December 2003

Assessing Impact of Organizational Culture in Transformation of IT into Business Value

Li Xiao
George Washington University

Assessing Impact of Organizational Culture in Transformation of IT into Business Value

Li Xiao
George Washington University
lilyxiao@gwu.edu

Introduction

We have significant advances in information technology (IT) in recent years. This accelerating pace of change is transforming businesses. For companies, IT brings new opportunities for growth as well as new threats for survival. To grow and prosper in such a competitive business environment, companies need to react rapidly to embrace the changes brought about by new technologies and obtain a leading position in market.

Companies and organizations of all types are investing heavily on IT projects to avoid being left behind by their competitors. Unfortunately investments in IT may not guarantee success, or even survival. Companies that decide to invest considerable amount of financial, human and various other resources on an IT project expect to see improved organizational performance. This improved performance, in many cases, is realized after years of continued investment. After significant allocation of resources to a project for years, management may find out that the project improved organizational performance only slightly, or had no improvement at all. No organization wants to see that huge investment on IT became waste of resources but such situation occurs every day.

Large IT projects require months and years to implement. After successful implementation, it takes another long period of time for new information systems to actually improve efficiency and effectiveness of an organization. In this extended process, there are many uncertainties involved that may influence the final outcome of IT projects. Information systems (IS) researchers have been studying the process of IT business value creation for years. Soh and Markus (1995) proposed a process theory on how IT creates business value. According to the process theory, there are three stages in the process that IT creates business value in organizations: the IT conversion process, the IT use process, and the competitive process.

IT business value creation not only is time consuming, it also involves a number of factors that may decide the fate of IT projects and their results in companies. A number of management authors have assumed that there is a correlation between the success of information technology and the types of policies, strategies, and controls, as well as the human and organizational relationships that surround this technology. Those organizational elements are greatly affected by the shared attributes that define the organizational culture. Organizational culture has been regarded as being among the crucial factors that influence IT implementation in organizations.

Studies have researched on relationship between organizational culture and general information system success (Harper, 2000; Harper and Utley, 2001) and between organizational culture and specific kinds of information systems, such as knowledge management success (Ribiere 2001). However, one of the drawbacks of these studies is that information technology success is taken as a single construct. As discussed above, the process from IT development and implementation to realized business value such as productivity and profitability is usually very long. Therefore, cross-sectional studies are not appropriate in these situations. Due to the usually extended period of implementation and transformation, the time lag issue should be addressed in evaluating success of information technology in organizations. The above-mentioned studies, unfortunately, did not consider the temporal dimension of IT projects.

The objective of this research is to empirically validate Soh and Markus's (1995) process theory with data collected from organizations, and investigate the role of organizational culture during each stage of IT value creation. Specific questions to be answered in this study are:

1. Does empirical data support the process theory that during the three processes of IT business value realization, the success of each process lead to success in the next process and finally lead to improved organizational performance?
2. Is there a relationship between organizational culture and IT implementation at the different stages of the process of IT business value realization?

This research will provide valuable insight into understanding the role of organizational culture in the process of IT creating business value. From a theoretical perspective, this research brings a new approach to look at relationships between organizational culture and IT. Instead of looking at broad IT success as most previous studies did, this study looks in depth at different stages of the process of IT creating business value, which more accurately reflect the reality of IT in organizations. From a practical perspective, determining the impact of organizational culture on IT conversion process, IT use process, and competitive process will enable organizations to focus on different cultural attributes during different stages of IT implementation. It will also help in ensuring success at each stage and in making more efficient decisions to abort IT projects at early stages, if necessary.

Literature Review and Theoretical Framework

The impact of information technology (IT) on organization performance has been a topic of interest for IS scholars for many years. Does IT really improve organizations performance? Does IT investment yield satisfactory payoff? How should we measure IT payoff? These issues are widely debated among IS researchers. In 1990s alone, there had been at least 66 studies on IT investment payoff (Kohli and Devaraj, 2003). In recent years, because of accelerating increase in IT investment, the issue of IT investment payoff has become a critical issue for both practitioners and researchers.

Although significant amount of research has been done in this area, results have been mixed, and this has made IT payoff issue even more controversial. As Kohli and Devaraj (2003) pointed out, studies on IT payoff differ greatly on sample size, process-orientation, and analysis methods, which are a few reasons that caused these inconclusive results in establishing a relationship between IT investment and organization performance.

Among the key issues in IT payoff research brought up by Kohli and Sherer (2003), the lag effects of IT investment are an important one. There are several steps between initial IT investment and improved organization performance. Soh and Markus (1995) synthesized previous studies on IT investment payoff and proposed the process theory, which well addresses the lag effects of IT investment payoff. According to this theory, the process that IT creates business value involves three stages: the IT Conversion process, the IT use process and competitive process (Figure 1).

Figure 1 Process Theory of how IT creates business value (Soh and Markus, 1995)
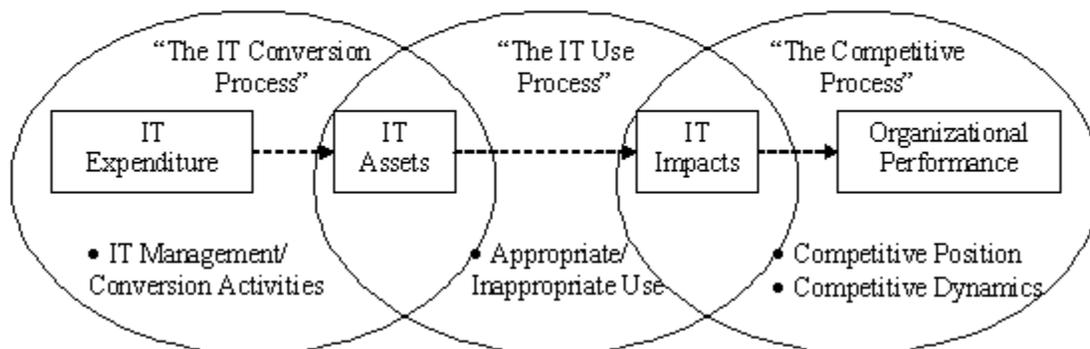
The process theory synthesizes previous studies and addresses the lag effect of IT payoff, however, it has not been verified with empirical evidence, which is one of the objectives of this study. This study will involve 2 steps. First, I will test this theory with empirical data. After empirically validating this theory, the second step in this study will be to examine the influence of

organizational culture at each of the three stages during which IT investment yield payoff. Here, I will use the Managerial Grid theory developed by Blake and Mouton (1964) as the theoretical framework for organizational culture.

Research Model

In determining the role of organizational culture in the process of turning IT investment into realized business value, the research model was proposed as follows (please refer to figure 2):

> Proposition 1: Organizational culture has a significant effect on success of the IT conversion process.
> Proposition 2: Organizational culture has a significant effect on success of the IT use process.
> Proposition 3: Organizational culture has a significant effect on success of the competitive process.

Figure 2 Research Model
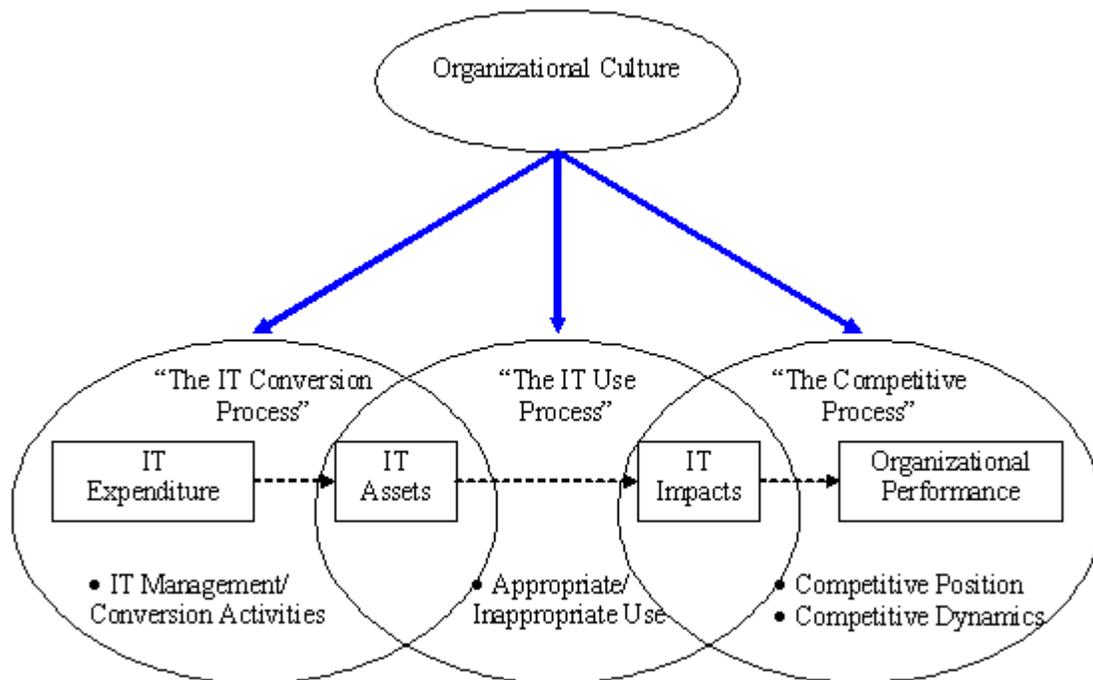
Research Design and Methodology

Instrument Development

A new instrument will be developed to survey organizations. Questions to be included will be based on the literature, especially IT investment studies on the operational, managerial and strategic variables of organizations (Kohli and Devaraj, 2003). And then I will develop a questionnaire based on Organizational Culture Profile (OCP) instrument by O'Reilly, Chatman and Caldwell (1991) to measure organizational culture. After developing the questionnaires, a pilot study will be conducted to obtain preliminary results. The data from the pilot test will be analyzed for validity and reliability and the instrument revised as appropriate.

Survey Administration

A paper questionnaire or a web survey will be used to conduct a single survey of individuals deemed representative of stakeholder groups. Several steps will be taken to maximize participation. Efforts will be made to secure a high-level sponsoring executive at the firm. Pre-survey announcements will be sent out explaining the nature and purpose of the survey. I anticipate two types of follow-up. Reminder postcards will be mailed as the first follow-up. The second follow-up will be personal phone calls.

Current Status of Research

Currently we are working on developing the proposal and the survey questionnaire as well as identifying potential data sources for collection. I will use operational, managerial and strategic variables to measure IT assets, IT impacts, and organizational performance. As for organizational culture, we will use the tested, theory-based instrument Organizational Culture Profile (OCP) by O'Reilly, Chatman and Caldwell (1991) to measure organizational culture.

Regression methods will be used to examine the relationships between organizational culture and the dependent variables at each stage of IT implementation.

Unresolved Issues

A number of issues may not be dealt with in this study. Those issues may include:

- The sampling technique is not random. Instead, the sample will be taken from organizations where there is reason to believe that the survey return rate will be high.
- Future replication is needed to validate this research effort.

References

Blake, R. R. and Mouton, J. S. *The Managerial Grid*, Houston, TX, Gulf Publishing Co., 1964.

Harper, G. R., *Assessing Information Technology Success As a Function of Organization Culture*, PhD Dissertation, The University of Alabama in Huntsville, 2000

Harper,G. R., Utley, D. R. Organizational culture and successful information technology implementation, *Engineering Management Journal,* Rolla; Jun 2001; Vol. 13, Iss. 2; pp. 11-15

Kohli, H. and Devaraj, S. Measuring Information Technology Payoff: A Meta-Analysis of Structural Variables in Firm-Level Empirical Research, *Information Systems Research*, 2003, forthcoming

Kohli, H. and Sherer, S. A. Measuring Payoff of Information Technology Investments: Research Issues and Guidelines, *Information Systems Frontiers*, 2003, forthcoming

O'Reilly, C. A. III, Chatman, J. A. and Caldwell, D. F., People and Organizational Culture: A Profile Comparison Approach to Assessing Person-Organization Fit, *Academy of Management Journal*, Vol. 34, No. 3, 1991, 487-516.

Ribiere, V. M. *Assessing Knowledge Management Initiative Success as a Function of Organizational Culture*, PhD Dissertation The George Washington University, 2001

Soh, C. and Markus, M. How IT Creates Business Value: A Process Theory Synthesis. *Proceedings of the Sixteenth International Conference on Information Systems,* Amsterdam, The Netherlands, 1995.