

The Effect of IT on Organizational Agility

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Abstract

In the unpredictable and competitive world of today the organizations must have different competitive features to compete, otherwise they will move towards annihilation. One of these features that organizations need in turbulent environments is agility. Agility provides the organization with the possibility of quick response and compatibility with environment and allows the organization to improve its efficiency. The organization is affected by a variety of features. One of which is the information technology (IT) that has effects not only on the organization, but also on its features. This essay attempts to study the effect of IT on agility and its different aspects.

Keywords

Agility, organizational agility, information technology, the effect of information technology on organizational agility

1. Introduction

In recent years organizations have been after features to compete with one another. Since the environment around organizations is changing constantly, the agility feature which is one of the most efficient features of environments of this kind has become the centre of attention in a way that has resulted in the division of organizations to the two types of agile and traditional. Agility is the result of the combination of several features and in fact an organization that owns the features of flexibility, speed and compatibility is known as an agile organization. Information technology is one of the most effective factors affecting the organizations and the environments. We can firmly state that IT has effects on all components and features of an organization. In the following part we study the effect of IT on organizational agility.

2. Study of Literature

1.2 History of organizational agility

The history of agility dates back to the U.S. industry downturn. With regard to the U.S. industry downturn and the disappearance of compatibility in the 1980s that was well documented, in the 1990 the U.S. Congress decided to take necessary measures in this regard. In conclusion, the congress ordered the Department of Defense to establish an agent and to investigate the U.S. manufacturing industries with the aim of making them more competitive. In fact by observing that the rate of changes in business environment is higher than the rate of compatibility with environment, a group of experts and scientists on the behalf of the Department of Defense in the University of Lehigh in the United of Pennsylvania gathered together to investigate the U.S. manufacturing industries with the aim that which systems and strategies will be successful in the industry. The result of their efforts was a two-volume report under the title of “the strategy of manufacturing firms of the 21st century”, which was published in the fall of 1991 by the Yakuka Institute in Lehigh University. The “agility” name was also assigned to it at the same time. Later in the 1995, the results of these researches were published in Steven Goldman and Nigel’s book and the press under the title of the “Nimble competitors and virtual organizations” [15].

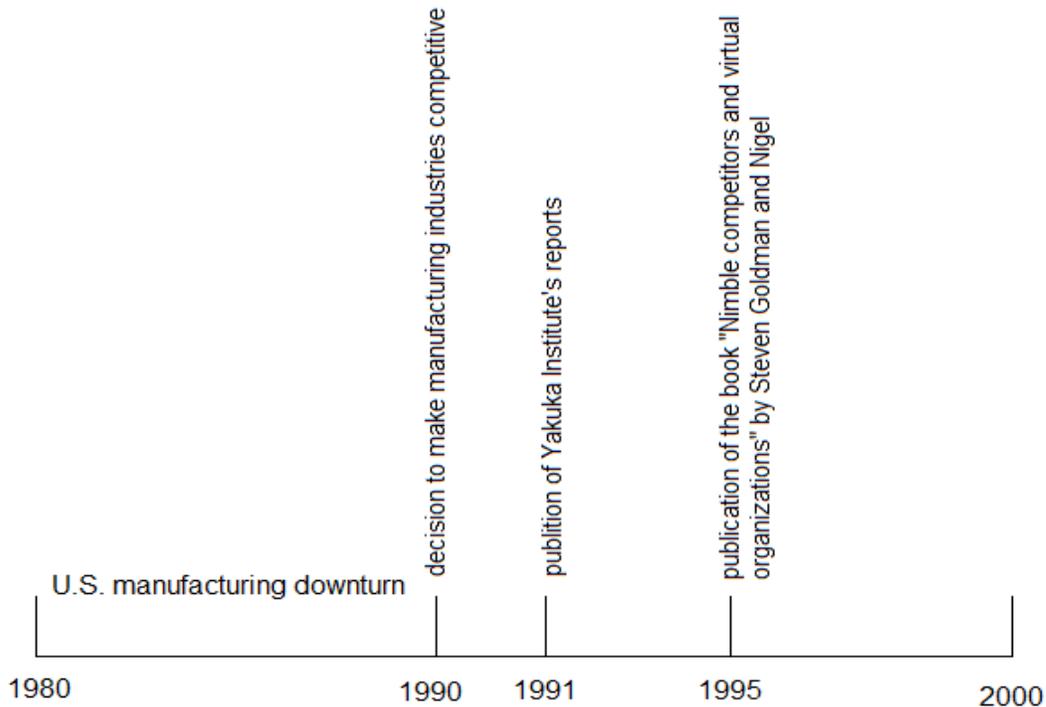


Figure 1: History of agility

2.2 Related concepts of the effect of IT on organizational agility

2.2.1 Organizational agility

Agility is ability to respond to unpredictable changes with quick response and profitability [13].this is an organizational ability to react quickly and effectively to an environment which can change radically [6]. According to the different definitions of the word **agility**, the concept of speed and quick response and also the concepts of group work and common goal regarding the word organization can be inferred from. Also we can propose a primary definition for the word organizational agility as follows: "Swiftness and quick response of a harmonious group to the changes made by the environment surrounding them in order to reach a goal." But agility has some components that are introduced in the following. Two concepts inherent to the definition of agility are speed and flexibility [5]Ability to adapt quickly, flexibly, and effectively to changing requirements [12]. Of course agility has even more components, but in general naming the same components will suffice.

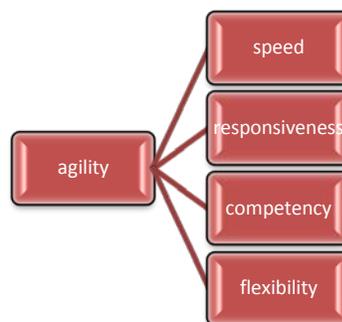


Figure 2: components of agility

The above figure addresses the responsiveness to the ability to diagnose changes and quick response to them and profit from them. Suitability refers to the ability to reach goals and objectives of the organizations and speed refers to the ability to do works in the least possible amount of time [3]. In simpler words speed is a measure of the time it takes to ship or receive a good [5], And flexibility is the ability to put different processes in circulation and reach different goals by the use of similar facilities [3] and in simpler words it is the degree to which the firm is able to adjust the time in which it can ship or receive goods [5]

2-2-2) Information technology

Information technology (IT) is related to technology and information. Acquisition, process, saving and audio and video publication of textual and numerical information and compounding them with microelectronic according to calculations and telecommunications are its main basics [16]. According to the proposed definitions for the word technology, the concept of the skill of using science and technology in practice and according to the word “information”, the concepts of awareness and knowledge can be inferred from. All in all the word information technology can be defined as: “Make use of science and technology to organize the obtained information”. About the components of the information technology it can be stated that: Major IT resources include external relationship management, market responsiveness, IS-business partnerships, IS management/planning, IS infrastructure, IS technical skills, IS development, and cost efficient IS operations (Wade and Holland 2004). Idiosyncratic IT resources help an organization to sense and respond to the rapidly changed environment [10]. In particular, IT applications, such as Internet computing, customer relationship management, enterprise resource planning, and supply chain management, allow firms to rapidly detect changes, flexibly alter their market strategies, and thus respond more quickly to customers’ changing requirements. Sambamurthy et al. (2003) [11], according to the above-mentioned articles, the components of information technology can be figured like this:

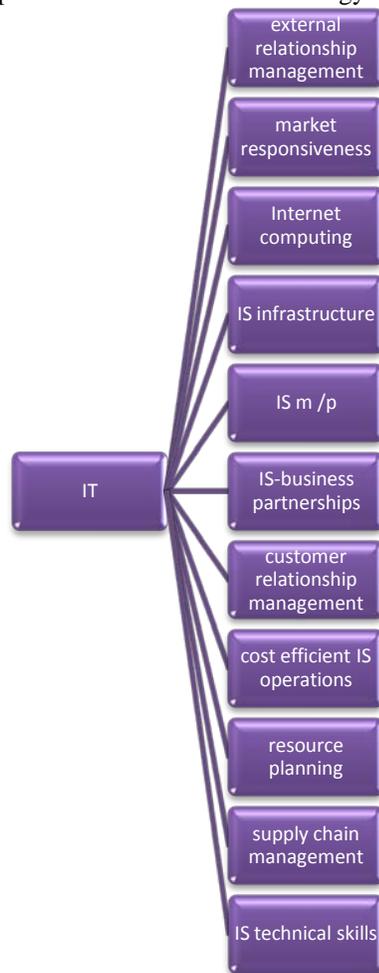


Figure 3: components of IT

Since the focus of this essay is not on the information technology, we dispense with their definitions.

3. The effect of IT on organizational agility

In this part, the articles published concerning the effects of information technology on organizational agility will be discussed. IT resources have been identified as one important type of resources in weaving organizational agility (Overby et al. 2006) [10]. Agarwal and Sambamurthy (2002) statement that IT plays an important role in corporate agility [4]. As it is clear, information technology is expected to have major effects on organizational agility. IS research and practice is subscribing to a common message of agility which consists of: recognition of a business environment that fluctuates quicker than conventional strategic planning cycles; the need to sense environmental fluctuations; the need to respond with options using existing information systems; and organizational readiness to effect the sensing and response [4]. In this article we discuss the information system – which is a subset of information technology – and agility. Recognition of an environment and its fluctuations and quick response to them requires information systems. First, the IT function fuses business and technical knowledge to sense the environment; and respond with IT-enabled options for future needs (Sambamurthy et al. 2003). Second, the IT function senses current use of information systems, monitoring and improving the value realized (Overby et al. 2006) [4].

In this article the effect of information technology on recognition of environment and also improving the value of services and manufactured goods have been discussed. Implementing at least a standard IT system would already decrease the overall exposure to the medium level [5]. Here the effect of information technology on the reduction of vulnerability, agility of supply chains and at last organizational agility are discussed. The Internet is increasing the visibility of supply chains and enabling virtual collaboration across supply chains, which are dramatically speeding up supply chain execution. [12]

In this part we discuss the effect of the internet – a subset of information technology – on the development of supply centers which in the end results in an increase in the communication with customers and also the effective communication between these centers which results in an increase in speed of responsiveness and in the end the agility of the organization. Today’s manufacturing software is more flexible and easier to set up and use than traditional material requirements planning (MRP) applications and better able to support agile manufacturing [12]. Software constitutes a small proportion of information technology and according to the above-mentioned article they are effective in support of agile production. The concept of leanness is incorporated in the concept of organizational agility. Both concepts are similar in striving for simplicity in e.g. tasks and information processing and for maintaining a high level of quality [6]. In this part the importance of information processing in increasing the level of quality is discussed, where information processing is the main duty of information technology.

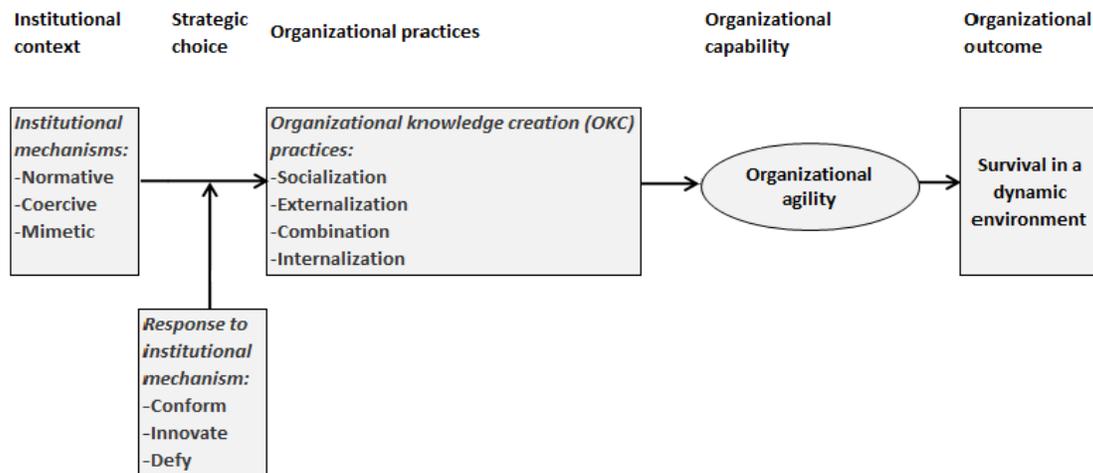


Figure 4: the relation between organizational knowledge and organizational agility[6]

In this chart, as can be seen, one of the steps in achieving organizational agility is attempts to create organizational knowledge and one of the necessities of reaching this key issue is the use of informational technology. Sensing the market refers to the ability to scan external environments, locate and analyze emerging developments, and quickly turns the resulting information into actionable decisions (Mara & Scott-Morgan, 1996; Teece, Pisano & Shuen, 1997) [7]. As can be inferred from the above sentence, information should be converted to practical decisions. The duty of information system is rapid processing of these data. The sooner this fact is accomplished, the quicker the decisions and the more agile the organization will be. DOs run on real-time, easily accessible information. They favor “broadcast” or consumer models of information technology that facilitate the full and timely flow of information both in and out, while placing responsibility on end-users to establish their own information requirements and, thus, to access only that which is needed when it is needed [7]. As it is mentioned in this article, information technology as a facilitator facilitates the communications not only outside the organization but also inside it. Moreover, it increases the swiftness by making available only the necessary information for each user.

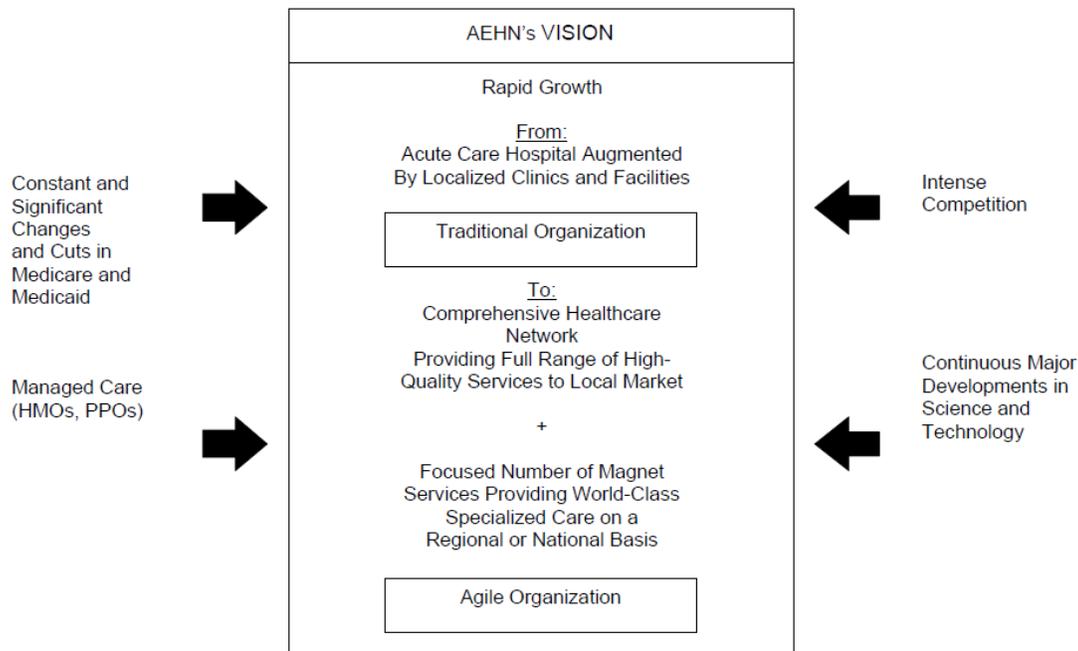


Figure 5: Albert Einstein’s preview of healthcare and remedy networks [8]

As it can be seen in the above figure, for a traditional organization to convert to an agile one it should be under the impact of different factors, one of which is the major ongoing developments in science and technology. Undoubtedly for becoming aware of the latest changes in science and technology, we are in need of information technology. A network participant with wide ranging network ties can bridge otherwise unconnected clusters of participants (and bring the knowledge of ancillary participants to bear on a work-design network) in a more timely and flexible manner, compared to one with less diversified ties [9]. This article shows that information technology makes a net more flexible and quick by making different communications among organizations. Therefore this factor makes organizations more agile, too. A work-design network involves coordinated effort and integration of various parties. To be agile, a work-design network also needs to be well-coordinated so that it can take timely responsive actions to changes [9]. In the above essay, coordination has been mentioned as the factor for making organizations more agile. And as the definition of information technology suggests, the duty of information technology is to organize and coordinate components, which according to this essay makes them more agile. For agility development of government, two types of resources are the most prominent ones among all resources: IT resources and institutional resources [10]. In this article we refer to information technology as a tool for developing agility. Idiosyncratic IT resources help an organization to sense and respond to the rapidly changed environment. [10]. The essay calls the information technology as a tool for recognition and response to a dynamic environment which is one of the necessary parts of an agile organization.

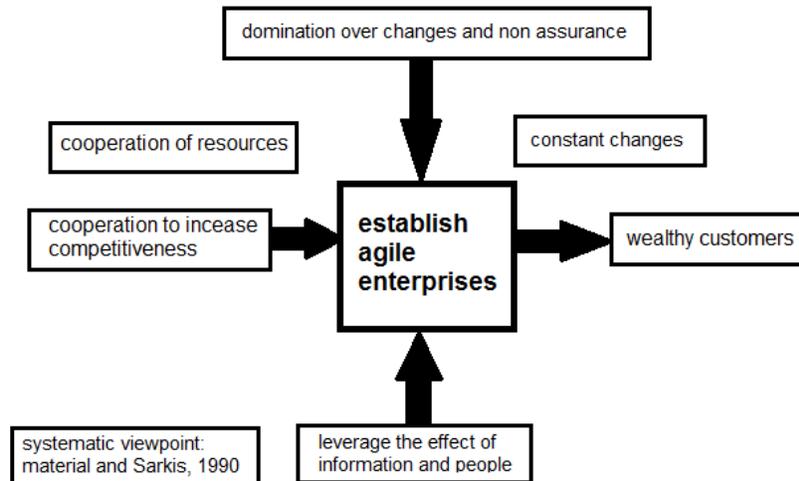


Figure 6: Factors needed to establish agile enterprises [2]

“The internet technology helps us to get access to agility and wealthy customers by different methods, from monitoring customers’ needs to better supporting of customer processes and also levers the impact of information and people.” As it can be inferred from the above figure and article, in order to establish an agile enterprise or organization people and information should be used and information technology is as a facilitator of this fact. Drawing on real option theory, Sambamurthy et al. (2003) have further explained how organizational agility is developed by leveraging existing IT resources to create digital options (Sambamurthy et al.2003). Digital options are a set of IT-enabled capabilities in the form of digitized organizational work processes and knowledge systems (Sambamurthy et al. 2003) [10].

In fact the above article supports the previous articles with the difference that it is stated with more details about the effect of information technology which is digitizing the process of work and the system of knowledge. In an agile manufacturing environment, manufacturing information systems should have access to a number of data resources and personal databases and pieces of equipment for effective monitoring of manufacturing [11]. As it was mentioned above, information technology helps to maintain agility by assisting the effective monitoring of manufacturing. In particular, IT applications, such as Internet computing, customer relationship management, enterprise resource planning, and supply chain management, allow firms to rapidly detect changes, flexibly alter their market strategies, and thus respond more quickly to customers’ changing requirements. Sambamurthy et al. (2003) [11], in fact the above articles show how information technology increases the factors of flexibility and responsibility by the use of its components and tools.

4. Conceptual model

Cooperation has always existed between organization and environment. According to the response the organizations show to their environment, they are divided to two types: agile organizations and traditional organizations. In fact agile organizations make this difference by creating features such as responsibility, suitability, flexibility and speed. As it was mentioned before, information technology has numerous effects on organizational agility, which are shown in figure 7. One of its most important effects is recognition of environment which is the direct result of cooperation between organization and environment and is distinctly shown in Figure 7. Figure 7 is an outline of all the matters mentioned in this essay.

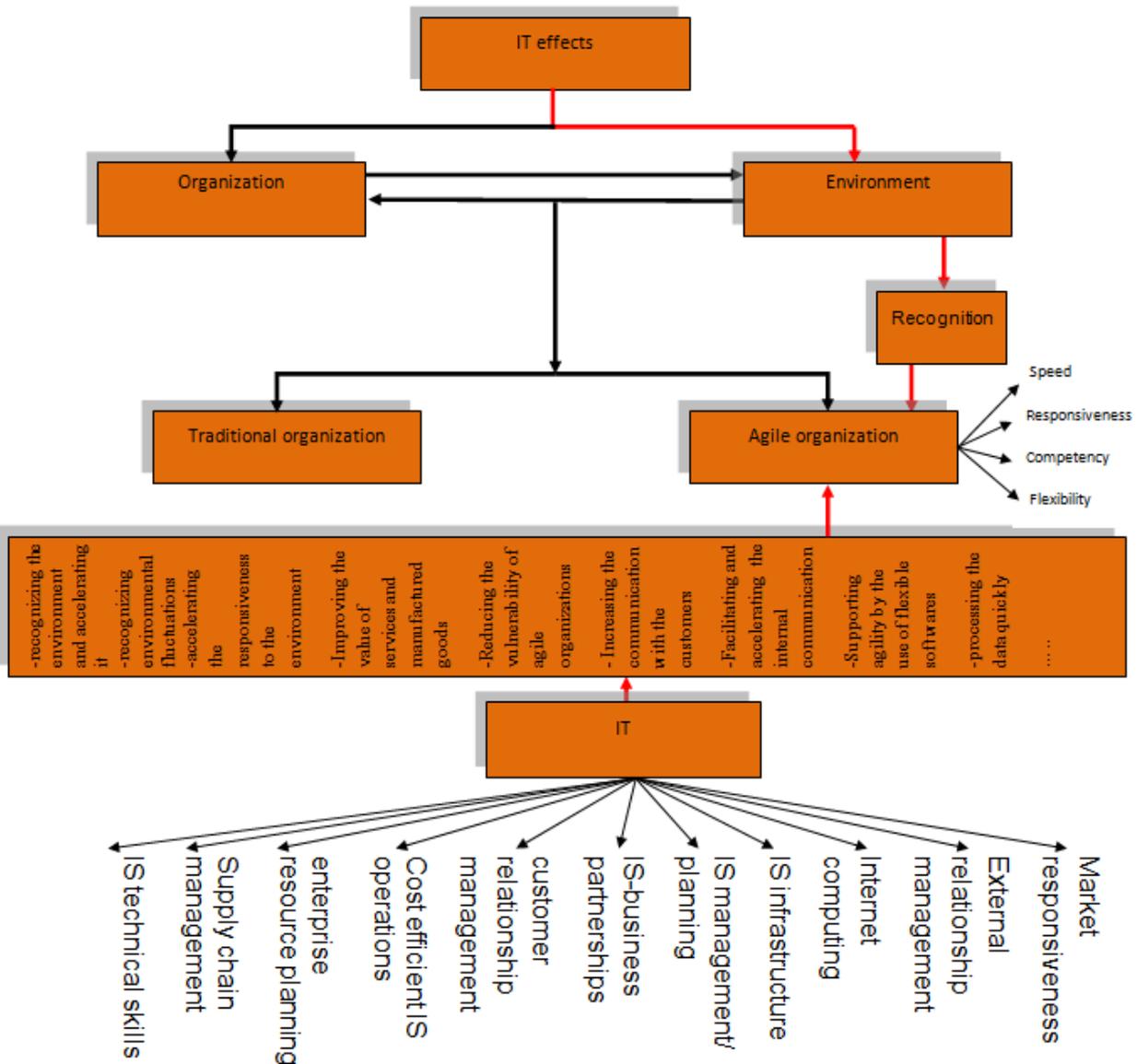


Figure 7: effect of IT on organizational agility [1]

5. Concluding

In order to coordinate a group, it should be organized. In fact the more organized a group is, the easier the coordination of the group can be. In other words the information technology increases the organization of an enterprise via science and technology, which causes its components to become more coordinated and as a result increases their swiftness. And in the end increases the organizational agility. Here the word “changes” refers to the environment and the more organized they are, the more the increase in swiftness will be, and in fact information technology with the use of science and technology makes these changes more known and organized, and the organization rapidly responds to them. According to the mentioned articles in this essay we can refer to these instances of the effects of information technology on organizational agility:

1. Help to recognize the environment and accelerating it
2. Help to recognize environmental fluctuations
3. Help to accelerate the responsiveness to the environment
4. Improve the value of services and manufactured goods
5. Reduce the vulnerability of agile organizations

6. Increase the communication with the customers and accelerate it and therefore increase the number of customers
7. Facilitate and accelerate the internal communications of the organization
8. Support agility by the use of flexible soft wares
9. Increase the level of quality besides the increase of agility
10. Help to process the data quickly
11. Help to increase the speed of decision-making
12. Facilitate the flow of the data
13. Increase the swiftness of members by making available sufficient and necessary data
14. Support the agile production
15. Help to create organizational knowledge
16. Help to recognize the science and technology of the time
17. Help to increase flexibility
18. Increase the harmony between the components of an agile organization
19. Help to develop agility
20. Help to make better use of human resources in an agile environment
21. Effective monitor of production to maintain agility

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