Beyond the Globalization of Information Technology:
The Life of an Organization and the Role of Information Technology

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Extended Abstract

The globalization of an information system in a major international bank is analyzed in order to explore the role of information technology in terms of organizational effectiveness. Our study shows that the globalization process revealed and intensified preexisting organizational issues such as the balance between local autonomy and global control in the international bank. A potential role is identified for information technology as a facilitator in formulating and revealing collectively-held organizational theory-in-use -- a theory of action constructed from an organization's actual behavior. This collectively-held organizational theory-in-use can then be used by members of the organization to compare with their privately-held organizational theory-in-use in order to identify issues, which, in turn, can lead to discussions for a solution. This process sets the stage for organizational learning centered on error-detection and error-correction.

Most of the conventional theories in Information Systems advocate efficient management based on two primary perspectives: The first is a top-down process moving from strategy-setting to management planning to operational control in an organization. The second is a static and closed change-process with four stages: initiating a change, creating a climate conducive to change, executing the change, and finalizing the change.

Contrary to these perspectives, we found that the global information system was developed initially as a software product aimed at processing a particular local branch's banking operation instead of serving as a tool for globalization. The decision for installing the system globally was an adaptive process to find the best fit between the software available in the local branches around the world and the top-down globalization strategy formulated at the corporate headquarters. The implementation process did not rigidly proceed through the static and closed change-process. Instead, the implementation process acted as the beginning of an iterative development and re-development process, where local modifications occurred based on error-detection and error-correction activities in the software to fit the local needs.

Our study suggests that an adaptive and flexible Composite Information Systems approach for the globalization of information technology which is conducive to organizational learning can create a medium not only for increased connectivity among information systems but also for an improved organizational dialectic among the members of an organization, which in turn can increase organizational effectiveness as well as efficiency.
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Key words and phrases: Information Technology, globalization, Composite Information Systems, organizational learning, theory-in-use, espoused theory, error-detection and error-correction, connectivity, systems development and implementation.

Introduction

This paper examines the role of information technology in the globalization process of an information system in a major international bank. We started with a general assumption that we need to review critically the commonly-held assumption that information technology always solves rather than defines problems, and that it produces or leads to new issues rather than revealing old ones.

We formulated our specific research question as follows: What are the differences between the intended role and the actual role of information technology in our case-study organization where globalization is set as a primary strategy? To answer this question, we need to trace and explore the decision-making process of the bank and the changes in the information system which are related to the globalization process.

We will first review research related to this topic. Second, we will explain how we conducted this research. Third, we will reconstruct and explain the bank’s experience in globalizing information systems, including the implementation of the Automatic Banking System and the experiment with the Composite Information Systems approach. Fourth, we will analyze the role of information technology in the globalization process in light of organizational learning. Finally, we will summarize the findings and identify new directions for future research.

The answers to our specific research question will: (1) contribute to the understanding of the dynamics of the globalization process of information technology in the 1990’s from an integrated perspective, which includes both information technology and organizational learning in a time series; (2) provide a comprehensive and realistic definition of the role of information technology, which can be utilized to increase organizational effectiveness; and (3) integrate top-down and bottom-up approaches which encompass the strategic, managerial, and operational levels of the decision-making process in an organization.
Information Technology and Organization

The use of information systems in an organization has been generally viewed as "problematic" despite the initial hopes for a smooth and successful operation. Research findings on information technology and organizational changes are dichotomous largely due to the researchers' disciplinary and methodological bases.

Technology-oriented research views organizational issues either as marginal or else as obstacles to the deployment of information technology. Its diagnosis of these difficulties is either "organizational constraints" or "organizational resistance." Therefore, its prescriptions focus on education, training, and persuasion so that advanced information technology can be deployed successfully in an organization.

On the other hand, organization-oriented research views technology either as an intruder or as an unscheduled visitor to an organization, whereby the problematic "parachuting" or uninformed changes generate conflicts among organizational members or groups. Consequently, their remedy centers on user participation or involvement so that the users' needs will coincide with the choice and design of the technology.

Both schools aim their research efforts at smooth operation and successful deployment of information technology. The difference between these two schools is the following: The technology-oriented school is primarily concerned with training users after technology has been selected and put in place; whereas the organization-oriented school is primarily concerned that users' needs be satisfied and, therefore, finds it most important that users be involved in selecting and developing information systems.

Yet another school of research, the matching school, has attempted to solve the weaknesses of both the technology-oriented and the organization-oriented schools. The essence of the research of the matching school is to design information systems which will correspond with the structure of an organization. However, even if a precise matching can be achieved, the deployment of information technology may not be a "success." The reason is that the research of the matching school assumes that
organizational structure is a faithful indicator of the way an organization works. However, organizational structure often does not fully represent how an organization actually works. Moreover, an organization may drive itself to develop not only needs-based reactive technology but also innovative and proactive technology which could stimulate newly-defined needs in the marketplace.

A strategy-oriented school focuses on how managers ought to take advantage of information technology for corporate strategy (Rockart and Scot-Morton, 1984); as the vanguard of strategy (Mason, 1984); as a necessity (Keen, 1986); and as an enabler for proactive and reactive strategies (Wang and Madnick, 1988). Its research emphasizes a stream-lined top-down strategy to set the direction of an organization, with operational control as insurance for faithful implementation. As a result, organizational intervention which can correct errors can not be easily introduced. In the real setting of an organization, most knowledge about errors tends to evolve after strategies have been set.

A process-oriented school looks into the inner workings of an organization in order to find out how it achieves its organizational goals. In an effort to come to terms with the complexity of the inner workings of an organization, some authors have described how decisions are made and implemented. For Lindblom (1963), decision-making in an organization is seen as a "muddling through" process. For Allison (1971), an organization is seen as having a group of actors who have conflicting objectives, values, and priorities. For Bardach (1977), a "fixer" is seen as needed to overcome all these implementation games in an organization. For Wildavsky (1979), implementation is seen as a transformation process of decision-making. These perspectives describe different facets of what an organization is; how its decision-making process works; how its decisions are carried out; how the implementation of a decided course of action is transformed; and how a fixer could re-steer the course of implementation toward an originally planned course. They tend to view the decision-making process as if it starts and ends through various static steps. However, the actual behavior of an organization resembles a complex dynamic system, which includes loop-like feedback processes.

1 Lee (Institutional Learning, 1988) distinguished and exemplified the differences between organizational workings and organizational structure.
In the context of our study, all of the above perspectives indicate the difficulties of linking the utilization of information technology and the improvement of organizational effectiveness. These difficulties call for organizational intervention focused on an organizational-capacity-for-learning which can enable an organization itself to learn from the experience of error, to build collective capacity where little or none occurred previously, and to play new enabling roles in a varied and rapidly changing information systems environment. Case studies of organizational learning at one time can be used as input at a later time and lessons from one place can be used as input to other places—not only the results but also the processes. Although the events may not be an exact repetition, threads of the underlying causes in one case can be learned and adapted to another case, and the explanatory power of these kinds of research can be conducive to generalization. This is the lever that permits us to introduce the organizational learning perspective (Deutsch, 1963; Bateson, 1972; Argyris and Schön, 1978; and Lee, 1988).

From the organizational learning perspective, we analyze the feedback processes which include the leap between individual and organizational level learning, the espoused theory, and the changes in theory-in-use. By espoused theory we mean a theory of action that can be constructed based on publicly and formally announced or written rules and procedures of an organization. By theory-in-use we mean a theory of action that can be constructed from observations of an organization's actual behavior. The leap from individual to organizational level learning explains the distortion between these two levels. The changes in the theory-in-use exhibit the quality of an organizational inquiry. In addition to distinguishing the espoused theory from the theory-in-use, Argyris and Schön (1978) examined these leaps and changes to explain how organizations learn or fail to learn, and further distinguished two kinds of organizational learning as follows:

“Organizational learning involves the detection and correction of error. When the error detected and corrected permits the organization to carry on its present policies or achieve its present objectives, then that error-detection-and-correction process is single-loop learning. Single-loop learning is like a thermostat that learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it can receive information (the temperature of the room) and take corrective action. Double-loop learning occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies, and objectives.” (Argyris and Schön, 1978: 2-3)
Research Method and Strategy

Our study of the role of information technology in a major international bank, for which we will use the pseudonym Elite Bank, employed a research method that could allow us to gain a historical and developmental perspective on the globalization process as well as to observe its dynamics. We traced the development and implementation process of a global information system, which we will call the Automated Banking System (ABS).

In studying the ABS, we collected stories as well as directly observable data because stories link and explain the processes that occurred in which the data were presented. Without knowing how the data were produced and what the context of ideas that gave meaning to the data was, one may lose hold of the complete picture of what occurred.

In collecting stories on how the bank works, we intentionally included subjective opinions and conflicting data that most conventional researchers have hitherto overlooked. The critical clues as to how the bank actually works lie in the complexity of incongruities between different stories on the same subject from different individuals (or groups) involved in the globalization process. The first-order incongruity results from the difference between an individual’s espoused theory and his theory-in-use. The second-order incongruity results from the fact that one individual’s espoused theory and theory-in-use are likely to be different from another individual’s. Thus, a multiplicity of espoused theories and theories-in-use may exist. This is why reconstructing a story through checking interactions among its parts of the story and its whole can be the source of corroboration, thereby serving as a checking method for objectivity in the story.

We started with two primary propositions which guided our story-collecting and ways of inferring theory-in-use from directly observed data and collected stories: (1) A story contains espoused theory and theory-in-use, and there may be an incongruity between the two (Argyris and Schön, 1978). (2) Any problem is not a problem until it is set or framed (Rein, 1986).

The first proposition was useful in collecting and interpreting stories and directly observable data because it explicitly distinguishes the actual organizational reality from the publicly-held
organizational theory of action. The second proposition guided us to raise the following critical questions: Who framed it? How did it come to be a problem? Why was it a problem to some and not to others? How did they solve it?

The interviews were of two kinds: structured and unstructured. The structured interviews were designed to elicit information that could be used for the comparison of the information systems of the local banks. They included questions on technical changes in the ABS’s implementation process. The unstructured interviews were designed to collect information on the bank’s working process and the organizational issues related to the ABS. To avoid interviewers’ bias, for each interview multiple members of our research team were present. As a further check on the validity of the interpretation of the interview responses, post-interview meetings were held to review the different versions of the interpretation of the interview responses. We also showed a written copy of the results to a group of interviewees so that they could check the accuracy of their responses. Face-to-face interviews were conducted in New York, London, Venezuela, and Puerto Rico, and telephone calls were made for follow-up questions.

The International Bank

The Elite Bank was established in 1812; it has over 80,000 employees in 90 countries, and over $9 billion in shareholders’ equity and over $200 billion in assets as of 1989. There are three primary sectors in the bank: the institutional banking sector, the individual banking sector, and the investment banking sector. Being highly decentralized, the heads of the three sectors essentially run their own business and review their operations with their chairman once a quarter.

The Elite Bank has been recognized as one of the world’s leading financial institutions, and has a reputation as a “technical whiz” with high-tech front- and back-office operations. To understand how the Bank and its information systems have evolved over the years, we shall describe the workings of the Bank, including its decision-making behavior throughout its recent history, and we shall focus on the globalization process of one of the bank’s information systems, the ABS.
The Mini-Banks: Locale of Decision-Making

Throughout the Bank's history, each local branch has essentially behaved as an independent mini-bank for its own local operation under the umbrella of the Elite Bank. The bank is a decentralized international bank whose local branches practice autonomous decision-making and operations based on the overall corporate objectives. The decentralized structure of the Elite Bank's operations provided the setting to which the architecture of the information systems needs to accommodate. Information systems at the local banks were developed and implemented primarily within the local bank's control, based on their own needs.

Marching for Growth: Globalization

To explain in greater detail how the bank and its information systems grew, we shall describe the evolutionary process of the information systems at both the global and local levels in the past. In this study, "global" means the international bank level and "local" means the country bank level.

The bank underwent several stages in the process of its global expansion. During the war and the post-war era, the Bank functioned as a "money house," tailored mainly to the army and corporations for mobilizing resources and rebuilding infrastructures and corporate bases. In the 1960's, the Bank's main focus shifted to the development of franchises in order to broaden the customer bases in various regions. In the 1980's, the focus was on gaining strategic advantages globally; it broadened the functions of the bank in each country branch in North America, Europe, Africa, Latin America, Asia, and Australia.

In the globalization process, the headquarters' major concerns have been issues such as its competitive strategy within the financial industry. At the local level, managers believe that advanced information technology can attract more global customers. As one of them put it, "We don't want to lose the oil princes to other banks just because we don't have better technology." Information technology not only enables global customers to connect and mobilize their resources, but it also makes the Elite Bank more competitive in transaction-based and fee-generating operations.
Yet, intra-organizational competition has also intensified as the distinctions among institutional banking, individual banking, and investment banking became blurred. This was particularly evident between the investment and the institutional banking sectors which need information and data from each other and have similar groups of customers. Examples for needed data range from macro level information on the overall economy to the exact exchange rate at a certain time. These increased needs for interdependency contradict three long-held cultural assumptions of the bank:

- Each local bank runs its own business – “mind your own business”;
- Members of the Bank compete against one another – “me first”; and
- Results and products are the only evidence for evaluation – “the bottom line”.

For example, the phrase “me first” was used privately by both managers and technicians in a U.S. branch of the Elite Bank to express and identify the root of the perceived problem.

“Let’s globalize our business” and “Exploit information technology” became common strategies in the Elite Bank as well as in the general business world. Most often, globalization as a strategy means “external globalization,” which focuses on the expansion of the scope of a market to a world-wide one, at least one beyond the North-American territory. Information technology was seen as a competitive advantage in making this globalization strategy work more efficiently.

Searching for Commonality: the Automated Banking System

How did the Elite Bank’s global strategy of using efficient information technology unfold? How was the intra- and inter-organizational competition related to this unfolding process? In the late 1960’s, a “stand alone” system, which we will call the Automated Banking System (ABS), was developed in a German branch for providing an efficient and all-encompassing information processing capability for the branch. The rationale given by the German branch was the lack of an information system that could process local banking operations. The ABS was originally designed as a batch system that had components for checking account transaction processing, letter-of-credit processing, and accounting reports. As the German branch continued to use the ABS, other functions such as managerial
reports were added. As some other European branches used the ABS, it became known as a "standard" system.

The fact that the ABS was working favorably to meet these particular local needs was recognized by a non-system senior business manager at the corporate headquarters. The new problem he espoused at that time was the lack of a common information system that could integrate the banking operations at the global level. He formed an alliance with a technical manager who was involved in the development of the ABS, and proposed the implementation of the ABS globally to the top management basing his proposal on the following rationales:

- Why reinvent the wheel ninety times?
- The application from one country to another is very similar.
- The ABS is the best system we have at hand.
- The ABS can save payrolls.
- With the ABS, the Elite Bank will be more competitive.

Consequently, the decision was made by the top management in 1976 to implement the ABS around the world in order to achieve efficient globalization. This decision was seen as a strategy for cost saving and information technology globalization. The local banks in various countries welcomed the decision because they had pressing needs for processing the ever-increasing volumes and types of transactions due to the successful expansion of their banking business.

In order to export the ABS to overseas branches, a central support group was established in Belgium. The central support group was also responsible for overseeing its installation around the world. Regional support groups were established, among others, in Hong Kong and in Latin America. Under the regional support groups, there were project coordinators in each country for the implementation of the ABS.

Ironically, the ABS, originally developed as a "stand alone" system by the autonomy-seeking local bank, became a core system believed by the top management to be an integrating vehicle which would facilitate commonality among the local banks and contribute to the globalization of the entire
banking system around the world. The management team at the corporate headquarters interpreted the claim that the ABS “worked” in European branches as a feasibility test for implementing the ABS beyond the European banking boundaries. They viewed the ABS as a way of establishing global conformity across the local banks, while the local banks saw it as a problem-solver that would enable efficient transaction processing.

The Implementation Process: Striving for Autonomy within Commonality

What happened once the ABS was implemented at the global level? Some fifty nations have installed the ABS since 1976. In terms of the enhancement of the ABS, it evolved to include on-line capability in the late 70’s. By all means, the ABS was not assumed to be a turn-key system. Instead, it was adopted as a common system which has a core and periphery components that local banks can modify and add to. The local branch managers initially thought that they could pick and choose part of the ABS to fit their local needs.

In terms of its implementation, the local banks whose working procedures were similar to those in Germany, for which the system was originally designed, experienced relatively smooth implementation. Other branches faced difficulties ranging from finding maintenance engineers to searching for ways to adapt the ABS appropriately to local conditions.

The ABS was programmed in COBOL, which is well suited for the batch processing that was needed for the German system at that particular time. It was not initially made for global processing which requires heterogeneous database management capability. The core of the ABS, which was assumed to address the common needs of the local banks, automated certain banking procedures such as checking account transactions. However, the procedures were hard-coded; a deep understanding of the code is required in order to make modifications.

Given the fact that different local banks had different procedures for checking accounts, the checking account module needed to be tailored to each local bank. In some local banks, the ABS provided by the central support group could not process even a checking account. As a result, the ABS was modified and became the butt of a joke as the “Heinz system” because there were about sixty
versions of the ABS in the various local branches. The revision which took place over a period of fifteen years was not recorded coherently. In most cases, the new versions were kept and the old versions were piled up somewhere or overwritten. As one software maintenance engineer put it, "Fixing anything became a hair-splitting job without knowing which hair to split."

Even if the changes were recorded, they were kept in reels of tapes and piles of printouts that could easily be junked simply because they occupied so much space. Records of problems and codes that did not work were not considered important enough to keep. If it worked for a certain task at a certain time, that was enough to go on. Making the ABS work with minimum system-down-time was essential for everyday banking operations, so this took priority over documenting errors detected.

The difficulties the local banks expressed in implementing the ABS were as follows:

• National regulatory agencies have different requirements for reporting banking operations.
• Differences in computer languages used for different databases make it difficult to fit the ABS into other systems.
• Different ways of calculating interest rates make it necessary to create special adaptations to use the ABS.
• Some local banks have unique products which are not provided for in the ABS.
• Some local Banks need to interface with New York in their banking business, but the ABS was designed to interface with London and is a European-style system.

Both the headquarters and the local banks underestimated the scope of the modification and the guidance needed at the local level from the beginning. The headquarters had assumed that the core part of the ABS would require only minor modifications to be effective in all local banks. As a result, the headquarters neglected both to set policy guidelines for change and modification, and to provide detailed and accurate system documentation to the local banks. The local banks saw that they could pick and choose parts of the ABS based on what they needed. Consequently, those that needed to change very little in order to accommodate their operations implemented the ABS without facing modification problems. On the other hand, banks that had completely different needs from those
supplied by the ABS had more difficulties, despite training concerning what the system was about and the proper procedures for going about changing the ABS to accommodate to their specific conditions.

In the early 80's, both the strong senior business manager in the corporate headquarters and the technical manager in Europe resigned. The ABS was in disarray, not because it was not working but because added modifications made it hard to keep the original name of the system. In a U.S. branch, for instance, the system was not called the ABS, and they told our research team that they did not use the ABS. In reality, their software engineers took the ABS's security application and modified it for their own needs. In some other branches, one processing module of the ABS had different functions from other branches. However, versions of the ABS were the encompassing software system supporting the larger portion of banking services. The Elite Bank was locked into the ABS.

After the two managers' resignations, the obstacles to implementing the European-version of ABS in the Caribbean and the Far East branches also became evident, and the central support group was moved from Belgium to the U.S. The new group in the U.S. had mostly old members yet had a new leader and a revised charter, which included not only supporting the ABS but also working on new modules of it. The new modules included a direct customer interface with the original ABS. Some of these modules were used and exported while others were not used. In an English branch, both individual and investment bank divisions eliminated the ABS, and only the institutional banking division is using it. As one of the business managers in England put it, "If you are going to hold me responsible for my bottom line, give me the flexibility to manage, control, and make decisions on everything including my systems people and the systems." In one U.S. branch, a business manager claimed that "the ABS does not work, we need to re-start with a clean slate." What he learned from the implementation of the ABS was that when the layers of reporting from local branch to the headquarters exceeds two levels, conflicting and overlapping reports were generated due to turf battle. In his claim, "You've got to make your own system only for your management turf. It's easier to standardize."

The new idea from the U.S. branch was similar to the original ABS except for its claim that this would not be for globalization purpose. The idea was to design data base systems with a structured
modular system for local databases. One of the managers in the U.S. branch put it, "Nobody has ever cared about aggregate. What people care about is whether their department has a project." In fact, the idea did not survive the independent consultant's evaluation, and the consultants could not survive the Bank's business manager's hiring list either. As a result, "Everybody was making his own toys."

Searching for Integration: Experimenting with the CIS Approach

Meeting of the market trend of globalization and local operational mishaps in implementing the ABS provided a new platform for understanding that the realities of local operation and the global strategies needed to be incorporated. Both headquarters and the local banks realized that the ABS could not standardize the entire banking operation across management turf; it only increased cost for modifying the ABS to fit the local needs. Instead of asking what was common, they started asking how they could connect with each other given the autonomous working relationships. In answering these questions, the Composite Information Systems (CIS) approach, that the headquarters' management team had reviewed but not taken any action on yet, became the alternative approach to be adopted. Since 1985, five systems have been implemented at the Bank following the CIS approach. The systems for the bank's transaction investigations and management information system reporting are examples among others.

The difference between the previous attempts and the CIS approach lies in the assumptions behind the design of the system. The CIS model gives system autonomy yet allows for integration and system evolution. The concepts of adaptability and flexibility are explicitly represented in the systems connectivity it provides. The technical difference from the ABS is that the CIS approach standardizes accessibility to the system, yet leaves applications to local turf; whereas the ABS was designed as a common system that was assumed to be used universally. The technical structure of the example of the CIS model consisted of seven major components: external interface, massage control, transaction processing, information processing, administrative support, data control, and a shared data

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2 See Wang and Madnick (1988) for details on design and implementation of Composite Information Systems.
resource. The advantages of the CIS approach can be summarized as a systems design methodology equipped with the flexibility and the adaptability that the ABS lacks.

**Information Technology as Facilitator for Organizational Learning**

What has been the actual role of information technology in the Bank during the globalization process of the ABS and the experimentation process of the CIS approach? We shall answer this question by identifying organizational theories-in-use held by different groups of the Bank and explain how the members of the Bank discovered and compared them with their privately-held organizational theory-in-use.

The headquarters' organizational espoused theory was to encourage managers to demonstrate innovative leadership. The headquarters' organizational theory-in-use was to find new opportunities unilaterally. Strategies were formulated based on this theory-in-use. The headquarters managers' strategy was to find a new project before anybody put his stamp on it. The strategy of the manager who initiated the adoption of the ABS to scout a local project. He formed an alliance with the European manager who had a local product at hand. "Having a bad project under your belt is much better than no project here -- no project spells you're on the way out" The headquarters' theory-in-use acted as the platform for formulating the strategy of adopting the ABS, while the local branches' organizational theory-in-use was conveniently ignored.

The local managers' organizational theory-in-use was to show increased productivity and profit without creating problems for themselves. Their strategy was to protect their local management turfs by all means. The local branch managers questioned the lack of consideration of local implementation particularly because they discovered that the headquarters' decision on the ABS violated local branch managers' understanding of the Bank's organizational theory-in-use. The local managers understood that the traditionally kept balance between local autonomy and global control could be shifted only when based on profit/loss accounting results, not when based on kinds of information systems local banks operate. This organizational theory-in-use held by the local manager was contradictory to the headquarters' espoused policy of keeping the image of being a "technical
whiz" among the financial service institutions in the World. The complaints from the local managers to headquarters can be exemplified by the statement a South American manager made: "If you want me to be responsible for making a profit, let me take care of it. We don't have time for tinkering about new toys for nothing in return now." The local information systems group had yet another theory-in-use: It was to keep their technical expertise critical to the success for banking operation. During the initial period of introducing the ABS, their gate-keeping power soared, but it was reduced as the technical difficulties of implementation increased. Different groups held different understandings of organizational theory-in-use, which served as the basis for developing their strategies. The general rubric of the organizational theory-in-use of the bank could be distilled as promoting oneself first.

Once the members had the opportunity to discover the differences in organizational theory-in-use held by different groups in the bank, which they had privately hypothesized, it became easier to discuss errors they made. The members of the bank identified the following issues through their discussions on errors:

- Headquarters considered globalization of information technology as a technical agenda because headquarters conveniently assumed that technical and organizational issues were separate. For example, the ABS was implemented to integrate workings of the Bank and increase productivity by increasing technical connectivity. However, when the ABS was implemented, the local banks did not change the internal workings of the bank to fit the ABS. Instead, the ABS was changed to fit the local banks' procedures and rules. Both the headquarters and the local banks, and line and information systems managers came to terms with the fact that developing and implementing a common system was an organizational as well as a technical endeavor that both line and information systems managers need to participate in.

- Communication among the local banks was almost non-existent due to the lack of a rewarding system for horizontal communication, which could have speeded up error-detection and error-correction process.

However, after the initial period of discussion, the attempt to correct the errors was put aside and bank members maintained the previous theory-in-use: "Minding their own business." The Bank was
going through zero-order learning (Schön, 1983): Local branches went back to exercise the old notion of making their own information systems.

Cooperating with the central ABS group in Belgium created delays in systems delivery and burdensome communications for the local banks. Although the local banks applauded error-free and fast transactions in public, they expressed mixed feelings about implementing the ABS in private. The reasons are, first, that the local management team felt that the local banks could not afford the transitional time lag between the old and the new system. Second, the local information systems team began to realize that they had significantly reduced control over the ABS. As the technical difficulties increased the cost for the modification of the ABS, the local branches' managers began to view the ABS as a system for falsely intended conformity and a hindrance for traditionally exercised local autonomy.

As modification was added to the original version of the ABS for local needs, the information systems group and the management group began to feel at ease that they did have a system that worked. This condition was achieved when the original architects of the ABS resigned from the bank. Regardless of the fact that the ABS was working after times of modification and addition, most local banks did not call the system ABS anymore.

However, the bank became able to engage in single-loop learning by detecting and correcting errors within the its conventional values. The CIS approach was used to correct the errors that the ABS had made. This approach guided development and implementation of information systems toward the framework that could facilitate a process of matching information systems with the organizational reality. In fact, the local managers questioned the balance between local autonomy and global control, but follow-up discussions were avoided. As a result, the Bank maintained the status quo. The basic assumptions, goals, and policies were kept unchanged; while the cost of technical modification was reduced by allowing local design of systems application. In actual design of the system, the basic architecture of the global information systems was framed, yet the local applications were left to the local bank.
The scope of the problem identified by the members from experimenting with the CIS approach was limited to an immediate technical domain. Broader issues related to a balance between the local autonomy and global control were revealed, but the discussions in the bank avoided conflicts among the members.

In summary, the globalization process revealed the preexisting issues in the bank. In this process, information technology served as a facilitator for understanding theory-in-use, thereby revealing preexisting issues as follows:

- The implementation process of the ABS revealed that the managers developed their tactics faithful to the organizational theory-in-use they held: The Bank's managers themselves translated the "innovative leadership" to a "race for unilateral survival."
- The balance between local autonomy and global control was not discussible due to the turf game between the local banks and headquarters of the Bank.

**Conclusion**

The experience of globalizing the Automated Banking System (ABS) at the Elite Bank has been analyzed in order to explore the role of information technology in a financial service institution in terms of organizational effectiveness.

Most of the conventional theories in Information Systems advocate efficient management based on two primary perspectives: The first is a top-down process starting from strategy-setting to management planning to operational control in an organization. The second is a static and closed change-process with four stages: initiating a change, creating a climate conducive to change, executing the change, and finalizing the change.

Contrary to these perspectives, we found that the global information system was developed initially as a software product aimed at processing a particular local branch's banking operation instead of a tool for globalization. The decision for installing the system globally was an adaptive process to find the best fit between the software available in the local branches around the world and the top-down globalization strategy formulated at the corporate headquarters. The implementation
process did not rigidly proceed through the static and closed change-process. Instead, the implementation process was the beginning of an iterative development and re-development process, where local modifications occurred based on technical error-detection and error-correction activities in the software system to fit local needs.

The globalization process of information technology in the bank revealed and intensified preexisting organizational issues, such as the shifts in a balance between local autonomy and global control. Information technology played a role as a facilitator for the organizational learning process by enabling the participants to discover organizational theories-in-use held by different groups and compare them with their privately-held theory-in-use. This process provided a setting for discussions on issues revealed and reformulated, which, in turn, set the stage for error-detection and correction.

Our study suggests that an adaptive and flexible process for the globalization of information technology which is conducive to organizational learning can create a medium not only for increased connectivity among information systems but also for improved organizational dialectic among members of an organization.

Because the Elite Bank was operating in a decentralized fashion, the bank's organizational learning system may have had an assumption that local banks' goals differed from headquarters' goals. Therefore, more centralized organizations may reveal somewhat different issues from the one we found. Yet, globalization process includes issues related to integration which result from the leap from a local operation to a global one, that is, from one set of management turf to another set of management turf. Therefore, our findings might be applicable to centralized organizations as well. Discovering the role of information technology as a potential facilitator for organizational learning fosters discussions on realistic understanding of relationships between information technology and an organization. Such discussions will contribute to identifying ways to improve strategies for a change which are conducive to improving organizational capacity for learning.
References


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