checkable accounts across boundaries. Although data are not directly available, public discussions and media reports indicate that an increasing number of people are interested in trading digital financial products such as bitcoin and cryptocurrencies.

Furthermore, there is the option of using a worldwide platform such as Visa, PayPal, MasterCard, American Express, and express Pay. Foreign financial institutions' offering of such services in country leaving the sector to considerably harsher competition. Although physical access by foreign institutions is complex, virtual financial services delivered via digitalized technology make entry simple. As a result, the degree of bank rivalry has increased which help to enhance customers services by provide more better services alternative. However, it has a detrimental influence on local banks that lack the financial resources to purchase the technologies required to provide digital financial services. The next critical issue is regulating virtual financial firms, particularly in unfair competition and unethical banking activities. The Pakistani digital economy has not been without consequences. According to Hutton (2017) online information has significant value to business transactions. Poor digital economy regulation provides spaces for cybercrimes which affect the digital economy. Digital technologies promote businesses but also face the pyramid banking schemes like Ponzi and deceptive financial games. Cyber criminals are early users of digital money technologies,

particularly when the characteristics of the financial product can potentially assist them in evading the law (Fanusie & Robinson, 2018).

As stated previously, financial institutions show response to the process and product digitalization at a cool pace. Among the causes are cyberattacks, promotion of anti-money laundering, encouraging illegal online gaming, and financial frauds, particularly in countries with weak cyber laws (Fanusie & Robinson, 2018; Şcheau & Pop Zaharie, 2017). These factors nurture financial institutions that lack a solid ICT infrastructure hesitant to efficient engagement in digital financial services' supply. Building a more robust ICT infrastructure for offering digitized financial services necessitates a significant investment. Multinational IT corporations frequently give servers and IT solutions due to insufficient investments by various financial institutions in the country. Financial institutions lack complete control over consumer data, leading to risks. The prevalence of online scam cases erodes public trust in digitalized financial services.

### **Research Methods**

The review's goal was to examine the digital economy and deduce conclusions about Pakistan's financial sector. The study employed an exploratory inquiry. Secondary data sources included articles, journals, publications, periodical, unpublished thesis/ case studies, and projects. Secondary data were gathered from online resources, websites, and databases. The collected data were analyzed using qualitative content analysis (QCA) (Hsieh & Shannon, 2005; Selvi, 2019). In international business and management research, the use of content analysis for quantitative and qualitative analysis has increased (Gaur & Kumar, 2018). In literature reviews, it is used to evaluate existing information and comprehend intellectual structure. Many researchers have employed content analysis, according to (Duriau et al., 2007; Short & Palmer, 2007) to detect and summarize trends in literature and quantify latent dimensions in quantitative research when valid, trustworthy data are hard to come by from traditional sources. The qualitative content analysis was considered well in investigating the theme, and subject matter of digital economy as a subjectivist analysis of data. The technique helped examine the perspectives and theories of this phenomenon. Lastly, themes developed from the contents of numerous elements synthesized. This helps develop suitable conclusions about the topic issue.

### **Analysis and discussion**

Themes from the previous research syntheses include: customer preferences for digital financial service delivery; digital platforms as a source of saving mobilization; increased financial deepening; the digital economy as a source of financial innovation; digitization as a catalyst for financial sector competition; and as a risk factor for financial institutions and customers.

### Customer preference for digital financial service delivery

Evidence shows that country’s utilization of digital technology is expanding at a high rate. The employment of digital technology is the only feasible choice for a society with a considerable population residing in places with poor transportation networks and primitive infrastructure to develop financial access and promote inclusion. This is one of the business strategies to attract access to undeveloped areas, enhance the financial institution’s consumer share, and make the business feasible. This, however, has repercussions for infrastructure development investment.

### Financial deepening with digital platforms

The earlier works’ synergies showed that digital platforms serve as savings mobilization and expanding financial depth. Mobile money transfers were the most widely used digital financial services provider technology. The broadband services in Pakistan reached a remarkable milestone of one hundred million subscriber in March 2021. Telecom and ICT services covering over 89% of the population. Teledensity has touched 87% of which cellular mobile phone penetration comprises over 86 %. Similarly, the number of cellular subscribers has risen to 188 million, taking the total telecom subscriber base to 191 million.

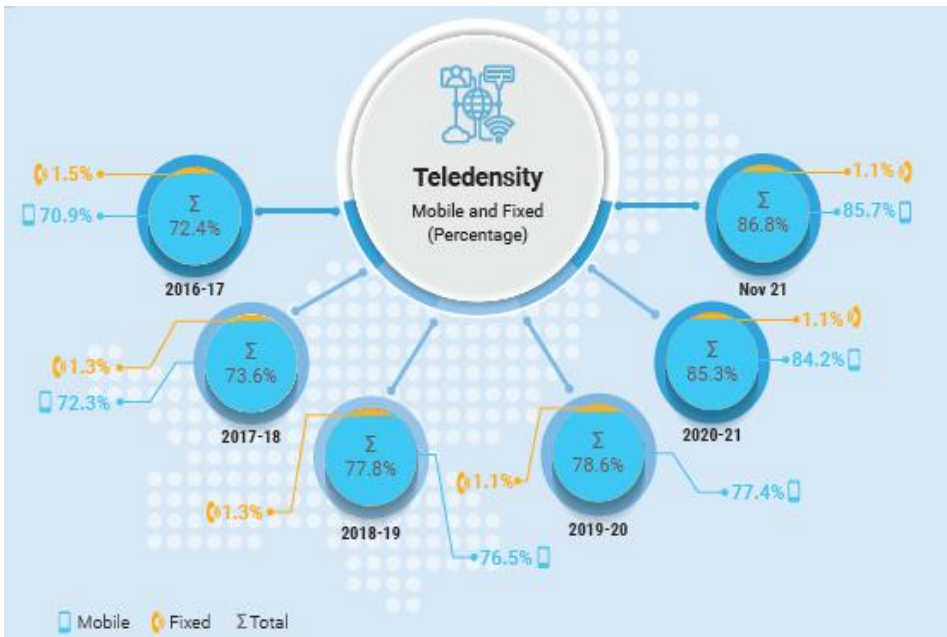


Figure 6 Source: PTA annual Report 2021.

## Financial innovations

One of the challenges that arose was the digital economy as a mean of financial innovation. This suggests that financial organizations emphasize online, Internet, and mobile banking over traditional location and branch financial services. Such financial services delivery practices remove the human element, slowing down service speed. This might also cut employee costs and other operational expenditures (such as stationery costs), raising financial service prices. Digital facilities are now available to seven hundred educational institutions, 330 hospitals and healthcare facilities, and 170 financial institutions and banks for online banking and ATM services.

## Financial sector competition

One major issue emerged due to digitalization, which promoted banking sector rivalry. The problems highlighted indicated that digitalization lowers the barrier to entry into the banking sector. This suggests that financial institutions presently compete with financial institutions and goods on domestic and Internet marketplaces. Customers benefit from this by having access to a wide range of high-quality financial products at low costs.

## Exposure to risks

According to the assessment, digitizing the financial industry exposes financial organizations and clients to dangers. Online financial fraud was one of the most severe threats. The digitization of financial services also benefits internet criminals such as money-laundering, illegal online gamblers, scam artist and financial fraudsters. This becomes upshots for public trust in digitalization and online financial transactions. As a result, to capitalize the opportunities provided by the digital economy, financial institutions must establish and maintain a solid IT infrastructure as well as a dependable and reputable database. In Pakistan, an increase in online attacks poses security and financial risks to users across the board, including individuals, businesses, sectors, and states.

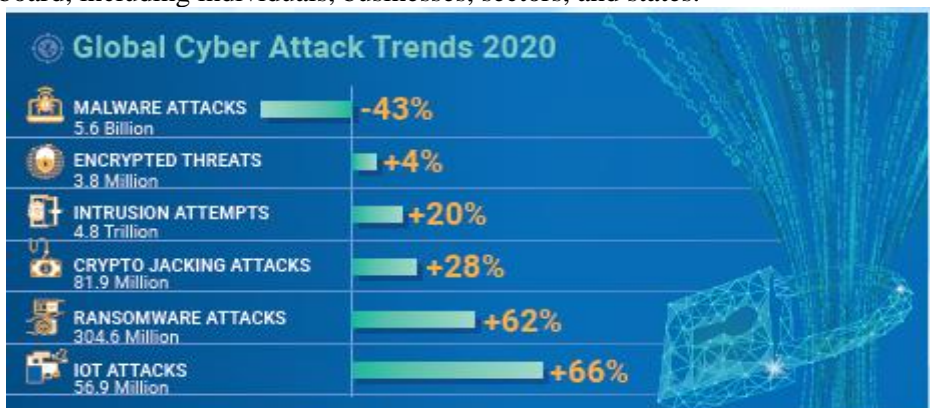


Figure 7 Global cyber-attacks trends, cyber threat report 2021, Sonic Wall.



## **Conclusions and recommendations**

Based on evaluations of the country's financial services ecosystem, it is possible to infer those financial institutions attempt to integrate digitization into their service delivery. Mobile money platforms are widely accepted as the most popular method of transferring funds and making payments. Likewise, the digital economy accelerates the mobilization of funds and expands accessing financial services. Digitization and the usage of the platform reduce banks operational expenses. Internalizing digital economy promotes a cashless society, freeing up funds for productive operations in businesses. The State Bank's efforts to clean up the financial industry has exposed organizations to multiple operational inefficiencies in expenses, management, and strategy. Increase in the minimum capital requirement necessary to operate in a specific sub-sector meant that the companies involved to incur more expenditures. This indicates that financial institutions should use technology to offer services far more effectively. Based on the findings, it was determined that the digital economy tends to minimize operational expenses through lowering workforce and transaction costs. This also helps to improve access to the financial services and customer's preference for the service alternatives. It aids in reducing the risk, expense, and time involved with clearing of cheque. It aids in in-time delivery of services to clients.

The digital economy serves as the foundation for gathering and storing copious amounts of data about financial institution clients. Such information is ancillary to the institution's decision-making. However, there are hazards linked with financial services digitization. Among these hazards is the security of clients' data, which might encourage anti-money laundering in nations with lax financial rules and laws of data protection.

## **Practical recommendations**

Human resource development and capacity improvement of financial institution workers are required. This begins with creating a business strategy and incorporating digitization into the supply of financial services. Moreover, it necessitates investment in the necessary infrastructure, both physical and software. Furthermore, for financial institutions to fully capitalize on the potential presented by the digital economy, the major players, particularly the institutions' consumers, must be educated. A customer's education on utilizing a financial institution's application helps to increase its use. The Central Bank must use digital technology in its surveillance and supervision of the country's financial institutions. Purchasing of apps that allow the Bank to monitor and even permit certain types of transactions conducted by financial institutions should be implemented. This ought to be done in conjunction along on-site visits to financial institutions.



## Policy recommendations

As far as recommendations are concerned, the first stage should be to establish the legal framework, guiding principles, standards, and code of behavior. There is a need to tighten data protection and cybercrime laws, policies, and regulations. System for storing and disseminating creditor information. A database is required to assist financial firms in dealing with information asymmetry and challenges of moral asset selection. Future research may concentrate on using quantitative approaches to examine the influence of digital economy aspects on the effectiveness of financial institutions. The constituents of digital economy should be defined and operationalized in a future study. There is also a need to reconsider the central bank's role in supervision.

## References

- Afonasova, M. A., Panfilova, E. E., Galichkina, M. A., & Ślusarczyk, B. (2019). Digitalization in economy and innovation: The effect on social and economic processes. *Polish Journal of Management Studies*, 19(2), 22-32.
- Ahad, M., & Imran, Z. A. (2021). Does governance quality matter for the development of financial institutions in Pakistan? *Journal of Economic and Administrative Sciences*. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JEAS-03-2021-0061>.
- Aloqab, A., Alobaidi, F., & Raweh, B. (2018). Operational risk management in financial institutions: An overview. *Business and Economic Research*, 8(2), 11-32.
- Amuakwa-Mensah, F., & Boakye-Adjei, A. (2015). Determinants of non-performing loans in Ghana banking industry. *International Journal of Computational Economics and Econometrics*, 5(1), 35-54.
- Atje, R., & Jovanovic, B. (1993). Stock markets and development. *European Economic Review*, 37(2-3), 632-640.
- Awo, J. P., & Akotey, J. O. (2019). The financial performance of rural banks in Ghana: the generalized method of moments approach. *World Journal of Entrepreneurship, Management and Sustainable Development*, 15(1), 2-18.
- Barefoot, K., Curtis, D., Jolliff, W., Nicholson, J. R., & Omohundro, R. (2018). *Defining and Measuring the Digital Economy*. US Department of Commerce Bureau of Economic Analysis, Washington, DC, 15.
- Belousov, Y. V., & Timofeeva, O. (2019). Methodology for defining the digital economy. *The World of New Economy*, 13(4), 79-89.
- Benson, S. P. (2019). *The Clerking Sisterhood: Rationalization and the Work Culture of Saleswomen in American Department Stores, 1890–1960*. Routledge.
- Brynjolfsson, E., & Kahin, B. (2002). *Understanding the Digital Economy: Data, Tools, and Research*. MIT press.

- Bukht, R., & Heeks, R. (2017). Defining, conceptualising and measuring the digital economy. *Development Informatics Working Paper* (68).
- Chavula, H. K., & Chekol, A. (2011). ICT policy development process in Africa. *Handbook of Research on Information Communication Technology Policy: Trends, Issues and Advancements*, 255-282.
- Chen, B., Liu, T., Guo, L., & Xie, Z. (2020). The disembodied digital economy: Social protection for new economy employment in China. *Social Policy & Administration*, 54(7), 1246-1260.
- Chernyakov, M., Chernyakova, M., & Akberov, K. C. (2019). Dynamic model of social risks in the digital economy. *Advances in Economics, Business and Management Research*, 81, 373-378.
- Chirkunova, E., Anisimova, V. Y., & Tukavkin, N. (2021). Innovative digital economy of regions: Convergence of knowledge and information. In *Current Achievements, Challenges and Digital Chances of Knowledge Based Economy* (pp. 123-130). Springer.
- Duriau, V. J., Reger, R. K., & Pfarrer, M. D. (2007). A Content Analysis of the Content Analysis Literature in Organization Studies: Research Themes, Data Sources, and Methodological Refinements. *Organizational Research Methods*, 10(1), 5-34.
- Fanusie, Y., & Robinson, T. (2018). Bitcoin laundering: an analysis of illicit flows into digital currency services. *Center on Sanctions and Illicit Finance Memorandum*, January.
- Feyen, E., Frost, J., Gambacorta, L., Natarajan, H., & Saal, M. (2021). Fintech and the digital transformation of financial services: implications for market structure and public policy. *BIS Papers*.
- Gaur, A., & Kumar, M. (2018). A systematic approach to conducting review studies: An assessment of content analysis in 25years of IB research. *Journal of World Business*, 53(2), 280-289.
- Geissbauer, R., Vedso, J., & Schrauf, S. (2016). Industry 4.0: Building the Digital Enterprise.
- Hanna, N. K. (2020). Assessing the digital economy: aims, frameworks, pilots, results, and lessons. *Journal of Innovation and Entrepreneurship*, 9(1), 1-16.
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Hutton, S. K. (2017). *Organized Crime: An Ethnographic Study of the Monitoring and Disrupting of those Designated as High-Level 'Organized Criminals' within the Metropolitan Police*. Open University (United Kingdom).
- IMF. (2018). *Measuring the Digital Economy*.
- Jakšič, M., & Marinč, M. (2019). Relationship banking and information technology: The role of artificial intelligence and FinTech. *Risk Management*, 21(1), 1-18.

- Jenkins, P., & Mathurin, P. (2012). Bank staff costs take bigger share of pot. Retrieved May, 13, 2019.
- Jing, W., & Sun, B. (2019). Digital economy promotes high-quality economic development: A theoretical analysis framework. *Economist*, 2, 66-73.
- Madugu, A. H., Ibrahim, M., & Amoah, J. O. (2020). Differential effects of credit risk and capital adequacy ratio on profitability of the domestic banking sector in Ghana. *Transnational Corporations Review*, 12(1), 37-52.
- Mwashuiya, H. T., & Mbamba, U. O. (2020). Relationship of information and communication technology adoption on microfinance institutions operational performance and access to financial services in Tanzania. *International Journal of Information, Business and Management*, 12(1), 214-237.
- Myovella, G., Karacuka, M., & Haucap, J. (2020). Digitalization and economic growth: A comparative analysis of Sub-Saharan Africa and OECD economies. *Telecommunications Policy*, 44(2), 101856.
- Osman, A. M. S. (2019). A novel big data analytics framework for smart cities. *Future Generation Computer Systems*, 91, 620-633.
- Rasheed, R., Siddiqui, S. H., Mahmood, I., & Khan, S. N. (2019). Financial inclusion for SMEs: Role of digital micro-financial services. *Review of Economics and Development Studies*, 5(3), 571-580.
- Ritchie, B., & Brindley, C. (2005). Risk management in the digital economy. In *Encyclopedia of Information Science and Technology, First Edition* (pp. 2431-2437). IGI Global.
- Rudyk, N. V., Niyazbekova, S. U., Yessymkhanova, Z. K., & Toigambayev, S. K. (2022). Development and Regulation of the Digital Economy in the Context of Competitiveness. In *Cooperation and Sustainable Development* (pp. 167-174). Springer.
- Scheau, M. C., & POP ZAHARIE, S. (2017). Methods of laundering money resulted from cyber-crime. *Economic Computation & Economic Cybernetics Studies & Research*, 51(3).
- Schön, W. (2017). Ten questions about why and how to tax the digitalized economy. Working Paper of the Max Planck Institute for Tax Law and Public Finance No. 2017-11, Available at <https://ssrn.com/abstract=3091496> or <http://dx.doi.org/10.2139/ssrn.3091496>
- Schumpeter, J. (2003). Theorie der wirtschaftlichen Entwicklung. In *Joseph Alois Schumpeter* (pp. 5-59). Springer.
- Selvi, A. F. (2019). Qualitative content analysis. In *The Routledge Handbook of Research Methods in Applied Linguistics* (pp. 440-452). Routledge.
- Short, J. C., & Palmer, T. B. (2007). The application of diction to content analysis research in strategic management. *Organizational Research Methods*, 11(4), 727-752.
- Strømmen-Bakhtiar, A. (2019). Digital economy, business models, and cloud computing. In *Global Virtual Enterprises in Cloud Computing Environments* (pp. 19-44). IGI Global.

- Swamy, L. N. (2020). The Digital Economy: New Business Models and Key Features. *International Journal of Research in Engineering, Science and Management*, 3(7), 118-122.
- Viollaz, M. (2019). Information and communication technology adoption in micro and small firms: Can internet access improve labour productivity? *Development Policy Review*, 37(5), 692-715.
- Wang, S., & Chen, J. (2019). The techno-economic paradigm of digital economy [J]. *Shanghai Journal of Economics*, 12, 80-94.
- Zhao, T., Zhang, Z., & Liang, S. (2020). Digital economy, entrepreneurship, and high-quality economic development: Empirical evidence from urban China. *Management World*, 36(10), 65-76.

