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## Article

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## International Journal of Technology for Business (IJTB)



### Computerization of Banking Operation in Bangladesh

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#### Abstract

This paper is about the computerization of the banking operation of two of the largest banks in Bangladesh. The discussion deals with the issues faced in rolling out Core Banking System (CBS) in Sonali Bank and Rupali Bank. The system we studied focuses on centralizing computing operations by consolidating IT infrastructure; this system is meant to replace the existing distributed computing components. In this paper, we will highlight both the technical and human issues we have faced. The paper highlights the context of the work, the scale of the problem, issues and challenges faced during the roll-out. The intricacies of implementing a large-scale system such as CBS are educational, but nevertheless daunting. The findings of the paper articulated that obstacles could be overcome through human ingenuity and discipline. The paper stresses that structural approach of software development is necessary for long-term success of a project and properly trained software professionals is integral to the development of a complex software project.

*Keywords:* Bangladesh, Core Banking System, Banks, Software, Information Technology Infrastructure

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#### 1. Introduction

This paper is about the computerization of the banking operation of two of the largest banks in Bangladesh. The discussion deals with the issues faced in rolling out Core Banking System (CBS) in Sonali Bank and Rupali Bank. The system we studied focuses on centralizing computing operations by consolidating IT infrastructure; this system is meant to replace the existing distributed computing components. We describe the banking operation before the initiative, issues we dealt with during the implementation, challenges we tackled, and the solutions we arrived at.

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Sonali bank, being the largest bank in the country, has had a huge operation before centralization of banking operation was attempted (Mia, 2017). In 2012, the bank has had approximately 1200 branches. The bank has been providing retail banking operation as well as corporate banking services for decades. Services have extended over to the rural corners of the country as well as to the large cities and a couple of offshore branches. It also has the largest coverage of services, such as, retail deposit/withdrawal, loan disbursement to both individuals and corporate bodies, an array of deposit schemes, treasury operation (the bank works on behalf of the central bank to manage foreign currency reserves of all other banks), money transfer under various methods, foreign remittance handling and ATM operation. During the nineties and the decade that followed, the bank successfully automated many of the services using the emerging telecommunication and the Internet infrastructure. The bank always had focus and financial capabilities to take on new IT initiatives (Hossin & Rahman, 2020). By 2012 the bank's IT infrastructure was a sprawl of distributed systems. The systems had no centralized server and common database (Yasmin, 2019). As a result, consolidated and accurate reports was not available. The bank also had duplication of effort and resources.

The other bank, Rupali Bank, is also one of the largest banks boasting more than five hundred branches. This bank has the distinction of being both privately and publicly funded. Rupali Bank also has been offering an array of services much like Sonali Bank and adopted technology at a similar fashion to automate its services (Rayhan, Ahmed, & Mondal, 2011). In this paper, we will highlight both the technical and human issues we have faced. To bring the gamut of issues we unearthed, we will walk the reader through the corporate IT infrastructure, relevant banking operations (Zaman & Chowdhury, 2012). We will describe how each of the above aspects were impacted and affected due to the centralization effort.

### *1.1 Technology used in Bangladesh banking sector*

Most banks have been relying on software solutions from foreign origin to manage core banking functions. Reputable Core banking solutions providing basic features, such as, customer deposits and withdrawals, month-end interest calculations, loan processing, have been in existence for decades. It made sense for the local banks to entrust banking solutions of western origins to handle the customer transactions and monthly/yearly balances. Although foreign banking solutions were not 100% fit for the local banking needs, banks having no reliable alternatives, overwhelmingly preferred time-tested systems of western origin (Ferrer & Kessedjian, 2019) regardless of their high acquiring and maintenance cost.

Bangladesh, being one of the most promising IT hubs of the world, boasts hundreds of young programmers, a fact that did not go unnoticed by the IT management of the financial institutions. In early 1990s, a handful local IT companies grew out of the need to provide services to the local banks (Begum et al., 2010). Banks found the services of local IT firms to be quite convenient: some of the banking functionalities particular to the local market were not available in the foreign banking solutions, whereas the local firms were eager to provide those solutions at a reduced cost. A crop of products, such as Micro-finance, Islamic banking, Mobilized banking, spawned as a result of collaboration between banks and local IT companies (Hasan et al., 2020).

While inclusion of local IT companies in the mix of banks' supply chain provided flexibility, a few new issues came to the surface, especially those related to maintainability and interoperability. More often than not, banks had to interface the solutions provided by the local IT firms with the core banking system (CBS), which were often of foreign origin and contained closed source system without open APIs (Hasan et al., 2010). Banks struggled to consolidate transactions originating from two different sources, severely constraining their ability to produce consolidated reports. The fact that local firms were inexperienced did not help the matter, as very often the local firms struggled with the quality of the service in terms of timeliness and correctness.

## 2. Materials and Methods

The research undertaken had two main objectives namely: a) identify issues relevant in IT infrastructure in Bangladeshi banks b) analyze major challenges in respect to IT transformation in Bangladeshi banks. This study conducted action research at two Bangladeshi banks undertaking IT transformation programs. Action research methodology has evolved over the years and can be defined as “orientation to knowledge creation that arises in a context of practice and requires researchers to work with practitioners” (Bradbury-Huang, 2010). Such method has previously proven to yield good results in IT adoption related research (Hearn & Foth, 2005). One of the authors was actively working in the programs for over a year with the organizations under investigation. In the course of this period, the researcher observed and executed various activities related to IT transformation. Furthermore, the researcher managed IT transformation team, attended meetings, interacted with external stakeholders, executed routine activities, conducted interviews and analyzed documents. Research memos were created and the empirical evidence unearthed were qualitatively analyzed.

## 3. Implementation of CBS in Sonali and Rupali Bank

### 3.1 Issues with old system

The old IT system in the organizations understudy were bogged down by various issues including: decentralized resources; lack of consolidated reporting; disparate IT infrastructure and other issues. These issues are discussed in detail in this section.

#### Decentralized resources

Before centralization, each branch housed an in-house server containing local customer data. This enabled the branch to maintain customer balance to carry on transactions locally. However, the branch could not do transaction for a customer of a different branch. It was also not possible to transfer fund from one branch to another electronically. Being resourceful, Sonali Bank's IT team came up with a stop-gap solution called ABB (Any Branch Banking). This system would connect branches through a telecommunication link. As a result, limited inter-branch transactions were possible. This system was not comprehensive, as only a few services would be offered through this system. Communication channel latency and concurrency issues hamstrung the success of the system. It was not deemed reliable enough to conduct day-to-day customer deposits and withdrawals.

#### Lack of consolidated reporting

The bank, not having a consolidated database, had customer information in different branches. As a result, it was too time-consuming to generate aggregated reports in the head office. Often it would take weeks to compile data from branch offices, check-recheck validity of records, and summarize data. It was no surprise that generating useful report in a timely fashion verged on impossibility. Lack of consolidated defaulter accounts list, profit-and-loss statements and asset liabilities figures gave rise to public distrust of the information that banks were able to provide.

#### Disparate IT infrastructure

Since the beginning of independence in the early 70s, the banks IT adopted new technology and IT components without having adequate centralized control. The IT infrastructure sprawl which started in the 80, grew to a sizable number of isolated islands of branches. Left alone, the branches were able to manage the customer needs through the IT platform that the individual branches possessed, but together the branches were unable to cooperate due to discrepancies in IT components. The hardware, software and communication protocol that branches used were so at odds with each other that the human resource to maintain them became diverse as well, since each branch required different skill sets to maintain its IT platform. As the difference in hardware and protocol mushroomed, vendors to the banks IT also grew diverse. Efficiently maintaining the IT staff and IT systems were impossible.

Lack of ATM, Internet services, SMS, RTGS, SWIFT, SMS

Some of the self-services provided by modern banks, such as, ATM (Automated Teller Machines), and Internet Banking (Making transactions over the Internet), were not being offered due to limitation of IT infrastructure. Even getting transaction confirmation through text messages were facing hurdles as branches were not unified. Local and international fund transfers, which are done in modern banks through RTGS (Real Time Gross Settlement) and SWIFT (Society for Worldwide Interbank Financial Telecommunications), respectively, were also not feasible because of inadequate software and hardware.

Lack of functionality

Modern-day banks ought to offer facility to automatically detect suspicious transactions and report to the central bank through a system called AML, acronym for Anti Money Laundering. There was no AML system to generate such reports. In addition, advanced money-market related banking function, namely Treasury, and adequate customer Loan handling modules were not available with the banks.

Lack of security and privacy

IT security policies were not adequately enforced, and in some cases were non-existent. Balance information were available for any internal operator to see. There were lack of encryption, data back-up plan and disaster recovery protocols.

The roll-out of CBS

A core banking solution was envisioned to mitigate the issues mentioned above. It was decided that the sizes of the banks were large enough to support a new joint venture with a reputed foreign banking solution provider. The joint venture would be a separate entity that would primarily serve the two banks. Source code were migrated from the foreign partner company, system analysis were conducted. Local programmers, testers, technical document writers, project managers and IT administrators were hired. The plan was to host the source code in Bangladesh, customize the code, purchase necessary hardware and communication equipment. The implementation of the system in 1200 branches in Sonali Bank and about 500 branches in Rupali Bank would be done in stages. As a pilot study indicated, to bring a new branch under the centralized CBS, it would generally take two to three weeks to migrate data after cleaning and formatting its existing records. Then it would take a few more days to initiate the staff both at the branch and the head office level to the new working procedures. Eventually, bringing all the branches under the CBS would take four to five years. The 1200th branch of Sonali Bank began operating under CBS in 2017 almost six years after the launch of the joint venture.

### *3.2 Challenges faced in implementing new IT infrastructure*

There were numerous challenges that had to be overcome when replacing the old system with the new IT infrastructure at the studied organizations. The challenges include- scaling out issues; documentation issues; software development methodology; and Cultural gap. This section discusses these challenges in detail.

Scaling out issues

One of the major hurdles faced was scaling the system: the source code that was brought were implemented and tested on banks having far fewer branches than Sonali Bank or Rupali Bank. The number of branches the system had to support was almost ten-fold. As soon as the 100<sup>th</sup> branch of Sonali Bank went live, the limitation of the source code was exposed, as the live system would be bogged down by transactions that the system were unable to handle. A study was carried out to detect the source of the problem. Upon tracing the log of the system, it was discovered that the source code contained references to stale connections that were not released. The incorrect coding of handling connections written in million places in the source code were not possible to manually correct. The only way the system could be kept operational was for the server administrators to manually bring the server down and restart the server.

#### Documentation issues

The source code was poorly written and documentation was scarce. Customizing the software for local requirement proved to be a time-consuming task. Developers, having not given standard technical documents, had to understand the functionality through guess-work and trial-and-error. This proved to be an error-prone and tedious process often resulting in frustrations among end-users and developers.

#### Software development methodology issues

A software is well-developed if its functionalities are modularized, as modularized software is easy to maintain and enhance. Also, a complex software project often become so huge that simply compiling the source code could take hours. This phenomena manifested in the CBS source code. At times, a developer had to wait hours to do a development test run of the module he or she intends to work on, as the source-code structure of the system forced unnecessary compilation of unrelated modules.

#### Cultural gap

During early stages, professional from the foreign partner would often take charge in development and system analysis. This, however, proved more daunting than one would initially envision. Very often the languages of the professional and banks personnel would lead to confusion and outright clash. Bringing in local professionals helped the CBS implementation, as the communication barriers were reduced.

## **4. Conclusions**

In this study, we brought to light the complex issues that were faced during implementation of a large system. We highlighted the context of the work, the scale of the problem, issues and challenges faced during the roll-out. The intricacies of implementing a large-scale system such as CBS are educational, but nevertheless daunting. We discovered that many obstacles were overcome through human ingenuity and discipline. We stress that structural approach of software development is necessary for long-term success of a project. Properly trained software professionals is integral to the development of a complex software project. While we laud the resourcefulness of the management and implementation team in bringing more than 1500 branches to live, we appreciate the importance of adequate training of professionals.

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