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Francis Kofi Andoh-Baidoo

University of Texas - Pan American, andohbaidoo@utpa.edu

Marco A. Villarreal

University of Texas - Pan American, mvillarrea13@utpa.edu

Lai C. Liu

University of Texas - Pan American, liul@utpa.edu

Perpetual Wuddah-Martey

PAVEB Consult, perps47@hotmail.com

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Francis Kofi Andoh-Baidoo

University of Texas – Pan American
andohbaidoo@utpa.edu

Marco A. Villarreal

University of Texas – Pan American
mvillarrea13@utpa.edu

Lai C. Liu

University of Texas – Pan American
liul@utpa.edu

Perpetual Wuddah-Martey

PAVEB Consult
perps47@hotmail.com

ABSTRACT

Information systems projects are undertaken by institutions due to perceived need and benefits that such systems promise. The understanding of users' perception of ICT implementation enables organizations benefit from such investments. Although research on IS investments in developed nations abound, there is scarce research on developing nations especially those south of the Sahara. This paper examined the success of electronic banking systems implementation in a developing nation environment. We evaluated users' perception on seven dimensions of IS success using one national and one international bank. Our results show that users of both the national and international bank had high perception of IS implementations success although the Natbank's responders had higher perception than IntBank's responders on all seven dimensions. Further, the differences in users' perception of information quality, system quality, information quality and intend to use/Use were statistically significant while the difference in user satisfaction and net benefits were not. While this study is exploratory in nature, the results provide a guide for further studies on success of IS implementation in developing nations.

Keywords

IS success, international, national, banking, developing nation, perceptions, success dimensions

INTRODUCTION

The financial industry and banking in particular is one of the largest investors in information systems and technologies. Banks need diverse information systems for growth and survival (Farhoomand and Huang, 2007). Banks employ information systems to create innovative products and services, capture market niches, and better serve the customer (Choi et al., 2006; Gupta and Collins, 1997). Information systems have become critical for banking institutions at many levels. First, information systems have become the largest component of capital investment. Second, information systems are the foundation of doing business in today's environment. This is evident in the growing interdependence between a firm's information systems and its business capabilities. Third, firms that have invested wisely in information technology experienced continued growth in productivity and efficiency (Farhoomand and Huang, 2007; Stratopoulos and Dehning, 2000). Fourth, information systems can be used to attain competitive advantage over rivals (Laudon and Laudon, 2010).

Although many financial institutions acknowledge that information systems can serve as powerful competitive tool to capture market share, improve customer service, reduce operating costs, and create new products and services (Lederer and Mendelow, 1988; Wonglimpiyarat, 2006), researchers and practitioners alike have shown an interest in understanding whether the added business values obtained are worth the amounts invested in information systems (Carr, 2003). However, while research that examines IS implementation success in developed nations abounds (Gupta and Collins, 1997), there is lack of research on the IS implementation success in developing nations especially for those South of the Sahara. This paper seeks to bridge the gap in research on IS implementation success in developing nations by examining how two banks in Ghana are being efficient and effective with the IS projects that they have undertaken over the past several years.

Ghana has in recent years been considered one of the most democratic nations in Africa after four successful transfer of power from one political party to another. The favorable economic and political conditions have fueled foreign investments in this West African nation. The banking sector is among the many industries that are benefiting from these investments (Sohinger and Horvatin, 2005; Bitzenis, 2004). Many international banks have expanded their operations into Ghana creating competition among both national and international banks. These institutions have had to develop strategic plans to face the competition in order to satisfy both internal users and external customers, while increasing the revenue and profitability for both the company and the stockholders (Yang and Ahmed, 2009). These investments must also create a corporate image that puts the institution as a leader in innovation among their competitors.

There are indications that several banks in Ghana have made a number of IT related investments to enhance their information systems in their entire business operations. These investments in hardware, software and networks include point of sale equipment, automated machines and other computer based information gathering, processing, storage and disseminating systems.

NatBank is a national bank while IntBank is an international bank with operations in Ghana and other African nations. Both banks have invested several millions of Ghana Cedis in hardware, software and communication systems over the past several years. The move to invest into information systems by IntBank was prompted by the objective to improve the delivery of services and products to the bank's customers in the local offices and the 26 affiliate countries within Africa and to gain benefits via cost reduction associated with automation. It is anticipated that these banks would realize the expected returns for their investment and reliable working system as intended.

Firms still face challenges to either make efficient use of or obtain the expected value from the information systems implemented (Eze, 2002; Gao and Owolabi, 2008). As information technology was being built into the infrastructure of business, the goal was to seize the opportunities for forward-looking companies to gain real competitive advantages (Wonglimpiyarat, 2006). However, it has been suggested that the increased availability and decreased cost of information technologies have diminished the strategic importance of these technologies making them more commodity inputs (Carr, 2003). The concern expressed by Carr (2003) makes it even more critical for organizations to assess the benefits from information systems investments. This study uses employees' responses to assess information systems projects in two banking institutions – NatBank – a national bank and IntBank – an international bank within the African region and in Ghana.

LITERATURE REVIEW

Gupta and Collins (1997) acknowledged how return on investments in IS has been an ongoing debate in the IS literature and clearly, one of the most challenging tasks that managers face, regardless of the industry in which they operate. Compounding the issue is the fact that some of the most significant benefits of IS are intangible and long term. This makes many managers simply avoid engaging in any meaningful evaluation of IS investments. Several researchers typically used reductions in operating expenses and increase in profitability as measures for assessing the return on IS investments (Barua et al., 1995; Benaroch and Kauffman, 1999; Rai and Patnayakuni, 1997). This practice was regarded as unfortunate as several studies have indicated the inadequacy and weakness of the above measures in determining the true value and contribution of IS (Tallon, Kraemer, and Gurbaxani, 2000).

Relating to Kauffman and Weber (2002), Farhoomand and Huang (2007) recognized that the investments in IT accounted for 20-25% of non-interest costs and around 6% of annual revenue for financial institutions and that the global banking industry spent US\$241.2 billion in 2007 on IT, including hardware, software, IT services, internal services and telecommunications (Moskalyuk 2007). They also noted that it was not all that clear whether IT investment provided the expected returns. Evaluating the IT investments of two large global banks of similar size – HSBC and Citigroup, Farhoomand and Huang (2007) gave insights on the issues of whether IT investments would improve the operational efficiency of banks or enhance their strategic positioning and sustainable competitive advantage. Farhoomand and Huang (2007) posited questions regarding the financial performance of the two banks with regards to their IT investments.

Measuring the returns on IT investments, Brynjolfsson (1994) cautioned that there is the possibility of getting distracted from the realities of using IT to create customer value, in any event, if there is excessive focus on aggregate productivity statistics. Technology must be aligned with the core competencies of the company to deliver true value (Brynjolfsson, 1994; Tallon, Kraemer, and Gurbaxani, 2000). Brynjolfsson (1994) acknowledged that the difficulty associated with measuring benefits such as improved customer service also accounts for the difficulty in justifying IT spending and to intelligently set budgets. Traditional capital budgeting approaches can be even more difficult especially when the costs and benefits of the IS are

intangible (Tallon, 1998). Grainger-Smith and Oppenheim (1994) looked at whether investment banks receive value for their money invested in IT and whether the invested IT can be evaluated for its contribution to profitability. Grainger-Smith and Oppenheim (1994) asserted that the failure to implement techniques for systematically identifying and quantifying IT costs and benefits poses the challenge of determining the level of value added as a result of the investment and the contribution of IT towards the organization's profitability (Aral and Weill, 2007).

Gupta and Collins (1997) suggested that some of the significant benefits derived from IS, such as added competitive edge in the marketplace and increased customer satisfaction are difficult to measure. In addition, the true impact of information systems can be assessed only over the long term (Gupta and Collins, 1997). These are some of the reasons why traditional measures of Return on Investment (ROI) are not effective in justifying IS investments.

Presenting a diverse view, Aral and Weill (2007) observed a firm's total IT investment was not associated with performance, but investments in specific IT assets explained performance differences along dimensions consistent with their strategic purpose. Aral and Weill (2007) expected positive associations between infrastructure investments and higher short-term costs, lower short term profitability and higher profitability and operational performance in the long run. Furthermore, Aral and Weill (2007) noted that infrastructure investments transparent to the market are likely to produce a positive impact on the firm's market value – a reflection of the market's assessment of firm's future value.

Theoretical Framework

The DeLone and McLean (1992) IS success model (D&M model) has evolved over the years and examined key dimensions in information systems. The updated DeLone and McLean (2003) model included several additional dimensions. Barki and Hartwick (1994) identified user involvement as an important dimension in information systems. These of information systems were used as the key points of examination for this research. Specifically, we use these dimensions for evaluation of the users' perception of banking information systems in the two Ghanaian banks. These dimensions were employed because it was observed that the emerging body of literature continues to draw upon these dimensions as the basis for developing theory and that of other researchers.

Review of Literature on the Dimensions of Information Systems

The first D&M IS Success Model, published in 1992, was based on theoretical and empirical IS research conducted by a number of researchers in the 1970s and 1980s (DeLone and McLean, 1992). It was a result of a review of over 100 articles from Information Systems Research, Journal of Management Information Systems, and MIS Quarterly on IS success measurement. After that, several researchers published some articles to challenge, critique, or suggest an extension of the model (eg., Sabherwal et al., 2006; Almutairi and Subramanian, 2005; Seddon, 1997). DeLone and McLean regarded the reviewed articles as a contribution to a better understanding of success and its dimensions. They argued in their later work that the six dimensioned are interrelated and indicated that causality flows in the same direction as the information process flows (DeLone and McLean, 2003).

Sabherwal, Jeyaraj and Chowa (2006) looked at how the various constructs reflecting IS success affect each other and how the IS success constructs also depend on constructs characterizing the users and the context. They developed a detailed theoretical model which included constructs related to the context, the users, and the IS success and tested it through a combination of meta-analysis and structural equation modeling. Based on the results of the test, they recommended that future research on IS success models should include user attitude toward information systems in general, at least as a control variable.

Almutairi and Subramanian (2005) observed how DeLone and McLean's (2003) model has gained strong theoretical and empirical support and the fact that it can be a useful model for assessing information system success globally if it is applied in other societies and cultures. Conducting a study to assess the extent of applicability of the DeLone and McLean's (2003) model in Kuwaiti, Almutairi and Subramanian analyzed the relationships among the variables in DeLone and McLean's model using a survey of employees and managers in the Kuwaiti private sector.

Barki and Hartwick (1994) examined users' participation in the development of information systems and the dimensions that are involved in its success. Their study looked at the influence that perceived usefulness, user involvement, argument for change, prior usage and ease of use have on the behavioral intention to use an information system. Several of these dimensions are similar to those identified by DeLone and McLean (2003).

Seven Interrelated Dimensions

The updated model of DeLone and McLean (2003) comprises six interrelated dimensions of IS success: information quality, system quality, service quality, intention to use, user satisfaction, and net benefits. A system can be evaluated in terms of information, system, and service quality; these characteristics affect the subsequent use or intention to use and user satisfaction (Olfman and Jennex, 2003). As a result of using the system, certain benefits can be achieved. The net benefits will (positively or negatively) influence user satisfaction and the further use of the information system (DeLone and McLean, 2003). The current study uses Barki and Harwick's dimension of user involvement along with DeLone and McLean's six dimensions forming a seven interrelated dimensions to examine IS implementation in two banking institutions in Ghana. The dimension of user involvement is defined as the users' participation in the systems development process (Barki and Harwick, 1994). Information quality is the dimension that captures the system content issue. Information quality must be complete, relevant, and easy to understand. System quality measures the sought characteristics of an information system which are usability, availability, reliability, adaptability, and response time that are anticipated by users of an information system. The dimension of service quality refers to the overall support delivered by the service provider regardless of who delivers the service. Intention to use/Use measures all aspects of the information system. User satisfaction remains one of the most important dimensions that measure a user's opinion of the information system. Net benefits are the most important success measures. They capture the user's opinion as to the positive and/or negative impacts of the information system on the users and the organization (Sabherwal et al., 2006; Seddon, 1997).

Data Requirements

The survey methodology was employed in this research. A survey instrument was developed for the collection of data from the two banks, NatBank and IntBank, in Ghana.

The Sample

Two banks were selected for the study - NatBank (national) and IntBank (international) because of the substantial investments they have made in information systems. A total of seventy-five (75) personnel were reached with the questionnaires from ten (10) of the sixteen (16) branches and the head-office of NatBank. This included seventy-one (71) end users of the IT/IS and four (4) managers who serve as heads of departments and units. At IntBank, eighty-five (85) employees including nine (9) management staff were reached from eight (8) of their branches countrywide and the head office which is also situated in Accra, the capital of Ghana.

Demographic information

The forty-eight (48) employees who responded from IntBank were made up of twenty-seven (26) males and nineteen (22) females. Twenty-two (22) of the males fall within the age range 25 to 29 and the remaining four (4) were within the range 30 to 34. Fifteen (15) of the females were also aged between 25 and 29 and the remaining seven (7) aged between 30 and 34. The respondents have college education and were in various departments namely, transactional banking, retail banking, SME banking, human resource management, cash management and IT.

NatBank's fifty-two (52) respondents consist of thirty-two (32) males and twenty (20) females. Twelve (12) of the males were within the 25 to 29 age range, sixteen (16) were within the 30 to 34 age range and the remaining four (4) were within the ages 35 to 44. Out of the twenty (20) females, nine (9) were within the age range of 25 to 29. Seven (7) were within the range 30 to 34 and the remaining four (4) were within the 35 to 44 age range.

NatBank's respondents had college education, relevant professional qualifications and banking experience in different capacities and jurisdictions. Most of them were from the credit risk, human resource management, finance, treasury, research, and the IT departments.

RESULTS AND DISCUSSION

Out of the one hundred and sixty questionnaires (160) administered, forty-eight (48) responses were received from IntBank, while fifty-two (52) were received from NatBank representing a response rate of sixty-one (61) percent.

IntBank's IT department makes investment decisions in consultation with management, but its respondents indicated less user involvement before information systems are implemented. Figure 1 shows users' perception of IT implementation at both banks with respect to the seven success dimensions.

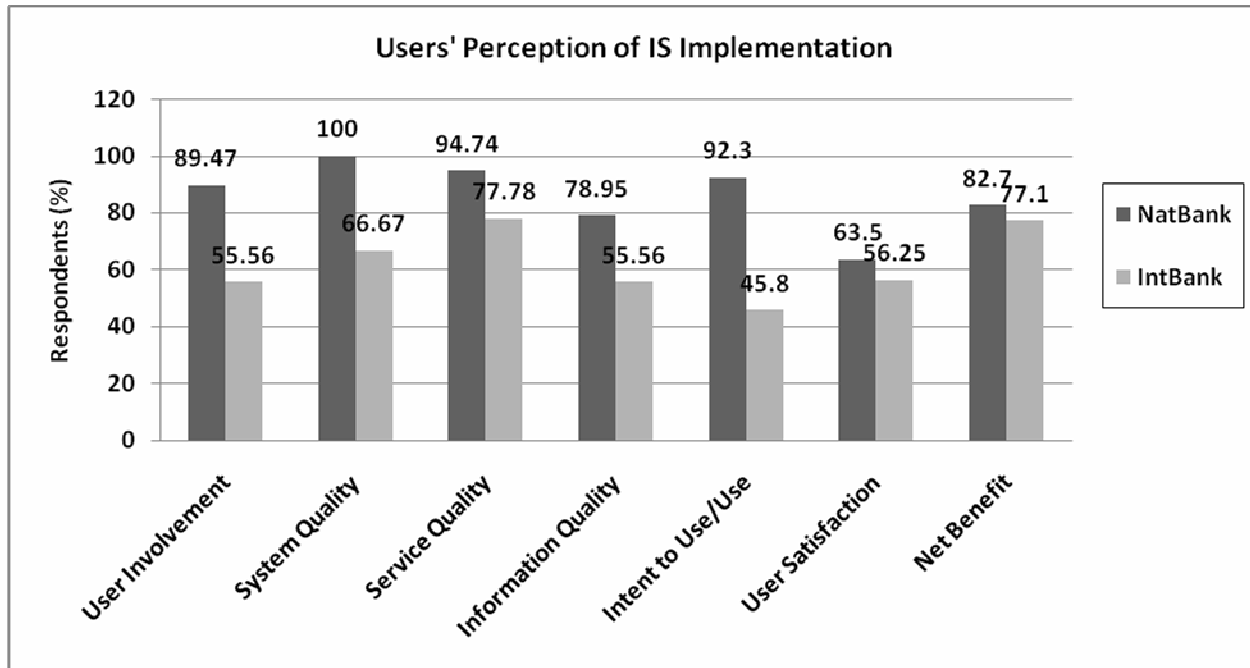


Figure 1 Users' Perception of IS Implementation

System Quality, Service Quality and Information Quality of information systems

Respondents of the two banks reported the extent to which they perceive their information systems based on user involvement, the quality of information generated by the systems, the quality of services provided by the systems and the quality of the systems itself, their intent to use/use, user satisfaction and net benefit. The chart indicates that respondents' perception of information systems were higher for NatBank than IntBank across all seven dimensions.

Table 1 Chi-square of the Seven Dimensions between the two banks

Dimension	User involvement	System Quality	Service Quality	Information Quality	Intent to Use/Use	User Satisfaction	Net Benefit
Chi-square	0.000	0.000	0.001	0.003	0.000	0.462	0.484

Table 1 is the crosstab of the seven dimensions. The differences in the percentages of respondents who answered "Yes" for User involvement, System Quality, Service Quality, Information Quality and Intent to use/Use were significant while those of User Satisfaction and Net Benefit were not.

A plausible explanation for this observation is that the employees of the national bank (NatBank) might not have been exposed to different electronic banking systems like those of the international bank (IntBank). NatBank employees may look at information systems as innovative mechanisms that make them more effective in meeting customers' requirements for new services and products. In the case of IntBank, these systems could be standard throughout the global organizations. Hence, expectations of the quality of IS systems are higher for IntBank employees than for NatBank. For instance, IntBank by the nature of its structure has made over \$70 million of increasing investment to serve the group membership and affiliates. These investments made over the past five to eight years include the hardware, software as well as the building of an entire data center serving as a shared service center for global database and changing of core banking applications for four countries within the group. The stated amount accounted for about 80% of the bank's total IT budget over that period.

Since user involvement in IT implementation has been found to influence users' intention to use a system, it is important that financial institutions involve their users in the implementation. Thus user involvement may be a reason why more responders from Natbank intend to use the systems than that of IntBank. For international banks, it is important that they include users when implementing information systems in developing nations even when such systems have been successfully implemented in other nations.

While the user's satisfaction and net benefits derived from IT implementation were higher for NatBank's respondents than IntBank's responders, the differences were not significant. This observation shows that although responders at IntBank were relatively unhappy with the dimensions of systems implemented and the level of user's involvement with the systems implementation they were quite satisfied with the systems and believed that the system provide benefits for the organization.

CONCLUSION

Businesses all over the world make investment in information systems projects due to perceived need and benefits that such systems promise. The understanding of users' perception of ICT implementation enables organizations benefit from such investments. Although research on IS investments in developed nations abound, there is scarce research on developing nations especially those south of the Sahara. This paper examined the success of electronic banking systems implementation in a developing nation environment. We evaluated users' perception on seven dimensions of IS success using one national and one international bank. Our results show that users of both the national and international bank had high perception of IS implementations success although the Natbank's responders had higher perception than IntBank's responders on all seven dimensions. Further, the differences in users' perception of information quality, system quality, information quality and intend to use/Use were statistically significant while the difference in user satisfaction and net benefits were not.

While this study is exploratory in nature, it serves as a roadmap for further studies. Future research can use more sophisticated statistical methods to examine the relationships between the dimensions. Examining more institutions and possibly more than one industry can help develop theoretical models for developing nation environments.

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