Large-Scale Sustainable Information Systems Development in a Developing Country: The Making of an Islamic Banking Package

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EXECUTIVE SUMMARY

Information technology (IT) transfer to developing countries is often affected by various problems. Most available application packages are too expensive and were originally designed to work in a developed economy. The international features of the application packages reduced the problems associated with long duration and huge cost of customization. Nevertheless, there are still some processes that require many peculiar requirements that customization of the off-the-shelf applications cannot meet. With the rapid changes in IT and the business environment, it is becoming essential to rely on information system that can be sustained and upgraded without much cost in order to meet those changes. This case describes a project for the development of such a system.

We present the background of the IT company and an Islamic bank as the customer. We highlight the circumstances that led to their decision to develop the systems locally. We discuss the facts that surround the development of the system: the outsourcing decision made by the African Arab Islamic Bank (AFAIB), the project management and systems development at Technology Associates Ltd. (TA), and other information system issues related to developing countries and their effect on the project's success.

BACKGROUND

While information systems management (e.g., Yahya, 1993) and implementation (Nidumolu & Goodman, 1996; Kirlidog, 1997; Lin & Berg, 2001) in developing countries has received some attention in the literature, there are few reports of cases of information systems development processes (e.g., Madon, 1992). Most efforts are focused on problems of infrastructure (Odedra, Lawrie, Bennett, & Goodman, 1993; Moyo, 1996). The call for more case study research by Montealegre (1999) was again focused on implementation issues. The activities of the indigenous software developers and companies have not received proper attention and make the possible lessons that could be learned from them limited. Information systems research has traditionally focused on organizations in the US and Western Europe without considering how this could be applied and extended to developing countries (Dasgupta, Agawrwal, & Ioannidis, 1999). The actual implementation in developing countries has not been able to benefit from this kind of results, as the local factors pose significantly different circumstances. Several systems have been developed where only the context of region of origin has been taken into account. This has resulted in information systems solutions that are not sustainable, even if they meet the needs of organizations in developing countries.

With globalization and internationalization of labor, it becomes important that we begin to have more contextual knowledge of information systems development in developing countries. In this regard, a locally oriented information systems methodology has even been proposed (Korpela, 1994; Korpela, Soriyan, Olufokunbi, & Mursu, 2000), yet comprehensive knowledge of the IS development activities from a real-life example could broaden our understanding of the processes and methods.

SETTING THE STAGE

Around December 12, 1996, the staff members at the research and software development (R&D) unit of the Technology Associates (TA) company were busy thinking what would be the best strategy to convince the management of AFAIB, a new company licensed to operate Islamic banking in Country X, to award the banking software project to the company. Khaled Al-Sayer, an expatriate finance manager from the Islamic Development Bank, Jeddah, was not convinced that any local company in a small country like Country X should be entrusted with such a mission-critical strategic system. Among his major concerns were the complexity of the Islamic banking operation compared to conventional banking, the tight schedule, and the budget.

Khaled had worked in many Islamic banks in the Middle East. In his last place of work in Bahrain, he worked with a group of programmers to develop the system they use there. Upon his posting to Country X, he had made arrangement to adapt the system for the new bank without considering the fact that the system was developed specifically for a particular bank and not for general use in any Islamic bank. This has been the problem with most of the available Islamic banking packages and is one of the reasons why that bank had to develop its own system locally. There was also the problem of technology, as, at that time, there was no local expertise in Country X to support the kind of technology used in the development of the system at Bahrain. In 1996, the Internet was not very available in Country X and remote support would have been too expensive. Due to other capital expenses, AFAIB had limited resources to acquire available expensive commercial banking packages. In addition to the fact that the operation of Islamic banking differs from conventional banking practices,

customization would, in turn, increase costs and delay delivery. All these facts left the management of AFAIB with the option of searching within the sub-region for an affordable and sustainable system with adequate support and provision for upgrading in view of future expansion.

There are only few possibilities, since the banking packages available at sub-regional countries are also expensive and the problems of customization due to original design are also present. The package in use in another Islamic bank in the neighboring country had its interface in a different language with a different accounting structure. Ahmed Barde, the managing director of AFAIB, a seasoned financial practitioner and one-time senior executive at the central bank of Country X, contacted his colleagues in the banking sector. At this time, there were three banks operating in Country X. One was Standard Chartered Bank (SCB), a multinational banking group that used BANKMASTER for its main banking operations. We call the other two, Bank A and Bank B. They both use in-house banking systems developed locally.

The management of Bank A agreed to sell its banking system to AFAIB and provide support to customize it. Bank A actually had the capacity since the main actor in the development of the package was still with the bank as the IT manager. After lengthy negotiations, the high price demanded by Bank A seemed to discourage the management of AFAIB. The issue of competition was also another major consideration. Bank A was going to be one of AFAIB's main competitors, and there was concern about entrusting the backbone of its operations to a competitor. There are, however, situations where competitors become partners; for example, in Hong Kong, owners of leading supermarket chains and department stores joined together to build an electronic commerce infrastructure to address common problems (Damsgaard, 1998).

While all this searching was going on, the management of TA kept visiting AFAIB and using other local contacts to convince its management that TA had the solution to AFAIB's systems problems. There appeared to be some scepticism at the bank about the qualification of TA, the only software house in Country X. This was despite the fact that TA had most of the major companies and organizations as customers and had undertaken many successful large-scale software development projects in the past (e.g., a billing system for a national utilities company, a works management system for a World Bank-assisted project organization, etc.). In addition, most of TA's management and operational staff were trained abroad and had considerable experience from working in various places, including banks. In fact, one of the major banks is one of TA's main customers. Usman Garba, TA's managing director, is still responsible for the payroll system that he developed while working there. With no other option left, the management of AFAIB contacted TA and a demonstration of a prototype banking application was fixed for the 26th of December, 1996. A prototype was designed by TA's developers based on their experience in banking and accounting systems and basic Islamic banking operation procedures provided by Khaled and other former colleagues of Usman, now employed at the bank.

The prototype was presented in the presence of AFAIB's management team (Operation Manager, Investment Manager, Finance Manager, and the Managing Director). Khaled asked several technical questions and others also probed to confirm the readiness of TA to meet AFAIB's requirements. They inspected TA's facilities, and their fears were reduced though not totally allayed. They now considered the risk of trusting TA as minimal.

The main problem was now the issue of time. They had hoped to open to the public by middle of February 1997 and wished to start using the system from the first day. Before any

serious development work could commence, there were still other issues like the nature of the contract, cost, etc., which could not be addressed until a more detailed analysis could be carried out. After two weeks of intensive preliminary analysis, draft, and redraft of the contract, representatives of both companies finally signed the contract. The management of TA was able to use the software contract to negotiate the hardware maintenance and networking contract. The bank was able to start its operation with the necessary modules. A banking system that covered most of its operations was ready within 10 months.

ORGANIZATION BACKGROUND
The African Arab Islamic Bank

Even though Country X is a secular state, it is predominantly an Islamic country. The country is a member of the Organization for Islamic Conference (OIC), which partly owned the Islamic Development Bank (IDB) (http:/www.isdb.org). For a very long time, multinational banks like Standard Chartered Bank and some other regional banks practicing conventional banking dominated the banking industry. They had established clientele and resources to tackle any new entrant to the market. The founders of AFAIB were not discouraged by the that market situation, but carefully adopted a better strategy to enter what seemed to be a saturated market. One major strategy to gain entry into new market was to change the rules of the game. One of the reasons why Netscape was able to compete with Microsoft could be attributed to this approach. Netscape did not play the game in the usual way; it changed the terrain and moved the competition to a level ground where the huge customer base and resources of Microsoft could not easily provide a competitive advantage (Cusumano & Yoffie, 1998). AFAIB used a similar strategy to enter the banking industry in Country X. AFAIB understood the religious beliefs of the people of Country X, and introduced another form of banking that would not be based on interest but on profit, as recommended in the Holy Quran, in which many of the people of Country X believe. Thus, in 1996, Islamic Development Bank, Saudi Arabia, Social Security and Housing Finance of Country X, Country X National Insurance Company, and several private individuals in Country X and one other African country came together to found a bank called the African Arab Islamic Bank.

The bank commenced operations in January 1997 to carry on banking business in all its departments and branches in accordance with Islamic (Sharia) principles and practices with a view to making a profit for its shareholders and depositors and to contributing to the socio-economic development of Country X. Apart from accepting deposits from customers and providing products and services traditionally rendered by conventional banks, AFAIB grants financing facilities for short-, medium-, and long-term economically and financially viable undertakings. The bank is, thus, mandated to carry on both commercial and development banking activities and, at the same time, trade in commodities. In addition, the bank assists the disadvantaged people of the community.

AFAIB is divided into five major departments: operations, finance & administration, investment, treasury & foreign exchange, and monitoring & recoveries (Appendix A). Each department has distinct functions, but the activities of all departments are coordinated towards the attainment of the bank's corporate objectives; i.e., to carry on Islamic banking business in all its departments and branches in accordance with Islamic principles, with the view to making profits and contributing to the economic and social advancement of Country X. The bank's services are opened to all individuals regardless of their religion. The bank performs investment management functions based on "Mudarabah Contract," which is a

profit-sharing contract between two parties. The first party (investor) provides funds and the other party (manager) provides professional services. The profit is shared between the two parties based on a predetermined, agreed to ratio. Islamic principles do not allow dealing in interest (usury) basis. Interest is understood to mean a predetermined return on cash lent out. The bank invests funds using investment windows consistent with Islamic principles. In addition, the bank provides customer services that are normally offered by conventional banks, such as letters of credit, letters of guarantee, current account, trading in currencies, etc. (see Gerrard & Cunningham, 1997, for more detail on Islamic banking products).

The board of directors of AFAIB consisted of the representatives of IDB and other local directors. The management team was comprised of Ahmed Barde (managing director), Khaled Al-Sayer (expatriate finance manager), Jeremy Bongo (operation manager), and Shehu Abdulahi (investment manager). Kuranga Yusuf later joined as the counterpart finance manager. Apart from Shehu who does not have conventional banking experience, all other members of management team had worked in a bank before in different capacities. AFAIB has, from the beginning, understood that its expertise is in Islamic banking and decided to outsource other related services like information technology. AFAIB knew the importance of IT in business and especially in banking, which require a huge data processing and information management. AFAIB directly acquired the basic hardware with the assistance of the contacts of Khaled in the Middle East, and eventually contracted the development of the banking software and acquisitions of other necessary software and hardware to a local company called Technology Associates Ltd. (TA).

Technology Associates Ltd, Country X

In spite of the political instability and economic downturn that followed the military takeover of the government in Country X in July 1994, Usman Garba and his colleagues still went ahead to start the company they had planned. From inception, Technology Associates (TA) set out to become a leader in information technology, committed to excellence and providing appropriate technology and solutions to meet the business needs. With their own personal resources, contributions, and loans from family as business angels, Garba and his colleagues started TA. They realized that it was becoming increasingly necessary that original software packages be developed locally for optimum computer and business applications. They also realized that it was right time to have a local company to provide adequate support for the local business, which was definitely missing as at the time of TA's incorporation. Foreign-owned companies dominated the IT industry, focusing on marketing off-the-shelf packages and using expatriates to provide support and services. TA was primarily structured into three functional departments: Research and software development (R&D), technical services and communications, and training and support services (Appendix B) and managed by Musa Abass, Sheikh Bwari, and Vicky Alabama, respectively.

A major strength of TA is the ownership and management structure. Apart from Alhaji Shettima Jalo, an uncle to one of the directors, all the remaining directors of TA also work as managers in the departments mentioned above; thus there is reduction in decision-making levels. Most decisions can be made during a management meeting or at a short impromptu directors' meeting. Unlike many start-up companies, TA was not under any pressure to make a profit and was able to concentrate on building a solid customer base and, as such, began to be trusted by the local business community. Education and training of the management was other strength of TA. Since there was no university in Country X, the management team all trained abroad in Computer Science. Despite the option to remain abroad with higher pay

and huge demand, all chose to return home to work for local companies, after which they started their own company, TA. There was also a close friendship and even family ties between the directors, which has a strategic importance in business survival in Africa (Lawrie in Odedra, Lawrie, Bennett & Goodman, 1993). They all speak a common local language and five other foreign languages: Chinese, French, Arabic, Russian, and English (the official language in Country X).

In 1996, there were about 20 permanent staff working at TA. The business development and growth was not easy, especially convincing local businesses to develop software to support their services. Many do not yet understand the advantages in using software to support business processes, even though they use computers for other purposes like word processing and keep basic spreadsheets. Few that have seen the need are comfortable with the off-the-shelf foreign packages, which they often acquire directly when they travel abroad or through friends and families. The majority of the international organizations usually rely on their expatriate-IT manager and already have contact with existing foreign-owned IT companies. Thus, in the early years, TA was almost developing free software in order to convince the business community of its use and the company's capabilities. During these early years, TA became involved in the development of taxation software for the Tax Department of the Ministry of Finance and Economic Development, with the supervision of a consultant from Harvard University. This paved way for the development of a billing system for the National Utilities Company (NUC) at a time when it was in serious crisis.

After the military takeover of the government in 1994, there was disagreement between the French company running the NUC and the new government. In a nutshell, they switched off the billing system that was being partly controlled from France and all the expatriate staff that could help also left the country. TA was able to use this crisis to convince the local businesses of the need to look inwardly and locally for a mission-critical system. TA brought out the effect of over-dependency on foreign-developed applications. Other units of TA also performed excellently in discharging their professional duties and soon won the confidence of the local businesses. When the local area network of the United Nation Development Program's (UNDP) national office was struck down by lightning, TA was able to restore it within a reasonable time and provided technical support for numerous businesses. Today, the majority of users in Country X were trained at the TA education center, where corporate and individual training is provided at affordable prices.

Getting competent staff is a general problem in sub-Saharan Africa (Odedra et al., 1993; Moyo, 1996), and Country X is not an exception. The demand for well-trained experts in information technology is greater than the supply. Despite this, TA ensured that it recruited the best IT personnel available in the market and provided many incentives to retain them. They also hire and train locals with high potential to learn new skills and eventually employ them in different positions. When required, TA recruits experts from other countries in sub-Saharan Africa. Among the staff from another country is Joseph Cardozo, a programmer who later played a major role in the product developments at TA.

CASE DESCRIPTION: THE MAKING OF AN ISLAMIC BANKING PACKAGE

After the awarding of the AFAIB contract, TA was confronted with choosing the best approach to proceed with the project. The project proposal and contract contain a vaguely written functional specification without detailed technical specification. This was partly due

to lack of time and shared trust that followed the demonstration of the prototype. It was agreed that the system would be developed in phases, based on the urgent needs and stage of operation of the bank. For example, it was compulsory that the account-management module be ready as soon as possible, while profit calculation could wait since the first time to use that feature would be after three months of operation.

Being a small company, almost everyone at TA was involved in the project. In this case, we only concentrate on the software development aspect of the contract, although necessary references are made to the hardware aspect. Four people were actively involved in the analysis, programming, testing, and implementation of the system: Usman Garba, Vicky Alabama, Musa Abass, and Joseph Cardozo. They constituted the development team. Joseph was appointed as the Project Manager to coordinate the development work and liase with the bank for daily updates and demonstrations of new features. He was also involved in the development of several modules and supported Vicky Alabama, who led the testing.

Contract and Agreement without Detailed Analysis

Under normal circumstances, and being the first time that these two organizations cooperated with each other, there supposed to be some kind of reasonable level of detailed description of what should be delivered. This was difficult in this situation since neither party knew how far the system would be developed. What was agreed upon was only the delivery of a banking system that would allow account management, post and process transactions, and perform normal banking procedures in addition to the profit calculation. The fact that the detailed description was not in written form posed some problems at later stages of the project.

System Development Process

Choice of technology and methodology.

Even though there are various ISD methodologies, each one has various advantage and disadvantages (see Avison & Fitzgerald, 1995, pp. 261-406, for detailed discussion). Considering the time and the low-cost requirements, prototyping was chosen as the methodology for developing the system (for further detailed review of prototyping see Alavi, 1984; Budde et al., 1992; Hardgrave & Wilson, 1999; Henson, 1991; Jason & Smith, 1985; Mogensen, 1991; Trigg, Bodker, & Groenbaek, 1991). According to Hirschheim and Klein (1992), making a prototype to eventually become the system involves five phases, as represented in Figure 1. The first stage is to identify some of the basic requirements without any pretensions that these are either complete or not subject to drastic changes. The second phase is to develop a design that meets these requirements and to implement them. The third phase is to have the user experiment with the prototype under the developer's supervision, recording bad and good features. The fourth phase is the revision and enhancements of the prototype based on the outcome of the third phase. This phase includes redefining and gradual completion of the requirements and also improving the interface and reliability. The last phase is actually continuous and includes repetition of phases three and four until the user is satisfied or money and time do not permit further revisions.

They also decided to use one-tier procedural architecture (see Chaffee, 2000) with enhanced capability to utilize the local area network. Since the whole project had started with a demonstration of a prototype in exactly similar hardware environment designed for the bank, the users were able to see the system in real-life situation. Although there are different kinds

Figure 1. Phase Structure of Prototyping
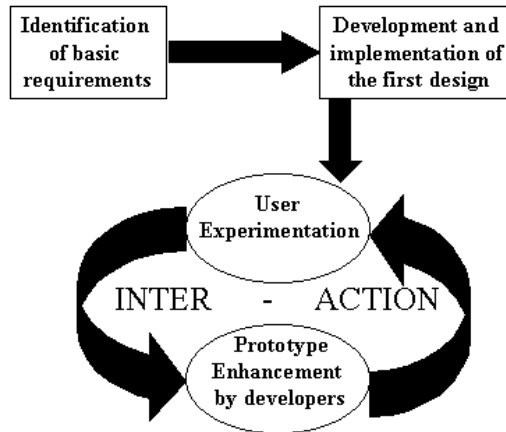
of prototyping, as described by Hirschheim and Klein (1992), this project used several features of each variant of prototyping. At earlier stages, horizontal prototyping was used to give the users an idea of the system without much computation, except when it was absolutely required. As the project advanced, and with the basic features already in place, emphasis shifted to vertical prototyping that provides full functionality for each module. The system was also designed in a cooperative manner (Trigg, Bodker, & Groenbaek, 1991) and could also be seen as evolutionary development (Budde, Kautz, Kuhlenkamp, & Zullighoven, 1992). Since the project team lacked detailed understanding of Islamic banking principles, it worked closely with Khaled, the finance manager.

Prototyping involves heavy use of productivity tools such as database languages, code generators, screen painters, and generators, etc., to enhance the process of logical design and ease the physical design in a cost-effective manner. This influenced the choice of the programming language and the techniques used. Because Khaled had been previously exposed to software development using Visual Basic, he strongly wished that the system could be developed with it. However, the development team at TA was not prepared to experiment on a technology where it lacked expertise. This has led to the failure of many software development projects (see Paynter & Pearson, 1998, for example, and Lyytinen, Mathiassen, & Ropponen, 1998, for software risks). Although it was not a problem to use Visual Basic, the risk was considered too high with the time schedule of AFAIB. Handling the functionality and meeting the specification of a new banking paradigm were considered sufficient challenges. In its previous projects, TA had used Clipper and FoxPro. To meet the prototyping need, the team finally agreed to use FoxPro, which provides enough functionality to support prototyping. Emphasis was put on writing reusable codes, and the system was highly thus reducing the coding time and making changes easier. The system was designed and implemented in a Microsoft DOS environment; however, the networking, file and record-sharing capability of Foxpro enabled the system to run on the bank's Novell Network LAN. The entire system resides on the server, and the data was not separated from the procedures as in the case of client/server systems. This obviously affected the speed of the system and lead to some minor problems associated with file sharing and record-locking techniques of flat files.

Security and reliability of the system is one of the major priorities of the management of AFAIB. Consideration was given to this from the very beginning. Apart from the well-defined, role-based access to the system, the tables were encrypted and the data was scrambled at record level.

Project Management

Unlike most projects, the starting date of this project was known but the completion period was agreed upon without any specific end date. In principle, when the need of the users were met, i.e., when a complete banking package acceptable to both parties was delivered, the project would be considered completed. This was a bit clumsy since the requirements of a growing organization could keep increasing and, thus, the project may never end. Nevertheless, this did not raise much concern since TA saw it as an opportunity to develop a longer-term relationship with the bank and secure all its future IT projects. Even though the project was large enough to use project management tools, none were used on this project— everything was handled manually. The writing of the technical and user's manual in parallel with development assisted in simultaneously recording the relationship between one module and the others. The programming conventions of TA also ensured that each programming module was properly addressed and documented with detailed title and header information (date created, major data files, author, date amended, old file, etc.).

 The project manager often met with the finance manager to clarify some design issues and demonstrate the latest update. When required, the entire team met with the representatives of the bank, mostly with the finance manager and the operation manager, to discuss the progress of the project. There were disagreements on a few occasions, when the finance manager changed what he had requested earlier after it had been implemented with much effort. TA was also under pressure to deliver the first indigenous Islamic banking system in the country. Some of these problems could be attributed to lack of any detailed specification in the contract. However, on those few occasions, differences were settled amicably.

Various risks were identified early and were carefully taken into consideration throughout the project. The bank was set up to keep a minimum essential manual record of the transactions, which meant the system could not be down at any time once the operation began, or the banking operation would come to a halt. There was also zero tolerance for transaction errors, which could adversely affect the image of the bank. Thus, adequate provisions were made in the error handling procedures. For example, a transaction had to be completed once it started, otherwise the debit might not have a corresponding credit and the whole account would not balance. This was a difficult and important issue, not only from the programming perspective, but also from the developing countries' infrastructure problems, for example, the inadequate electricity supply that often caused data corruption. It was also important that TA deliver each module as required; there could be no delay since it would mean an interruption in the bank's operations. The issue of budget and time overrun was out of the way by the nature of the contract. It was a fixed amount payable periodically without any direct attachment to the deliverables. Since the project did not have any specific end date, successful completion of the set objectives thus concluded the project.

In the absence of any written communication plans, the project team met often to agree on some important design issues, resolve any conflict, and to monitor the state of the development. Almost on daily basis, the bank was shown the latest version and its comments were incorporated immediately. The users were involved in the testing, which revealed

several errors that would normally have occurred and been found after the system was in use. This experience also familiarizes the users with the kind of possible errors they might encounter when using the system and what to do at that stage. Their reception to the system was quite nice and the feeling of ownership was clearly evident through their participation. With the TA's experience with regard to problems with preparation of technical and user's manuals, these were written in parallel with the development. The usual practice was to wait for the system to be ready before the work on the manuals began. This usually causes delay in its completion.

Communication and Power-Related Issues

As the success of the project become more realistic, everyone wanted to be part of the project. This led to some conflicts of interest and minor misunderstandings among the staff, but not directly within the development team, as it was too busy for any conflicts. As mentioned earlier, while the software project was going on, the hardware and networking project was also in top gear at the bank. When the bank eventually started operation and it began using the system, the error-handling program usually returned a red screen with the message, *"Press ESC to continue and report the error to TA's engineer………."* The problems were often reported to Sheikh Bwari or his staff who were often at the bank. As the head of technical services, he was very interested in the project. He knew that the hardware-servicing contract was anchored to the success of the software and was always eager to respond to the problems instantly.

Although he understood the process of software development, he always felt that the team was not doing enough to make the system stable and reliable. He usually spoke at the bank on behalf of the development team on what he knew a little about. This occasionally brought some disagreement between him and the development team. He sometimes made promises that are not realizable within the given time and expected the development team to comply. Through the head of the R&D, the development team also emphasized that the users were supposed to be communicating with them directly through the project manager and not through someone they considered external to the development process. It took some time before the problem was completely resolved, actually until the system become more stable and the users were no longer scared of the common errors.

Cultural Issues and Influences

Some practical issues that we often neglect in work practices sometime affect the output and the quality of project. Individuals have personal beliefs and values, and aligning those to fit into the organization where they work or the kind of work they do becomes quite important. The workers at the bank had to pray five times a day, three of which were within working hours. As a matter of fact, the room next to the banking hall, adjacent to the computer room, is a mosque. They often had to have a break during presentations or meetings to have prayer. Considering the pressure and the willingness of the project manager to get to the root of any pending problems, it often led to some frustration when the people who were supposed to be working with him had to break for prayers. As mentioned earlier, Musa Abass, the R&D manager at TA, is fluent in Arabic, the official language of the Egyptian finance manager. This automatically enabled a cordial professional relationship between the two of them and, in effect, with the development team. They often preferred to speak in Arabic on issues that did

not concern other team members. Other members of the team even allowed Khaled to use Arabic to explain those Islamic banking concepts that could not be easily translated and explained in English. On the few occasions that the bank's chairman visited the bank from Saudi Arabia, the language capability of the TA development team became useful. Apart from his impression about the performance of the system, the chairman was very comfortable with the language ability and religious beliefs of the vendor's team. Thus, a relationship that was beyond vendor-customer developed between the two companies due to this cultural influence.

Professionalism, Ethics, and Trust

While every detail might not be clearly spelled out, AFAIB had a clear goal for the project—an application system to run its banking operation. Khaled was an expert in Islamic finance and accounting, but it was not long before the development team realized the extent of his understanding of software development. AFAIB did not yet have any justification to hire a full-time IT manager, thus it had to rely on TA for all the IT services and strategies. Occasionally, the bank sought advice from IDB at Jeddah, but it still had to rely on TA for its implementation. This dependency and lack of adequate in-house expertise created an avenue for monopolistic bargaining for TA. TA was also left with its choice of technology and any kind of practice convenient for it. It was here that the professionalism of TA came into play. In spite of all these dependencies and freedom, TA ensured that it critically considered all possible options and provided justification for all the decisions made in the project. The approach used was to make the project manager completely independent of the team and work as a client advocate. In this role, he questioned any decision he felt was not good enough from professional point of view. He always took time to explain to Khaled why a particular option was chosen and its advantage over the others.

Similarly, AFAIB relied on TA to staff the department. TA assisted the bank to recruit one of its own trainees to work as the operator of the system and manage the IT unit of the bank. Again, without strictly adhering to professional ethics, it would have been easy to influence the operator to carry out the wishes of TA while compromising the quality and integrity of the system. As soon as the operator became a member of the AFAIB staff, he used his exposure and experience to contribute to the project and offer several constructive criticisms, even though the project was at advanced stage at the time of his arrival at the bank. There existed a mutual trust and care that transcended the vendor-customer relationship between TA and AFAIB. AFAIB believed TA would provide the best system that would enable the bank to compete well in the market without compromising the business strategy to its competitors (who also happened to be customers of TA). At this stage, every other bank wanted to know more about Islamic banking and its mode of operations. The relationship was not of customer-vendor but more of partners where both working towards the success of the project and organizational developments.

Intellectual Property and Software Ownership Issue

Who should own the intellectual property right to the final product? Was it AFAIB that understood Islamic banking and paid for the services to code it into the system for its use, or TA that labored to interpret and translate the Islamic banking knowledge into a codified form and got paid to do so? This issue of ownership was not discussed in much detail at the

time the contract was awarded. AFAIB was preoccupied and satisfied to get a system to start its operations without thinking about the ownership issue and the future of the banking system. Meanwhile, TA had added a clause that gave it the ownership of the software. But the question was would TA be able to resell the package without the permission of AFAIB? As of the time this case study was written, this issue has not arisen and the relationship between TA and AFAIB was still very cordial.

Motivation and Reward System

There are many factors that could be responsible for the delivery of the system within the expected period. Apart from the fact that everyone was enthusiastic about the project, TA also provided an enabling environment and encouraged its staff to work hard. There was a goal-oriented culture and everyone involved in the project had a sense of achievement and belonging. All the project team members never hesitated to work overnight to deliver a new module in the following morning. The working culture at TA prior to this project allowed for flexible resumption and closing time. This became useful on this project as the development team members were already used to long hours of work. The leadership at the organization provided a good example. Usman Garba had a record of working later than anyone and arrived before all other team members. He was able to combine the development work with his normal management and administrative tasks, without allowing any of his duties to suffer. At the beginning of the project, there were no promises of any reward for the core development team if it met the deadline; it just worked in a professional manner and accepted the satisfaction of delivering a good product as its motivation. Although not having the possibility of providing stock options as is common in the Western countries, TA does offer yearly profit sharing to reward its staff.

Project Completion

The end of the project was a relative issue since there was no specification of the exact features that should be present in the completed system. However, after the first six months, the system was able to handle most of the basic operations of the bank; profits had been calculated twice. Profit calculation was one of the major tasks in the whole project. The system was also able to process various kinds of investment: Musharaka, Mudaraba, Istisna, etc., without any major problem. On a daily basis, the bank could produce trial balances and other reports, and everybody seemed happy. The system was accepted after nine months of development. To officially mark the end of the project, TA and AFAIB organized a big hand-over ceremony. However, there were still other parts of the bank and banking operations that needed to be computerized. The finance department still depended heavily on spreadsheets for some processes and calculations; the input comes mostly from the banking system but had to be re-entered manually.

At the handing-over ceremony, the project manager highlighted many features for the next version of the system. Even though e-banking was then not well-known in the country, he described a scenario where corporate customers could directly link their accounting systems to the banking package. He also suggested upgrading the system to a Microsoft Windows-based application. He suggested other applications like payroll, fixed-asset management, credit analysis system, etc., to complete the automation of the entire bank and its services. He suggested n-tier architecture where the user services would be separate from business and data services (Chaffee, 2000). All of these additional features would make the

system more robust and scalable in preparation for when other AFAIB branches would be added to the system.

Exposure to Technology

Shortly after the handing over and the official conclusion of the project, the project manager travelled to one Middle Eastern country in the fall of 1997 on annual vacation. During his holiday, he visited several organizations and was surprised to realize how far behind the technology that was used in the project was in comparison. He was exposed to new approaches that would have made the development work faster with better quality. Even though TA was able to accomplished most of the requirements with FoxPro, he found out about modern tools for software development and was eager to spread the news when he returned back to his company. The management of TA were quite aware of the developments in software tools, but it was confronted with many limitations due to the geographical location. As mentioned earlier, TA was the best IT organization in the country and there was no place to train its staff locally. The cost of sending them abroad would be too high, considering the fact that the market is a bit small and the businesses are not prepared to pay for the cost of modern technology. For example, in 1997, there was an attempt to recruit one Oracle expert from a neighboring country in order to bring Oracle expertise to TA . The attempt failed due to his demands. The local companies are not prepared to pay for the cost of the software, hence there was a need to balance the use of technology and the local market realities.

CURRENT CHALLENGES AND PROBLEMS

There have been rapid developments and changes in the IT industry since 1996 when the project started. These also brought about changes in the business environment. Electronic banking was added to the telephonic banking that was common at the time. The architecture of the AFAIB system was not ready for either of these. The major competitors of AFAIB introduced ATM, changed their banking systems and offered more IT-based services, yet AFAIB is performing well in the market. Within the first two years of operation, it had good percentage of the market. AFAIB was also aware that it needed to quickly upgrade its software and integrate its systems to meet the dynamics of the banking industry. It realized that it was locked into TA as its IT provider, at least for software services. AFAIB had invested so much on the software that it would be very difficult to change it. Changing the system would require amending many aspects of its operation, which might just be too costly. However, the system meets its needs, and TA is committed to providing all the possible support. For the reasons explained earlier, TA still ensured that professional integrity and good practices were maintained throughout the project and to date.

The project manager visited the bank in the spring of 2001, and the system was functioning very well and was stable. AFAIB has started electronic banking with the support of TA. TA owns the only commercial ISP in Country X and is well-positioned to assist AFAIB in this regard. AFAIB has not appointed a substantive IT manager, and how far TA can continue to provide the kind of support that the bank's expanding operation and more complex applications demands remains an open question. Work is still in progress to upgrade the system to accommodate the recent developments in IT, i.e., making the system integrate well with the Internet and even with wireless technology. This requires a considerable amount

of work and time since the architecture of the system was completely different. Nevertheless, it is a challenge for TA to meet the need of its client.

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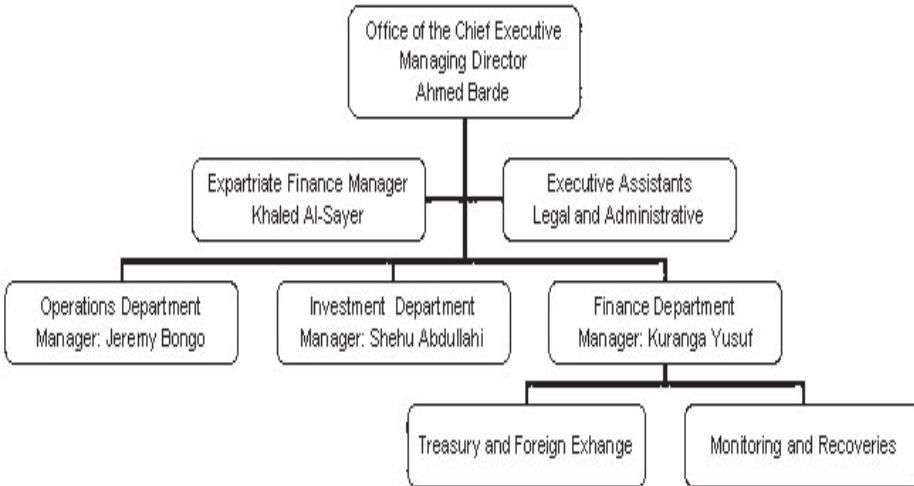
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BIOGRAPHICAL SKETCH

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APPENDIX A
Organizational Chart of the
African Arab Islamic Bank, 1996

Office of the Chief Executive
Managing Director
Ahmed Barde

Expartriate Finance Manager
Khaled Al-Sayer

Executive Assistants
Legal and Administrative

Operations Department
Manager: Jeremy Bongo

Investment Department
Manager: Shehu Abdullahi

Finance Department
Manager: Kuranga Yusuf

Treasury and Foreign Exhange

Monitoring and Recoveries

APPENDIX B
Organizational Chart of Technology Associates, 1996

Managing Director
Usman Garba

Administrative Assistant
Fasinu Anago

Research and Software
Development
Head: Musa Abass

Technical servcies and
Communications
Head: Sheikh Bwari

Training and Support services
Head: Vicky Alabama