

December 2003

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Robert Nickerson
San Francisco State University

Jamie Eng
San Francisco State University

Lisa Ho
Longs Drug Stores

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Recommended Citation

Nickerson, Robert; Eng, Jamie; and Ho, Lisa, "An Exploratory Study of Strategic Alignment and Global Information System Implementation Success in Fortune 500 Companies" (2003). *AMCIS 2003 Proceedings*. 214.
<http://aisel.aisnet.org/amcis2003/214>

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AN EXPLORATORY STUDY OF STRATEGIC ALIGNMENT AND GLOBAL INFORMATION SYSTEM IMPLEMENTATION SUCCESS IN FORTUNE 500 COMPANIES

Robert C. Nickerson
San Francisco State University
Rnick@sfsu.edu

Jamie Eng
San Francisco State University
jeng@sfsu.edu

Lisa C. Ho
Longs Drug Stores
Lisa_C_Ho@yahoo.com

Abstract

This paper examines the effect of the alignment of a business's global strategy and its global information systems on the success of information system implementation. The paper proposes that global information systems that are aligned with a firm's global business strategy are more likely to reach a level of implementation that will add value to the business than those systems that are not so aligned. Exploratory hypotheses examining this proposition are presented in the paper, and a survey instrument to test the hypotheses is described. The results of a survey of Fortune 500 companies using the survey instrument are presented. The results indicate that the alignment of global business strategy with global information systems correlates with global information system implementation success.

Keywords: Strategic alignment, global information system, information system implementation success

Introduction

In recent years, considerable attention has been focused on the effect of the alignment of a business's strategy and its information systems on the success of information system implementation. Henderson and Venkatraman (1993) contend that "the inability to realize value [as a measure of IS implementation success] from I/T investments is, in part, due to the lack of alignment between the business and the I/T strategies of organizations". On the other hand, when an information system is aligned with the business strategy so that it is clearly apparent and widely accepted that the system has an important role in achieving a business's goals, the organization's members have an incentive to ensure the system's successful implementation.

This issue becomes more complex in firms that engage in international business activities, which usually have global information systems with components and functions that span national borders. Alignment of a business's global business strategy and its global information systems is difficult to achieve because of the added complexity created by the legal, political, economic, cultural, and technical differences in different countries. The effect of such alignment on system success is, therefore, an even more complex question for international businesses than for domestic businesses.

Although the issue of strategic alignment has been studied by others (e.g., Luftman 1996, Chan et al. 1997, van der Zee and de Jong 1999, Luftman 2000), little attention has been paid to *global* business strategy and *global* information systems. As companies increasingly engage in international business activities, examination of global strategic alignment becomes more significant. The purpose of this paper is to examine, through an exploratory study, whether the alignment of global business strategy and global information systems correlates with successful information system implementation.

In this paper, we first provide a brief (due to space limitations) review of the background literature related to information system implementation success and to the alignment of business strategy and information systems. Then we present a proposition that links global strategic alignment and global IS implementation success, and give exploratory hypotheses that investigate the proposition. Next, we describe a survey instrument designed to test the hypotheses. Finally, we discuss the results of a survey of Fortune 500 companies using this instrument.

Background

Information system implementation success is difficult to define (DeLone and McLean 1992). One model of the IS implementation process by Cooper and Zmud (1990) that can serve as a guide involves six stages: initiation, adoption, adaptation, acceptance, routinization, and infusion. The first three stages characterize the initiation and implementation of the IS but the last three stages can be used to characterize levels of implementation success of the information system: Acceptance covers the process of convincing employees to use the IS, routinization characterizes the IS's transition to a normal part of work activity when other business processes are adjusted to coincide with the IS, and infusion marks the reaching of increased effectiveness through full integration of the IS into the business and full utilization of its potential. In this paper we define the degree of IS implementation success as which of these last three stages the system has reached in the organization, and we make the assumption that an IS that has reached the infusion stage is more successful than an IS that has only reached the routinization stage, which in turn is more successful than an IS that has only reached the acceptance stage.

An emerging body of literature has suggested that the alignment of an IS with business strategy is possibly more important than other factors in determining the success of the IS implementation. Henderson and Venkatraman (1993) found in their research that lack of alignment between the organization's business and IT strategies is a key reason organizations fail to achieve full value from the resources invested in information technology. Their strategic alignment model is composed of four domains: business strategy, organizational infrastructure and processes, IT strategy, and IT infrastructure and processes. Within the business arena and within the IT arena, strategic fit is needed between the organization's internal infrastructure and process, and the organization's external positioning. At the same time, functional integration is needed across the business and IT arenas.

Ives and Jarvenpaa's (1991) work regarding global information systems produced conclusions similar to the business-IT functional integration of Henderson and Venkatraman's strategic alignment model. They found that unless a compelling business reason to share data exists, standardizing and coordinating management of information systems across international branches of a firm may be blocked by international differences in business processes. Ives, Jarvenpaa, and Mason (1993) define global business drivers (GBDs) as "those entities that benefit from global economies of scale and scope, and thus contribute to the global business strategy". Once agreed upon, these GBDs "form the basis for the I/T strategy and an applications portfolio" and identify what business entities will derive the most value from IT investments. They assert that "if information technology is to add value to international business operations, it must be applied through the firm's global business drivers".

Research Proposition and Hypotheses

With this background, we now present a proposition that links global strategic alignment with global IS implementation success. We base our concept of strategic alignment on Henderson and Venkatraman's functional integration between the business/organizational domains and the IT domains. This concept together with Ives, Jarvenpaa, and Mason's work on global business drivers suggests that organizations will achieve greater value from information systems that support business strategy and processes than systems that are not aligned with business strategy. Cooper and Zmud's model of IS implementation maintains that an IS is most successful, and thus has the greatest potential to add value to the organization, when it is fully infused into business processes. Combining these perspectives within the context of global information systems leads us to the following proposition:

A global information system in a business that is aligned with the business's global business strategy is more likely to move through the implementation process to ultimate infusion in the business and thus add more value to the business than a global information system that is not so aligned.

Strategic alignment is difficult to define and to identify in organizations (Chan et al. 1997, Reich and Benbasat 2000). In this paper we do not try to define strategic alignment in organizations but instead to infer that it exists indirectly. If the strategy of a business is to have a certain global business capability, such as transaction processing for global customers, then providing that capability

will be important to the business. If the business's global information system strategy is aligned with its global business strategy, then a corresponding system that supports that capability, such as one to provide global customer support, is likely to be implemented and reach an increased level of usage and add value to the business. Thus, we investigate strategic alignment by looking at the importance of certain global business capabilities, the level of implementation and usage of the corresponding global information systems, and the perceived value added by those systems.

We now present a series of exploratory hypotheses based on this approach. First, we surmise that if a global business capability is important, then the corresponding global information system is more likely to be implemented:

H1. Increases in the perceived importance of a global business capability are associated with increases in the level of implementation of a corresponding global information system.

If a global business capability is important, then the length of time that the capability has been considered to be important may have an impact on the level of implementation:

H2. For an important global business capability, the number of years that the capability has been considered to be important is associated with increases in the level of implementation of a corresponding global information system.

To explore usage and value added, we must examine systems that have reached an operational level of implementation. If a global business capability is important and its corresponding global information system is operational, then the system may be more likely to reach an increased level of usage and add more value to the business:

H3. For an operational global information system, increases in the perceived importance of a corresponding global business capability are associated with increases in the level of usage of the information system.

H4. For an operational global information system, increases in the perceived importance of a corresponding global business capability are associated with increases in the perceived value added to the business by the information system.

The length of time that a global information system has been operational may have an impact on the level of usage of the system and the value the system adds to the business:

H5. For an operational global information system, the number of years the system has been operational is associated with increases in the level of usage of the information system.

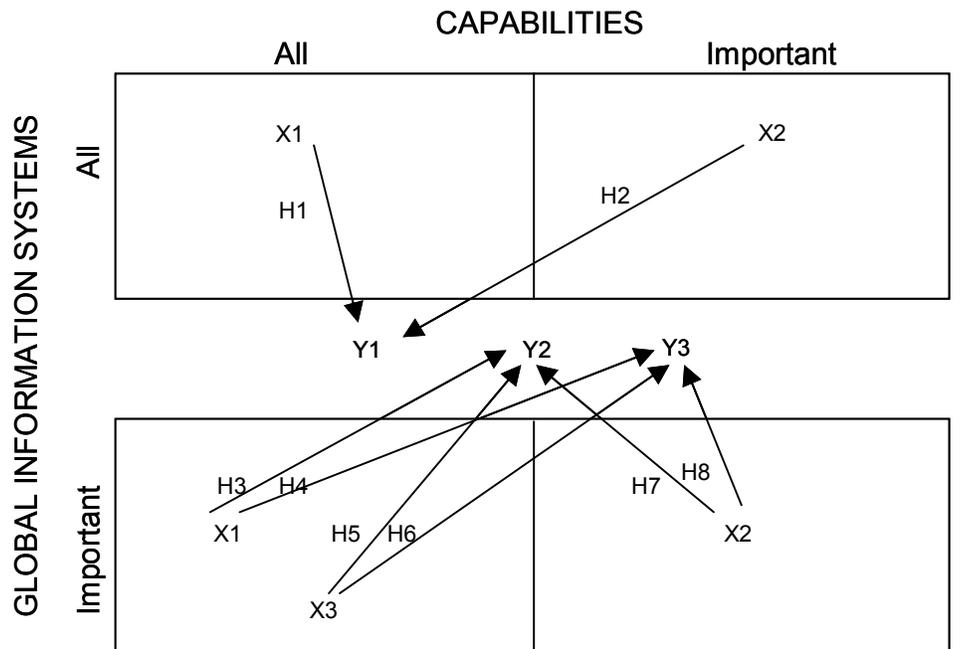
H6. For an operational global information system, the number of years the system has been operational is associated with increases in the perceived value added to the business by the information system.

If a global business capability is important, then the length of time that the capability has been considered to be important may have an impact on the level of usage of and the value added by the corresponding operational global information system:

H7. For an important global business capability and a corresponding operational global information system, the number of years that the capability has been considered to be important is associated with increases in the level of usage of the information system.

H8. For an important global business capability and a corresponding operational global information system, the number of years that the capability has been considered to be important is associated with increases in the perceived value added to the business by the information system.

Figure 1 summarizes the hypotheses given here.



Independent variables:
 X1 = Global business capability importance
 X2 = Global business capability importance duration
 X3 = Global IS operational duration

Dependent variables:
 Y1 = Global IS level of implementation
 Y2 = Global IS level of usage
 Y3 = Global IS value added

Figure 1. Summary of Hypotheses

Methodology

To test the hypotheses, a survey instrument in the form of a self-administered questionnaire was designed. An initial version of the questionnaire was used for a survey of firms in the San Francisco, California, Bay Area and the results were analyzed. Based on that experience, several modifications in the questionnaire were made. The questionnaire was then sent to the Chief Information Officers or Managers of Information Systems (by name or by title when the name was not known) of 491 of the Fortune 500 companies. (Some of the Fortune 500 companies were no longer separate entities at the time of the mailing.)

Because of space limitations, the questionnaire is not included in this paper; a copy of the questionnaire can be obtained from the first author. Survey respondents were first asked to rate, on a seven-point scale, the importance of a list of seven global business capabilities to their companies' global business strategies. The list of capabilities was chosen to represent generic tasks in a typical global business supply chain. The Ives, Jarvenpaa, and Mason (1993) analysis of global business drivers was drawn upon in the development of these capabilities. Respondents were also asked to mark the number of years that the capability had been considered important to global business strategy if the capability was important (arbitrarily selected as an importance of 4 or higher).

Then respondents were asked to identify their companies' level of implementation (none, under investigation, being implemented, or operational) for a list of seven global information systems. For operational systems, the number of years the system had been operational, the system's level of usage (accepted, routinized, or infused), and the perceived added value of the system (none, little, some, or great) were requested. The usage and value scales were intended as measures of the system's implementation level beyond basic operation.

The two lists of global business capabilities and global information systems were constructed in pairs to create a one-to-one relationship between each capability and an information system that would typically be needed to provide that capability. These pairs are listed in Table 1. The pairs were not identified as such in the questionnaire, nor were the items in the two lists presented in paired order.

Table 1. Global Business Capabilities and Global Information System Pairs

Global Business Capability	Global Information System
Coordinating purchasing globally.	Suppliers/Purchasing Needs
Producing different parts of a product in various locations around the world.	Production Plans
Bringing together the expertise of knowledge workers around the world.	Workgroup Collaboration
Marketing products globally.	Market Research/Sales Data
Managing the company’s financial assets globally.	Financial Assets
Moving inventories around the world quickly and efficiently.	Distribution/Logistics
Providing seamless transaction processing for global customers	Customer Account Information

Analysis of Responses

Seventy-eight questionnaires (16% of those received by companies) were completed and returned. Of these, 53 were from companies that indicated both international business activity and global information systems that were either planned or operational. The survey responses of these 53 companies were analyzed.

The seven alignment possibilities (Table 1) from each of the 53 companies were combined to provide a maximum of 371 observations of the importance of the global business capabilities. The actual number of observations ranged from 77 to 357, depending on the conditions in the hypothesis and the number of responses to the questions. Numeric scales were used for the level of implementation, level of usage, and perceived value added. Simple linear regression was used to test the hypotheses. Table 2 lists the correlation coefficient and p-value for each hypothesis and whether the hypothesis is supported at the .05 and .01 levels.

Table 2. Results of Hypotheses Tests

Hypothesis	Capabilities	Systems	N	R	P value	Hypothesis supported (P<.05)	Hypothesis supported (P<.01)
H1	All	All	357	.4013	.0000	Yes	Yes
H2	Important	All	266	.1737	.0045	Yes	Yes
H3	All	Operational	94	.1103	.2898	No	No
H4	All	Operational	91	.2101	.0456	Yes	No
H5	All	Operational	95	.3251	.0013	Yes	Yes
H6	All	Operational	92	.2568	.0135	Yes	No
H7	Important	Operational	78	.1712	.1338	No	No
H8	Important	Operational	77	.1652	.1510	No	No

The data gathered from Fortune 500 companies strongly supports the hypotheses that the importance of a global business capability is positively related to the level of implementation of the corresponding global information system (H1). Similarly, the data strongly supports the hypotheses that the length of time an important capability has been considered to be important is positively related to the level of implementation of the corresponding global information system (H2). For operational systems,

the importance of a corresponding global business capability is not related to the system's level of usage (H3) but is positively related to the perceived value added to the business by the system (H4). The length of time a global information system has been operational is positively related to the level of usage of and the perceived value added by the system (H5 and H6). The length of time that an important capability has been considered to be important is not related to the level of usage of or the value added by the corresponding operational global information system (H7 and H8).

Interpretation of Results

Although correlation does not imply causality, the results of this exploratory study might be interpreted as follows: If a global business capability is important or has been important for some time, then the corresponding global information system is likely to be implemented. After a global information system has become operational, the importance of the corresponding global business capability does not impact the level of usage of the system but does impact the perceived value added by the system. The length of time that a global information system has been operational, however, does impact both the level of usage of and the perceived value added by the corresponding global information system. After a global information system has become operational, the duration of the importance of the corresponding global business capability does not impact the level of usage of or the perceived value added by the global information system.

Conclusion

The results of this exploratory study indicate that alignment of a global information system with global business strategy is associated with implementation success. The data from the Fortune 500 companies supports our proposition that global information systems that are aligned with global business strategy are more likely to be implemented, reach ultimate infusion in the business, and add value to the business than systems that are not so aligned. This conclusion endorses the recommendation that MIS managers give specific consideration to the alignment of a global information system to global business strategy when deciding which global information systems to implement at their companies.

The data for this study came from large international firms headquartered in the United States. Further research into firms located in other regions of the world may provide similar or different results. We are currently investigating whether the results hold for large international firms headquartered in Western Europe.

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