Digitalization in Software Engineering and IT Business

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ABSTRACT

Competition in industry of software production as well as in IT sector has special features. Understanding current trends and complex connections between software industry and world economic development gives new ideas about competition in the IT domain. One of the key trends is digital transformation. It is supported by software, but it also has a strong impact on the software development industry and provides the new opportunities in software production and IT business change management. The main idea of the paper is total automation and a focus on measurable processes that give a continual flow of digital data that should be used on different levels of a company's management, business development, production processes, and even client's perception of the software product. Management of those core activities, based on such digital data flows, is becoming sophisticated and more flexible, based on relevant and estimated indicators. In this article, there is a multifactor analysis of digitalization in software engineering and IT business management with a focus on change management. The main results of research are demonstrating how the influence of digitalization could be used in competition.

KEYWORDS

Agile, Digitalization, Production, Software

INTRODUCTION AND GOALS OF STUDY

Software production is a huge sector of world economy with its own evolution process and big impact on digital economy on the whole. According last analytical reports IT sector is a real driver for world economy growth (Ebert, 2019) that means the critical importance of his prosperity. Understanding of trends inside this sector is giving a clear competency picture and could help in prediction of its development on different levels: company, region, country, world-wide. Despite of very rapid speed of software industry changing and among of a lot of trends like agile transformation, GUI simplification or fast-development paradigms there is an interesting and unobvious trend – digitalization of IT.

It has a lot of practical impacts, but in this article would be described:

- Mutual influence of the common Digitalization trend and software.
- Digitalization in software design and production.
- Influence of digitalization in IT companies on usage of the symmetrical models in organization of the processes and projects.

Beside of those impacts it's important to note that competition model of software industry has very specific features and the main of them is inevitable need of continues changing of production and

business processes in endless and very speedy changing competitive fight. Digitalization in software industry gives a straight flow of various data that should be used in mentioned change management.

Another unobvious feature in software development industry is modification of symmetrical approach in corporate process organization. The impact of digitalization also presents additional opportunities to make this approach more flexible and process organization – more competitive.

The goal of this study is demonstrating some specific competitive features and current unobvious trends of software production industry like digital transformation and modification of symmetrical models of organization. Moreover, paper defines some basic ideas how to use those features and trends in strengthening competitive position of IT-company.

In next sections of this article would be presented how unobvious trends and industry features might change common economic description of the industry. Paper focused on simple examples that can be repeated by industry players with effort and time saving.

INEVITABLE NEED OF BUSINESS CHANGES AS M. PORTER'S COMPETITIVE FORCE IN IT INDUSTRY

The information technology industry is a vivid example of the "new economy" branches, where the success of the company is associated with a flexible adaptation to constant changes on the one hand, and the ability to shape the needs of customers on the other.

Of course, the features of competition also have a significant impact on the development of the business of IT companies (Pashchenko, 2015), giving to some typical scenarios the definition of "best industry practices". The software development industry is highly profitable, and before delving into its unique competitive features, we will carry out a simplified and modified analysis of Michael Porter's five competitive forces (Porter, 2008) by considering:

- The market power of suppliers and consumers.
- The arrival of new players and industry competition.

The modification of the industry competition model of M. Porter consists in eliminating the influence of substitute products and replacing this type of competitive forces with the risks associated with managing the constant changes in the software development business. Such a modification of classical analysis is connected with the following circumstances:

1) On the one hand, the industry is protected from the appearance of substitute products, and the threat of their appearance in the coming years is not significant. Informatization, automation and digitalization are global economic trends implemented by the IT industry, for such trends there are no substitute goods or services. Any manual labor, paperwork or qualitative estimates of business parameters instead of numbers are hopelessly outdated and economically inefficient.
2) On the other hand, the products and services of the IT industry themselves are developing rapidly, due primarily to the intense and global competition between IT companies. Of course, in the 80s, personal computers replaced mini-computers, and modern laptops and tablets replaced the traditional PC. However, such modernization associated with the introduction of new hardware models and software versions from the point of view of the competitive forces of M. Porter can be attributed to competition within the industry.
3) Managing timely changes in the IT business - these are the conditions for survival in the market; it requires significant resources and carries significant risks (Pashchenko, 2019).

Thus, a simplified and modified model of the competitive forces of M. Porter for the IT industry can be represented in Figure 1:

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