

Payment and Settlement Systems

11.1 Payment system is a set of physical and electronic infrastructures with associated procedures and protocols for the transfer and settlement of financial obligations arising from the exchange of goods and services. Safe and efficient payment systems are fundamental to promote financial stability. It facilitates the Central Bank for conducting efficient monetary policy by allowing better use of market-based instruments to achieve its objectives, enhancing the efficiency of the financial system and the economy as a whole.

11.2 One of the main functions of the Bangladesh Bank is - "to promote, regulate and ensure a secured and efficient payment system, including the issue of bank notes." In fulfilling this mandate and considering the importance of having a state-of-the-art payment and settlement system, Department of Currency Management and Payment Systems (DCMPS) of Bangladesh Bank (BB) has been working to implement a secured and efficient payment system in the country. Payment Systems Division (PSD) under DCMPS has been working on the essentials to put into operation a modern National Payment and Settlement System. The PSD is working on the following core areas -

- Payment Systems Strategy,
- Automated Cheque Processing System,
- Electronic Funds Transfer,
- National Payment Switch,
- Mobile Financial Services,
- e-commerce and m-commerce,
- Legal and Regulatory Framework,
- Payment Systems Oversight, and
- Remittance Issues.

11.3 The traditional paper based payment system was semi-automated, time consuming and prone to so many risks. The system was not at par with international best practices. It took t+2 or t+3 days to clear the cheques and other paper-based instruments within a clearing region. The inter-regional instruments required much longer time to clear. Bangladesh Bank realised the necessity of modernising the clearing system.

11.4 Four payment and settlement systems have been in operation in Bangladesh prior to 7 October 2010. They were: (a) Bangladesh Bank's Clearing Houses in eight clearing regions; (b) Sonali Bank's Clearing Houses in 31 cities where there are no BB branches; (c) the BB large value cheque settlement system; and (d) the BB Foreign Currency Clearing System in Dhaka. The instruments cleared through the clearing houses are cheques, bank drafts, pay orders, dividend and refund warrants etc. Apart from such non-cash payment instruments credit card, debit card and ATM transactions are becoming popular specially in the urban areas.

11.5 With a view to developing an electronic payment system, Bangladesh Bank took maiden initiative to replace the traditional paper based clearing and settlement system by an IT-centric fast, secured and efficient system. With the technical and financial assistance from Department for International Development (DFID) of United Kingdom (UK), Bangladesh Bank started working to implement Bangladesh Automated Clearing House (BACH) from October 2006, the first electronic clearing house in the country.

Table 11.1: 'Strategic Plan 2010-2014' for Payment Systems

Objectives	Key Performance Area	Time Frame	Comments/Updates
1. Implement Bangladesh Automated Clearing House (BACH) comprised of automated cheque processing systems and Electronic Fund Transfer (EFT)	<ul style="list-style-type: none"> Magnetic Ink Character Recognition (MICR) Cheque printing and circulation. 	Near Term	Bangladesh Automated Cheque Processing System (BACPS) has started its live operation on 7 October 2010 and Bangladesh Electronic Funds Transfer Network (BEFTN) started its live operation on 28 February 2011.
	<ul style="list-style-type: none"> Establish communication link between BB and participating banks. 	Near Term	
	<ul style="list-style-type: none"> Install software on each bank's end and test the same. 	Near Term	
	<ul style="list-style-type: none"> Test the central system and integrate with the participating banks' Cheque Processing System. 	Near Term	
	<ul style="list-style-type: none"> Awareness building/ sensitisation 	Near Term	
2. Establish required legal and regulatory framework for efficient payment system	<ul style="list-style-type: none"> Implement Bangladesh Payment and Settlement Systems Regulations, 2009 	Near Term	Bangladesh Payment and Settlement Systems Regulations (BSSR), 2009 was published on 27 April 2009. BACPS Operating Rules and Procedures have been published on 11 January 2010 and BEFTN Operating Rules have been published on 11 August 2010.
	<ul style="list-style-type: none"> Implement operating rules and procedures of Bangladesh Automated Cheque Processing Systems (BACPS). 	Near Term	
	<ul style="list-style-type: none"> Assess suggestions and feedback on Bangladesh Electronic Fund Transfer Network (BEFTN) rules and BEFTN risk management guidelines and make ready to distribute to the BACH participants. 	Medium Term	
	<ul style="list-style-type: none"> Review and modify the payment and settlement system regulations continuously as needed. 	Medium Term	
3. Promote and encourage on-line banking, e-commerce, e-payments, shared ATMs, POS, mobile payments, etc.	<ul style="list-style-type: none"> Formulate regulatory measures for electronic and m-payments. 	Near Term	'Guidelines for Mobile Financial Services' is under the process of approval. Initiatives to establish National Payment Switch (NPS) is already underway which will promote e-commerce substantially. Circular has been issued for e-commerce and for implementation of CBS to the banks.
	<ul style="list-style-type: none"> Diversify the delivery channels for online banking and e-commerce. 	Near Term	
	<ul style="list-style-type: none"> Promote Core Banking Application (CBS) and Centralised Accounting Systems (CAS) for commercial banks. 	Medium Term	
	<ul style="list-style-type: none"> Establishment of a National Payment Switch (NPS) bringing about interoperability of the existing e-payment networks in liaison with the Government. 	Medium Term	

11.6 In alignment with the vision, mission, strategies and objectives as set in the 'Strategic Plan 2010-2014' of Bangladesh Bank, key strategies for developing payment and settlement systems of the country are listed in the Table 11.1. Most of these goals were already achieved while others are in the implementation process.

11.7 Bangladesh Automated Clearing House (BACH), the first ever electronic clearing house of Bangladesh, has two components - the Automated Cheque Processing System and the Electronic Funds Transfer. Both the systems operate in batch processing mode - transactions received from the banks during the day are processed at a pre-fixed time and settled through a single multilateral netting figure on each individual bank's respective books maintained with the Bangladesh Bank. A state-of-the-art Data Center (DC) and a Disaster Recovery Site (DRS) have been established comprising of most modern software and hardware for dealing with the operations of Bangladesh Automated Clearing House (BACH). A Virtual Private Network (VPN) has been created using the established communication links between the participating commercial banks and DC and DRS for communicating BACH related information. Digital certificate has been formulated for the first time in Bangladesh for secured data communication.

11.8 Bangladesh Automated Cheque Processing Systems (BACPS) is the electronic cheque processing of paper-based instruments uses Cheque Imaging and Truncation (CIT) technology. The system supports both intra-regional and inter-regional clearing and is based on a centralised processing center located in Dhaka and in designated clearing regions. The proposed process and system conforms to the international best practices and also represent the most cost effective solution for cheque processing. In the first step of the process, BACPS participants, i.e.

commercial banks and related Government offices have been sensitised. All the clearing instruments, i.e. cheques, drafts, pay orders, dividend and refund warrants, etc. have been standardised. Each instrument was encoded with MICR line which includes information on the amount, transaction code, clients account, routing number and the cheque leaf's serial number. Specially schemed routing numbers have been assigned to the bank branches for easy identification of origin and destination of instruments. Country wide use of MICR encoded and standardised instruments i.e. cheques, drafts, pay-orders, dividend and refund warrants, etc. has been ensured. Following successful System Integration Test (SIT), Live Simulation Test (LST) and Live Day Simulation (LDS), BACPS started its 'Live Operation' on 7 October 2010. Gradually other main cities of the country joined the system. At present, 85,000 (approximately) regular and 3000 high value cheques and other instruments are cleared through BACPS. On an average, 85 percent of the clearing instruments are cleared through clearing house. Total amount of regular value instruments cleared is approximately Taka 25 billion and it is approximately Taka 20 billion for high value instruments. The clearing cycle has been brought down to t+0 for high value cheques and t+1 for regular value cheques throughout the country.

11.9 Bangladesh Electronic Funds Transfer Network (BEFTN) is the most critical component in the development of a modern payments system infrastructure among the present initiatives. BEFTN started its 'Live Operation' on 28 February 2011 with 47 banks of the country. The network started with credit transactions and will gradually progress to debit transactions. A wide variety of credit transfer applications such as payroll, foreign and domestic remittances, social security, company dividends, retirement, expense reimbursement, bill payments, corporate payments, Government tax payments,

veterans payments, Government license fees and person to person payments as well as debit transfer applications such as mortgage payments, membership dues, loan payments, insurance premiums, utility bill payments, company cash concentration, Government tax payments, Government licenses and fees are settled under the network. This system will bring down the operational cost, reduce risk and increase the efficiency of the payments process. At the initial stage, approximately 1500-1600 EFT transactions are processed on an average with an increasing trend. The amount transferred using EFTN is approximately Taka 120 million per day. BEFTN will be linked to the mobile financial services in the near future. The mobile networks will provide the gateway for the non-bank public to reach bank customers and businesses and for bank customers and businesses to reach the non-bank public. The ultimate objective of the EFT system is to lessen paper-based payment methods and encourage paper-less payment methods for faster and cost-effective transactions specially at the corporate levels. The EFT facilitates the transmission of payments between the banks electronically in order to make faster and efficient inter-bank clearing over the existing paper-based system (Box 11.1).

11.10 National Payment Switch (NPS): Bangladesh Bank has taken initiative to establish National Payment Switch (NPS) in order to facilitate interbank electronic payments originating from different delivery channels e.g. Automated Teller Machines (ATM), Point of Sales (POS), Internet, Mobile Applications, etc. The main objective of NPS is to create a common platform among the existing shared switches already built-up by different private sector operators. NPS will facilitate the expansion of the card based payment networks substantially and promote e-commerce throughout the country. Online payment of Government dues, using cards and account number information through internet will greatly be enhanced using NPS.

PSD under the DCMPS, BB will implement this World Bank funded initiative.

11.11 e-commerce & m-commerce: In order to start m-commerce in Bangladesh, mobile network operators have been given permission to sell railway tickets and tickets of cricket matches organised by the Bangladesh Cricket Board (BCB) using mobile technology. BB has issued directives regarding e-commerce activities like online payment of utility bills; online funds transfer between clients of the banks, credit card based internet payment in local currency, etc.

11.12 Mobile Financial Services: The total number of active mobile phone subscribers was 75.5 million¹ as of May 2011. This rapid growth of mobile phone users and countrywide coverage of mobile operators' network have made their delivery channel an important tool-of-the-trade for extending banking services to the people, specially to expedite faster delivery of remittances across the country. Bangladesh Bank has approved the following mobile financial services (in broad categories) aiming at financial inclusion of the non-bank public.

- Inward foreign remittance disbursement,
- Cash in /out using m-wallet account through agents/ bank branches/ ATMs/ mobile operator's outlet,
- Person to business payment (e.g. utility bill payment),
- Business to person payment (e.g. salary disbursement by corporate bodies/industries /offices etc.),and
- Government to person payment (e.g. elderly allowances, freedom fighter allowances etc.)

Permission for mobile financial services was given to 11 commercial banks out of which 5 banks have already started their operation.

¹(sourcehttp://www.btrc.gov.bd/newsandevents/mobile_phone_subscribers/mobile_phone_subscribers_may_2011.php)

Box 11.1**Electronic Funds Transfer (EFT)**

The Bangladesh Electronic Funds Transfer Network (BEFTN) is a multilateral electronic clearing system which operates as a processing and delivery center for the distribution and settlement of electronic credit and debit transactions among participating banks. The system involves transmitting, reconciling and calculating the net position of each individual participant reflecting the final settlement in the respective accounts of each bank maintained with Bangladesh Bank. Participating banks in the EFT Network and the EFT Operator (BEFTN) are inter-connected via secured communication links. This is a significant advantage over other modes of payment systems being developed in the country. The system has laid the foundation for e-commerce in the country. BEFTN started its live operations on 28 February 2011 with all the banks on board. As of June 2011, approximately 1500-1600 EFT transactions were processed on an average, with the mean number of transactions increasing gradually. The amount transferred using EFTN is approximately Taka 120 million per day.

EFT Participants

The participants involved in the EFT transactions are a) Originator, b) Originating Bank (OB), c) Bangladesh Electronic Funds Transfer Network (BEFTN), d) Receiving Bank (RB), e) Receiver, f) Third-Party Service Provider and g) Authorisation.

The Originator initiates EFT entries into the network according to an arrangement with a receiver. It executes an EFT fund transfer entry through an Originating Bank (OB). The Originator is usually a company, government agency or an individual directing a transfer of funds to or from a consumer's or a company's account. After receiving payment instructions from its client, the originating bank forwards the entry to the BEFTN (the central clearing facility). BEFTN which is operated by the Bangladesh Bank receives entries from OBs, distributes the entries to appropriate RBs and facilitates the settlement functions for the participating banking institutions. The RB which receives EFT entries from BEFTN posts the entries to the account of depositors. The receiver (person/organisation) authorises an Originator to receive an EFT entry to the account maintained with the RB. However, in some cases an Originator, OB or RB may like to use the services of a third-party service provider approved by the Bangladesh Bank for all or part of the process of handling EFT entries. Authorisation is allowed in EFT transaction which is a written arrangement with the Originating Company signed by an employee or customer to allow payments processed through the EFT Network to be deposited in or withdrawn from his or her account with a schedule bank. The Originator and Receiver can also give authorisation in a written form to allow payment which is an agreement that defines the terms, conditions and legal relationship between them.

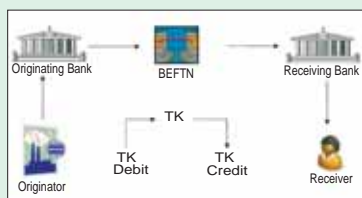


Figure 1: EFT Credit Transaction Flow

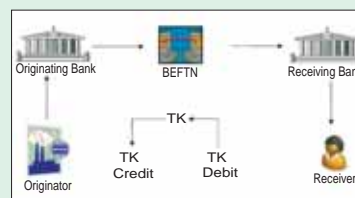


Figure 2: EFT Debit Transaction Flow

EFT Transaction

An EFT entry may be either credit or debit. EFT credit entries occur when an Originator initiates a transfer to move funds into a Receiver's account. EFT credit transactions involve both consumer and corporate payments with separate rules and regulations for each. The most typical EFT credit example is salary payment. Some other common credit applications are i) Inward foreign remittances, ii) Domestic remittances, iii) Dividends/Interest/Refunds of IPO, iv) Business-to-business payments (B2B), v) Government tax payments, vi) Government vendor payments and vii) Customer initiated transactions (online payments).

Box 11.1**Electronic Funds Transfer (EFT)***(Contd.)*

In an EFT debit transaction, funds are collected from the Receiver's account and transferred to an Originator's account, even though the Originator initiates the transaction. Some examples of EFT debit applications are i) Utility bill payments, ii) Loan repayments (EMI), iii) Insurance premium, iv) Mortgage payments, v) Government tax payments, vi) Government license fees and vii) Club/Association subscriptions.

Legal and Regulatory Framework

'Bangladesh Electronic Funds Transfer Network (BEFTN) Operating Rules' was published on 11 August 2010 for the operation of electronic fund transfers. The EFT process operates from the beginning to end through a series of legal agreements. Each participating bank has already signed an agreement with Bangladesh Bank to comply with and be subject to the BEFTN Operating Rules. BEFTN Operating Rules define the parameters of the relationship between the two parties, and identify processing requirements for the specific application(s), and establish liability and accountability for procedures related to certain application(s).

Electronic payments have a clear advantage over paper-based payments and it is extremely important to adopt such payment mechanisms in Bangladesh. BEFTN provides access to a wide range of electronic payment products that will improve payment services for the participating banks' customers. By launching BEFTN, Bangladesh Bank and the banking sector as a whole, has taken a step forward in developing a digital financial sector for Bangladesh. Bangladesh Bank is encouraging commercial banks and other players in the financial sector as well as the business community to use this fast, safe, secure, low cost, reliable payment procedure for the development of their businesses and the economy of Bangladesh.

11.13 Legal & Regulatory Framework: In order to provide legal and regulatory support for electronic exchange of images of paper items and electronic transfer of funds, Bangladesh Bank had published Bangladesh Payment and Settlement Systems Regulations (BPSSR), 2009 on 27 April 2009. This regulation is the bedrock of modern payment systems in Bangladesh. 'BACPS Operating Rules and Procedures' was published on 11 January 2010 for the operations of automated cheque processing. 'BEFTN Operating Rules' was published on 11 August 2010 for the operations of electronic fund transfer. 'Guidelines for Mobile Financial Services' was under the process of approval. Moreover, Bangladesh Bank has taken steps to amend certain provision of the existing Negotiable Instruments Act, 1881 and Bankers Book of Evidence Act, 1891 for providing comprehensive legal backing to the

operation of Electronic Clearing House. Bangladesh Bank in cooperation with International Finance Corporation-Bangladesh Investment Climate Fund (IFC-BICF) has drafted Payment Systems Act, reviewed the existing BPSSR, framed rules for electronic payments (ATM, POS; internet based and m-payment) and set guidelines for consumer protection related to electronic payments.

11.14 Remittance Issues: Remittance being the major source for foreign exchange earnings has drawn the attention of decision makers for encouraging the remitters to use formal channel instead of risky informal channels. The scheme of PSD for improving the current scenario is to implement a country-wide safe and efficient payment system to expedite faster delivery of remittances across the country. The PSD has been working on simplifying the procedure of sending remittances both domestically and internationally.

Box 11.2**IT Governance**

IT Governance is the use of modern Information and Communication Technology (ICT) such as internet, LAN/WAN, mobiles etc. by different organisations with the aim of improving their access to information and capacity building. Bangladesh bank has taken several initiatives to implement IT governance. The efficiency and transparency of various activities of Bangladesh Bank have been increased substantially through implementation of 80 in-house developed application softwares. Moreover BB is now implementing several outsourced applications like ERP, Banking, Enterprise Data Warehouse etc. The e-tendering, e-recruitment and *Sanchaypatra* systems have already been well received. Key software developed include:

e-tendering: Bangladesh Bank has developed and implemented an e-tendering system through which all tendering procedures have been undertaken. The announcement of tenders, distribution of schedules, collection of bid documents, preparation of shortlists of valid bids & comparison statements etc. are done through this system which decreases complexity and brings transparency in the overall tendering system. Data security and integrity as per BB ICT Security Policy including audit trials are followed strictly. The e-tendering system is also supplied to Bangladesh Bridge Authority & Rupali Bank Ltd. for their tendering purposes.

e-recruitment: Recruitments under BB and BRC (Bankers Recruitment Committee) are carried out through on-line recruitment systems since 2009. Collection & sorting of applications, validation checking, admit cards distribution, seating arrangements etc. are done through this system.

Networking: All the departments of the head office and branch offices have been connected through LAN/WAN. More than three thousand computers are connected to its highly sophisticated Data Center (DC) and Data Recovery Site (DRS). BB executives are enjoying internet and e-mail facilities through this network. Data security and availability are ensured by real time replication between DC & DRS.

Intranet System: The Intranet system has helped to increase the overall productivity of the organisation. Contemporary economic and financial information are published through the Intranet daily. Important economic data is visualised in the intranet with graphs, charts etc. The online phone book, organisation chart, various publications, visitor access pass systems, HRMS, LMS, some workflows like leave applications, conference room bookings, requisition of vehicles etc. have been included on the Intranet to make daily work simpler and faster.

Open Data Initiative: In September 2011, Bangladesh Bank launched an 'Open Data Initiative' so that key economic data is readily available to researchers and can be downloaded in Excel format. All data from the 'Monthly Economic Trends' publications which includes data on a wide range of indicators from 1993 onwards is now available in Excel.

Training Management System: BBTA is using the system for training management which includes yearly training plans, training schedules, preparation of class routines, trainee registration, online examinations, result preparation, trainer evaluations, release letters for the trainees, list of faculties/guest speakers and all necessary reports.

ATM card: BB Co-operative, Dhaka has collaborated with Dutch-Bangla Bank Limited ATM switches and BB employees have been using ATM card facilities all over the country. This system is maintaining all information regarding debit, credit, balance, loans, FDR etc. of BB Co-operative, Dhaka.

Web Site: The BB website which has been redesigned recently with latest technology contains all up-to-date information necessary for financial and economical research purposes.

ICT Security Policy: Considering ICT risk, the IT Operation & Communication Department (IT OCD) has developed the ICT Security Policy for Bangladesh Bank. Internal Audit Department and IT OCD jointly conduct ICT audits for each department/office twice a year under the ICT Security Policy to ensure the secured usage of its ICT resources.

Guideline on ICT Security for Banks and FIs: Bangladesh Bank is continuously supporting banks and financial institutions for their ICT developments by providing "ICT Guidelines" to create secured ICT infrastructure in banks and financial institutions.

Box 11.2**IT Governance***(Contd.)*

EXP Form Matching System: Using the EXP Form Matching System, the Foreign Exchange Operation Department of BB takes decisions regarding export earning realisation/overdue and monitors the banks as well as exporters.

Shanchay Patra System: The very recently developed *Shanchay Patra* System has been maintaining all information of sold shanchay patras and interest. The purchaser can purchase, sale and get interest through this system quickly and efficiently.

Additional software is being developed and some are at different stages of implementation such as:

a) Enterprise Resources Planning : This system covers the digitisation of procurement, human resources management, cash management, accounts payable, accounts receivable, access control, budget and cost center accounting, material management etc.

b) Banking Application: This includes automation of all the accounts maintained with Bangladesh Bank, foreign exchange management, currency management, treasury and securities systems/module, public debt management module, and the establishment of a Central Depository System (CDS) to build a platform for secondary trading of treasury bills and bonds.

c) Enterprise Data Warehouse: An electronic data bank will be created under the system, building upon the existing Open Data Initiative, which will provide information and statistics of monetary, trade and fiscal policies.

d) National Payment Switch: The national payment switch and e-payment gateway will provide inter-bank fund transfers with full e-commerce facilities in the country.

Along with the above implemented systems, the ITOCD also has several projects under implementation such as the Foreign Exchange Investment System, Foreign Exchange Monitoring System, Circular Management System etc. The department is committed to developing a modern ICT in Bangladesh Bank through the use of latest technology. These initiatives are in line with the greater aim of achieving a Digital Bangladesh.

11.15 Awareness Raising Campaign:

Bangladesh Bank has taken a number of initiatives for raising awareness on the new payment systems like automated cheque processing, electronic funds transfer and mobile financial services. BB has organised seminars and workshops for officials from all commercial banks, Government offices and industry alliances. Besides, Bangladesh Bank has been working to popularise electronic funds transfer network among the stakeholders like Chamber of Commerce, Stock Exchange, Security Exchange Commission, Central Depository Bangladesh Limited, National Board of Revenue etc.

11.16 The Automated Cheque Processing Systems and the Electronic Fund Transfer Network have already proved their potential

by offering fast, secure and cost-effective financial services. Specially, paper-less EFT transactions are becoming popular among the corporate bodies, stock exchanges' members and industry alliances. Besides, the introduction of mobile financial services, m-commerce and e-commerce will significantly change the financial services landscape of the country. These kinds of convergences of paper and electronic modes of payments already improved operational efficiency, increased transaction frequency and brought flexibility. The development of the systems will consequently result into an effective and efficient National Payment and Settlement System consistent with its neighbours and international standards in near future.