

Information & Communication Technology (ICT) Policy
of
Karmasangsthan Bank

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CHAPTER 01

1 Introduction:

Banking environment has become highly competitive today. To be able to survive and grow in the changing market environment banks are going for the latest technologies, which is being perceived as an 'enabling resource' that can help in developing learner and more flexible structure that can respond quickly to the dynamics of a fast changing market scenario. It is also viewed as an instrument of cost reduction and effective communication with people and institutions associated with the banking business. Information and communication technology (ICT) has become a powerful tool in the fight against world poverty, providing developing countries with an unprecedented opportunity to meet vital development goals, such as poverty reduction, far more effectively than before. Our country will succeed in bridging the digital divide by harnessing the potential of ICT can look forward to enhancing economic growth, and improving human welfare and good governance practices. The Karmasangsthan Bank (KB) recognizes that ICT is a powerful force in shaping the social and economic development of the Country. KB must help its clients benefit from the new opportunities created by ICT and is committed to helping bridge the growing digital nation.

Now a day, Banks are exposed to a variety of operational and transactional risks, including crime, employment fraud and natural disaster. Additionally, because of the nature and amount of information gathered regarding the financial transactions of its customers and the extensive use of technology to process this information, Bank is exposed to specific information and technology risks. Karmasangsthan Bank (Here in after called as 'Bank') has prepared this revised ICT Security Policy to use as a strong guideline to comply with the level of its ICT operation.

1.1 Objectives

Information and Communication Technology is related to both logical and physical existence and protection of data, applications, computer, network and associated ICT equipment. ICT policy also covers the security and ensures the environmental support and related equipment which is necessary to banking and business activities & communication systems. A comprehensive ICT policy is thus essential for proper and lawful development, management, maintenance, security and uses of ICT assets. The primary objectives of the Policy are:

- a) To help the Bank for secured setup of its ICT infrastructure;
- b) To establish a secured environment for the processing of data;
- c) To establish a holistic approach for ICT Risk management;
- d) To establish a procedure for Business Impact Analysis in conjunction with ICT Risk Management;
- e) To aware stakeholders' roles and responsibilities for the protection of information;
- f) To prioritize information and ICT systems and associated risks those need to be mitigated;
- g) To establish appropriate project management approach for ICT projects;
- h) To aware and train the users associated with ICT activities for achieving the business objectives;

- i) To provide paperless services and establish "Green Banking";
- j) To define procedure for periodic review of the policy;
- k) To identify information security risks and their management;
- l) To make all kinds of Banking services easier.
- m) To ensure the best practices of the usage of technology.

1.2 Scope

This policy is applicable to the Bank's ICT systems and all activities and operations required ensuring data security including facility design, physical security, network security, disaster recovery and business continuity plan, use of hardware and software, data disposal, protection of copyrights and other trade related aspects of intellectual property rights. This policy also provides all related personnel of the bank with clear instruction of their responsibilities in managing and using operational systems, information, resources and all related equipment. This policy covers all aspects of information that are electronically generated, received, stored, printed, scanned and typed.

1.3 ICT Infrastructure level in Karmasangsthan Bank

Centralized ICT operation for managing core banking application solution through Central Data Center (CDC)/ Server. With backup assets for continuation of critical services including Disaster Recovery Site (DRS)/Secondary Data Center to which all controlling offices, branches and booths are connected through WAN/ VPN with 24 x 7 hours attended operation.

All departments of Head Office, branches/ RM offices/ Divisional offices and Divisional audit offices are connected with Internet.



CHAPTER 02

2 ICT Security Management

ICT Security Management must ensure that the ICT functions and operations are efficiently and effectively managed. Management ensures standard policy to prevent unauthorized physical access, damage and interference to data centers and information system. ICT Security Management deals with Roles and Responsibilities, ICT Security Policy, Documentation, Internal and External Information System Audit, Training and Awareness, Insurance or Risk coverage fund.

2.1 Roles and Responsibilities

Well-defined roles and responsibilities of Board and Senior Management are critical while implementing ICT Governance but clearly-defined roles enable effective project control and expectations of organizations. ICT Governance that is Board of Directors, Managing Director, ICT Security Committee, Chief Information Officer (CIO), Chief Technology Officer (CTO), Chief Information Security Officer (CISO), Risk Management Committee, Chief Risk Officer and Business Executives.

2.1.1 Roles and responsibilities of Board of Directors

The roles and responsibilities of the Board of Directors are:

- a) Approving ICT strategy and policy documents;
- b) Ensuring that the management has placed an effective planning process;
- c) Endorsing that the ICT strategy is indeed aligned with business strategy;
- d) Ensuring that the ICT organizational structure complements the business model and its direction;
- e) Ensuring ICT investments represent a balance of risks and benefits and acceptable budgets;
- f) Ensure compliance status of ICT Security Policy.
- g) Ensuring periodic review of policy.

2.1.2 Roles and responsibilities of ICT Steering Committee

ICT Steering Committee needs to be formed with representatives from ICT, Risk, HR, Audit, Legal and other related Business units. The roles and responsibilities of this committee are:

- a) Monitor management methods to determine and achieve strategic goals;
- b) Aware about exposure towards ICT risks and controls;
- c) Provide guidance related to risk, funding, or sourcing;
- d) Ensure project priorities and assessing feasibility for ICT proposals;
- e) Ensure that all critical projects have a component for "project risk management";

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- f) Consult and advise on the selection of technology within standards;
- g) Ensure that vulnerability assessments of new technology are performed;
- h) Ensure compliance to regulatory and statutory requirements;
- i) Provide direction to architecture design and ensure that the ICT architecture reflects the need for legislative and regulatory compliance.

2.1.3 Roles and responsibilities of ICT Security Committee

ICT Security Committee needs to be formed with representative from ICT, ICT Security, Risk, Audit and Business units. The roles and responsibilities of this committee are:

- a) Ensure development and implementation of ICT security objectives, ICT security related policies and procedures;
- b) Provide ongoing management support to the Information security processes;
- c) Ensure continued compliance with the business objectives, regulatory and legal requirements related to ICT security;
- d) Support to formulate ICT risk management framework/process and to establish acceptable ICT risk thresholds/ICT risk appetite and assurance requirements;
- e) Periodic review and provide approval for modification in ICT Security processes.

2.2 ICT Policy, Standard and Procedure

2.2.1 Bank has formulated this 'ICT Security Policy' complied with Bangladesh Bank ICT Security Guideline and got approval by the Board. The policy covers common technologies such as computers and peripherals, data and network, applications and other specialized ICT resources. Our service delivery depends on availability, reliability and integrity of its information technology system. Therefore, Bank has adopted appropriate controls to protect its information system. The senior management of the bank has expressed commitment to ICT security by ensuring continuous awareness and training program for each level of staff.

2.2.2 The policy requires regular update to deal with evolving changes in the ICT environment within the Bank

2.2.3 Bank has engaged ICT security professional employed in separate ICT security department/unit/cell for improved and impartial dealing with security incidents, policy documentation, inherent ICT risks, risk treatments and other relevant activities.

2.2.4 For noncompliance issues, compliance plan shall be submitted to Bangladesh Bank as per their instructions for taking dispensation. Dispensation shall be for a specific period of time.

2.3 Documentation

The systems already in place and to be developed further to meet future requirements and should be documented according to standards set by the management. Any changes in the systems should also be appropriately reflected in the documents to facilitate further improvements in the systems design. Complete technical and user documentation must be provided for the

systems together with regular updates in hard and soft copy form. The following should be documented properly:

- 2.3.1 An organogram chart for IT & MIS Department/ Regional office's /Divisions.
- 2.3.2 Branch organogram chart with ICT support unit/section/personnel (business/ICT)
- 2.3.3 All records of IT Personnel mentioning skill in special field.
- 2.3.4 A mandatory Service Level Agreement (SLA) vetted by skilled lawyer should be accomplished if any services/goods are taken from vendors & this document/agreement must be kept in safe vault.
- 2.3.5 Job Descriptions (JD) for each ICT personnel should be prepared.
- 2.3.6 A scheduled roster should be maintained for IT Operation.
- 2.3.7 Segregation of duties should be maintained for IT tasks
- 2.3.8 Fallback plans for various levels of system support personnel.
- 2.3.9 There should be clear instruction/guidelines relating to transfer, placement, promotion etc for IT personnel incorporated in Bank's personnel policies.
- 2.3.10 Relevant requisition forms of different ICT requests or services.
- 2.3.11 Detailed documentation of system design

2.4 Internal Information System Audit

Internal Information System Audit Team shall have sufficient IT Expertise/resources capable of conducting Information system audit and who will be from relevant departments other than IT & MIS Department.

IT experts should have training on software packages/hardware, cyber security and the team accompanied by the General Audit team of Audit Division who will conduct audit in the branches to check fraud and forgery.

Internal ICT System Audit should be done periodically at least once a year and the report must be preserved for inspection by Bangladesh Bank officials or Bank management or persons selected from the IT & MIS Division as and when required. An Annual System Audit plan shall be developed. Bank shall also ensure that audit issues are properly tracked and, in particular, completely recorded, adequately followed up and satisfactorily rectified.

Previous reports pertaining to Audit compliance (issues raised/resolved) should be preserved and appropriate measures should be taken to address the recommendations made in the last report.

2.5 External Information System Audit

2.5.1 Bank may engage external auditor(s) for their information systems auditing in-line with their regular financial audit.

2.5.2 The audit report shall be preserved for regulators as and when required.

2.6 Standard Certification

Bank may obtain industry standard certification related to their Information System Security, Quality of ICT Service Delivery, Business Continuity Management, Payment Card Data Security, etc.

2.7 Security Awareness and training

2.7.1 A detailed training including assessment must be undertaken to identify and document training needs.

2.7.2 Training should be coordinated with the implementation of any proposed systems so that no significant delays occur between commissioning and user training.

2.7.3 Before their deployment in ICT jobs, employees should be given adequate training on the aspects of importance and awareness of IT security.

2.7.4 All network users and controlling officers on database maintenance, hardware maintenance, network operation, application software maintenance, should be trained on operation and security procedures and should be aware of their importance before assuming their responsibilities.

2.7.5 A training database should be maintained to use for making decision relating to training and development of IT personnel.

2.7.6 Minimum level of business foundation training should be arranged for ICT personnel.

2.8 Insurance or Risk Coverage fund

2.8.1 Adequate insurance coverage or risk coverage fund shall be maintained so that costs of loss and/or damage of the ICT assets can be mitigated.

2.8.2 The risk coverage fund shall be maintained properly in the accounting system of Bank, if applicable.



CHAPTER 03

3 ICT Risk Management

The operation & activities of ICT Management are segregated and assigned in three major groups i) Software Development & Implementation, Operations, ii) Communications, Network & Hardware and iii) Project Implementation and maintenance. Similarly, the ICT personnel are divided into three groups to accomplish all related tasks although there is a provision to transfer internally whenever required or suggested by senior management. Although duties of each group members are segregated to balance the workload, all of them are wholly responsible for tasks assigned to each group.

3.1 ICT Risk Governance

- 3.1.1 Bank shall form an ICT Risk Management Committee to govern overall ICT risks and relevant mitigation measures.
- 3.1.2 The Bank shall define the Risk Appetite (amount of risk the Bank is prepared to accept to achieve its' objectives) in terms of combinations of frequency and magnitude of a risk to absorb loss e.g., financial loss, reputation damage.
- 3.1.3 The Bank shall define the Risk Tolerance (tolerable deviation from the level set by the risk appetite definition) having approval from the board/Risk Management Committee.
- 3.1.4 The Bank shall review and approve risk appetite and tolerance change over time; especially for new technology, new organizational structure, new business strategy and other factors require the enterprise to reassess its risk portfolio at a regular interval.
- 3.1.5 The Bank shall define the risk responsibilities to individuals for ensuring successful completion.
- 3.1.6 The Bank shall define the risk accountability applies to those who owned the required resources and have the authority to approve the execution and/or accept the outcome of an activity within specific ICT Risk processes. Ownership of risk stays with owner or custodian whoever is in better position to mitigate the identified risk for that specific ICT asset.
- 3.1.7 The Bank shall acknowledge all risks by Risk Awareness so that those are well understood and known and recognized as the means to manage them.
- 3.1.8 The Bank shall contribute to executive management's understanding of the actual exposure to ICT risk by Open Communication, enabling definition of appropriate and informed risk responses.
- 3.1.9 The Bank shall aware amongst all internal stakeholders of the importance of integrating risk and opportunity in their daily duties.
- 3.1.10 The Bank shall be transparent to external stakeholders regarding the actual level of risk and risk management processes in use.
- 3.1.11 The Bank shall begin Risk-aware Culture from the top with board and executives, who set direction, communicate risk-aware decision making and reward effective risk management behaviours.

3.1.12 ICT security department/unit/cell shall report status of identified ICT security risk to the ICT security committee and Risk Management Committee periodically as defined in the policy.

3.2 ICT Risk Assessment

Meaningful ICT risk assessments and risk-based decisions require ICT risks to be expressed in unambiguous and clear, business-relevant terms. Effective risk management requires mutual understanding between ICT and the business over which risk needs to be managed. All members of Board and executives must have the ability to understand and express how adverse events may affect business objectives.

- a) An ICT person shall understand how ICT-related failures or events can impact enterprise objectives and cause direct or indirect loss to the enterprise.
- b) A business person shall understand how ICT-related failures or events can affect key services and processes.

3.2.1 Bank shall establish business impact analysis needs to understand the effects of adverse events. Bank may practice several techniques and options that can help them to describe ICT risks in business terms.

3.2.2 The Bank shall practice the development and use of Risk Scenarios technique to identify the important and relevant risks among stall. The developed risk scenarios can be used during risk analysis where frequency and impact of the scenario are assessed.

3.2.3 The Bank shall define Risk Factors those influence the frequency and/or business impact of risk scenarios.

3.2.4 The Bank shall interpret risk factors as casual factors of the scenario that is materializing, or as vulnerabilities or weaknesses.

3.2.5 ICT security department/unit/cell shall conduct periodic ICT risk assessment of ICT related assets (process and system) and provide recommendation to risk owners for mitigation.

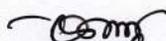
3.3 ICT Risk Response

Risk response is to bring measured risk in line with the defined risk tolerance level for the Bank. In other words, a response needs to be defined such that as much future residual risk as possible (usually depending on budgets available) falls within risk tolerance limits. When the analysis shows risks deviating from the defined tolerance levels, a response needs to be defined. This response can be any of the four possible ways such as Risk Avoidance, Risk Reduction/Mitigation, Risk Sharing/Transfer and Risk Acceptance.

3.3.1 Bank shall develop a set of metrics to serve as risk indicators for risks with high business impact are most likely to be Key Risk Indicators (KRIs).

3.3.2 The Bank shall give effort to implement, measure and report different indicators that are equivalent in sensitivity.

3.3.3 Selection of the right set of KRIs, Bank hall carry out:



- a) Provide an early warning for a high risk to take proactive action
- b) Provide a backward-looking view on risk events that have occurred
- c) Enable the documentation and analysis of trends
- d) Provide an indication of the risk's appetite and tolerance through metric setting.
- e) Increase the likelihood of achieving the strategic objectives
- f) Assist in continually optimizing the risk governance and management environment.

3.3.4 The Bank shall define risk response to bring risk in line with the defined risk appetite for the Bank after risk analysis.

3.3.5 The Bank shall strengthen overall ICT risk management practices with sufficient risk management processes.

3.3.6 The Bank shall introduce a number of control measures intended to reduce either of an adverse event and/or the business impact of an event.

3.3.7 The Bank shall share or reduce risk frequency or impact by transferring or otherwise sharing a portion of the risk, e.g. insurance, outsourcing.

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CHAPTER 04

4 ICT Service Delivery Management

ICT Service Management covers the dynamics of technology operation management that includes capacity management, request management, change management, incident and problem management etc. The objective is to set controls to achieve the highest level of ICT service quality by minimum operational risk.

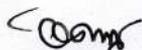
4.1 Change Management

- 4.1.1 Changes to information processing facilities and systems shall be controlled.
- 4.1.2 Bank shall prepare Business Requirement Document (BRD) which will cover the requirements of system changes and the impact that will have on business processes, security matrix, reporting, interfaces, etc.
- 4.1.3 All changes of business application implemented in the production environment must be governed by a formal documented process with necessary change details.
- 4.1.4 Audit trails shall be maintained for business applications.
- 4.1.5 Bank shall prepare roll back plan for unexpected situation.
- 4.1.6 User Acceptance Test (UAT) for changes and upgrades in application shall be carried out before deployment.
- 4.1.7 User Verification Test (UVT) for post deployment may be carried out.

4.2 Incident Management

An incident occurs when there is an unexpected disruption to the standard delivery of ICT services. The Bank shall appropriately manage such incidents to avoid a situation of mishandling that result in a prolonged disruption of ICT services.

- 4.2.1 The Bank shall establish an incident management framework with the objective of restoring normal ICT service as quickly as possible following the incident with minimal impact to the business operations. The Bank shall also establish roles and responsibilities of staff involved in the incident management process, which includes recording, analyzing, remediating and monitoring incidents.
- 4.2.2 It is important that incidents are accorded with the appropriate severity level. As part of incident analysis, the Bank may delegate the function of determining and assigning incident severity levels to a technical helpdesk function. The Bank shall train helpdesk staff to determine incidents of high severity level. In addition, criteria used for assessing severity levels of incidents shall be established and documented.
- 4.2.3 The Bank shall establish corresponding escalation and resolution procedures where the resolution timeframe is proportionate with the severity level of the incident.



- 4.2.4 The predetermined escalation and response plan for security incidents shall be tested on a periodic basis.
- 4.2.5 The Bank shall form an ICT Emergency Response Team, comprising staff within the Bank with necessary technical and operational skills to handle major incidents.
- 4.2.6 In some situations, major incidents may further develop adversely into a crisis. Senior management shall be kept apprised of the development of these incidents so that the decision to activate the disaster recovery plan can be made on a timely basis. Bank shall inform Bangladesh Bank as soon as possible in the event that a critical system has failed over to its disaster recovery system.
- 4.2.7 The Bank shall keep customers informed of any major incident. Being able to maintain customer confidence throughout a crisis or an emergency situation is of great importance to the reputation and soundness of the Bank.
- 4.2.8 As incidents may trail from numerous factors, Bank shall perform a root-cause and impact analysis for major incidents which result in severe disruption of ICT services. The Bank shall take remediation actions to prevent the recurrence of similar incidents.
- 4.2.9 The root-cause and impact analysis report shall cover following areas:
- a. Root Cause Analysis
 - i. When did it happen?
 - ii. Where did it happen?
 - iii. Why and how did the incident happen?
 - iv. How often had a similar incident occurred over last 2 years?
 - v. What lessons were learnt from this incident?
 - b. Impact Analysis
 - i. Extent of the incident including information on the systems, resources, customers that were affected;
 - ii. Magnitude of the incident including foregone revenue, losses, costs, investments, number of customers affected, implications, consequences to reputation and confidence;
 - iii. Breach of regulatory requirements and conditions as a result of the incident.
 - c. Corrective and Preventive Measures
 - i. Immediate corrective action to be taken to address consequences of the incident. Priority shall be placed on addressing customers' concerns.
 - ii. Measures to address the root cause of the incident.
 - iii. Measures to prevent similar or related incidents from occurring.
- 4.2.10 The Bank shall adequately address all incidents within corresponding resolution timeframes and monitor all incidents to their resolution.



4.3 Problem Management

While the objective of incident management is to restore the ICT service as soon as possible, the aim of problem management is to determine and eliminate the root cause to prevent the occurrence of repeated incidents.

4.3.1 Bank shall establish a process to log the information system related problems.

4.3.2 The Bank shall have the process of workflow to escalate any problem to a concerned person to get a quick, effective and orderly response.

4.3.3 Problem findings and action steps taken during the problem resolution process shall be documented.

4.3.4 A trend analysis of past problems shall be performed to facilitate the identification and prevention of similar problems.

4.4 Capacity Management

The goal of capacity management is to ensure that ICT capacity meets current and future business requirements in a cost-effective manner.

4.4.1 To ensure that ICT systems and infrastructure are able to support business functions, the Bank shall ensure that indicators such as performance, capacity and utilization are monitored and reviewed.

4.4.2 The Bank shall establish monitoring processes and implement appropriate thresholds to plan and determine additional resources to meet operational and business requirements effectively.



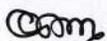
CHAPTER 5

5 Infrastructure Security Management

The ICT landscape is vulnerable to various forms of attacks. The frequency and malignancy of such attacks are increasing. It is imperative that Bank implements security solutions at the data, application, database, operating systems and networks to adequately address related threats. Appropriate measures shall be implemented to protect sensitive or confidential information such as customer personal information, account and transaction data which are stored and processed in systems. Customers shall be properly authenticated before access to online transactions, sensitive personal or account information.

5.1 Asset Management

- 5.1.1 Prior to procuring any new ICT assets, compatibility assessment (with existing system) shall be performed by the Bank.
- 5.1.2 All ICT asset procurement shall be complied with the procurement policy of Bank.
- 5.1.3 Each ICT asset shall be assigned to a custodian (an individual or entity) who will be responsible for the development, maintenance, usage, security and integrity of that asset.
- 5.1.4 All ICT assets shall be clearly identified and labeled. Labeling shall reflect the established classification of assets.
- 5.1.5 Bank shall maintain an ICT asset inventory stating significant details (e.g. owner, custodian, purchase date, location, license number, configuration, etc.).
- 5.1.6 Bank shall review and update the ICT asset inventory periodically.
- 5.1.7 Information system assets shall be adequately protected from unauthorized access, misuse or fraudulent modification, insertion, deletion, substitution, suppression or disclosure.
- 5.1.8 The Bank shall establish a Disposal Policy for information system asset protection. All data on equipment and associated storage media must be destroyed or overwritten before sale, disposal or re-issue.
- 5.1.9 Bank shall provide guidelines for the use of portable devices, especially for the usage at outside premises.
- 5.1.10 Bank shall provide policy to return back organizational assets from employees/external parties upon termination of their employment, contract or agreement.
- 5.1.11 Bank shall comply with the terms of all software licenses and shall not use any software that has not been legally purchased or otherwise legitimately obtained.
- 5.1.12 Outsourced software used in production environment shall be subjected to support agreement with the vendor.
- 5.1.13 Bank shall approve list of Software which will only be used in any computer.
- 5.1.14 Use of unauthorized or pirated software must strictly be prohibited throughout the Bank.





5.2 Desktop/Laptop Devices Controls

- 5.2.1 Desktop computers shall be connected to UPS to prevent damage of data and hardware.
- 5.2.2 Before leaving a desktop or laptop computer unattended, users shall apply the "Lock Workstation" feature. If not applied then the device will be automatically locked as per policy of Bank.
- 5.2.3 Confidential or sensitive information that stored in laptops must be encrypted.
- 5.2.4 Desktop computers, laptops, monitors, etc. shall be turned off at the end of each workday.
- 5.2.5 Laptops, computer media and any other forms of removable storage containing sensitive information (e.g. CDROMs, Zip disks, PDAs, Flash drives, external hard- drives) shall be stored in a secured location or locked cabinet when not in use.
- 5.2.6 Access to USB port for Desktop/Laptop computers shall be controlled.
- 5.2.7 Other information storage media containing confidential data such as paper, files, tapes, etc. shall be stored in a secured location or locked cabinet when not in use.
- 5.2.8 Individual users must not install or download software applications and/or executable files to any desktop or laptop computer without prior authorization.
- 5.2.9 Desktop and laptop computer users shall not write, compile, copy, knowingly propagate, execute, or attempt to introduce any computer code designed to self- replicate, damage, or otherwise hinder the performance of any computer system (e.g. virus, worm, Trojan etc).
- 5.2.10 Any kind of viruses shall be reported immediately.
- 5.2.11 Viruses shall not be cleaned/ deleted without expert assistance unless otherwise instructed.
- 5.2.12 User identification (ID) and authentication (password) shall be required to access all desktops and laptops whenever turned on or restarted.
- 5.2.13 Standard virus detection software must be installed on all desktop and laptop computers and shall be configured to check files when read and routinely scan the system for viruses.
- 5.2.14 Desktop and laptop computers shall be configured to log all significant computer security relevant events. (e.g. password guessing, unauthorized access attempts or modifications to applications or systems software.)
- 5.2.15 All computers shall be placed above the floor level and away from windows.

5.3 BYOD Controls

"Bring Your Own Device" (BYOD) is a relatively new practice adopted by banks and financial institutions to enable their employees to access corporate email, calendars, applications and data from their personal mobile devices like smart phones, tablet computers, etc. Bank shall be aware of the heightened security risks associated with BYOD due to challenges in securing, monitoring and controlling employees' personal devices.

- 5.3.1 Bank shall conduct a comprehensive risk assessment on the BYOD implementation to ensure that measures adopted sufficiently to mitigate the security risks associated with BYOD.

5.3.2 Bank shall not proceed with the BYOD implementation if they are unable to adequately manage the associated security risks.

5.3.3 BYOD is associated with a number of information security risks such as:

- a. Loss, disclosure or corruption of corporate data on Personally Owned Devices (PODs);
- b. Incidents involving threats to, or compromise of, the ICT infrastructure and other information assets (e.g. malware infection or hacking) of Bank;
- c. Noncompliance with applicable laws, regulations and obligations (e.g. privacy or piracy);
- d. Intellectual property rights for information created, stored, processed or communicated on PODs in the course of work for the Bank.

Due to information security risks associated with BYOD, employees who wish to opt-in to BYOD must be authorized to do so and must not introduce unacceptable risks onto the banks' networks by failing to secure their own equipment.

5.3.4 The Bank may implement appropriate forms of device authentication for PODs approved by authority, such as digital certificates created for each specific device.

5.3.5 The Bank has the right to control its information. This must include the right to backup, retrieve, modify, determine access and/or delete bank data without reference to the owner or user of the POD.

5.3.6 Any POD used to access, store or process sensitive information must encrypt data transferred over the network (e.g. using SSL or a VPN).

5.3.7 The employee's device shall be remotely wiped if the device is lost, or the employee terminates his/her employment, or ICT detects a data or policy breach, a virus or similar threat to the security of the bank's data and technology infrastructure.

5.4 Server Security Controls

5.4.1 Users shall have specific authorization for accessing servers with defined set of privileges.

5.4.2 Additional authentication mechanism shall be used to control access of remote users.

5.4.3 Inactive session shall be expired after a defined period of inactivity.

5.4.4 Activities of System Administrators shall be logged. Servers containing sensitive and confidential data may export activity logs to a central log host.

5.4.5 Bank shall maintain test server(s) to provide a platform for testing of configuration settings, new patches and service packs before applied on the production system.

5.4.6 Bank shall ensure the security of file sharing process. File and print shares must be disabled if not required or kept at a minimum where possible.

5.4.7 All unnecessary services running in the production server shall be disabled. Any new services shall not run in production server without prior testing.

5.4.8 All unnecessary programs shall be uninstalled from production servers.

5.4.9 In case of virtualization:

- a. Bank shall plan of setting limit on the use of resources (e.g., processors, memory, disk space, virtual network interfaces) by each VM.
- b. Host and guest Operating System (OS) must be updated with new/required security patches and other patches if necessary. Patching requirements shall also be applied to the virtualization software.
- c. Like physical servers, virtual servers need to be backed up regularly.
- d. Bank shall ensure that host and guests use synchronized time.
- e. File sharing shall not be allowed between host and guest OSs, if not required.

5.5 Data Center Controls

As critical systems and data of a Bank are concentrated and housed in the Data Center (DC), it is important that the DC is resilient and physically secured from internal and external threats.

5.5.1 Physical Security

- 5.5.1.1 Physical security shall be applied to the information processing area or Data Center. DC must be a restricted area and unauthorized access shall be strictly prohibited.
- 5.5.1.2 The Bank shall limit access to DC to authorized staff only. The Bank shall only grant access to the DC on a need to have basis. Physical access of staff to the DC shall be revoked immediately if it is no longer required.
- 5.5.1.3 Access authorization procedures shall be strictly applied to vendors, service providers, support staff and cleaning crews. The Bank shall ensure that visitors are accompanied at all times by an authorized employee while in the DC.
- 5.5.1.4 Access authorization list shall be maintained and reviewed periodically for the authorized person to access the Data Center.
- 5.5.1.5 All physical access to sensitive areas must be logged with purpose of access into the Data Center.
- 5.5.1.6 The Bank shall ensure that the perimeter of the DC, facility and equipment room are physically secured and monitored. The Bank shall employ physical, human and procedural controls for 24 hours such as the use of security guards, card access system, mantraps and surveillance system where appropriate.
- 5.5.1.7 Emergency exit door shall be available.
- 5.5.1.8 Data Center must have a designated custodian or manager in charge to provide authorization and to ensure compliance with Policy.



- 5.5.1.9 An inventory of all computing equipment, associated equipment and consumables housed in DC must be maintained by the manager or a delegate.
- 5.5.1.10 Where DC is operated by an outsourced service supplier, the contract between the bank and supplier must indicate that all the requirements of Policy regarding physical security must be complied with and that the Bank reserves the right to review physical security status at any time.
- 5.5.1.11 Where DC is operated by an outsourced service supplier, the responsibility for physical security lies with the supplier, but access to such facilities dedicated to bank use must be reviewed and authorized by the Bank.
- 5.5.1.12 The physical security of Data Center premises shall be reviewed at least once each year.

5.5.2 Environmental Security

- 5.5.2.1 Protection of Data Center from the risk of damage due to fire, flood, explosion and other forms of disaster shall be designed and applied. To build Data Center and Disaster Recovery Site in multi-tenant facilitated building is discouraged.
- 5.5.2.2 Layout design of Data Center including power supply and network connectivity shall be properly documented.
- 5.5.2.3 Development and test environment shall be separated from production.
- 5.5.2.4 Separate channels for data and power cables to protect from interception or any sort of damages shall be made in the data center.
- 5.5.2.5 Water detection devices shall be placed below the raised floor, if it is raised.
- 5.5.2.6 Any accessories or devices not associated with Data Center and powered off devices shall not be allowed to store in the Data Center. Separate store room must be in place to keep all sorts of unused and redundant IT equipments.
- 5.5.2.7 Closed Circuit Television (CCTV) camera shall be installed at appropriate positions of all sides for proper monitoring.
- 5.5.2.8 The sign of "No eating, drinking or smoking" shall be in display.
- 5.5.2.9 Dedicated office vehicles for any of the emergencies shall always be available on-site. Availing of public transport must be avoided while carrying critical equipments outside the bank's premises to avoid the risk of any causality.
- 5.5.2.10 Data Center shall have dedicated telephone communication.
- 5.5.2.11 Address and telephone or mobile numbers of all contact persons (e.g. fire service, police station, service providers, vendors and all ICT personnel) must be available to meet any emergency necessity.
- 5.5.2.12 Power supply system and other support units must be separated from production site and placed in secure area to reduce the risks from environmental threats.

- 5.5.2.13 Power supply from source (Main Distribution Board or Generator) to Data Center must be dedicated. Electrical outlets from these power sources for any other devices must be restricted and monitored to avoid the risk of overloading.
- 5.5.2.14 The following environmental controls shall be installed:
- a. Uninterrupted Power Supply (UPS) with backup units
 - b. Backup Power Supply
 - c. Temperature and humidity measuring devices
 - d. Water leakage precautions and water drainage system from Air Conditioner
 - e. Air conditioners with backup units. Industry standard air conditioning system shall be in place to avoid water leakage from the conventional air conditioning system.
 - f. Emergency power cut-off switches where applicable
 - g. Emergency lighting arrangement
 - h. Dehumidifier for humidity control
- 5.5.2.15 The abovementioned environmental controls shall be regularly tested and maintenance service contract shall be for 24x7 bases.

5.5.3 Fire Prevention

- 5.5.3.1 Wall, ceiling and door of Data Center shall be fire-resistant.
- 5.5.3.2 Fire suppression equipments shall be installed and tested periodically.
- 5.5.3.4 Automatic fire/smoke alarming system shall be installed and tested periodically.
- 5.5.3.5 There shall be fire detector below the raised floor, if it is raised.
- 5.5.3.6 Electric cables and data cables in the Data Center must maintain quality and be concealed.
- 5.5.3.7 Flammable items such as paper, wooden items, plastics, etc. shall not be allowed to store in the Data Center.

5.6 Server/Network Room/Rack Controls

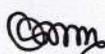
- 5.6.1 Server/network room/rack must have a glass enclosure with lock and key under a responsible person.
- 5.6.2 Physical access shall be restricted, visitors log must exist and to be maintained for the serverroom.
- 5.6.3 Access authorization list must be maintained and reviewed on regular basis.
- 5.6.4 There shall be a provision to replace the server and network devices within shortest possible time in case of any disaster.



- 5.6.5 Server/network room/rack shall be air-conditioned. Water leakage precautions and water drainage system from Air Conditioner shall be installed.
- 5.6.6 Power generator shall be in place to continue operations in case of power failure.
- 5.6.7 UPS shall be in place to provide uninterrupted power supply to the server and required devices.
- 5.6.8 Proper attention must be given on overloading electrical outlets with too many devices.
- 5.6.9 Channel alongside the wall shall be prepared to allow all required cabling in neat and safe position as per layout of power supply and data cables.
- 5.6.10 Address and phone numbers of all contact persons (e.g. fire service, police station, service providers, vendors and all ICT/ responsible personnel) must be available to cope with any emergency situation.
- 5.6.11 Power supply shall be switched off before leaving the server room if otherwise not required.
- 5.6.12 Fire extinguisher shall be placed outdoor visible area of the server room. This must be maintained and checked on an annual basis.

5.7 Networks Security Management

- 5.7.1 The Bank shall establish baseline standards to ensure security for Operating Systems, Databases, Network equipment and portable devices which shall meet organization's policy.
- 5.7.2 The Bank shall conduct regular enforcement checks to ensure that the baseline standards are applied uniformly and non-compliances are detected and raised for investigation.
- 5.7.3 The Network Design and its security configurations shall be implemented under a documented plan. There shall have different security zones defined in the network design.
- 5.7.4 All type of cables including UTP, fiber, power shall have proper labeling for further corrective or preventive maintenance works.
- 5.7.5 The Bank shall ensure physical security of all network equipment.
- 5.7.6 Groups of information services, users and information systems shall be segregated in networks, e.g. VLAN.
- 5.7.7 Unauthorized access and electronic tampering shall be controlled strictly. Mechanism shall be in place to encrypt and decrypt sensitive data travelling through WAN or public network.
- 5.7.8 The Bank shall install network security devices, such as firewalls as well as intrusion detection and prevention systems, at critical stages of its ICT infrastructure to protect the network perimeters.





- 5.7.9 The Bank shall deploy firewalls, or other similar measures, within internal networks to minimize the impact of security exposures originating from third party or overseas systems, as well as from the internal trusted network.
- 5.7.10 Secure Login feature (i.e. SSH) shall be enabled in network devices for remote administration purposes. Any unencrypted login option (i.e. TELNET) shall be disabled.
- 5.7.11 The Bank shall backup and review rules on network security devices on a regular basis to determine that such rules are appropriate and relevant.
- 5.7.12 The Bank shall establish redundant communication links for WAN connectivity.
- 5.7.13 The Bank deploying Wireless Local Area Networks (WLAN) within the organization shall be aware of risks associated in this environment. Secure communication protocols for transmissions between access points and wireless clients shall be implemented to secure the corporate network from unauthorized access.
- 5.7.14 SYSLOG Server may be established depending on Network Size to monitor the logs generated by network devices.
- 5.7.15 Authentication Authorization and Accounting (AAA) Server may be established depending on Network Size to manage the network devices effectively.
- 5.7.16 Role-based and/or Time-based Access Control Lists (ACLs) shall be implemented in the routers to control network traffic.
- 5.7.17 Real time health monitoring system for infrastructure management may be implemented for surveillance of all network equipments and servers.
- 5.7.18 Connection of personal laptop to office network or any personal wireless modem with the office laptop/desktop must be restricted and secured.
- 5.7.19 The Bank shall change all default passwords of network devices.
- 5.7.20 All unused ports of access switch shall be shut-off by default if otherwise not defined.
- 5.7.21 All communication devices shall be uniquely identifiable with proper authentication.
- 5.7.22 Role-based administration shall be ensured for the servers.

5.8 Cryptography

The primary application of cryptography is to protect the integrity and privacy of sensitive or confidential information. Cryptography is commonly used in Banks and NBFIs to protect sensitive customer information such as PINs relating to critical applications (e.g. online financial transaction/access). All encryption algorithms used in a cryptographic solution shall depend only on the secrecy of the key and not on the secrecy of the algorithm. As such, the most important aspect of data encryption is the protection and secrecy of cryptographic keys used, whether they are master keys, key encrypting keys or data encrypting keys.

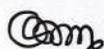
- 5.8.1 The Bank shall establish cryptographic key management policy and procedures covering generation, distribution, installation, renewal, revocation and expiry.



- 5.8.2 The Bank shall ensure that cryptographic keys are securely generated. All materials used in the generation process shall be destroyed after usage and ensure that no single individual knows any key in its entirety or has access to all the constituents making up these keys.
- 5.8.3 Cryptographic keys shall be used for a single purpose to reduce the impact of an exposure of a key.
- 5.8.4 The effective timeframe that a cryptographic key may be used in a given cryptographic solution is called the cryptoperiod. The Bank shall define the appropriate cryptoperiod for each cryptographic key considering sensitivity of data and operational criticality.
- 5.8.5 The Bank shall ensure that hardware security modules and keying materials are physically and logically protected.
- 5.8.6 When cryptographic keys are being used or transmitted, the Bank shall ensure that these keys are not exposed during usage and transmission.
- 5.8.7 When cryptographic keys have expired, the Bank shall use a secure key destruction method to ensure keys could not be recovered by any parties.
- 5.8.8 In the event of changing a cryptographic key, the Bank shall generate the new key independently from the previous key.
- 5.8.9 The Bank shall maintain a backup of cryptographic keys. The same level of protection as the original cryptographic keys shall be accorded to backup keys.
- 5.8.10 If a key is compromised, the Bank shall immediately revoke, destroy and replace the key and all keys encrypted under or derived from the exposed key. The Bank shall inform all parties concerned of the revocation of the compromised keys.

5.9 Malicious Code Protection

- 5.9.1 The environment of Banks or NBFIs including servers and workstations must be protected from malicious code by ensuring that approved anti-virus packages are installed.
- 5.9.2 Users must be made aware of arrangements to prevent and detect the introduction of malicious software.
- 5.9.3 Software and data supporting critical business activities must be regularly scanned or searched to identify possible malicious code.
- 5.9.4 Files received on electronic media of uncertain origin or unknown networks must be checked for malicious code before use.
- 5.9.5 Attachments to electronic mail must be checked for malicious code before use.
- 5.9.6 The anti-virus package must be kept up to date with the latest virus definition file using an automated and timely process.
- 5.9.7 All computers in the network shall get updated signature of anti-virus software automatically from the server.





- 5.9.8 Virus auto protection mode shall be enabled to screen disks, tapes, CDs or other media for viruses.
- 5.9.9 A computer virus hoax is a message warning the recipients of a non-existent computer virus. The message is usually a chain e-mail that tells the recipients to forward it to everyone they know. Employees must be made aware of the problem of hoax viruses and must not forward such virus alarms.
- 5.9.10 A formal process for managing attacks from malicious code must include procedures for reporting attacks and recovering from attacks.
- 5.9.11 Bank may arrange awareness program for the end users about computer viruses and their prevention mechanism.

5.10 Internet Access Management

- 5.10.1 Internet access shall be provided to employees according to the approved Internet Access Management Policy.
- 5.10.2 Access to and use of the internet from bank premises must be secure and must not compromise information security of Bank.
- 5.10.3 Access to the Internet from bank premises and systems must be routed through secure gateways.
- 5.10.4 Any local connection directly to the Internet from Bank premises or systems, including standalone PCs and laptops, is prohibited unless approved by Information Security.
- 5.10.5 Employees shall be prohibited from establishing their own connection to the Internet using banks' systems or premises.
- 5.10.6 Use of locally attached modems with banks' systems in order to establish a connection with the Internet or any third-party or public network via broadband, ISDN or PSTN services is prohibited unless specifically approved.
- 5.10.7 Internet access provided by the Bank must not be used to transact any commercial business activity that is not done by the Bank. Personal business interests of staff or other personnel must not be conducted.
- 5.10.8 Internet access provided by the Bank must not be used to engage in any activity that knowingly contravenes any criminal or civil law or act. Any such activity will result in disciplinary action of the personnel involved.
- 5.10.9 All applications and systems that require connections to the Internet or third-party and public networks must undergo a formal risk analysis during development and before production use and all required security mechanisms must be implemented.

5.11 Email Management

- 5.11.1 Email system shall be used according to the Bank's or NBF's policy.
- 5.11.2 Access to email system shall only be obtained through official request.



- 5.11.3 Email shall not be used to communicate confidential information to external parties unless encrypted using approved encryption facilities.
- 5.11.4 Employees must consider the confidentiality and sensitivity of all email content, before forwarding email or replying to external parties.
- 5.11.5 Information transmitted by email must not be defamatory, abusive, involve any form of racial or sexual abuse, damage the reputation of the Bank, or contain any material that is harmful to employees, customers, competitors, or others. The willful transmission of any such material is likely to result in disciplinary action.
- 5.11.6 Bank email system is principally provided for business purposes. Personal use of the bank email system is only allowed under management discretion and requires proper permission; such personal use may be withdrawn or restricted at any time.
- 5.11.7 Corporate email address must not be used for any social networking, blogs, groups, forums, etc. unless having management approval.
- 5.11.8 Email transmissions from the Bank must have a disclaimer stating about confidentiality of the email content and asking intended recipient.
- 5.11.9 Concerned department shall perform regular review and monitoring of email services.

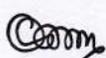
5.12 Vulnerability Assessment and Penetration Testing

Vulnerability assessment (VA) is the process of identifying, assessing and discovering security vulnerabilities in a system.

- 5.12.1 The Bank shall conduct VAs regularly to detect security vulnerabilities in the ICT environment.
- 5.12.2 The Bank shall deploy a combination of automated tools and manual techniques to perform a comprehensive VA. For web-based systems, the scope of VA shall include common web vulnerabilities such as SQL injection, cross-site scripting, etc.
- 5.12.3 The Bank shall establish a process to remedy issues identified in VAs and perform subsequent validation of the remediation to validate that gaps are fully addressed.
- 5.12.4 The Bank shall carry out penetration tests in order to conduct an in- depth evaluation of the security posture of the system through simulations of actual attacks on the system. The Bank shall conduct penetration tests on network infrastructure and internet-based systems periodically or need basis.

5.13 Patch Management

- 5.13.1 The Bank shall establish and ensure that the patch management procedures include identification, categorization and prioritization of security patches. To implement security patches in a timely manner, the Bank shall establish the implementation timeframe for each category of security patches.
- 5.13.2 The Bank shall perform rigorous testing of security patches before deployment into the production environment.



5.14 Security Monitoring

- 5.14.1 The Bank shall establish appropriate security monitoring systems and processes, to facilitate prompt detection of unauthorized or malicious activities by internal and external parties.
- 5.14.2 The Bank shall implement network surveillance and security monitoring procedures with the use of network security devices, such as intrusion detection and prevention systems, to protect the Bank against network intrusion attacks as well as provide alerts when an intrusion occurs.
- 5.14.3 The Bank may implement security monitoring tools which enable the detection of changes to critical ICT resources such as databases, system or data files and programs, to facilitate the identification of unauthorized changes.
- 5.14.4 The Bank shall regularly review security logs of systems, applications and network devices for anomalies. Logs shall be protected and retained for defined period to facilitate future investigation.



CHAPTER 06

6 Access Control of Information System

Bank shall only grant access rights and system privileges based on job responsibility. Bank shall check that no person by virtue of rank or position shall have any fundamental right to access confidential data, applications, system resources or facilities for lawful purposes.

6.1 User Access Management

- 6.1.1 Bank shall only grant user access to ICT systems and networks on a need-to-use basis and within the period when the access is required.
- 6.1.2 Bank shall closely monitor non-employees (contractual, outsourced, or vendor staff) for access restrictions.
- 6.1.3 Head Office/ Regional Offices/ Branches should select Authorized person (Executives/Managers/Officers/Assistant Officers/ Data Entry Operators) as 'User', who used to work in the Computer System with Banking Software system. Everyone should have a user ID (name/number). Each user must have a unique User ID and a valid password.
- 6.1.4 User ID Maintenance form with access privileges shall be duly approved by the appropriate authority.
- 6.1.5 User access shall be locked for 03(three) unsuccessful login attempts.
- 6.1.6 User access privileges must be kept updated for job status changes.
- 6.1.7 Bank shall ensure that records of user access are uniquely identified and logged for audit and review purposes.
- 6.1.8 Bank shall perform regular reviews of user access privileges to verify that privileges are granted appropriately.

6.2 Password Management

- 6.2.1 Bank shall enforce strong password controls over users' access.
- 6.2.2 Password controls shall include a change of password upon first logon.
- 6.2.3 Password definition parameters shall ensure that minimum password length is maintained according to Bank's Policy (at least 6 characters).
- 6.2.4 Password shall be combination of at least three of stated criteria like uppercase, lowercase, special characters and numbers.
- 6.2.5 Maximum validity period of password shall not be beyond the number of days permitted in the Bank's Policy (maximum 90 days' cycle).
- 6.2.6 Parameter to control maximum number of invalid logon attempts shall be specified properly in the system according to the Bank's Policy (maximum 3 consecutive times).

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- 6.2.7 Password history maintenance shall be enabled in the system to allow same passwords to be used again after at least three (3) times.
- 6.2.8 Administrative passwords of Operating System, Database and Business Applications shall be kept in a safe custody with sealed envelope.

6.3 Input Control

- 6.3.1 Session time-out period for users shall be set in accordance with the Bank's Policy.
- 6.3.2 Operating time schedule of users' input for banking applications shall be implemented as per regulatory enforcement unless otherwise permitted from appropriate authority.
- 6.3.3 Audit trail with User ID and date-time stamp shall be maintained for data insertion, deletion and modification.
- 6.3.4 Software shall not allow the same user to be both maker and checker of the same transaction unless otherwise permitted from appropriate authority.
- 6.3.5 Management approval must be in place for delegation of authority.
- 6.3.6 Sensitive data and fields of banking applications shall be restricted from being accessed.

6.4 Privileged Access Management

Information security ultimately relies on trusting a small group of skilled staff, who shall be subject to proper checks and balances. Their duties and access to systems resources shall be placed under close scrutiny.

- 6.4.1 Bank shall apply strict selection criteria and thorough screening when appointing staff to critical operations and security functions.
- 6.4.2 Having privileged access, all system administrators, ICT security officers, programmers and employees performing critical operations invariably possess the capability to inflict severe damage on critical systems. Bank shall adopt following controls and security practices for privileged users:
 - a) Implement strong authentication mechanisms;
 - b) Implement strong controls over remote access;
 - c) Restrict the number of privileged users;
 - d) Grant privileged access on a "need-to-have" basis;
 - e) Review privileged users' activities on a timely basis;
 - f) Prohibit sharing of privileged accounts;
 - g) Disallow vendors from gaining privileged access to systems without close supervision and monitoring;

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CHAPTER 07

7 Business Continuity and Disaster Recovery Plan

Business Continuity Plan (BCP) is required to cover operational risks and takes into account the potential for wide area disasters, Data Center disasters and the recovery plan. The primary objective of BCP is to enable a bank to survive a disaster and to re-establish normal business operations. The contingency plan shall cover the business resumption planning and disaster recovery planning. Success of business continuity depends on how quickly disaster is recovered; BCP addresses the backup, recovery and restore process. Keeping these into consideration, this chapter covers Business Continuity Plan (BCP), Disaster Recovery Plan (DRP) for centralized operation and Backup and Restore Plan (BRP).

7.1 Business Continuity Plan (BCP)

- 7.1.1 Bank must have an approved Business Continuity Plan addressing the recovery from disaster to continue its operation.
- 7.1.2 Approved BCP shall be circulated to all relevant stakeholders. The recipients would receive a copy of amended plan whenever any amendment or alteration takes place.
- 7.1.3 Documents related to BCP must be kept in a secured off-site location. One copy shall be stored in the office for ready reference.
- 7.1.4 The BCP shall be coordinated with and supported by the Business Impact Analysis (BIA) and the Disaster Recovery Plan (DRP) considering system requirements, processes and interdependencies.
- 7.1.5 BCP shall address the followings:
 - a) Action plan to restore business operations within the specified time frame for: i) office hour disaster ii) outside office hour disaster.
 - b) Emergency contacts, addresses and phone numbers of employees, vendors and agencies.
 - c) Grab list of items such as backup tapes, laptops, flash drives, etc.
 - d) Disaster recovery sitemap
- 7.1.6 BCP must be tested and reviewed at least once a year to ensure the effectiveness.

7.2 Disaster Recovery Site map.

- 7.2.1 A Disaster Recovery Site (DRS) must be in place replicating the Data Center (Production Site);
- 7.2.2 Disaster Recovery (DR) site shall be equipped with compatible hardware and telecommunication equipment to support the live system operation in the event of a disaster;
- 7.2.3 Physical and environmental security of the DR site shall be maintained;

- 7.2.4 Information security shall be maintained properly throughout the recovery process;
- 7.2.5 An up-to-date and tested copy of the DR plan shall be securely held off-site. DR plans shall exist for all the critical services where DR requirement is approved by the business;
- 7.2.6 DR test shall be carried out successfully at least once a year;
- 7.2.7 DR test documentation shall include at a minimum:
 - a) Scope
 - b) Plan
 - c) Test Result

7.3 Backup and Restore Plan (BRP)

Backup means savings of data or information to assure business continuity in case of a loss of resources at the production site.

- 7.3.1 There shall be a documented backup procedure;
- 7.3.2 Bank shall ensure the safety and security of the backup copies of information from not being damaged by natural calamities and theft (if possible to be sent at off-site location);
- 7.3.3 At least one copy of backup shall be kept on-site for the time of critical delivery;
- 7.3.4 The backup shall be done periodically considering the cycle of:
- 7.3.5 Daily, b) Weekly, c) Monthly, d) Yearly or as required by regulatory authority.
- 7.3.6 The backup log sheet shall be maintained, checked & signed by supervisor;
- 7.3.7 The backup inventory shall be maintained, checked & signed by supervisor;
- 7.3.8 The ability to restore from backup media shall be tested at least quarterly;
- 7.3.9 Backup media must be labeled (soft/hard format) properly indicating contents, date etc.
- 7.3.10 Set a minimum reservation time for inoperative data.



CHAPTER 08

8 Software Development and Acquisition

For any new application of business function for The Bank requires rigorous analysis before acquisition or development to ensure that business requirements are met in an effective and efficient manner. This process covers the definition of needs, consideration of alternative sources, review of technological and economic feasibility, execution of risk analysis and cost-benefit analysis and conclusion of a final decision to 'make' or 'buy'.

Many systems fail because of poor system design and implementation, as well as inadequate testing. The Bank shall identify system deficiencies and defects at the system design, development and testing phases. The Bank shall establish a steering committee, consisting of business owners, the development/technical team and other stakeholders to provide oversight and monitoring of the progress of the project, including deliverables to be realized at each phase of the project and milestones to be reached according to the project timetable.

8.1 ICT Project Management

- 8.1.1 In drawing up a project management framework, The Bank shall ensure that tasks and processes for developing or acquiring new systems include project risk assessment and classification, critical success factors for each project phase, definition of project milestones and deliverables. The Bank shall clearly define in the project management framework, the roles and responsibilities of staff involved in the project.
- 8.1.2 Project plan for all ICT projects shall be clearly documented and approved. In the project plans, The Bank shall set out clearly the deliverables to be realized at each phase of the project as well as milestones to be reached.
- 8.1.3 The Bank shall ensure that user functional requirements, business cases, cost-benefit analysis, systems design, technical specifications, test plans and service performance expectation are approved by the relevant business units and ICT management.
- 8.1.4 The Bank shall establish management oversight of the project to ensure that milestones are reached and deliverables are realized in a timely manner.

8.2 Vendor Selection

- 8.2.1 There must be a core team comprising of personnel from Functional Divisions, Information Technology Division and Internal Audit Division for vendor selection;
- 8.2.2 Vendor selection process must have conformity with the Procurement Policy of The Bank.
- 8.2.3 Vendor selection criteria for application must address the following:
 - a. Market presence of minimum 3 years in the appropriate field;
 - b. Years in operation of business minimum 3 years;
 - c. Technology alliances with renowned foreign software companies, like Microsoft, Oracle etc.;

- d. Extent of customization and work around solutions;
- e. Performance & Scalability should be measured in point basis;
- f. Number of installations at least 3 organizations including 1(One) will be Bank;
- g. Existing customer reference of at least 3 companies/organizations;
- h. Support arrangement of adequate skilled manpower;

8.3 In-house Software

- 8.3.1 Detailed design and technical application requirements shall be prepared;
- 8.3.2 Criteria for acceptance of the requirement shall be defined and approved by the concerned business unit;
- 8.3.3 Application security and availability requirements shall be addressed;
- 8.3.4 Developed functionality in the application shall be managed in accordance with design specification and documentation;
- 8.3.5 Source code must be available with the concerned department and kept secured;
- 8.3.6 Source code shall contain title area, the author, date of creation, last date of modification and other relevant information;
- 8.3.7 Software Development Life Cycle (SDLC) with User Acceptance Test (UAT) shall be followed and conducted in the development and implementation stage;
- 8.3.8 System documentation and User Manual shall be prepared and handed over to the concerned department;
- 8.3.9 Necessary 'Regulatory Compliance' requirements must be taken into account by the Bank.

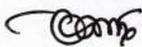
8.4 Software Documentation

- 8.4.1 Documentation of the software shall be available and safely stored;
- 8.4.2 Document shall contain the followings:
 - a. Functionality
 - b. Security features
 - c. Interface requirements with other systems
 - d. System Documentation
 - e. Installation Manual
 - f. User Manual



8.5 Other Requirements

- 8.5.1 There shall have a test environment to ensure the software functionalities before implementation;
- 8.5.2 User Acceptance Test (UAT) shall be carried out and signed off before going live;
- 8.5.3 Necessary 'Regulatory Compliance' requirements for banking procedures and practices in the application must be taken into account by the Bank;
- 8.5.4 Any bugs and/or errors found due to design flaws, must be escalated to higher levels in Software Vendors' organization and bank, and must be addressed in time;
- 8.5.5 Support agreement must be maintained by the provider for the software used in production with the confidentiality agreement.





CHAPTER 09

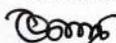
9 Alternative Delivery Channels (ADC) Security Management

"Channelize through channels" is the new paradigm for banking today, which in earlier relied solely on the branch network. Branchless banking is a distribution channel strategy used for delivering financial services without relying on bank branches. Alternate Delivery Channels are methods for providing banking services directly to the customers. Customers can perform banking transactions through their ATM, contact the bank's Call Center for any inquiry, access the digital Interactive Voice Response (IVR), perform transactions through Internet Banking and even on phones through mobile banking, etc. These channels have enabled banks to reach a wide consumer-base regardless of time and geographic location. ADCs ensure higher customer satisfaction at lower operational expenses and transaction costs.

9.1 ATM/POS Transactions

The ATMs and Point-of-Sale (POS) devices have facilitated cardholders with the convenience of withdrawing cash as well as making payments to merchants and billing organizations. However, these systems are targets where card skimming attacks are perpetrated. To secure consumer confidence in using these systems, The Bank shall consider putting in place the following measures to counteract fraudsters' attacks on ATMs and POS devices:

- 9.1.1 The Bank shall install anti-skimming solutions on ATM devices to detect the presence of unknown devices placed over or near a card entry slot.
- 9.1.2 The Bank shall install detection mechanisms and send alerts to appropriate staff for follow-up response and action.
- 9.1.3 The Bank shall implement tamper-resistant keypads to ensure that customers' PINs are encrypted during transmission.
- 9.1.4 The Bank shall implement appropriate measures to prevent shoulder surfing of customers' PINs.
- 9.1.5 The Bank may implement biometric finger vein sensing technology to resist PIN compromise.
- 9.1.6 The Bank shall conduct video surveillance of activities for 24 hours at these machines and maintain the quality of CCTV footage and preserve for at least one year.
- 9.1.7 The Bank shall introduce a centralized online monitoring system for Cash Balance, Loading-Unloading functions, Disorders of machine, etc.
- 9.1.8 The Bank shall deploy security personnel for all ATM devices 24 hour basis.
- 9.1.9 The Bank shall verify that adequate physical security measures are implemented in ATM devices.
- 9.1.10 Bank shall inspect all ATM/POS devices frequently to ensure standard practice (i.e., environmental security for ATM, anti-skimming devices for ATM, POS device surface tempering, etc.) is in place with necessary compliance. Inspection log sheet shall be maintained in ATM booth premises and centrally.



- 9.1.11 Bank shall monitor third party cash replenishment vendors' activities constantly and visit third party cash sorting houses regularly.
- 9.1.12 The Bank shall train and provide necessary manual to its merchants about security practices (e.g. signature verification, device tampering/ replacement attempt, changing default password, etc.) to be followed for POS device handling.
- 9.1.13 The Bank shall educate its customers on security measures that are put in place by The Bank and are to maintain by the customers for ATM and POS transactions.

9.2 Internet Banking

Information involved in internet banking facility passing over public networks shall be protected from fraudulent activity, dispute and unauthorized disclosure or modification. Banks' internet systems may be vulnerable as financial services are increasingly being provided via the internet. As a counter-measure, The Bank shall devise a security strategy and put in place measures to ensure the confidentiality, integrity and availability of its data and systems.

- 9.2.1 The Bank shall provide assurance to its customers and users so that online access and transactions performed over the internet are adequately protected and authenticated.
- 9.2.2 Bank or NBFIs shall properly evaluate security requirements associated with its internet banking system and adopt mechanisms which are well-established international standards.
- 9.2.3 The Bank shall formulate Internet Banking Security policy considering technology security aspects as well as operational issues.
- 9.2.4 The Bank shall ensure that information processed, stored or transmitted between the bank and its customers is accurate, reliable and complete. The Bank shall also implement appropriate processing and transmission controls to protect the integrity of systems and data, e.g. SSL, TLS.
- 9.2.5 The bank shall implement 2-FA (two-factor authentication) for all types of online financial transactions. Hardware/Software based tokenization means will be preferred. The primary objectives of two-factor authentication are to secure the customer authentication process and to protect the integrity of customer account data and transaction details as well as to enhance confidence in online systems.
- 9.2.6 An online session needs to be automatically terminated after a fixed period of time unless the customer is re-authenticated for the existing session to be maintained.
- 9.2.7 The Bank shall implement monitoring or surveillance systems to follow-up and address subsequently any abnormal system activities, transmission errors or unusual online transactions.
- 9.2.8 All system accesses, including messages received shall be logged. Security violations (suspected or attempted) shall be reported and followed up. Bank may acquire tools for monitoring systems and networks against intrusions and attacks.
- 9.2.9 The Bank shall maintain high resiliency and availability of online systems and supporting systems (such as interface systems, backend host systems and network equipment).

The Bank shall put in place measures to plan and track capacity utilization as well as guard against online attacks. These online attacks may include denial-of-service attacks (DoS attack) and distributed denial- of-service attack (DDoSattack).

- 9.2.10 The Bank shall take appropriate measures to minimize exposure to other forms of attacks such as middleman attack which is commonly known as a man- in-the-middle attack (MITMA), man-in-the browser attack or man-in-the application attack.
- 9.2.11 The information security officer or any other assigned person/team shall undertake periodic penetration tests of the system, which may include:
- a) Attempting to guess passwords using password-cracking tools
 - b) Searching for back door traps in the programs
 - c) Attempting to overload the system using DDoS (Distributed Denial of Service) and DoS (Denial of Service) attacks
 - d) Checking middleman attacks
 - e) Checking of commonly known holes in the software, especially the browser and the e-mail software exist
 - f) Checking the weaknesses of the infrastructure
 - g) Taking control of ports
 - h) Cause application crash
 - i) Injecting malicious codes to application and database servers
- 9.2.12 The Bank shall educate its customers on security measures to protect them in an online environment.

9.3 Payment Cards

Payment cards allow cardholders the flexibility to make purchases wherever they are. Cardholders may choose to make purchases by physically presenting these cards for payments at the merchant or they could choose to purchase over the internet, through mail-order or over the telephone. Payment cards also provide cardholders with the convenience of withdrawing cash at automated teller machines ("ATMs").

Payment cards exist in many forms; with magnetic stripe cards posing the highest security risks. Sensitive payment card data stored on magnetic stripe cards is vulnerable to card skimming attacks. Card skimming attacks can happen at various points of the payment card processing, including ATMs, payment kiosks and POS terminals.

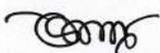
- 9.3.1 The Bank which provides payment card services shall implement adequate safeguards to protect sensitive payment card data. The Bank shall ensure that sensitive card data is encrypted to ensure the confidentiality and integrity of these data in storage and transmission.
- 9.3.2 The Bank shall ensure that the processing of sensitive or confidential information is done in a secure environment.

- 9.3.3 The Bank shall deploy secure chips with multiple payment application supported to store sensitive payment card data. For interoperability reasons, where transactions could only be resulted by using information from the magnetic stripe on a card, The Bank shall ensure that adequate controls are implemented to manage these transactions.
- 9.3.4 The Bank shall perform (not a third party payment processing service provider) the authentication of customers' sensitive static information, such as PINs or passwords. The Bank shall perform regular security reviews of the infrastructure and processes being used by its service providers.
- 9.3.5 Equipments used to generate payment card PINs and keys shall be managed in a secured manner.
- 9.3.6 Card personalization, PIN generation, Card distribution, PIN distribution, Card activation groups shall be different from each other.
- 9.3.7 The Bank shall ensure that security controls are implemented at payment card systems and networks. Bank or NBFi must comply with the industry security standards, e.g. - Payment Card Industry Data Security Standard (PCI DSS) to ensure the security of cardholder's data.
- 9.3.8 The Bank shall only activate new payment cards upon obtaining the customer's instruction.
- 9.3.9 The Bank shall implement a dynamic one-time-password ("OTP") as 2-FA for CNP (Card Not Present) transactions via internet to reduce fraud risk associated with it.
- 9.3.10 To enhance card payment security, The Bank shall promptly notify cardholders via transaction alerts including source and amount for any transactions made on the customers' payment cards.
- 9.3.11 The Bank shall set out risk management parameters according to risks posed by cardholders, the nature of transactions or other risk factors to enhance fraud detection capabilities.
- 9.3.12 The Bank shall implement solution to follow up on transactions exhibiting behavior which deviates significantly from a cardholder's usual card usage patterns. The Bank shall investigate these transactions and obtain the cardholder's authorization prior to completing the transaction.

9.4 Mobile Financial Services

Controls over mobile transactions are required to manage the risks of working in an unprotected environment. The Bank shall formulate security controls, system availability and recovery capabilities, which commensurate with the level of risk exposure, for operations.

- 9.4.1 Security standards shall be followed appropriate to the complexity of services offered.
- 9.4.2 Banks shall clearly identify risks associated with the types of services being offered in the risk management process.



- 9.4.3 Appropriate risk mitigation measures shall be implemented like transaction limit, transaction frequency limit, fraud checks, AML checks etc. depending on the risk perception, unless otherwise mandated by the regulatory body.
- 9.4.4 Bank shall arrange an agreement with Mobile Network Operator (MNOs) about SIM replacement process which includes sending prior notification and getting confirmation to ensure appropriate measures of MFS account for avoiding risk of unwanted transactions.
- 9.4.5 Services provided by banks through mobile shall comply with security principles and practices for the authentication of transactions mandated by the regulatory body.
- 9.4.6 Bank shall conduct periodic risk management analysis and security assessment of the MFS operation and take appropriate measures accordingly.
- 9.4.7 Bank shall have conformity with 'Regulatory Compliance' requirements of the country.
- 9.4.8 Proper documentation of security practices, guidelines, methods and procedures used in such mobile financial services shall be maintained and updated.



CHAPTER 10

10 Service Provider Management

There is an increasing reliance on external service providers as partners in achieving the growth targets and as effective cost alternatives. ICT outsourcing comes in many forms and permutations. Some of the most common types of ICT outsourcing are in systems development and maintenance, support to DC operations, network administration, disaster recovery services, application hosting and hardware maintenance.

10.1 Outsourcing

10.1.1 The board of directors and senior management shall fully understand risks associated with ICT outsourcing. Before appointing a service provider, due diligence shall be carried out to determine its viability, capability, reliability, track record and financial position.

10.1.2 The bank shall ensure that contractual terms and conditions governing the roles, relationships, obligations and responsibilities of all contracting parties are set out fully in written agreements.

10.1.3 Outsourcing activities shall be evaluated based on the following practices:

- a) Objective behind Outsourcing
- b) Economic viability
- c) Risks and security concerns.

10.1.4 Bank shall develop a contingency plan for critical outsourced technology services to protect them from unavailability of services due to unexpected problems of the technology service provider. This may include termination plan and identification of additional or alternate technology service providers for such support and services.

10.2 Cross-border System Support

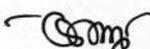
10.2.1 The bank shall provide official authorization/assurance from the group ensuring the data availability and continuation of services for any circumstances e.g. diplomacy changes, natural disaster, relationship breakdown, discontinuity of services, or others.

10.2.2 The Disaster Recovery Site shall be multi-layered in terms of physical location and redundancy in connectivity.

10.3 Service Level Agreement (SLA)

10.2.3 There shall be Service Level Agreement between the vendor and bank.

10.2.4 The Annual Maintenance Contract (AMC) with the vendor shall be active and currently in-force.



- 10.2.5 Bank shall ensure that the equipment does not contain sensitive live data when hardware is taken by the service provider for servicing / repairing.
- 10.2.6 Service contracts with all service providers including third-party vendors should include:
- a. Pricing
 - b. Measurable service/deliverables
 - c. Timing/schedules
 - d. Confidentiality clause
 - e. Contact person names (on daily operations and relationship levels)
 - f. Roles and responsibilities of contracting parties including an escalation matrix
 - g. Renewal period
 - h. Modification clause
 - i. Frequency of service reporting
 - j. Termination clause
 - k. Warranties, including service suppliers' employee liabilities, 3rd party liabilities and the related remedies
 - l. Geographical locations covered
 - m. Ownership of hardware and software
 - n. Documentation (e.g. logs of changes, records of reviewing event logs)
 - o. Right to have information system audit conducted (internal or external).



CHAPTER 11

11 Customer Education

With the advent of electronic banking, customer's experience of banking is therefore no longer fully under control of a Bank. In the age of self-service banking model, a customer also has to be equipped to do safe banking through self-help. It is often said that the best defense against frauds is awareness of customer. With fraudsters constantly creating more diverse and complex fraudulent ruses using advanced technology and social engineering techniques to access their victims' accounts, accelerating awareness among consumers becomes imperative.

It is also important to educate other stakeholders, including bank employees, who can then act as resource persons for customer queries, law enforcement personnel for more understanding response to customer complaints and media for dissemination of accurate and timely information.

11.1 Awareness Program

Awareness programs can be successful only if users feel the content is in their interest and is relevant to their banking needs. For fruitful awareness program to be arranged, the bank needs to identify personnel, awareness material, advertisements and promotions and maintenance of website.

- 11.1.1 The needs of the target audience shall be identified, appropriate budgets obtained and priorities established.
- 11.1.2 The work plan shall clearly mention the main activities with the required resources, timelines and milestones.
- 11.1.3 The Bank shall create and publish proper contents.
- 11.1.4 The common objectives of the awareness program will be to:
 - a) Provide general and specific information about fraud risk trends, types or controls to people who need to know.
 - b) Help consumers to identify areas vulnerable to fraud attempts and make them aware of their responsibilities in relation to fraud prevention.
 - c) Motivate individuals to adopt recommended guidelines or practices.
 - d) Create a stronger culture of security with better understanding and commitment.
 - e) Help minimize the number and extent of incidents, thus reducing costs directly (fraud losses) and indirectly (reduced need to investigate).
- 11.1.5 The Bank shall deliver the right message content to the right audience using the most effective communication channels.
- 11.1.6 Awareness building collaterals can be created in the form of:
 - a) Leaflets and brochures
 - b) Short Messaging Service (SMS) texts

- c) Safety tips in account statements and envelopes
- d) Educational material in account opening kits
- e) Receipts dispensed by ATM/POS
- f) Screensavers
- g) Electronic newsletters
- h) DVDs with animated case studies and videos
- i) Recorded messages played during waiting period of phone banking calls

11.1.7 Since the target groups obtain information from a variety of sources, more than one communication channel could be used to engage them successfully.

- a) Advertising campaigns through print and TV media
- b) ATM screens, Emails and SMS texts
- c) Common website developed with content from all stakeholders
- d) Groups, games and profiles on social media
- e) Advertisements on online shopping sites
- f) Bill boards
- g) Online training modules and demos hosted on this site
- h) Posters in prominent locations such as petrol pumps, popular restaurants, shopping malls, etc.
- i) Interactive guidance in the form of helplines
- j) Customer meets and interactive sessions with specialists
- k) Talk shows on television/radio

11.1.8 Continuous improvement cannot occur without knowing how the existing program is working. A well-calibrated feedback strategy must be designed and implemented.

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CONCLUSION

As Information Technology (IT) is changing with rapidly changing global environment, the total ICT Policy may be amended /modified and upgraded time to time accepting the better policies compared to the prevailing one.

The policies outlined into this document are equally applicable for any branch of Karmasangsthan Bank.

This policy document should be made available and accessible to all concerned persons, authorities and organizations related to Karmasangsthan Bank. To facilitate easy access, this document should be published into Banks web-site in downloadable format. All subsequent updates to this document must be uploaded immediately.

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GLOSSARY AND ACRONYMS

BCP	Business Continuity Plan
BRP	Backup and Restore Plan
BYOD	Bring Your Own Device
CDROM	Compact Disk Read Only Memory
DC	Data Center
DR	Disaster Recovery
DRP	Disaster Recovery Plan
DRS	Disaster Recovery Site
E-mail	Electronic Mail
GUI	Graphical User interface
HDD	Hard Disc Drive
ICT	Information and Communication Technology
IPS	Intrusion Prevention System
IPSec	Internet Protocol Security
ISO	International Organization for Standardization
IT	Information Technology
KB	Karmasangsthan Bank
LAN	Local Area Network
PC	Personal Computer
RDBMS	Relational Database Management System
PIN	Personal Identification Number
PKI	Public Key Infrastructure
RO	Regional Office
SDLC	Software Development Life Cycle
SLA	Service Level Agreement
SMS	Short Massaging System
SSL	Secured Socket Layer
UAT	User Acceptance Test
UPS	Uninterrupted Power Supply
User ID	User Identification
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
WAN	Wide Area Network

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এ কে এম কামরুজ্জামান
বোর্ড সচিব (এজিএম)


(মোঃ তাজুল ইসলাম)
ব্যবস্থাপনা পরিচালক
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