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IT Operations of Banks

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IT Operations of Banks

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Foreword

The banking sector of Bangladesh is undergoing a significant transformation driven by rapid advancements in information technology and the growing demand for efficient, secure, and customer-centric financial services. In this evolving landscape, IT operations have emerged as a critical backbone of modern banking, influencing everything from core banking systems and digital delivery channels to cybersecurity, data governance, and regulatory compliance.

In this context the review workshop paper titled “IT Operations of Bank” has been prepared. The paper provides a timely and comprehensive review of the changing landscape of technology integration and adoption within the banking sector of Bangladesh. It thoughtfully examines how banks are responding to emerging technologies, regulatory expectations, and operational challenges while striving to enhance service quality, operational resilience, and financial inclusion.

The insights presented in this paper are particularly relevant for policymakers, banking professionals, IT executives, auditors, and academicians. By highlighting current practices, key challenges, and future directions, the paper contributes to a deeper understanding of how effective IT operations can support sustainable growth, risk management, and innovation in the banking industry.

I commend the efforts of the authors, reviewers, and organizers of the review workshop for their dedication and scholarly approach in addressing this important subject. I am confident that this paper will serve as a valuable reference for stakeholders and will stimulate informed discussion and strategic thinking on strengthening IT operations in banks across Bangladesh.

I hope that the findings and recommendations presented herein will contribute meaningfully to policy formulation, capacity building, and the continued digital transformation of our banking sector.

Dr. Md. Ezazul Islam
Director General, BIBM

Acknowledgment

The successful completion of this review study titled “IT Operations of Bank” has been made possible through the collective contributions, cooperation, and encouragement of many individuals and institutions. We express our sincere gratitude to Dr. Md. Ezazul Islam, Director General of BIBM, for his continuous guidance and strong support throughout the study.

We are especially thankful to the wider banking community of Bangladesh for their enthusiastic participation and collaboration. The senior officials including Managing Directors/CEOs and Heads of Information Technology Departments have generously shared data, insights, and experiences, significantly enriching the analysis and findings of this paper.

We would also like to acknowledge the support received from our fellow colleagues at BIBM, especially the teams from the Training, Administration, Accounts, and Publication Wings, whose cooperation ensured smooth execution of various aspects of the study.

Special appreciation is extended to Mr. Motahar Hossain, MBM student at BIBM, for his diligent assistance in data processing and documentation as a research assistant.

Lastly, we are grateful to all those who, directly or indirectly, contributed to this effort. The open dialogue and continuous engagement with stakeholders have provided us with diverse perspectives and helped make this paper a comprehensive reflection of the evolving adoption of Information Technology in the banking sector of Bangladesh.

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Executive Summary

In our fast-moving modern era, Information and Communication Technology (ICT) serves as the primary foundation for the banking sector, which is essential for maintaining a stable and growing economy. Beyond simply providing a modern framework for global finance, ICT has allowed forward-thinking banks to gain a pivotal lead over their competitors. The digital banking movement has transformed financial services; backed by heavy investment in Information Technology. As a result, the ongoing IT revolution has created a high-speed global marketplace where financial activities grow at an incredible rate. Technological breakthroughs and interconnected networks have slashed the expenses of moving money across borders.

In Bangladesh, ICT has become a central pillar of the banking industry. Because banking is a primary driver of the nation's economic health, the adoption of digital tools has vastly improved how banks operate. These technologies have refined internal workflows, empowered leaders to make decisions based on precise data, and encouraged better teamwork across different departments. Together, these digital advancements have strengthened the competitive edge of banks operating within Bangladesh's rapidly developing economy.

The findings of this report highlight the evolving maturity of IT operations in the banking sector of Bangladesh, alongside critical gaps that must be addressed to ensure resilience, compliance, and sustainable digital transformation.

IT budgeting practices show progress but remain misaligned with emerging risk priorities. While banks continue to invest heavily in core ICT components such as software, hardware, and networks, allocations for cybersecurity, IT audit, and workforce training remain disproportionately low. Establishing a minimum benchmark for IT expenditure and adopting agile budget reallocation models are essential to respond to dynamic threats such as cyber risk and fraud. Governance reforms are also necessary to stabilize finances and enable consistent reinvestment in critical IT areas.

In terms of IT workforce structure, key risk-sensitive functions particularly cybersecurity, IT audit, MIS, and database administration are under-resourced. The absence of minimum staffing benchmarks and structured future-skills planning poses compliance and operational risks. A forward-looking workforce roadmap

emphasizing cross-skilling in AI, cloud computing, and fintech is crucial to build long-term institutional capacity.

The expansion of Cash Recycling Machines (CRMs) reflects growing acceptance of alternative delivery channels, with installations increasing significantly since 2018. However, deployment remains heavily concentrated in urban areas, limiting financial access for rural and semi-urban populations. Strategic expansion of CRMs in underserved regions is required to enhance inclusion and optimize channel benefits.

Regarding Core Banking Software (CBS), the rapid increase in dual CBS adoption demonstrates growing demand for operational flexibility to support both conventional and Islamic banking. While reliance on local and foreign vendors remains dominant, banks are encouraged to explore in-house development and joint ventures to reduce dependency, manage costs, and better align systems with local regulatory needs.

The adoption of innovative technologies such as AI, RPA, machine learning, NFC, and microservices has accelerated operational efficiency and customer experience. However, declining blockchain usage and limited IoT adoption suggest the need for reassessment and targeted investment. A balanced technology portfolio combining mature and emerging solutions is essential for future readiness.

The report identifies serious vulnerabilities in Disaster Recovery Site (DRS) management. A majority of banks operate non-hot DRSs, significantly increasing operational risk in disaster scenarios. Immediate action is required to establish hot DRSs across separate seismic zones, supported by scientific infrastructure planning, virtualization, and international data center certifications (Tier III or IV). Skilled and certified data center professionals are also critical to ensuring uninterrupted operations.

In pursuit of IT cost optimization, banks have increasingly adopted virtualization, cloud solutions, and digital collaboration tools. While cost minimization strategies are widely in place, further integration of cloud and virtualization technologies across all operational layers is recommended to sustain efficiency gains.

Although all banks claim to have an IT strategy, only a few possess an effective technology roadmap aligned with business objectives. Developing and executing a

clear roadmap supported by skilled personnel and active management involvement is essential for successful digital transformation and competitive positioning.

On cybersecurity and compliance, the report underscores the need for mandatory baseline security controls across all banks, wider adoption of advanced security tools, and universal compliance with ISO 27001 and PCI DSS standards. Sector-wide preparedness assessments are also necessary to support future data protection regulations.

Weaknesses in incident response, patch management, and data security further expose systemic risks. Standardized regulatory guidelines, strengthened CIRT capabilities, mandatory MFA for privileged access, and broader use of BI and data warehousing are critical to improving operational resilience.

The shortage of professionally certified IT personnel remains a structural concern. Setting minimum certification thresholds and linking career progression to professional credentials will help strengthen technical competence across the sector.

Finally, the transition toward a cashless society requires coordinated action. Banks strongly emphasize the need for public awareness, financial literacy, inclusive access to digital services, robust infrastructure especially in rural areas and strong cybersecurity and consumer protection frameworks. Collaborative efforts among government, regulators, financial institutions, and technology providers are vital to building trust and accelerating adoption.

Overall, the findings indicate that while Bangladesh's banking sector has made notable progress in digitalization, targeted policy interventions, governance reforms, and strategic investments are urgently required to close existing gaps and ensure secure, inclusive, and future-ready IT operations.

List of Abbreviations

2FA	Two Factor Authentication
ACHS	Automated Clearing House System
ADCs	Alternative Delivery Channels
AI	Artificial Intelligence
AMC	Annual Maintenance Charge
API	Application Programming Interface
ATM	Automated Teller Machine
BACH	Bangladesh Automated Clearing House
BACPS	Bangladesh Automated Cheque Processing System
BB	Bangladesh Bank
BCA	Bank Company Act
BCP	Business Continuity Plan
BEFTIN	Bangladesh Electronic Funds Transfer Network
BFIU	Bangladesh Financial Intelligence Unit
BI	Business Intelligence
BIBM	Bangladesh Institute of Bank Management
CBS	Core Banking Software
CBS	Core Banking Solution
CDCDPs	Certified Data Centre Design Professionals
CDMs	Cash Deposit Machines
CDPR	Central Data Protection Regulation
CEH	Certified Ethical Hacker
CIB	Credit Information Bureau
CIRT	Computer Incident Response Team
CRMs	Cash Recycling Machines
DC	Data Center
DDoS	Distributed Denial of Service
DMS	Document Management Systems
EFT	Electronic Fund Transfer
e-KYC	Electronic Know Your Customer
FCBs	Foreign Commercial Banks
FDC	Far Data Center
FinTech	Financial Technology

IB	Internet Banking
IBFT	Internet Banking Fund Transfer
ICT	Information and Communication Technology
IDTP	Interoperable Digital Transaction Platform
IS	Information System
ISMS	Information Security Management System
ISRM	Information Security and IT Risk Management
IT	Information Technology
MFA	Multifactor Authentication
MFS	Mobile Financial Services
MIS	Management Information Systems
ML	Machine Learning
NDC	Near Data Center
NFC	Near Field Communication
NGFW	Next Generation Firewall
NPSB	National Payment Switch Bangladesh
PCBs	Private Commercial Banks
PCIDSS	Payment Card Industry Data Security Standard
POST	Point of Sale Terminal
PSPs	Payment Service Providers
QMS	Quality Management System
RBA	Risk-Based Authentication
RHCE	Red Hat Certified Engineer
RPA	Robotic Process Automation
RTGS	Real Time Gross Settlement
SDBs	Specialized Banks
SDN	Software-Defined Networking
SIEM	Security Information and Event Management
SOCBs	State-Owned Commercial Banks
SOCs	Security Operations Centers
VMs	Virtual Machines

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IT Operations of Banks

1.0 Background of the Study

In today's rapidly evolving world, information and communication technology (ICT) has become the backbone of the banking industry, an industry that plays a vital role in supporting a strong and resilient economy. ICT has not only established a modern infrastructure that powers the global financial system but also given early adopters a significant competitive advantage. The rise of electronic banking has revolutionized the way financial transactions are conducted. Driven by major investments in telecommunications and electronic platforms, banks have made electronic banking widely accessible and user-friendly. Today, transactions involving billions of dollars can be completed within seconds, with just the click of a button, from virtually anywhere in the world.

The advent of the information technology (IT) revolution has fostered a dynamic global environment in which financial activities have expanded at an unprecedented pace. Innovations in technology, coupled with the development of integrated global networks, have substantially lowered the costs associated with cross-border fund transfers. In this evolving digital landscape, customers now more informed and technologically adept than previous generations have come to expect immediate, around-the-clock access to banking services. In response to these delicate expectations, information and communication technology (ICT) has enabled banks to implement efficient systems for managing accounting operations and back-office functions.

In the context of Bangladesh, information and communication technology (ICT) has emerged as a critical driver at the core of the banking sector. As the banking industry functions as a cornerstone of economic stability and growth, the integration of ICT has significantly enhanced the efficiency and effectiveness of banking operations. It has improved internal business processes, supported data-driven managerial decision-making, and fostered greater collaboration among organizational units. Collectively, these advancements have bolstered the competitive positioning of banks, particularly within the dynamic landscape of emerging and rapidly evolving economies.

Technology has always played a central role in banking, particularly since the advent of the internet. Now, we can confidently say that technology and banking are inseparable and will remain so in the foreseeable future. The emergence of fintech companies further emphasizes this integration, as all banks have the

opportunity to leverage cutting-edge technology. Only those banks that embrace new technology will lead in the evolving banking world.

In Bangladesh, banks have made substantial investments in information and communication technology (ICT) platforms and information systems, enabling the establishment of diverse distribution channels for delivering online financial services. These strategic efforts have led to notable advancements, including the development of innovative product features, improved cost-efficiency in operations, enhanced customer service delivery, and more effective risk management.

In the country, banks have established extensive ATM, CRM and POS networks to offer 24-hour access to customers. They provide services such as electronic payment services through e-money and e-cards, ATM, CRM, POS, mobile banking, internet banking, and apps banking. Many technology-driven banks offer internet banking with a range of customer-friendly features, allowing customers to conduct banking transactions from anywhere in Bangladesh at any time.

Contemporary banking institutions are increasingly prioritizing the reduction of administrative and operational expenditures as part of their broader strategy to enhance profitability. This objective is being pursued through the strategic deployment of information technology (IT) and information systems (IS), with a focus on minimizing reliance on cash-based and paper-intensive processes. Emphasis is being placed on promoting digital payment ecosystems such as e-money and contactless transactions while also strengthening internal communication channels via secure intranet and extranet networks. In pursuit of a more cashless banking environment, institutions are actively introducing innovative digital platforms, including mobile banking applications, QR code payment systems, and electronic wallet services.

Given the significance of information and communication technology (ICT) to both the design and delivery of modern financial services, banks are compelled to leverage IT resources effectively. This involves the adoption of advanced financial technologies aimed at streamlining costs, enhancing workforce productivity, safeguarding internal digital infrastructure, and meeting the expectations of an increasingly technology-oriented clientele. Inadequate adaptation to these technological imperatives may leave financial institutions vulnerable to significant operational and strategic risks in an era defined by intense competition and rapid digital transformation.

Given this context, it is beneficial to review the overall activities of the ICT division of banks for the year 2024. Such a review helps detect changes and developments in e-banking services and operations in recent times and allows for comparisons with previous years. The study aims to capture and evaluate the use of ICT in banking, identify gaps, and address associated problems in technology-driven banking operations.

1.1 Objectives of the Study

The detailed objectives of the study are: one, to discuss the IT based products and services in the banking sector of Bangladesh; two, to analyse the activities of IT departments of banks in 2024; three, to examine the comparative status of IT operations of banks for last few years; and four, to detect the challenges and recommend future courses of actions for better and secured IT operations of banks.

1.2 Methodology and Data

The study used both primary and secondary data to accomplish the objectives. Secondary data were collected from various publications of BB and BIBM, research articles, and websites of Bangladeshi banks. A total of 33 banks (Appendix-1) responded to the questionnaire survey of the study. The survey questionnaire was sent to the IT departments of 61 banks in Bangladesh, and we received information from 33 banks. Table-1 shows the category of banks.

Table-1: List of Banks

Category of Banks	No. of Banks
State-Owned Commercial Banks (SOCBs)	3
Specialized Banks (SDBs)	1
Private Commercial Banks (PCBs)	27
Foreign Commercial Banks (FCBs)	2
Total	33

1.3 Organization of the Review Report

The paper is organized into five sections. After an introductory section with objectives and methodology, Section-2 discusses the IT based products and online services in banking sector. Section-3 reviews and analyses the activities of IT departments of banks in 2024 and its comparison with previous years. Section-4 identified some challenges of IT operations in banks and role of BB to overcome these challenges. Section-5 puts forward concluding remarks and some recommendations.

2.0 Various Systems, Products and Services are being adopted by Banks to bring Efficiency

Bangladesh Automated Clearing House (BACH) is the first automated national payment infrastructure established in 2010. BACH has proved its significance in country's payment and settlement system over last fifteen years by reducing time and risks of payment and settlement in the country. According to the guidelines published by Bangladesh Bank, all scheduled banks participating in the Bangladesh Automated Clearing House (BACH) must adhere to the Bangladesh Automated Cheque Processing System (BACPS) Operating Rules and Procedures Version 2.0 for their clearing and settlement operations.

One of the significant systems adopted by banks in Bangladesh is Electronic Fund Transfer (EFT), facilitated through the Nikash-Bangladesh Electronic Funds Transfer Network (BEFTN). Nikash-BEFTN functions as a centralized platform for the processing and distribution of electronic credit and debit transactions among participating banks. Its efficiency and cost-effectiveness have made it a reliable mechanism for facilitating interbank fund transfers, including activities such as salary disbursements and the distribution of cash dividends across different banking institutions.

To strengthen interoperability in the financial ecosystem, the National Payment Switch Bangladesh (NPSB) was established. This system enables seamless transactions among participating banks for both account-based and card-based services. Currently, NPSB supports interbank connectivity for Automated Teller Machines (ATM), Point of Sale (POS) terminals, Internet Banking Fund Transfers (IBFT), and Bangla QR.

As part of inclusive digitalization initiative, Bangladesh Bank launched Real Time Gross Settlement (BD-RTGS) system on 29th October 2015 to facilitate safe, secured and efficient interbank payment system. This mechanism has opened a new horizon in the payment ecosystem, accommodating instant settlement of large value and time critical payments in the country. As an electronic settlement, it ensures transfer of funds from one account of a bank to that of another bank on a real-time and on gross basis. Here real-time refers transactions that do not need any waiting period. Transactions are settled as soon as they are executed. It is worthwhile to

mention here that, besides customers transaction, BD-RTGS System are facilitating Financial Institution's transaction, inland foreign currency transaction, Customs Duty e-Payment, VAT e-Payment and other important Government's Payments.

Online Credit Information Bureau (CIB) systems have been implemented by banks to expedite the processing of customer information. By utilizing online CIB, banks can access borrower information more quickly and efficiently. Many banks have automated the process of obtaining borrower information centrally, eliminating the need to retrieve information from individual branches.

The Core Banking Solution (CBS) is a standardized and flexible system that allows banks to respond rapidly to changing business requirements and comply with regulations. Guidelines on CBS features and controls were published by Bangladesh Bank to streamline and standardize CBS functionalities.

Banks in Bangladesh have established extensive networks of ATMs, POSTs, and Cash Recycling Machines (CRMs) to cater to customer needs. These channels provide convenient banking services such as cash withdrawals, deposits, and various transactions. Non-bank entities are also allowed to deploy White Label ATMs and merchant acquiring services, enhancing banking and retail payment services' accessibility throughout the country.

Electronic Know Your Customer (e-KYC) guidelines were introduced by the Bangladesh Financial Intelligence Unit (BFIU) to promote financial inclusion, fintech, and regtech while ensuring cybersecurity. Banks, insurance companies, financial institutions, and other entities are required to implement e-KYC/Digital KYC procedures.

To meet the demands of tech-savvy customers, many banks offer Internet Banking (IB) facilities, allowing customers to access their accounts from mobile devices and conduct banking transactions. Mobile Financial Services (MFS) regulations were also published, promoting access to formal financial services through mobile accounts.

Agent Banking, introduced by Bangladesh Bank, simplifies banking services for the unbanked population by providing limited-scale banking services through engaged agents. Information Technology has played a crucial role in the growth of agent banking.

Banks have embraced chatbot technology and established high-tech contact centers to improve customer satisfaction and provide easy access to banking services. Customers can interact with AI-based chatbots or consult contact center agents for information and assistance.

As the name suggests, Bangla QR is a QR-based solution that enables digital payments that can be used with other apps that support Bangla QR. In cooperation with banks and card network partners, SSLCOMMERZ developed it. It is the most recent method of payment acceptance available to businesses in Bangladesh, allowing them to take payments from clients directly into their bank accounts. It is one of the safest digital payment methods because it is entirely contactless, which protects both the client and the merchant.

To reduce paper usage and enable efficient communication, banks have implemented Corporate Intranet Systems that provide features like circulars, messaging, news, employee profiles, and online processing for leaves, requisitions, and cheques. Other software systems, including reconciliation systems, payroll systems, and foreign exchange return software, contribute to efficient banking operations.

Business Intelligence Software is being implemented by banks to extract the right information from various electronic systems and provide comprehensive management information systems (MIS) to top executives. Document Management Systems (DMS) have revolutionized the way banks capture, archive, and share documents, eliminating the need for physical filing systems. DMS enables easy retrieval of documents through a searching system and promotes a paper-free communication environment within banks.

Banks have also established systems to support cross-border operations, facilitating real-time remittance transactions from overseas exchange

houses and instant fund transfers to customers' accounts or other bank customers through the BEFTN network or other mechanisms.

The financial system worldwide is experiencing constant transformation due to digital innovation. Bangladesh Bank (BB) actively supports a regulatory environment that encourages innovation to enhance the strength, efficiency, and security of the financial system. Recognizing the pivotal role of digital platforms, BB acknowledges their potential to improve the delivery of financial products and services while expanding the reach of the financial system. To this end, BB has developed comprehensive "Guidelines to Establish a Digital Bank."

These guidelines provide a set of instructions that applicant/promoter/sponsor/shareholder must adhere to when establishing a digital bank in Bangladesh. The proposed digital banks are required to comply with these guidelines in addition to the Bank Company Act (BCA), 1991 (Act No. XIV of 1991) (as amended), and other guidelines, circulars, and circular letters issued by Bangladesh Bank periodically.

In recent years, Cloud Computing has brought numerous benefits in terms of scalability, flexible resource allocation, organizational agility, and operational resilience. This technology has enabled banks and other financial institutions to quickly meet customer demands for products and experiences. The trust placed in a reliable financial system is crucial for the smooth functioning of the economy. Consequently, Cloud Computing has gained significant popularity as banks, non-bank financial institutions, mobile financial service providers, payment service providers, payment system operators, and other financial service providers aim to access new technologies easily and achieve immediate cost efficiencies. However, it is essential to effectively manage Cloud Computing to identify potential risks and monitor industry concentration to mitigate any risks to the overall financial stability of the economy. In this regard, Bangladesh Bank has issued guidelines on cloud computing on March 16, 2023.

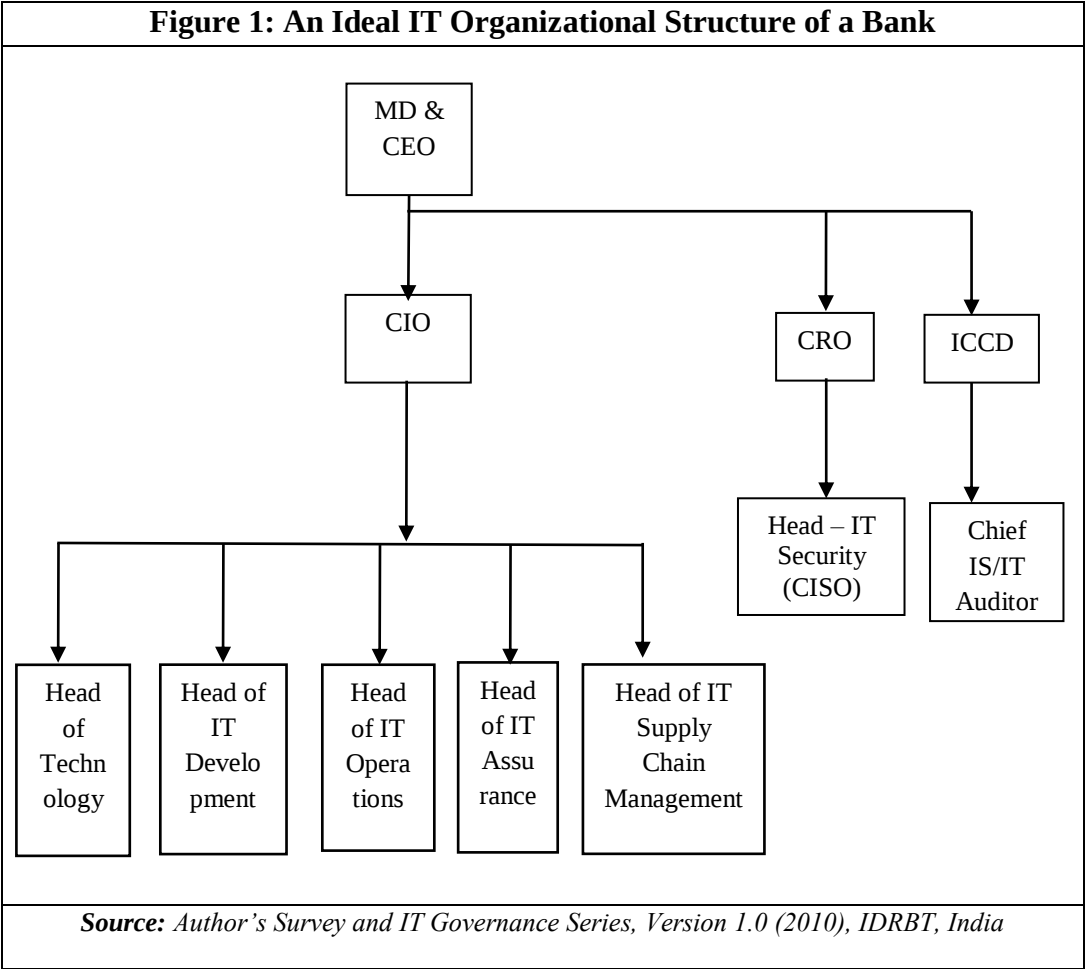
2.1 Typical Activities Performed by the IT Department in Banks

The IT department in banks performs a range of activities organized into functional units such as Hardware Maintenance, Network Support and Data Communication, IT Security Management, Database Management,

Software Development, DC/DR Operation, IT Help Desk, IT Audit, Delivery Channel Management, CBS Management, System Administration, and Storage Management. These units work together to ensure smooth IT operations and support the overall functioning of the bank.

2.2 Organogram of Information Technology Department in Banks

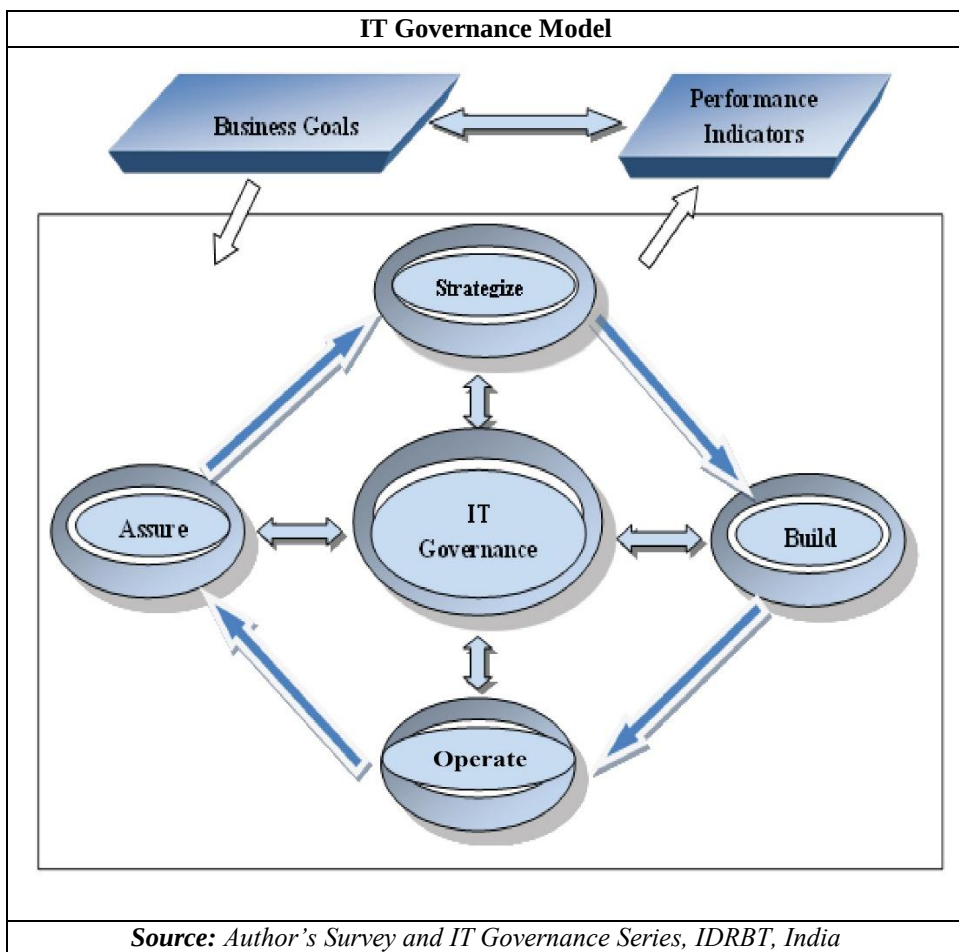
An effective IT organizational structure plays an important role in improving the efficiency, reliability and security of e-banking services. The following figure (Figure-1) shows an organizational structure for the IT department of a bank. The details of the organogram are provided in Appendix-2.



2.3 IT Governance Model

The need for alignment of IT strategies with business strategies is to ensure that IT investments are appropriately prioritized to serve business requirements. Failure to achieve the alignment leads to business not reaching its full potential, missed opportunities, and lack of focus on optimal deployment of IT resources. Alignment mismatch may also lead to IT-related HR issues and ultimately result in erosion of stakeholder value in the long run. The IT Governance Model recommended in this document aims at helping banks achieve IT alignment in tune with the best practices adopted worldwide. The Model prescribes a well-defined approach to evolving an Organizational Structure for IT Governance to deliver the required results.

[Core Concept & Key Function]



IT Governance Key Functions

Strategize:

- The goal of this function is to design optimal IT architecture for the bank.
- This role will also provide for adequate reengineering, feasibility studies and directions to ensure that the IT implementation aligns with the business strategy, for optimal utilization of IT investments.

Build:

- The goal of this function is to create and enable new systems.
- The objective is to conduct feasibility studies of applications, gather and process business requirements, build, acquire and implement technology-based solutions, keeping in mind sustainability of such solutions over a pre-defined life-cycle.

Operate:

- The goal of this function is to ensure the continuous availability of IT systems.
- This includes managing systems and maintenance of the IT infrastructure (including applications, data centers, technology platforms and software solutions).
- Availability, reliability, scalability and continuity of services are an integral part of this function.

Assure:

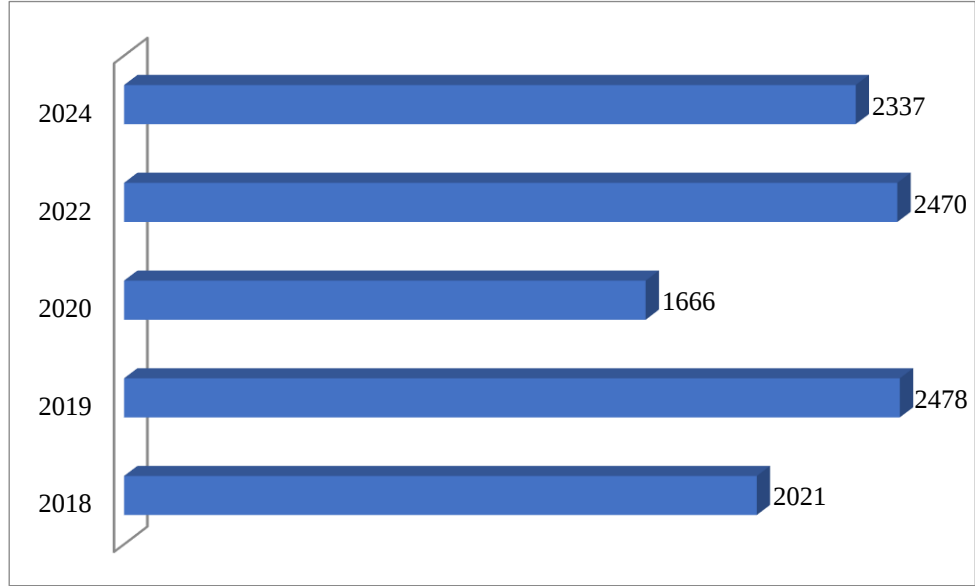
- The goal of this function is to provide assurance (evaluate, analyze, control and report) on the performance of the various processes in the IT environment.
- Testing of all solutions, either developed in-house or outsourced, also falls under this function.
- Performance metrics and dashboards should be published to the stakeholders at regular intervals to ensure fulfillment of IT goals in tune with business goals.
- To ensure quality management on an ongoing basis.
- To take periodic feedback from users and service providers. This function will also closely coordinate with the other functions in the

3. Data Analysis and Findings:

3.0 IT Investment and Sector-wise IT Budget

ICT investment in the banking sector has experienced both progress and disruption from 2018 to 2024, shaped by technological priorities as well as deep-rooted financial challenges (Figure-2). In 2018, banks invested Tk. 2,021 crore in IT systems, showing a steady push toward digital infrastructure. This upward trend continued into 2019, with investment rising to Tk. 2,478 crore, reflecting banks' growing focus on digital transformation. However, in 2020, ICT investment sharply declined to Tk. 1,666 crore, a drop of around 39.37% compared to 2019. This decline was primarily due to the adverse economic effects of the COVID-19 pandemic, which stalled projects and reduced operational spending. A stronger rebound occurred in 2022, with ICT investment reaching Tk. 2,470 crore, nearly matching pre-pandemic levels. By 2024, investment slightly dipped to Tk. 2,337 crore, suggesting a period of stabilization where banks began focusing on optimizing and consolidating their existing IT infrastructure rather than aggressively expanding it.

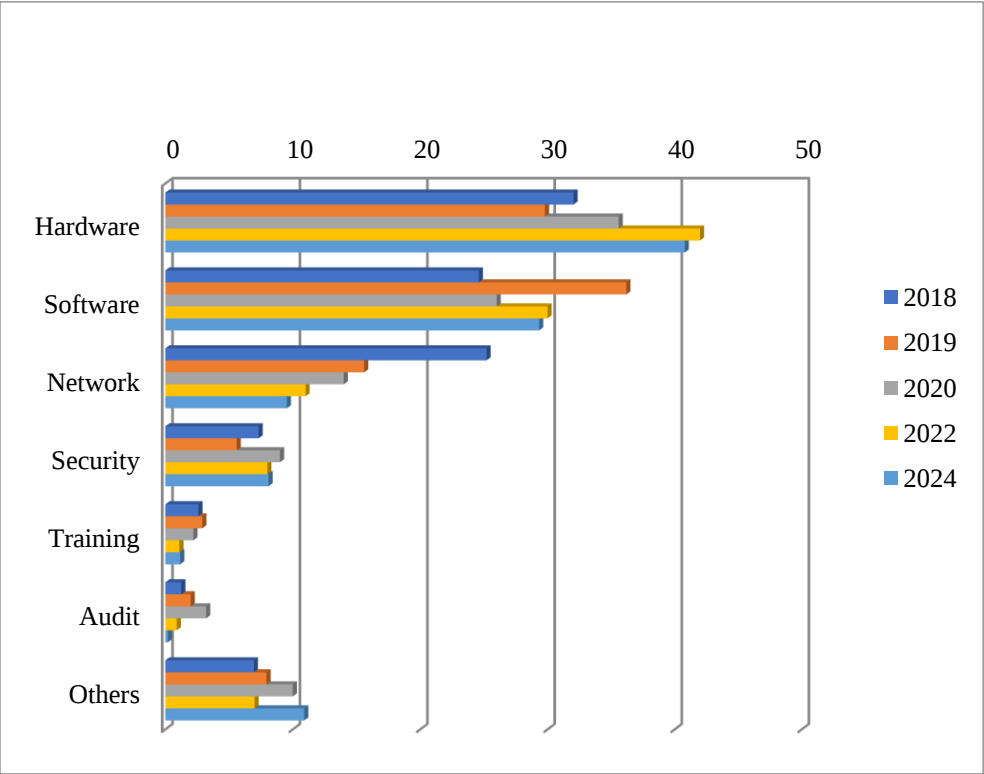
Figure-2: IT Investment in Banks (In Crore BDT)



Source: Survey Information

However, underlying these figures is a more troubling issue: the deteriorating financial health of many banks, largely driven by systemic problems such as loan defaults and financial mismanagement. Widespread loan irregularities, including looting of funds and non-refunding of large loans, have placed immense pressure on banks’ balance sheets. These practices have not only eroded public trust but also limited the ability of banks to allocate resources toward long-term investments like ICT. As a result, even though digital transformation remains a strategic priority, financial instability rooted in governance failures and weak enforcement continues to constrain the sector’s potential.

Figure-3: Distribution of IT Budget (% of Total Budget)



Source: Survey Information

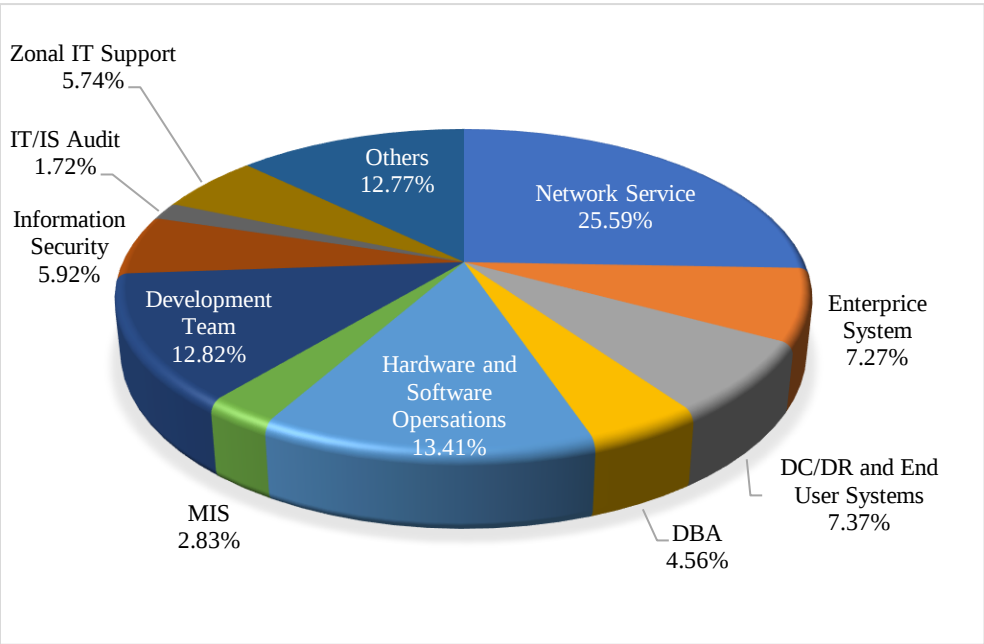
Based on the sector-wise IT budget data from 2018 to 2024 (expressed as percentage of total IT investment), there is a clear shift in spending patterns across banking technology priorities (Figure-3). Hardware investment began at 32.05% in 2018 and initially declined in 2019 to 29.8%, but rose sharply during and after the pandemic, reaching 35.6% in 2020 and peaking at 42% in 2022, before settling slightly lower at 40.8% in 2024. This indicates a renewed emphasis on strengthening physical infrastructure. Software saw a dramatic increase from 24.6% in 2018 to 36.2% in 2019, highlighting the shift toward digital platforms and automation. While it dipped to 26% in 2020, it rebounded to 30% in 2022 and remained strong at 29.3% in 2024, confirming an ongoing commitment to software modernization. Network expenditure decreased significantly from 25.2% in 2018 to 9.5% in 2024, suggesting a reduction in traditional infrastructure spending likely due to prior completion of major installations or a shift to cloud-based systems. Security spending peaked during the pandemic at 9% in 2020, up from 7.32% in 2018, and stabilized at 8.1% by 2024. This trend reflects banks' heightened focus on cybersecurity in response to increasing digital threats. Training and audit remained minimal throughout the period. Training dropped from 2.6% in 2018 to just 1.2% in 2024, while audit saw an initial rise to 3.2% in 2020, then fell drastically to 0.2% in 2024, indicating a deprioritization of capacity building and oversight. The “Others” category showed a gradual rise from 6.95% in 2018 to 10.9% in 2024, which may reflect new investments in emerging technologies, fintech partnerships, or AI-related services that don’t fall under traditional IT categories.

3.1 Size of the IT Department

In 2024, the total number of ICT employees in the banking sector stood at approximately 8,250, distributed across various specialized functions. The largest share 25.59% was assigned to Network Services, reflecting the sector’s continued reliance on stable, secure connectivity despite reduced spending on network infrastructure. The Hardware and Software Operations unit employed 13.41% of staff, playing a key role in maintaining critical IT systems. Similarly, the Development Team accounted for 12.82%,

indicating strong emphasis on in-house software development and digital product innovation.

Figure-4: Distribution of IT Employees in 2024 (% of Total IT employees)



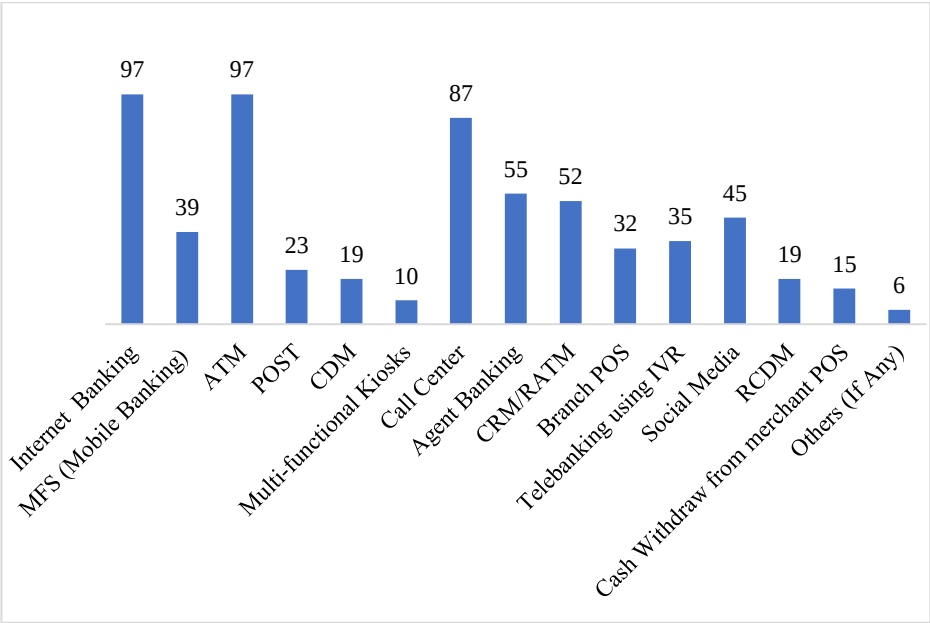
Source: Survey Information

Enterprise Systems and DC/DR (Data Center/Disaster Recovery) & End User Systems each engaged about 7.27% and 7.37% of employees, supporting backend systems and user environments. The Information Security segment represented 5.92%, aligning with growing concerns around cybersecurity, while IT/IS Audit remained relatively small at 1.72%, suggesting limited staffing for compliance and oversight. Zonal IT Support employed 5.74%, highlighting the need for on-ground technical assistance across branches. Database Administration (DBA) accounted for 4.56%, ensuring data integrity and system performance, whereas MIS (Management Information Systems) had 2.83% of total ICT personnel. Finally, “Others”, likely including roles in fintech coordination, cloud, or AI support, made up 12.77% a sizable portion that may indicate evolving roles beyond traditional IT categories.

3.2 Alternative Delivery Channels (ADCs) in Banks

Alternative Delivery Channels (ADCs) enlarge the scope of services outside the traditional bank branch channel. ADCs are transformative in nature, accommodating the demand for access to financial services “anytime, anywhere, anyhow”. Bangladeshi banks have already developed several ADCs to serve their customers round the clock. It is found from survey data that Internet banking and ATM service are very popular among Bangladeshi clienteles and 97% banks in our country offer these services. Among other services, call center and agent banking facilities are provided by 87% and 55% banks, respectively. However, very few banks offer channels like RCDM and multi-functional kiosk which are already popular in advanced countries. Also, social media is an appreciated channel for banks to generate brand awareness, product/service delivery and advertising. But, 45% banks in Bangladesh have endorsed this service for their customers.

**Figure-5: ADCs Used by Banks to Provide Online Services to Customers
(% of Banks)**



Source: Survey Information

3.3 Mobile Banking

Bangladeshi banks have introduced two types of mobile banking service. USSD code is a menu-based service that can be accessed on any phone. It can be operated as a real-time open session between the application and end user, whereas the app can only be accessed on a smartphone with a running data bundle. Since the commencement of MFS, the flow of money into the rural parts of Bangladesh has been increasing significantly and a high growth per year is observed in terms of number of customers, volume of transactions and number of transactions (Table-2).

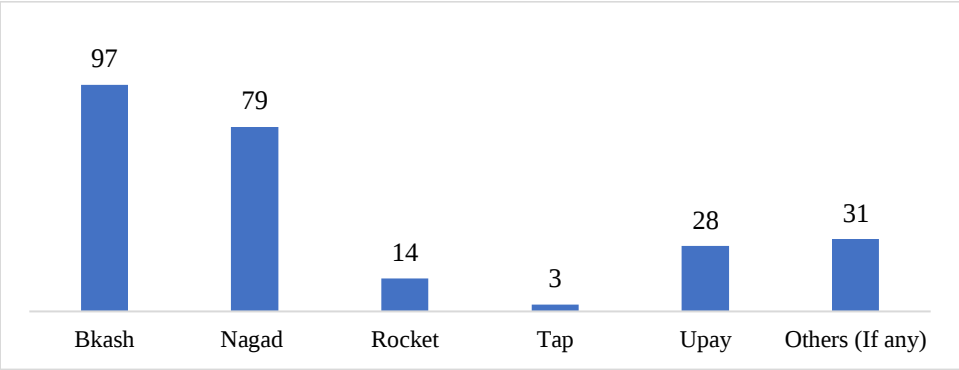
Table-2: Growth of Mobile Banking from 2020 to 2024

	2020	2021	2022	2023	2024
No. of Banks Offering MFS	15	13	13	13	13
No. of Agents	1,058,897	1,123,113	1,554,637	1,724,685	1,828,864
No. of Customers (in Lac)	993.36	1,114.67	1,907.83	1,724,685	2,366.69
No. of Active Customers (in Lac)	323.27	410.96	573.74	837.49	888.87
No. of Total Transaction (Millions)	3,172.0	3,837.05	4,749.33	6,161.44	7,289.91
Total Transaction Amount (Billions BDT)	5,616.0	7,701.45	1,0163.63	13,529.07	17,374.1

Source: Monthly Economic Trends and Financial Stability Report, Bangladesh Bank.

Among the surveyed banks, except the FCBs, all banks have agreements with different MFS providers for financial transactions. bKash grips the uppermost position by making agreements with 97% of these banks. Nagad, which is in second position makes agreements with 79% of surveyed banks. Very limited banks work with other MFS providers like Upay (28%) and Rocket (14%) for financial transactions.

Figure-6: Agreements with Different MFS Service Providers (% of Banks)

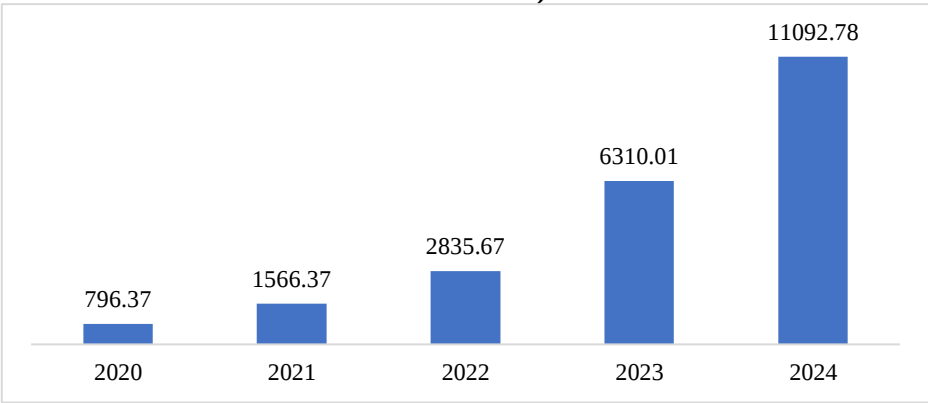


Source: Survey Information

3.4 Internet Banking

In our banking sector, there has been a satisfactory improvement in terms of providing Internet Banking services. Though only 52 percent banks provided such services in 2015, now almost all banks in our country have activated either informational or transactional Internet Banking services. In 2024, the number of customers and transactions were 11,241,657 and 150,595,466, respectively, which were only 3,245,333 and 24,438,452 correspondingly, in 2020. Since 2020, a noteworthy development in volume of transactions was observed compared to the previous years.

Figure-7: Volume of Internet Banking Transaction from 2020 to 2024 (In Billion BDT)



Source: Financial Stability Report (2019-2024), Monthly Economic Trends, Bangladesh Bank.

3.5 POST

A point-of-sale terminal (POST) is a hardware system for processing all types of debit and credit card payments at merchandizing locations. When a card is used to pay for something, a POST first reads the data of the card to check for necessary funds to transfer to the merchant, then makes the transfer. The growth of POST in Bangladesh is shown in Table-3.

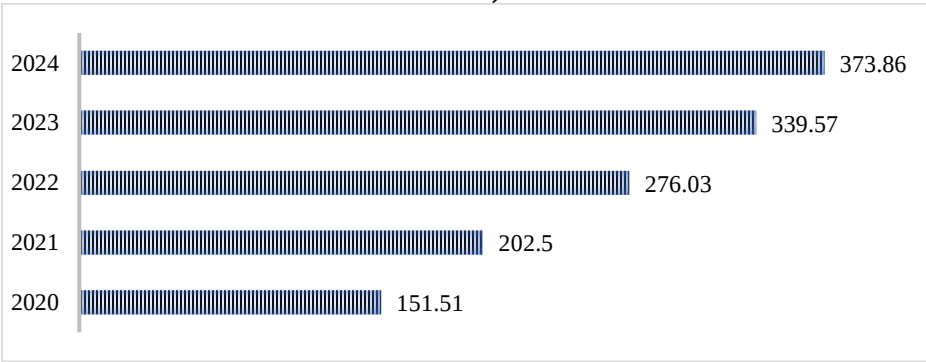
Table-3: Number of POST

	2020	2021	2022	2023	2024
POS	73229	92086	103055	108469	125641

Source: <https://www.bb.org.bd/en/index.php/econdata/index>

As of December, 2024, most POSTs (90.02%) are being operated in urban areas. In Bangladesh, only PCBs provide this service. In 2024, total number of POS transactions was recorded at 7.65 crore which was only 2.84 crore in 2020. Volume of POST transactions from 2020 to 2024 is shown in Figure-8.

Figure-8: Volume of Transactions in POST from 2020 to 2024 (In Billion BDT)



Source: <https://www.bb.org.bd/en/index.php/econdata/index>

Branch POS terminals assist customers to complete chequeless transactions for cash withdraw at branch premises by using cards on the POS machine, which is very helpful for customers. It is observed that among the surveyed banks, only 32% banks provide this facility.

3.6 ATM

An automated teller machine (ATM) is an electronic telecommunications device that enables customers of banks or financial institutions to accomplish financial transactions, i.e. cash withdrawals, funds transfers, balance inquiries or account information inquiries, at any time without the need for direct communication with bank staff. The number of ATMs in Bangladesh is shown in Table-4.

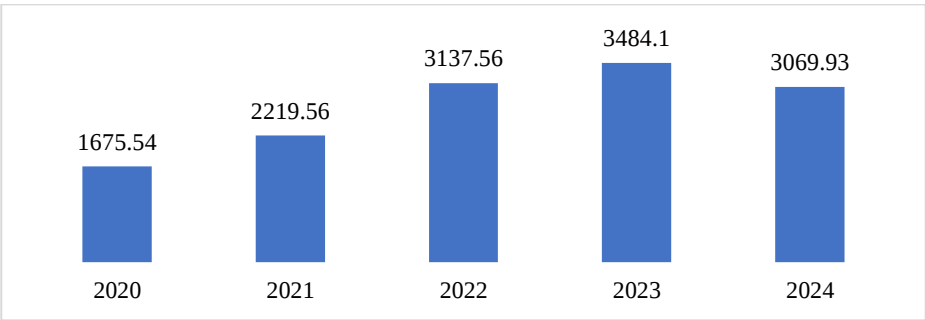
Table-4: Number of ATM

	2020	2021	2022	2023	2024
ATM	11923	12831	13434	13436	12859

Source: Source: <https://www.bb.org.bd/en/index.php/econdata/index>

At the end of 2024, total number of ATM transaction was recorded at 29.30 crore which was 19.43 crore in 2020. Volume of transactions in ATMs from the year 2020 to 2024 is shown in Figure-9.

Figure-9: Volume of Transactions in ATMs from 2020 to 2024 (In Billion BDT)



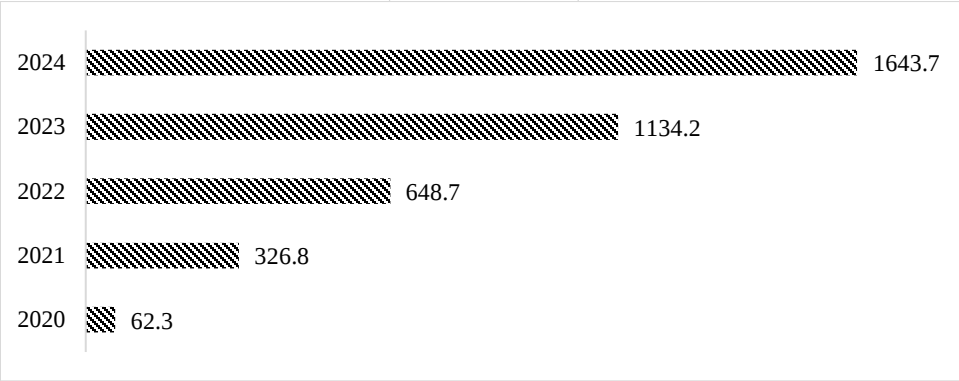
Source: <https://www.bb.org.bd/en/index.php/econdata/index>

3.7 Cash Recycler Machines (CRM) and Cash Deposit Machine (CDM)

A CRM receives cash, tally the notes, validate them, and credit the amount to customers' accounts on a real-time basis, helping banks do away with the manual labor needed to provide the facility. It also lets users to withdraw and transfer funds to other accounts. This technology was introduced in Bangladesh in 2017. Currently, among the surveyed banks, 52% banks in

Bangladesh installed CRMs and 6970 CRMs have been installed by these banks till 2024, increasing from 780 in 2020, which shows an enormous growth. In 2024, number of transactions through CRM was 14.63 crore while it was only 96.49 lac in 2020.

**Figure-10: Volume of Transactions in CRMs from 2020 to 2024
(In Billion BDT)**



Source: <https://www.bb.org.bd/en/index.php/econdata/index>

Using CDM customers can deposit money and get real time reflections of the transaction with an instant message. It is found that in 2024, only 19% banks in Bangladesh installed CDMs and there were only 197 CDMs in the market which was 1527 in 2020. In case of establishing CDM, a negative growth is seen in our banking sector. One point should be stated that, only 10.65% CDMs are installed in rural areas.

3.8 Digital Wallet and QR-Code Payments

A digital wallet (or e-wallet) is a software-based system that securely stores users' confidential data such as payment information and passwords for numerous payment methods and websites. By using a digital wallet, users can easily and quickly complete purchases with near-field communications technology. Digital wallets can be used in conjunction with mobile payment systems, which allow customers to pay for purchases with their smartphones.

In Bangladesh, among the surveyed banks, majority of them (97%) have Mobile App and Digital wallet-based e-banking service. 83% banks provide QR-Code Payment Service for their customers. Another initiative is taken by 76% banks to replace their proprietary QR with “Bangla QR” in response

to the PSD Circular No 1, Dated on February 8, 2023 published by Bangladesh bank.

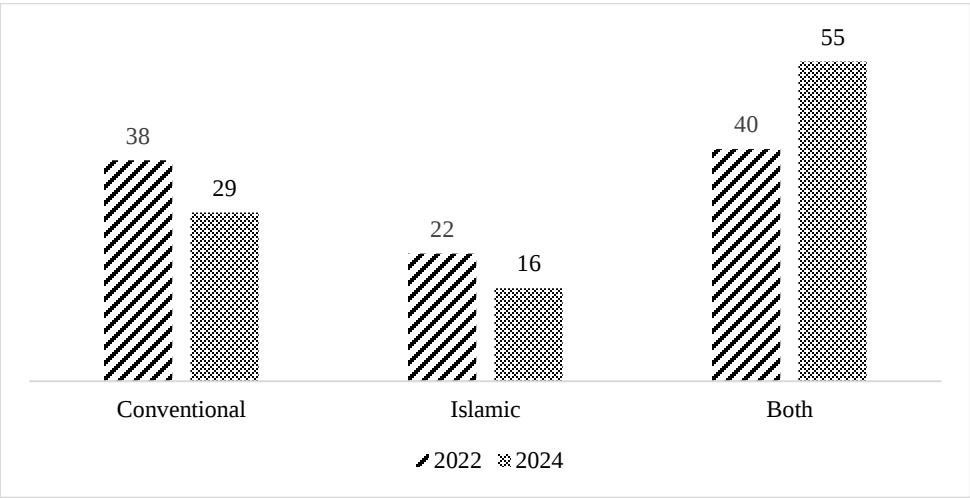
3.9 E-commerce transactions

Around 94% banks in our country use Two-Factor Authentications (2FA) in E-commerce transactions which include Online Marchant Payment, Utility Bill Payment etc. But in case of using 3DS version 2, 74% banks have implemented this technology which is essential in combating card not present (CNP) transactions.

3.10 Core Banking Software (CBS)

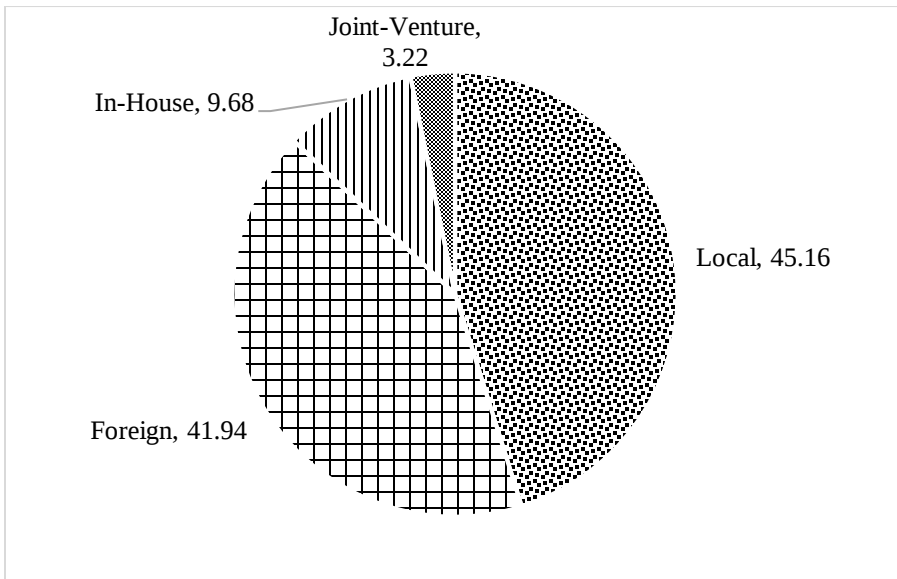
In 2024, the adoption trend of Core Banking Software (CBS) in Bangladeshi banks shows a notable shift. Banks using only conventional CBS decreased from 38 percent in 2022 to 29 percent in 2024, and those using only Islamic CBS declined from 22 to 16 percent. In contrast, the number of banks using both conventional and Islamic CBS systems increased significantly from 40 to 55 percent. This indicates a growing preference for dual-system integration, reflecting a strategic move by banks to cater a broader client base and ensure operational flexibility in both conventional and Islamic banking services.

Figure-11: Types of Core Banking Software Banks are Using (% of banks)



Source: Survey Information

Figure-12: Banks using Different Types of CBSs (% of Banks)



Source: Survey Information

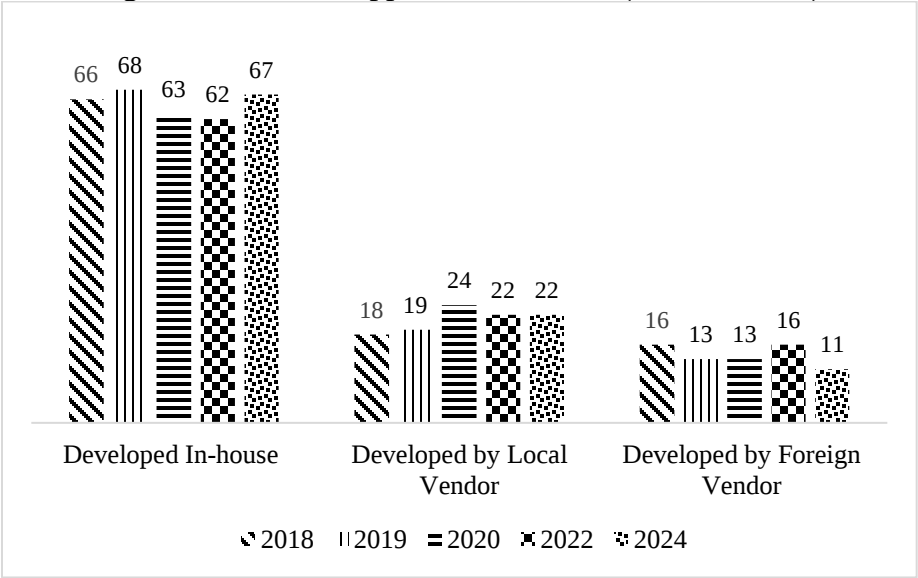
In 2024, the Core Banking Software (CBS) landscape in Bangladesh reflects a diverse adoption of systems across four major categories: local, foreign, in-house, and joint-venture solutions. Local CBS solutions accounted for the largest share, representing 45.16% of the total usage among banks. Foreign CBS platforms followed closely with a 41.94% share. In-house developed CBS, created and maintained internally by individual banks, comprised only 9.68% of the market. Joint-venture CBS solutions held the smallest share at 3.22%, indicating limited traction for systems developed through partnerships between local and international firms.

3.11 Application Software

The data presents the percentage distribution of application software excluding Core Banking Software (CBS) used by banks in Bangladesh, categorized by development source. In 2024, 67% of banks used in-house developed application software, reflecting a resurgence in internal software development and marking the highest percentage since 2019. This increase from 62% in 2022 suggests a strategic shift back toward customized, bank-managed solutions tailored to specific operational needs. Local vendor-

developed software maintained a steady share at 22% in both 2022 and 2024, slightly below the peak of 24% in 2020, indicating continued but stabilized reliance on domestic third-party providers. In contrast, the use of foreign vendor-developed software declined notably to 11% in 2024, the lowest figure over the period, down from 16% in 2022. This downward trend underscores a broader movement within the banking sector toward reducing dependence on foreign solutions, favoring greater control, and cost-efficiency through locally developed or in-house systems.

Figure-13: Share of Application Software (% of Software)



Source: Survey Information

*******In 2021 and 2023 IT Review were not conducted*

3.12 Adoption of New Technologies

In 2024, Bangladeshi banks demonstrated notable progress in adopting advanced digital technologies to enhance operational efficiency and customer service experiences. The data reveal a strong focus on technologies that improve transaction ease, service integration, and automation.

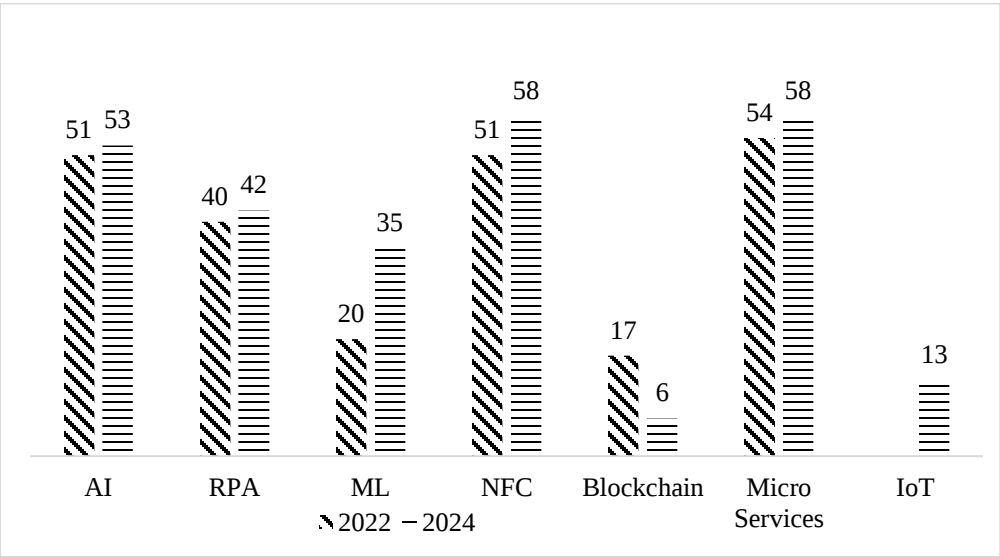
Near Field Communication (NFC) and Microservices are the most widely adopted technologies, each used by 58% of banks. This suggests a growing

emphasis on seamless digital payment methods and modular service architecture to enhance scalability and flexibility in banking systems.

Internet of Things (IoT) has a modest adoption rate of 13%, indicating early-stage integration, possibly for smart branch services or ATM monitoring. Blockchain adoption remains low at 6%, reflecting either regulatory hesitation or lack of infrastructure for widespread distributed ledger implementation.

This data indicates that while NFC and microservices are leading the digital transformation in Bangladeshi banking, AI and RPA are also becoming mainstream. However, newer technologies like blockchain and IoT are still in the exploratory or pilot phase for most of the banks.

Figure-14: Use of Advanced Technologies by Banks (% of Banks)



Source: Survey Information (IoT Data available from 2024)

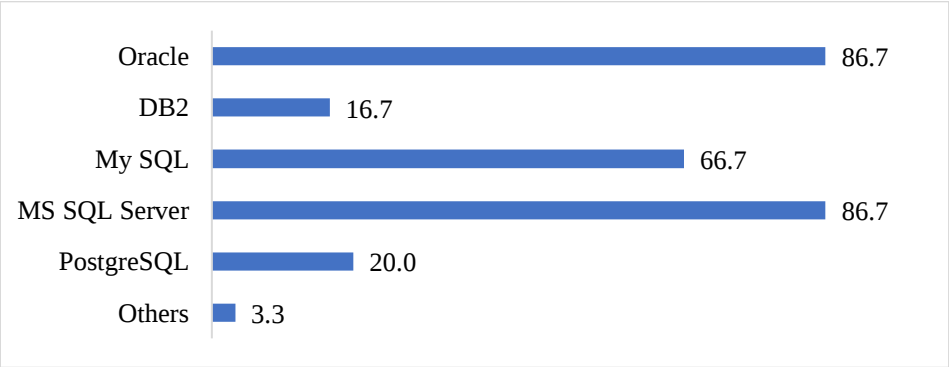
3.13 Information Technology (IT) Strategy and Roadmap in Banks

According to research findings, although all banks have developed an IT strategy in place, only 28% of banks have a short-term, 50% have a mid-term, and 53% have a long-term Technology Roadmap.

3.14 Data Management

The data reveals that the majority of banks utilize Oracle and MS SQL Server databases, with both being used by 86.7% of banks. MySQL also sees substantial adoption at 66.7%, indicating its relevance in web-based or lighter-weight database environments. In contrast, DB2 and PostgreSQL are used by fewer banks 16.7% and 20.0%, respectively suggesting a smaller footprint in the industry. Only 3.3% reported using other types of databases, pointing to a general trend toward standardization around well-established RDBMS platforms.

Figure-15: Use of Database by Banks (% of Banks)



Source: Survey Information

In terms of administrative and security practices, 96.7% of banks have implemented Segregation of Duties (SoD) between Database Administrators (DBAs) and System Administrators. This is a strong indicator of mature internal controls that reduce risk from insider threats. Furthermore, 66.7% of banks require privileged administrators to use multi-factor authentication (MFA) when accessing servers. While this is a positive sign of enhanced security measures, the remaining 33.3% that do not enforce MFA may remain vulnerable to credential-based attacks.

Regarding analytics and data-driven decision-making, only 36.7% of banks have implemented a data warehouse with business intelligence (BI) and analytics tools. This indicates that more than half of the banks may not be fully leveraging their data assets for strategic insights, which could hinder competitive and operational efficiency.

When examining database replication strategies, it becomes evident that 37.8% of banks use synchronous replication between their data center (DC) and near data center (Near DC), ensuring high data availability with minimal delay. Asynchronous replication is used by 32.2% in the same configuration, while 6.7% use a hybrid approach. However, for replication between DC and far DC, the preferred mode shifts only 15% use synchronous replication due to likely latency issues, and 23.3% opt for asynchronous. About 13% banks reported using a hybrid model for far DC replication. Overall, the findings point to a strong foundation in core database technologies and security practices among banks, while also highlighting potential areas of improvement in BI adoption and advanced replication strategies.

3.15 Data Center (DC) and Disaster Recovery Site (DRS): Mode of Replication with DC

The majority of banks (92%) operate data centers at Tier-2 or Tier-3 levels. In contrast, Tier-4 data centers are designed to be fully fault-tolerant, featuring redundancy across all components and offering an expected uptime of 99.995% equivalent to just 26.3 minutes of downtime per year. However, only 3% of banks maintain Tier-4 data centers, highlighting a significant vulnerability in the resilience of our banking infrastructure.

Table-5: Status of Tier Level of DC

Tier Level of DC	% of Banks
Tier-1	5
Tier-2	32
Tier-3	60
Tier-4	3

Source: Survey Information

Active-active replication mode between DC and NDC facilitates the banks to run live operations from NDC to ensure optimum utilization of IS resources in the data center. Consequently, banks will be able to recover the live operation of their banking business quickly when the primary data center goes down due to major natural or man-made disasters.

As seen from Table-6, in 2024, among the banks having NDC, 44% and 57% of banks supported active-active and active-passive replication mode, respectively. In the the year (2022), 43% of NDCs had active-active mode. In case of FDC, only 15% were active-active and 86% were active-passive mode. Very insignificant growth is observed compared to previous years. According to the best practice, banks should maintain at least one DRS operating in active-active replication mode.

Table-6: Mode of Replication with Primary DC in Banks

Mode of Replication with Primary DC (PDC) or Production Site	% of Banks							
	Near DRS /DC (N-DRS/N-DC)				Far DRS /DC (F-DRS/F-DC)			
	2019	2020	2022	2024	2019	2020	2022	2024
Active-Active	36	42	43	43	12	13	14	14
Active-Passive	64	58	57	57	88	87	86	86

Source: Survey Information

3.16 Status of Hot DR in Banks

Another disappointing issue is that only 48% of NDCs are acting as Hot DR in 2024, which was the same in 2022, but 42% in 2020 indicates very slow growth. In case of FDCs, more unsatisfactory improvement is observed, as only 24% of FDCs are hot. That means, rest of the banks (76%) might not be able to run business operations or critical services immediately from FDC due to any major man-made or natural disaster, like an earthquake.

Table-7: Status of Hot, Warm, and Cold DRS in Banks

Type of DRS	% of Banks					
	Near DRS /DC (N-DRS/N-DC)			Far DRS /DC (F-DRS/F-DC)		
	2020	2022	2024	2020	2022	2024
Hot	42	48	48	12	24	24
Warm	40	38	38	53	44	44
Cold	18	14	14	35	32	32

Source: Survey Information

3.17 Live Testing of Business Operations from DR Site

Regular and periodic testing of live business operations from the DR site is a very significant issue for the centralized online banking system. Because this practice will increase the level of confidence and expertise in recovering data and business operations in case of any IT disaster.

According to Table-8, 75% and 25% of banks have tested live business operation in 2024 from N-DRS and F-DRS, respectively. Among the banks that tested the live operation of business in 2024, about 70% and 46% of banks did the test from N-DRS on holiday and a working day, respectively. Only a few banks performed a live test from F-DRS. Another important finding is that most of the local banks (90% banks) did not perform a live test of the whole business operations from DRS; they performed it partially (some limited applications or services). Considering the best practice, banks should run 24 hours live business operations of whole e-banking functionalities from DRS at least once a month on working days.

Table-8: Live Test of Business Operation from DRS

Live Test	% of Banks			
	Near DRS/DC (N-DRS/N-DC)		Far DRS/DC (F-DRS/F-DC)	
	2022	2024	2022	2024
Live Test of business operations from NDRS or FDRS	70	75	22	25
Live Test of business operations on a holiday	70	70	22	22
Live Test of business operations on Open days/Office hours	46	46	16	16
Backups tested regularly for integrity and recoverability	80	88	4	6
Off-site backups or cloud backups used to ensure data redundancy	72	75	7	9

Source: Survey Information

3.18 Advancement of Network Technologies in Banks

The data indicates a significant shift in the adoption of advanced network security technologies by banks in Bangladesh between 2022 and 2024. There is a notable increase in the use of Software Defined Networking (SDN) from 29.73% to 40.62% and SDWAN from 8.11% to 12.5%, reflecting a growing emphasis on flexible and scalable network

infrastructure. The deployment of Next Generation Firewalls reached full saturation in 2024 at 100%, up from 94.59% in 2022, highlighting its critical role in modern threat prevention strategies. Similarly, the adoption of Anti-DDoS solutions rose to 75% in 2024, reinforcing the banking sector’s preparedness against large-scale cyberattacks.

Moreover, the introduction of ransomware protection in 2024, covering 75% of banks, suggests a strategic response to evolving threats. Overall, this trend illustrates a proactive approach by banks in strengthening cybersecurity infrastructure through the adoption of modern and robust network defence mechanisms.

Table-9: Advancement of Network Technologies in Banks in 2022 and 2024

Technologies	2022	2024
SDN	29.73	40.62
SDWAN	8.11	12.5
Next Generation Firewall	94.59	100
Application Monitoring Tool	56.76	58.3
Load Balancer	83.78	85.7
Anti DDoS	67.57	75
Ransomware Protection	-	75
Others	24.32	21.88

Source: Survey Information

3.19 Adoption of Cyber Security Solutions in Banks

Almost all banks stated that they have dedicated Computer Incident Response Team (CIRT). 97% banks mention that they follow the policy during security/OS patching and among them, 40% and 60% banks follow Current Stable Version (N) and Prior Current Stable Version (N-1) respectively during security/OS patching. The following table (Table-10) depicts the status of using different types of security solutions by the banks. We observe a weak scenario in case of using SOC, API Security, SOAR, AIM and DAM.

Table-10: Cyber/IT Security Solutions Used by Banks

Types of Security Services / Solutions	% of Banks
SOC	54
SIEM	75
API Security	43
PAM	60
SOAR	27
AIM	5
DAM	24

Source: Survey Information

3.20 Cybersecurity Regulations, Frameworks, and Compliance Standards for Banks

Although cybersecurity regulations are continually evolving to address the changing threat landscape, compliance standards remain largely consistent across industries to govern data handling, customer privacy, and cyber-attack prevention. Cybersecurity frameworks also serve as structured roadmaps that guide organizations in strengthening their data protection measures. Table 11 reveals that 35% of banks have obtained the PCI DSS compliance certificate to ensure data security for card-related operations. Additionally, 67% of banks have been awarded the ISO 27001:2013 certification for compliance with the Information Security Management System (ISMS). Only 13% of banks are ISO 9001 certified, meeting the requirements of an effective Quality Management System (QMS), and just 10% have received Tier certifications for their data centers. The Capability Maturity Model Integration (CMMI) is designed to assess the maturity of an organization's processes and offer guidance for improvement, ultimately aiming to enhance product and service quality. Surprisingly, no banks have yet achieved CMMI certification.

Table-11: Global Certifications Achieved by Banks

Type of Global Certifications	% of Banks
PCI DSS	35
ISO 27001	67
ISO 9001	13
DC Certification	10

Source: Survey Information

3.21 Cost Minimization for IT Systems and IT Operations in Banks

The survey found that about 97 percent of banks have an IT cost minimization plan, which was the same in 2022 but 92% in 2020. Table-12 shows various factors that are considered by banks to reduce the cost of IT operations in Banks. Banks mostly use virtualization, virtual meetings and training programs to reduce IT costs. However, banks have many other scopes to reduce cost; they can focus on Clouding, Outsourcing/Sharing, Augmented Resource Hiring, and Process Simplification to achieve their cost minimization strategy.

Table-12: Factors that are considered to reduce the Cost of IT Operation in Banks

Factors	% of Banks			
	2019	2020	2022	2024
Virtualization	100	100	100	100
Hosting services	15	18	31	32
Private Clouding	27	28	39	43
Public Clouding	20	20	17	17
Outsourcing/Sharing	33	35	31	32
Open source for Desktop OS and Office software	27	27	19	19
Process Simplification	53	54	53	53
Change of Depreciation Method	7	7	22	22
Virtual Training Program	80	80	95	87
Virtual Official Meeting	80	80	95	87
Augmented Resource Hiring	-	-	-	9

Source: Survey Information

3.22 Virtualization and Clouding in Banks

The table (Table-13) represents the adoption of virtualization across various areas in banks. In 2024, the adoption of virtualization technologies across different banking areas exhibits a varied landscape. Operating System (OS) virtualization remains widely implemented, with 90% of banks adopting it. Application virtualization shows a steady upward trend, reaching 33% in 2024 its highest level over the recorded years indicating growing interest in isolating and streamlining software deployment.

Network virtualization continues to gain momentum, increasing to 30% in 2024 from just 8% in 2018. This upward trajectory reflects banks' increasing demand for agile and scalable network infrastructure. Hardware virtualization remains consistently high, with 67% adoption in both 2022 and 2024, showing sustained reliance on this foundational virtualization approach.

In contrast, desktop virtualization adoption remains relatively low, recorded at only 7% in 2024, a slight decline from 8% in 2022, suggesting limited implementation or perceived benefit in this area. Storage virtualization experienced a notable decline in 2024, dropping to 33% from a high of 43% in 2022, indicating a possible shift in storage strategies or adoption of alternative technologies.

Overall, the 2024 data reflect a mature virtualization environment in banks, with strong adoption in OS and hardware virtualization, and growing interest in application and network virtualization, while desktop and storage areas show relatively modest or declining trends.

Table-13: Areas of Virtualization used by Banks

Areas of Virtualization	% of Banks				
	2018	2019	2020	2022	2024
OS	37	71	71	89	90
Application	16	19	20	32	33
Desktop	4	4	6	8	7
Hardware	62	62	62	67	67
Network	8	14	18	27	30
Storage	20	24	26	43	33

Source: Survey Information

3.23 Virtualization Technology

The survey data (Table-14) reveals a continued and growing reliance on key virtualization technologies within the banking sector. VMware remains the most widely used platform, adopted by 90% of banks in 2024. This reflects a significant increase from 81% in both 2020 and 2022, and marks the highest adoption rate across the entire period surveyed.

Hypervisor-based virtualization also demonstrates consistent growth, reaching 67% adoption in 2024 an increase from 64% in 2022 and 46% in 2018. This upward trend highlights the enduring importance of hypervisor technology as a backbone for virtual infrastructure.

Container-based virtualization shows the most dramatic growth. While only 4–5% of banks used containers between 2018 and 2020, adoption surged to 21% in 2022 and further to 30% in 2024. This sharp rise suggests that banks are increasingly recognizing the benefits of scalable, and flexible containerized environments, likely driven by cloud-native and DevOps approaches.

Overall, the data indicate a strong and increasing adoption of virtualization technologies in banks, with VMware and hypervisors maintaining leadership, while containers rapidly emerge as a transformative tool in modern banking IT environments.

Table-14: Kinds of Virtualization Technology Used in Banks

Virtualization Technology Used	% of Banks				
	2018	2019	2020	2022	2024
Hypervisor	46	52	47	64	67
Containers	4	4	5	21	30
VMware	80	81	81	81	90

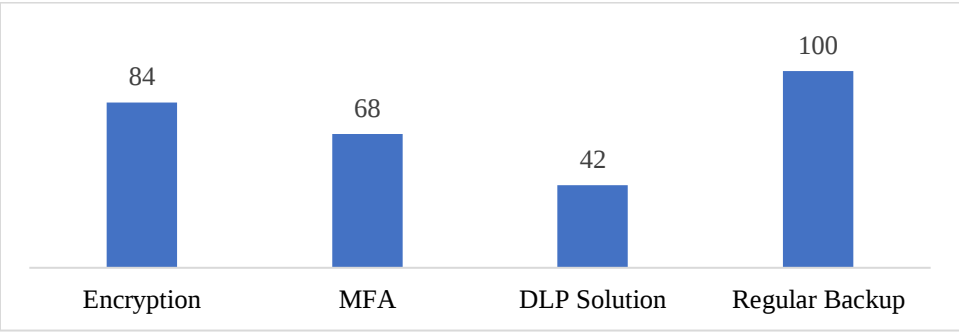
Source: Survey Information

3.24 Data Handling Mechanism for Regulatory Compliance

All the surveyed banks ensure that they conduct regular compliance audits in adherence to relevant laws and standards, which is indeed a very positive indication. The methods they use to handle sensitive data in order to meet legal and regulatory requirements is shown in figure-16. Regular backup is done by 100% banks, but only 42% bank use DLP solution. DLP is an

effective cybersecurity tool that helps banks prevent sensitive data from being lost, misused, or accessed by unauthorized users, is implemented by only

Figure-16: Sensitive Data Handling Mechanism to Meet Legal and Regulatory Requirements



Source: Survey Information

3.25 IT Service Management Process and Tools

A formal IT Service Management (ITSM) process is a structured approach to manage IT services aligned with business needs. ITIL (Information Technology Infrastructure Library) is the most widely adopted framework for ITSM. Following table shows the percentage of banks uses different processes for IT service management.

Table-15: IT Service Management Process

Process	% of Banks
Problem Management	75.00
Change Management	90.62
Incident Management	90.62
New Deployment Management	50.00
Others	3.12

Source: Survey Information

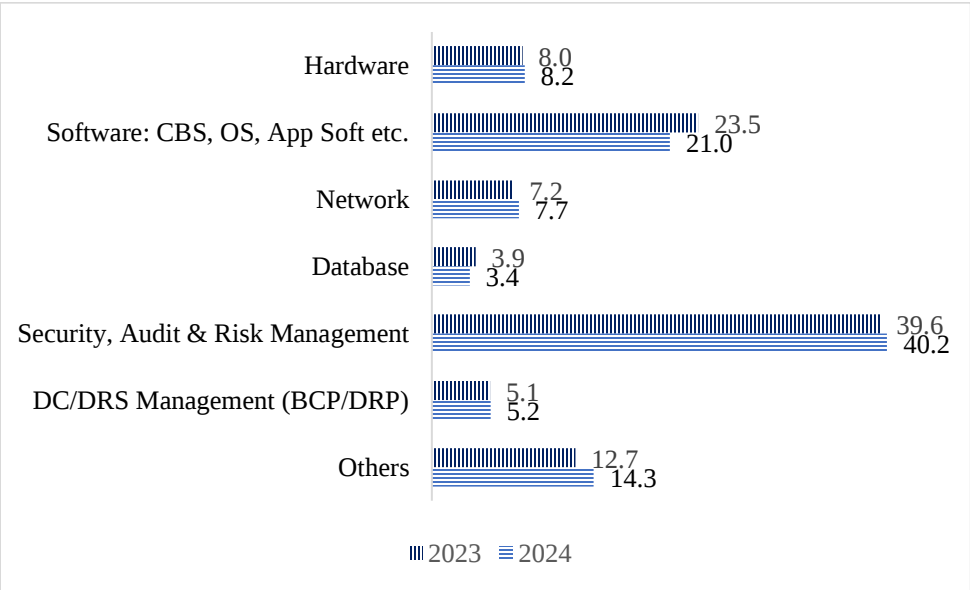
ITSM tools are software platforms that help organizations standardize, automate, and improve the delivery of IT services based on best practices like ITIL. They provide structured workflows, centralized data, and automation capabilities to manage incidents, changes, assets, and more. Almost all banks use different service management tools for managing IT

service requests and incidents. The study reveals that 37.5 percent banks use automated/ software-based tools, 25 percent use manual tools and rest of the banks use hybrid tools.

3.26 Training

In 2023 and 2024, the percentage of IT employees who received training remained nearly constant 24.86% in 2023 compared to 24.79% in 2024 despite a rise in the overall number of IT staff from 8,126 to 8,294. However, the distribution of training across categories revealed notable changes. Training in Software (CBS, OS, App Software, etc.) declined from 23.5% to 21%, and Database training also saw a slight decrease from 3.9% to 3.4%. In contrast, categories such as Hardware (8.0% to 8.2%), Network (7.2% to 7.7%), and Others (12.7% to 14.3%) saw modest increases. Notably, Security, Audit & Risk Management training slightly increased from 39.6% to 40.2%, reflecting sustained focus on risk and compliance. These changes suggest a gradual realignment of training efforts to meet shifting technological and organizational needs.

Figure-17: Distribution of ICT Training Provided (% of Total Employees got ICT Training)



Source: Survey Information

Between 2023 and 2024, IT training delivery experienced a modest shift in both format and platform preferences. In 2023, physical training accounted for 28.9% of sessions, while virtual training dominated at 71.1%. By 2024, physical training increased to 36.8%, with virtual training decreasing to 63.2%, suggesting a gradual return to in-person formats likely driven by evolving organizational policies or renewed emphasis on face-to-face interaction.

Regarding virtual platforms in 2023, Zoom was the predominant choice, representing 51.0% of virtual training sessions. Microsoft Teams followed with 21.6%, Webex at 13.7%, Google Meet at 11.8%, and a small fraction (2.0%) used other platforms. WhatsApp, Facebook Live, and Messenger were not utilized for training purposes.

In 2024, platform preferences shifted slightly. Zoom remained the leader at 49.1%, though its share declined marginally. Microsoft Teams fell to 20.0%, Google Meet to 10.9%, and Webex to 12.7%. Notably, the "Other" category grew significantly from 2.0% to 7.3%, indicating diversification and a willingness to adopt newer or alternative virtual training platforms. WhatsApp, Facebook Live, and Messenger continued to see no usage, reflecting a consistent organizational preference for formal, enterprise-grade tools in virtual IT training delivery.

Table-16: Number of Employees Attended ICT Training/Workshop/Seminar/Discussion Programs

Level of Employees/Officials/Executives	Number of Employees/Executives	
	2023	2024
Employees from Business [Junior officer to Executive Officer/SPO]	32383	29507
Middle Management [AVP/AGM to SEVP/GM]	4796	1595
Senior /Executive Management [DMD, AMD and MD/CEO]	40	37
Top Management/Authority [Members of BoDs]	7	10
Employees from ICT Wing/Departments	1700	1681
Total	38926	32830

Source: Survey Information

In 2023 and 2024, participation in ICT-related training, workshops, and open discussion programs varied across different organizational levels, reflecting both strategic priorities and engagement trends. In 2023, a total of 38,926 employees took part in such programs, while participation declined to 32,830 in 2024. The majority of participants were employees from business functions at junior to senior principal officer level, numbering 32,383 in 2023 and decreasing to 29,507 in 2024. Middle management participation saw a sharper drop, from 4,796 to 1,595, indicating a potential shift in focus or availability. Senior and executive management involvement remained relatively stable, with 40 participants in 2023 and 37 in 2024. Participation by top management, including board members, increased slightly from 7 to 10, suggesting growing leadership attention to ICT matters. Employees from dedicated ICT wings or departments maintained steady engagement, with 1,700 in 2023 and 1,681 in 2024, highlighting consistent technical involvement despite the overall reduction in total participation.

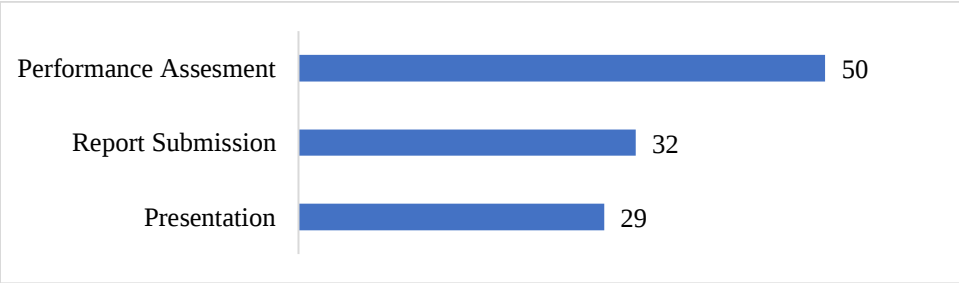
3.27 Post Training Assessment

Among the organizations that reported having a post-training assessment mechanism (55%), a variety of methods are used to evaluate the effectiveness of training and the performance of participating employees. Common practices include conducting short assessments or quizzes immediately after training to measure knowledge retention, and using structured exams sometimes through Learning and Assessment Management Systems (LAMS). Several organizations require trainees to deliver presentations or face viva sessions to demonstrate their understanding. Others employ performance reviews, feedback surveys (both online and offline), and track attendance and participation logs. Some institutions conduct formal exams with results shared with HR and line managers for performance tracking. A few banks link assessments with rewards or annual performance appraisals. While mechanisms vary, the emphasis is clearly on practical application, knowledge evaluation, and integration of training outcomes into broader performance management systems.

Following the completion of training by employees, organizations adopt several initiatives to ensure knowledge transfer and assess impact, though

the extent of implementation varies. Among the 55% banks who apply post training evaluation methods, only 29% of organizations require trainees to deliver a presentation within their respective departments, and 32% mandate the submission of a report summarizing key learnings from the training or workshop. However, a more proactive approach is evident in performance evaluation, as 55% of organizations assess the skill development or performance improvement of trainees post-training. This indicates a stronger emphasis on measuring tangible outcomes rather than relying solely on self-reporting or peer knowledge sharing.

Figure-18: Post Training Assessment (% of Banks)



Source: Survey Information

3.28 Challenges Faced by Banks to Move Towards Cashless Society

Table-17 summarizes the opinions of IT Heads regarding the challenges faced by banks to move in cashless society.

Table-17: Challenges Faced by Banks to Move Towards Cashless Society

SL. No.	Challenges	Details	% of Banks
1	Infrastructure	One of the primary challenges that Bangladesh faces in moving towards a cashless society is the lack of infrastructure. To move towards the cashless society, a robust and reliable digital infrastructure is required, which include high speed Internet connectivity, secure networks, and sufficient power supply. Banks need to invest in this infrastructure to ensure that their customers always have access to digital payment and service. In rural areas of Bangladesh, there may be limited access to reliable internet connectivity and infrastructure to support digital payments. This may hinder the adoption and usage of cashless payment systems in these areas. For a cashless society to be successful, a wide range of merchants,	86

		including small businesses and local vendors, need to accept digital payments. Swipe machines are expensive and only viable for the few merchants only. The QR payment has not been deployed nationwide. Huge budgetary allocation for adoption of cashless technologies and security issues is also a big concern.	
2	Regulatory and Policy Frameworks	The regulatory framework around digital payments is still evolving in Bangladesh. Bangladesh will need to develop and implement regulatory and policy frameworks to govern cashless payments, money laundering, terrorist financing and protect consumers' rights. This will require collaboration between government agencies, financial institutions, and other stakeholders.	85
3	Financial Inclusion and Financial Literacy	Significant portion of people in Bangladesh remains unbanked, especially large amount of low-income people do not have bank or MFS account. Another significant challenge is limited financial literacy among the population. Many people in Bangladesh do not understand how to handle finance and use digital payment systems.	80
4	Privacy, Security and Trust	Digital payment methods may be vulnerable to cyber-attacks, fraud, and data breaches. This could result in financial losses, identity theft, and other security risks. As more financial transactions are conducted digitally, the risk of cybersecurity threats such as hacking and identity theft increases and the security of electronic payment systems is critical. The country needs to establish robust security measures to protect against fraud and hacking. Digital payment systems are vulnerable to system failures and downtime, which can cause significant disruptions to financial transactions. A cashless society relies heavily on technology, which can be subject to failures and disruptions. This could result in inconvenience, financial losses, and other challenges. It is necessary to have backup systems in place to minimize the impact of such outages.	80
5	Dependence on Cash and Resistant to Change	Cash has been a dominant payment method in Bangladesh till now. And there is a strong cultural preference and strong customer demand for using cash. People may feel more comfortable with physical money as it has been a part of their lives for a long time. Some people, mainly illiterate and senior citizens, are resistant	76

		to change and prefer the familiarity and convenience of cash transactions.	
6	Awareness and Education	In Bangladesh, there is a lack of familiarity and hesitancy among many people regarding digital payments, which poses a barrier to the adoption and usage of cashless payment systems. It is crucial for banks to take the initiative in educating their customers about the advantages of going cashless and how to safely and securely utilize digital payment systems. Providing education and training is essential to ensure that individuals are well-informed about the effective use of digital payment systems. This includes understanding safety measures, secure practices, and troubleshooting connectivity issues. It is particularly challenging to promote digital literacy and educate individuals who may have limited knowledge or experience with digital technologies, especially among the elderly and those from low-income groups.	64
7	Interoperability	To achieve a cashless society, payment systems must be interoperable, meaning they can communicate and work seamlessly with each other. Bank must work together to ensure that their payment systems are compatible and can be used by all consumers, regardless of which bank they belong to.	62

Source: Survey Information

4.0 Challenges of IT Operations in Banks and Role of the Central Bank (BB)

4.1 Challenges Related to IT Operations in Banks

Executives of IT division face different challenges or difficulties to manage IT system proficiently. The list of challenges (given by HoITs of sampled banks) are summarized in Table–18.

Table–18: Views of Heads of ITD of Different Banks

Sl. No.	Category	Key Suggestions	% of Banks
1	Cybersecurity & Risk Management	Implement Zero Trust Architecture; enforce Multi-Factor Authentication (MFA); deploy Endpoint Detection and Response (EDR) and Data Loss Prevention (DLP) tools; use SIEM/SOAR systems for real-time threat response; encrypt sensitive data; ensure timely patch management.	85%
2	Monitoring & Audits	Establish 24/7 Security Operations Centers (SOC); conduct continuous monitoring of systems; perform regular vulnerability assessments, penetration testing (VAPT), and red/blue team security exercises; track logs and incidents for audit readiness.	75%
3	Disaster Recovery & Business Continuity	Develop and test robust Disaster Recovery (DR) plans; perform regular data backups with offsite storage; implement failover systems to ensure minimal downtime during outages; conduct DR drills.	73%
4	Employee Training & Awareness	Provide ongoing cybersecurity awareness training for all staff; offer technical upskilling; promote industry-standard certifications such as ISO 27001 and NIST; conduct phishing simulations and awareness assessments.	70%
5	Governance & Compliance	Adopt IT governance frameworks like ITIL and COBIT; align practices with Bangladesh Bank guidelines; ensure compliance with international standards such as ISO 27001, PCI DSS, and GDPR; conduct regular compliance audits.	60%
6	Automation & Operational Efficiency	Use AI and machine learning for fraud detection and operational analysis; implement robotic process automation (RPA) for	55%

		repetitive tasks; adopt DevOps practices for software deployment; set KPIs for continuous improvement.	
7	Vendor & 3rd Party Risk Management	Evaluate third-party security controls before onboarding; enforce Service Level Agreements (SLA) and Annual Maintenance Contracts (AMC); monitor vendor systems; define clear ICT security benchmarks for integration.	55%
8	Emerging Technologies & Innovation	Pilot and gradually adopt AI, ML, blockchain, and hybrid cloud infrastructure; test innovations in sandbox environments; use advanced analytics for personalized banking services.	50%
9	Customer Protection & Experience	Raise digital banking safety awareness among customers; use fraud detection tools; ensure secure, user-friendly mobile and online banking platforms; deploy AI chatbots for improved service.	45%
10	Infrastructure Redundancy &	Ensure redundancy of critical IT systems and networks; maintain backup communication and power sources; secure physical IT environments; build a skilled and redundant IT workforce.	35%
11	Policy Government Support &	Request clearer policy direction and support from central bank; advocate for national-level cyber insurance, digital training funds, and uninterrupted internet and power connectivity for banking IT operations.	30%

Source: Survey Information

4.2 Role of Bangladesh Bank for Maintaining Better IT Operations in Banks

As a regulatory body, the contribution of the Central Bank in developing the automation process of banking system is undeniable. Through the formulation and circulation of proper ICT related policy and guidelines, BB helps our banking system in maintaining a robust IT system with a view to maintain reliable and secured IT operations in banks. Besides, due to rapid growth of digital and IT innovation in the area of banking products and services, the banking community expects more realistic and effective steps from BB. Opinions and expectations of

banks regarding the role of the Central Bank are summarized and presented in Table-19.

Table-19: Possible Roles of the Central Bank

Sl. No.	Category	Explanation	% of Banks
1	Policy Formulation & Regulatory Oversight	Bangladesh Bank may continue to issue and update IT governance, cybersecurity, fintech, and digital banking guidelines and circulars aligned with global standards like ISO 27001, PCI DSS, and NIST.	88%
2	IT Audit & Compliance Monitoring	The central bank may mandate regular IT and cybersecurity audits, enforce compliance, and require mandatory reporting of incidents or vulnerabilities and apply penalties for violations.	76%
3	Capacity Building & Training	Bangladesh Bank may organize training, certifications, and knowledge sessions (local and international) for IT teams, CISOs, and leadership to build technical capacity.	66%
4	Cybersecurity & Incident Response	Bangladesh Bank may establish a national CERT, enable centralized threat intelligence sharing, and support banks in real-time cyber incident response coordination.	63%
5	Standardization of Best Practices	The central bank should promote uniform standards like ISO 27001, COBIT, ITIL, and NIST across the banking industry for consistency and control.	60%
6	Support for Innovation & Emerging Tech	Bangladesh Bank might promote the safe adoption of technologies like AI, cloud, and IoT through supportive policies.	57%
7	Interbank Collaboration & Knowledge Sharing	The central bank may establish platforms, conferences, and forums where banks can share real-life challenges, solutions, and innovations.	54%
8	Infrastructure Support & Interoperability	The central bank may help banks develop DRS in seismic zones, coordinate with utility providers, and ensure seamless integration of systems like RTGS, BEFTN, BACH and mobile platforms.	51%
9	Incentives for IT Investment	Bangladesh Bank could offer financial incentives, refinancing schemes, or tax breaks for banks investing in IT modernization, security, or green IT.	49%

Source: Survey Information

5.0 Summary of Observations and Recommendations

One, IT Budgeting and Sector-wise Allocation: Strategic planning for IT investments must be aligned with the objectives of digital banking and the requirements set by regulators. A benchmark for the minimum ratio of IT budget to total budget should be established for banks to guarantee ongoing digital advancement. The survey indicates that the budget distribution for audit, cybersecurity, and training is significantly lower compared to other ICT sectors such as software, hardware, and networks. IT spending must be recalibrated to increase funding for training, audits, and cybersecurity, which are currently underfunded. Management should understand that investment in IT security is not an expenditure.

Governance reforms should be enacted to address financial instability, thus enabling reinvestment in IT and cybersecurity. Bank should increase IT investment and decrease operational expenditure. Promoting agile reallocation models is crucial, allowing the budget to be shifted towards high-risk areas like data security or fraud detection as threats evolve.

Two, IT Department Size and Workforce Structure: Staffing in security, audit, and MIS units should be increased, as these areas are currently underrepresented despite being critical for compliance and risk. Minimum staffing benchmarks should be set in key roles such as IT/IS audit, DBA, and cybersecurity functions. A future-ready workforce roadmap should be developed, with cross-skilling in AI, cloud, and fintech being emphasized. Bangladesh Bank may develop a standard IT organogram in this regard.

Three, Augmenting the Setup of CRM in Rural Areas: The benefits of providing CRM service are already recognized. In Bangladesh, 52% of banks have installed CRMs, and 6,970 CRMs have been set up by these banks as of 2024, compared to 126 in 2018. Though in recent years, the number of CRM is increasing in rural areas, a big portion of CRMs are still in urban areas, which means that people of rural and semi-urban areas are not getting the full benefit of this channel. So, bank management should think about this and take measures to rise the number of this ADC, particularly in rural areas. Also, bank should use AI based CRM software to further smoother services.

Four, Core Banking Software: Given the evolving landscape of Core Banking Software (CBS) adoption in Bangladesh, it is recommended that banks strategically invest in dual CBS systems that support both conventional and Islamic banking operations. The significant rise in dual-system usage from 40% in 2022 to 55% in 2024 highlights a growing demand for operational flexibility and broader customer coverage. Additionally, banks should critically assess their CBS sourcing strategies. While local and foreign CBS solutions dominate the market, there is potential for enhancing in-house capabilities and exploring joint-venture development to reduce dependency on external vendors, lower long-term costs, and tailor systems to local regulatory and market needs. A balanced and future-ready approach to CBS adoption can improve efficiency, compliance, and competitiveness in a rapidly digitalizing financial ecosystem.

Five, Use of Innovative Technology to Accelerate the Operational Capacity of Banks: In light of the evolving technological landscape within the Bangladeshi banking sector, it is recommended that banks adopt a more strategic and data-driven approach to technology investment. The increasing adoption rates of AI, RPA, ML, NFC, and Microservices between 2022 and 2024 reflect a positive trend toward digital transformation, particularly in enhancing customer experience and operational efficiency. As an example, banks can use AI to choose an appropriate borrower. However, the sharp decline in Blockchain usage and the relatively low introduction of IoT indicate potential areas that require further evaluation and targeted investment. Banks should prioritize technologies like Machine Learning and IoT, which are gaining global relevance, while also reassessing the practical challenges associated with Blockchain integration. A balanced portfolio of mature and emerging technologies will help banks stay competitive, agile, and responsive to future banking demands.

Six, DRS Management for Uninterrupted IT Operations in Banks: It is an alarming issue that 52% of NDCs and 76% of FDCs are not hot; they are operating in either warm or cold mode. In that case, banks might not be able to run business operations or critical services immediately if any disaster occurs.

Banks should take immediate action to set up Hot DRS in separate seismic zones. Both Govt. and BB may take initiatives to provide robust infrastructure and support services for maintaining reliable operations from DRS. Using a proper scientific plan (virtualization of server/storage, KVM switch, smart rack, and other standard solutions), banks can ensure optimum utilization of space and reduce the area of DC/DRS to minimize the operating cost. For effective management of DC/DRS operations, international certification is a vital issue. Very few banks achieved this certification (Only 3% of banks have Tier-4 DC). Banks should achieve global certification of Tier 3 or 4 DC to ensure fully fault-tolerant and uninterrupted e-banking operations and employ sufficient Certified Data Centre Design Professionals (CDCDPs) to handle the DC management properly.

Seven, Replication Mode and Live Testing of Business Operation from DRS: Mode of replication of NDC with DC should be in synchronous (active-active) mode so that banks can run live operations from NDC to ensure optimum utilization of IT resources/assets. Accordingly, banks will be able to restart the live operation of their banking business quickly if a real disaster occurs. Only 44% and 15% of banks support synchronous replication mode with NDC and FDC, respectively. According to best practice, banks should maintain at least one DRS (NDC or FDC) operating in synchronous replication mode. Banks should have proper policies and guidelines for business continuity and disaster recovery management. Bank authority should have proper support and close monitoring to ensure the effectiveness of the policy related to ITDRP.

Regular and periodic testing of business operations from DRS is an important and crucial issue for a centralized online bank. This type of testing increases confidence and expertise in recovering data and business operations in case of any disaster. 54% of banks hesitate to test business operations from N-DC during working hours. Another important observation is that most of the local banks (90% banks) do not perform live tests of the whole business operations from DRS; they perform it partially. To reduce risk, banks should run live operations of the whole business function from DRS at least once a month on working days for the whole day (24 hours).

Eight, Cost Minimization Strategy of IT Operations: Information Technology (IT) assists banks in lowering operational expenses; however, it is equally crucial to minimize IT costs. Given that IT products and services tend to be costly, a significant portion of these offerings is outsourced and imported from overseas. The research indicates that 97 percent of banks have implemented a plan for IT cost reduction, an increase from 92% in 2020. The results demonstrate a steady and increasing trend among banks in adopting virtualization, cloud solutions, communication tools, process simplification, and virtual meeting/training programs. This transition towards more efficient and technologically sophisticated practices underscores the industry's ongoing efforts in digital transformation. Bank management should prioritize the integration of virtualization technologies and cloud services across all operational levels.

Nine, Developing and Implementing Technology Roadmap in Banks: While all banks assert that they possess an IT strategy, only a small number have a truly effective Technology Roadmap. This strategic document serves to align the bank's long-term IT strategy with its business strategy and objectives. Organizations driven by technology, such as Banks and Financial Institutions, must establish a clear and well-defined technology roadmap to facilitate digital transformation planning and ensure success, as well as to navigate the complexities of a highly competitive industry. By creating and successfully executing a technology roadmap, banks can harness technology to achieve their business goals, maintain a competitive edge, and fully embrace digital transformation. To achieve this, banks should cultivate skilled personnel and hire experienced professionals. Furthermore, bank management should possess insights and actively engage in this process.

Ten, Adoption of Cybersecurity Solution and Compliance Standards: Mandatory baseline security measures (such as VAPT, SIEM, PAM) must be implemented across all banking institutions. The encouragement of advanced tools like SOAR, DAM, and AIM should be prioritized, especially in banks that have elevated risk profiles. All banks must attain ISO 27001 and PCI DSS certifications as a fundamental requirement. Incentives ought to be established for obtaining BCMS and Tier certifications, particularly for banks that oversee critical infrastructure.

Comprehensive sector-wide readiness assessments should be carried out to facilitate the future implementation of data privacy laws equivalent to GDPR.

Eleven, Incident Response and Patching Practices: A mandatory patch management guideline may be issued by Bangladesh Bank, with preference given to the latest stable versions (N), unless documented risk exists. Quarterly audits of patch and system update compliance should be enforced. National capability standards should be met by CIRT teams, with support provided through simulation-based training.

Twelve, Data Management and Security: The broader adoption of business intelligence (BI) and data warehouses should be promoted for data-driven decision-making. Multi-Factor Authentication (MFA) for privileged access should be mandated across 100% of banks. Replication strategies should be standardized with clear guidance on synchronous and asynchronous usage to ensure resilience.

Thirteen, ICT Certifications among IT Employees: A minimum percentage of certified IT personnel (e.g., 40%+) with industry-recognized certifications should be maintained by each bank. Career progression incentives should be introduced and tied to the achievement of professional IT certifications. Banks may develop a separate promotion policy for IT professionals which can ensure the retention of expert IT professionals.

Fourteen, Developing a Cashless Society: To create a cashless society, various future pathways can be explored. A significant 74% of banks believe that prioritizing awareness and education regarding the digital payment system is essential. Collaboration among governments, financial institutions, and technology companies can lead to the initiation of extensive campaigns, training programs, and workshops aimed at educating the public about the advantages and procedures associated with cashless transactions.

Furthermore, 80% of banks assert that improving financial inclusion and literacy is vital. Initiatives should be undertaken to ensure that underserved communities gain access to digital financial services, alongside enhancing

financial education programs to equip individuals with the necessary knowledge and skills for engaging in digital payments.

Moreover, 88% of banks concur that the development of infrastructure must persist, particularly with an emphasis on broadening internet connectivity, mobile networks, and payment systems, especially in rural regions. This approach will guarantee that all societal segments can engage in the cashless ecosystem. According to 80% of banks, it is imperative to protect privacy, security, and trust by instituting strong cybersecurity measures, data protection laws, and regulations concerning consumer rights.

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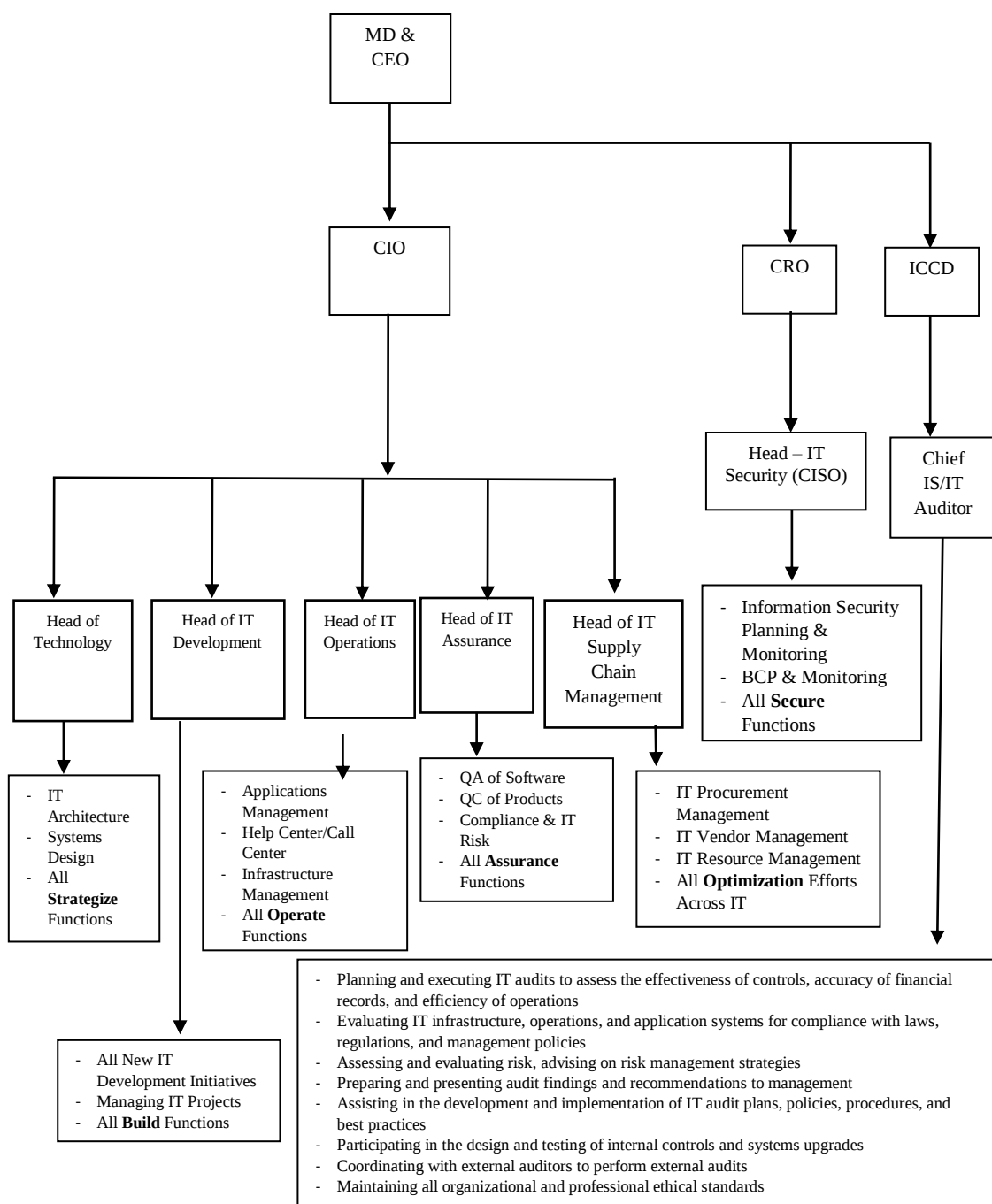
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Appendices

Appendix-1: List of Respondent Banks

S/L	Bank Name	S/L	Bank Name
1	Islamic Bank Bangladesh PLC	18	Prime Bank PLC
2	The City Bank	19	Pubali Bank PLC
3	Export Import Bank of Bangladesh	20	Social Islami Bank PLC
4	Mutual Trust Bank PLC	21	Eastern Bank PLC
5	ONE Bank PLC	22	United Commercial Bank PLC
6	Shimanto Bank PLC	23	AB Bank PLC
7	Southeast Bank PLC	24	First Security Islami Bank PLC
8	Mercantile Bank PLC	25	Trust Bank PLC
9	IFIC Bank PLC	26	NCC Bank PLC
10	BRAC Bank PLC	27	NRBC Bank PLC
11	Al-Arafah Islamic Bank PLC	28	SBAC Bank PLC
12	Bank Asia PLC	29	The premier Bank PLC
13	Community Bank Bangladesh PLC	30	Uttara Bank PLC
14	Dutch-Bangla Bank PLC	31	Commercial Bank of Ceylon
15	HSBC Bangladesh	32	Rupali Bank PLC
16	Bangladesh Development Bank PLC	33	Janata Bank PLC
17	Bangladesh Krishi Bank		

Appendix 2: An Ideal IT Organizational Structure of a Bank



Source: Author's Survey and IT Governance Series, IDRBT, India

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