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ABSTRACT

Business strategists have continually studied how companies are staying competitive (or getting ahead) by increasing their agility. In today's ever-changing, fast-paced, and global environment, this is especially important. However, an organization cannot simply complete a checklist and be "agile". And while certain key elements are non-negotiable, core values and results must be the primary goals. The road taken to reach those goals must be adapted to some extent to each unique organization's model and culture. In this paper, we examine the major topics researched on the topic of IT and business agility and the results found. We finish with a look at the potential for future research contributions in this area.

Keywords

Organizational agility, IT agility, Workforce agility

INTRODUCTION

Organizational agility refers to improving the speed and flexibility of the overarching processes, decisions, and concerns at the company level. It deals with high-level process improvements to streamline activities for efficiency and effectiveness. All aspects of the business are reviewed and improved, such as human capital management, operations, production/manufacturing, relationships (supplier or customer), and IT. Infrastructure and business culture play a major role in order to support the changing business environments. A business must be flexible to anticipate or respond to changes, but there must also be standards and protocols in place to provide a model for quick response (Lu and Ramamurthy, 2011; Zain, Rose, Abdullah, and Masrom, 2005).

METHODOLOGY

Two database searches using both ABI/Inform Complete and Business Source Elite were conducted to find research articles that have examined organizational and IT agility. The first searched for the term "IT agility" anywhere in the paper. The second search looked for "organizational agility" in just the abstract. From these two searches, 37 articles were identified. After reading the articles, eight were deemed out of scope and eliminated. Because we searched only on the terms, no restrictions were placed on the journal the article was published in. With this search, we were able to find articles published in journals that were not necessarily IT specific, but did cover IT in business fields.

After reviewing the remaining 29 papers, four major areas of research on organizational and IT agility were identified. These areas included: Workforce Issues, Organizational Characteristics, IT Structure Characteristics, and Types of Agility. Figure 1 depicts the main areas studied in the agility literature.

TOPICS REVIEWED IN AGILITY

Workforce Issues and Agility

Workforce agility relates to how a firm's human capital interacts with IT to impact overall business agility (Breu, Hemingway, and Strathern, 2001). Topics studied in relation to workforce issues and agility include IT tools, training, acceptance, ease of use, and perceived usefulness.

Tools provided by IT for collaboration, processing, automation, and communication assist workers in their day-to-day activities and seek to make them more productive. Tools provide the speed and flexibility needed to achieve and improve agility (Breau et al., 2001). Companies who value their employees' learning will also provide opportunities (often through online training) for employees to gain confidence and/or knowledge with IT tools. In a case study at a healthcare organization, an agile workforce was produced, in part, because of training put into place (Shafer, Dyer, Kilty, Amos, Ericksen, 2001).
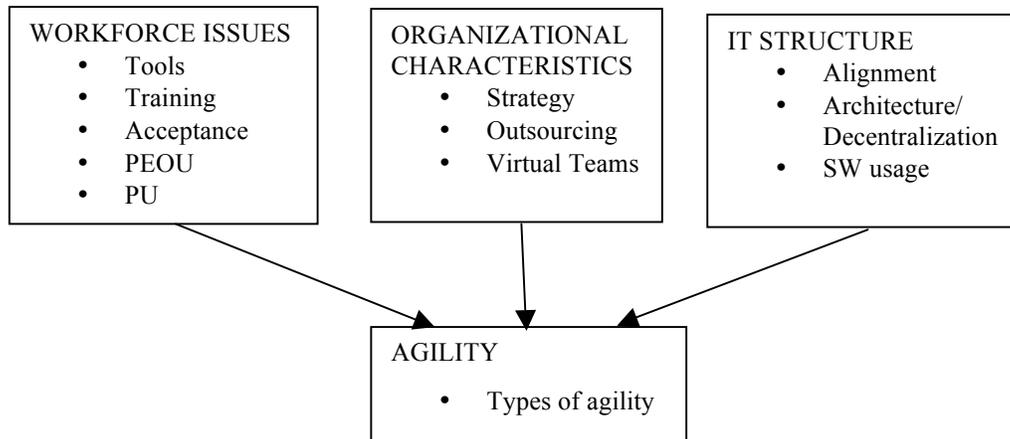
Figure 1. Framework of IT and Organizational Agility Literature

A positive relationship with IT in a company correlates with increased organizational agility (Zain et al., 2005). Two separate studies found that technology's perceived ease of use (PEOU) and perceived usefulness (PU) influenced user acceptance of IT. When users like technology, they use it, which improves business processes and agility (Zain et al., 2005). Both PEOU and PU of technology are essential to perceived organizational agility in the eyes of employees. Users who have embraced mobile enterprise technologies see PEOU and PU as exceptionally important to organizational agility as it relates to how well they can do their jobs at any location (Chung, Lee, Kim, 2014).

By making the workforce more agile, companies are able to mobilize their processes through their employees, thus increasing overall organizational agility.

Organizational Characteristics and Agility

Several research articles have looked specifically at characteristics of the organization and how those characteristics have impacted the organization's agility.

One particular study established the inventive concept of a completely blended organization where IT and business are not vying for precedence, but rather working as one unit (Smaczny, 2001). Instead of two strategies – one for business, one for IT – Smaczny suggested that IT and business develop a single strategy together, thus discouraging an "us-versus-them" mentality and also decreasing response time on a decision.

Establishing modular integration processes in an organization adds structure for external vendor integration through partnerships and outsourcing. Outsourcing can then improve agility by freeing up resources and certain costs (Ross and Westerman, 2004).

Virtual teams and collaborations are also changing the structure of daily business, as firms are now working with multiple people, in various time zones, and with various knowledge areas. This may complicate logistic and geographic aspects of business, but it also increases the human capital knowledgebase and global flexibility. IT provides these virtual capabilities to support various types of partnerships improving organizational agility (Castro-Leon and He, 2009).

Therefore, components that support a modular and collaborative environment appear to help build a structure for organizational agility. The ability to have information available to make business decisions and communicate with people on a global scale allows firms to continuously improve their strategy and be more agile in the marketplace.

IT Structure and Agility

The prior sections dealt with workforce relationships with IT and organizational characteristics; this section looks at the IT department and its impact on an organization's agility. How can a firm's IT area continue to be agile and how can it propel its entire organization into agility? Internal IT agility has an overall impact on the organization as a whole through IT's infrastructure and competencies.

Business and IT alignment is one area that has been studied in the IT-organizational agility literature. It is easy for IT to get out of alignment because the business environment changes so quickly. Similarly, technology environment also changes, so

keeping up with both makes alignment even more of a moving target. Rapid changes need to be made, and this is where a modular IT architecture comes into play. With no broad dependence on other areas, modular architecture allows changes to one component without affecting other components, which also reduces time to market on products, services, or fixes. This plug-and-play environment can also be applied to IT governance. Tiwana and Konsynski (2010) make the case that a decentralized IT governance structure (smaller, movable components) allows IT to make faster, more pertinent decisions to meet changing business needs.

The type of architecture used within a company's IT department plays a role in the capabilities of IT agility. The research divided IT architecture into three components – modularity, flexibility, and decentralization. One particular study described modular and flexible IT architecture that allowed a non-profit organization to change quickly to meet global medical needs and disperse life-saving knowledge to unsupported areas. This organization demonstrated agility through IT communication, collaboration, knowledge transfer, data sharing/integrity, and integration (Richardson, Banks, Kettinger, and Quintana, 2014). Decentralization of the IT infrastructure allows quicker response to market changes (Harraf, Wanaskia, Tate, and Talbott, 2015; Lu and Ramamurthy, 2011).

Some studies have examined the relationship between particular technologies and agility. The use of a knowledge management system (KMS) has been correlated with increased agility (Khalifa, Yu, and Shen, 2008). RFID technology was also found to increase organizational agility and performance. RFID allows a company to track its inventory, operations, and throughput, thereby decreasing time spent in these areas. This allows operations and logistics to respond faster, yet also increases accuracy in inventory control (Zelbst, Sower, Green, and Abshire, 2011). Several studies have focused upon the relationship between a service-oriented architecture (SOA) and agility. A SOA environment (which is slowly being usurped by microservices) usually has vendors that provide various components and services for use. This means that using SOA increases modularity and flexibility and IT can respond to various changes in business with little cascading effect. Integration between different components must allow functions to work together, yet, if one changes, it should not impact others. This is the model service-oriented architecture seeks to establish (Basias and Themistocleous, 2013; Butler, 2008; Ghosh and Li, 2013; Matei, 2011).

A plug-and-play environment allows businesses to customize their abilities and offerings in the industry, giving them endless combinations and opportunities for moving their company in various directions. If the market changes, a company is better situated to adjust its model to move with (or even lead) the market change. The IT structure, therefore, can give businesses a great advantage in agility.

Types of Agility

Agility in an organization can be approached in different manners; there are different types of agility that may provide different benefits to an organization.

Organizational agility can be entrepreneurial or adaptive (Chakravarty, Grewal, and Sambamurthy, 2013). The former is a proactive (or first-mover) approach where a company sees an opportunity for change that could positively impact results, and it acts upon it. The second type (adaptive) is a reactive approach that occurs after an event has already occurred to prompt a change. Higher market volatility impacts both types of agility, decreasing or even negating the benefits. When the market is less dynamic, IT competencies actually improve both entrepreneurial and adaptive agility (Chakravarty et al., 2013).

A different way to consider IT agility is to focus upon range agility (the capability to increase/decrease a variety of product, services, or internal processes) or on time agility (the speed at which products or information can be presented). A company can either choose range or time agility, but cannot increase agility by choosing both (Sengupta and Masini, 2008).

In another study, agility was considered as IT's facilitation of both business/organizational agility and operational/logistics agility (Huang, Ceroni, and Nof, 2000). IT improved business and organizational agility by integrating data and communication amongst all areas of the business. From a logistics perspective, IT can increase agility in the operations and logistics as an extension of flexibility.

Finally, agility has also been considered at the business-unit level and at the organizational level. In one article, a case study was conducted demonstrating how increased business unit agility enhanced company-wide improvements (Gallagher and Worrell, 2008).

To enhance organizational agility, organizations need to consider all types of agility options. The type of industry an organization operates in may determine whether a company adopts an entrepreneurial or adaptive form of agility. Different types of agility can create advantages and opportunities for firms. If Company A is strong in their ability to provide products (range agility), then perhaps they can focus their efforts on increasing their product offerings and gain more market share. On the other hand, Company A could decide to focus upon improving time agility, or even logistics agility, to provide

information or products in a timelier manner. Companies can and should choose different types of agility based upon their strengths and weaknesses.

CONCLUSION

Throughout this research, we have discussed many aspects of overall agility, as well as IT agility. We identified four main areas that past research has focused on: workforce characteristics, organizational characteristics, IT characteristics, and types of agility. Additional research could focus on combining the first three of these categories, rather than just investigating each in isolation.

Agility in the workforce is enabled by IT providing technology to aid in day-to-day activities and business processes. Technology that is fast and flexible to meet users' needs increases the amount of work that can be accomplished, therefore impacting overall agility. What tools for collaboration, automation, communication, and data sharing/reporting allow organizations to increase agility? Management can also play a key role in workforce agility by offering training amongst all employees. Additional research on the types of training that best enable agility is needed. In order to aid IT acceptance, management must also support and encourage users to adopt new technologies to reap the benefits they can provide.

Limited research has compared overall organizational agility with business unit agility, and more work would extend our knowledge on this subject. When is it better for an organization to concentrate on business unit agility? When is it optimal to focus on overall organizational agility? Can both be accomplished? Market volatility often influenced the level of agility possible for firms. Given the uncertainty and rapidly changing structure or organizations today, additional research should focus on agility in times of uncertainty and agility within new organization forms (such as virtual organizations).

The business environment is constantly changing, and technology seems to morph increasingly quickly. To keep up with this environment, research and ideas will need to be continually developed and shared. Some of the greatest untapped capabilities lie in human capital. Businesses are still struggling to find ways in which to capture and transfer expert knowledge and experience. As we explore KMSs and workforce agility, we believe there is room to grow in exploiting agility provided by the workforce. Aspects of IT agility will also continue to grow as technologies change and people find newer, creative solutions to solving business problems. This will continue to be an area of study. As global economies become more prevalent, solutions for companies across various countries/time zones/languages will be another interesting area. As we solve certain problems with logistics and communication through technology and better business processes, others will arise. The secondary or residual issues will also need addressed and create a continuous cycle for us to learn and improve businesses.

A complete list of articles reviewed can be obtained from either author.

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