Attributes for Executing Change in an Agile Information System

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ABSTRACT

Information Systems (IS) agility is a current topic of interest in the IS industry. The study follows up on work on the definition of the construct of IS agility and attributes for sensing and diagnosis in an agile IS. IS agility is defined as the ability of an IS to sense a change in real time; diagnose it in real time; and select and execute an action in real time. This paper explores the attributes for selecting and executing a response in an Agile Information System. A set of attributes were initially derived using the practitioner literature and then refined using interviews with practitioners. The attributes’ importance and validity was established using a survey of the industry. All attributes derived in this study were deemed pertinent for selecting and executing a change in an agile information system. Dimensions underlying these attributes were identified using Exploratory Factor Analysis. This list of attributes can form the basis for assessing and establishing execution mechanisms to increase IS Agility.

Keywords: Agile Information Systems, Execution Attributes, Information Systems Agility, Response Execution, Response Selection, Selection Attributes

INTRODUCTION

Change is the rule of the game in the current business environment. The rate of change has been continuously increasing due to factors like globalization and the opportunities presented by the development and evolution of technologies. Not only are changes occurring at an increasing rate, they are becoming increasingly unpredictable. This unpredictability can involve the timing of a known change; not knowing about a change; and/or a combination of these. The rapid rate of change implies that an organization needs to become an expert at changing and morphing itself rapidly in response to a change. Retention of leadership and/or competitive position requires that an organization should be able to change at will in any direction, with minimal cost and time, to counter a threat or capitalize on an opportunity. Such an organization may be characterized as an agile organization. For most organizations the survival and/or retention of market share demands that the organization
should be able to change faster than, or as fast as, new entrants and rivals.

Information Systems (IS) pervade all aspects of modern organizational functioning and play an integral role in information processing activities of an organization. Information Systems are needed for organizational agility on account of their ability to provide shared, distributed and integrated, current, and fast-flowing information (Bajgoric, 2000; Bal, Wilding, & Gundry, 1999; Christopher, 2000; Hoek, 2000; Mason-Jones & Towill, 1999; Sharifi & Zhang, 1999; Y. Y. Yusuf, Sarahadi, & Gunasekaran, 1999).

Modern business processes in organizations use IS as a core resource or component. In many and most cases, IS may completely or significantly embed a business process (e.g., Internet banking). The pivotal role of IS in modern organizational business processes means that an organization (agile or striving to be) cannot change its business processes unless the IS changes as well. Thus an agile organization would need an agile IS. What Brandt and Boynton indicated in 1993 still holds true - current IS are not easy to change though several are getting closer in some aspects. Markets change but IS do not. Though more organizations are experimenting with Agile Development methods, most IS have been developed and are still being built to cover a closed/defined set of requirements using the waterfall development methodology, especially in contracting and outsourcing arrangements. The performance of an IS is also optimized for these requirements. The result of this optimization is that IS changes are often arduous and complicated, especially in cases where the requirements were not explicitly foreseen by the designers. But such requirements are frequent in today’s environment. The problems in changing an IS are further aggravated by other factors such as outsourcing, where the knowledge about the architectural and technical aspects of IS may primarily reside outside the organization. The inability of IS to change quickly impedes organizational agility. The challenge for an organization is to structure its IS to meet a variety of changing requirements, many of which are not even known when the IS are built. In summary, an agile organization needs an agile IS.

So what is an agile IS? We arrive at the definition or construct of an agile IS based on prior work done by the authors in this area. Agility in general is defined (Pankaj, 2005; Pankaj, Hyde, Ramaprasad, & Tadisina, 2009) as a formative construct comprised of the ability to sense a change, diagnose a change, select a response, and execute the response in real-time:

1. **Sense**: Ability to sense the stimuli for change (as they occur) in real-time;
2. **Diagnose**: Ability to interpret or analyze stimuli in real-time to determine the nature, cause, and impact of change;
3. **Respond**: Ability to respond to a change in real-time, further disaggregated into select and execute.
   3.1. **Select**: Ability to select a response in real-time (very short planning time) needed to capitalize on the opportunity or counter the threat.
   3.2. **Execute**: Ability to execute the response in real-time.

Real-time is defined as the span of time in which the correctness of the task performed not only depends upon the logical correctness of the task performed but also upon the time at which the result is produced. If the timing constraints of the system are not met, system failure is said to have occurred (Unknown, 2002).

Thus an Agile IS may be defined as one that has the ability to sense a change in real-time, diagnose the change in real-time, select a response in real-time, and execute the response in real-time. Due to the formative nature of the construct, several, or some, of these abilities might exist in the absence of others.

This paper is organized starting with a definition of the formative construct of an “Agile IS” and the construct’s components: Sense, Diagnose, and Select and Execute. The Introduction is followed by a Literature Review and general discussions of Information Systems.