

Chapter 17

The Project Management of Industry 4.0 Strategy for Software Houses

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ABSTRACT

Nowadays, Industry 4.0 is becoming a strategic issue for software companies. Because of fast digital conversion, they should review their visions and strategies. In this study, a project management framework is proposed for software companies considering Industry 4.0 as a future strategy. Global ERP firms try to find a good integration of ERP and Industry 4.0 applications. A global ERP firm's solution partner is used as a case study in this chapter. The study includes: the development of an internet-based portal application that integrates all their business partners (customers, suppliers); a collaborative project management software; and an industry 4.0 portal. The benefits of this study after applying in the software house are explained.

INTRODUCTION

Software companies, including global ERP firms' solution partners, must be involved in industry 4.0 applications, because in the near future their customers will ask industry 4.0 applications. If they do not satisfy their customers about industry 4.0, they will lose some of their customers. Therefore industry 4.0 strategy is vital for them. On the other hand, industry 4.0 software companies need information gathered from ERP systems. It is very important to manage industry 4.0 projects collaboratively for successful customer industry 4.0 applications of software houses.

Industry 4.0 is an important strategy not only manufacturing companies but also software houses. According to a study, German companies from different sectors are expected to invest 650 million Euros into Industry 4.0- related technologies and applications in 2015. (Bitkom, 2015). But Erol et al. (2016) state that companies have substantial problems to grasp the idea of Industry 4.0 and relate it to their specific domain.

DOI: 10.4018/978-1-7998-8548-1.ch017

Lot sizes are getting smaller. Therefore, a greater level of customization for manufacturing companies is necessary. The customers push the ERP software vendors beyond classical ERP. Industry 4.0 solutions can integrate agile supply chains both vertically and horizontally. The manufacturing companies need to be smarter and agile.

The rest of the paper is organized as follows: Literature review is explained in the next section.

How to manage industry 4.0 strategy for software houses section explains the proposed framework. In the case study section, the proposed methodology is detailed. Further research directions are discussed into Future Research Directions section and results are evaluated in Conclusion Section.

BACKGROUND

There is no scientific research regarding a software house's industry 4.0 strategy.

IT solution providers are developing internet-based applications to enable integration with their external counterparts. With the development of cloud technology, the solutions offered in the internet environment become unlimited. When examining existing solutions, there are some specialized applications such as CRM, B2B.

Oztemel and Gursev (2018) reviewed the industry 4.0 related technologies in literature. They explain some leading countries' investments and activities. For example, China spent approximately \$200 billion on research and development, the second-largest investment by any country. (McKinsey, 2017). France, the second biggest economy of European Union, started "New Industrial France" initiative in 2013 to be an innovation leader country and to push the technological frontier to create the products and the uses of tomorrow (DEF., 2016). United States, Japan, Germany, (the origin of Industry 4.0 concept, Kagermann 2013), South Korea are aware of Industry 4.0 and start similar projects. In Turkey, TUBITAK (Turkish Science and Technology Research Council) funds the original and value-added industry 4.0 projects.

Moghaddam and Nof (2017) stated a collaborative control theory to provide a framework of the collaborative factory of the future. Wollschlaeger et al. (2017) studied the impact of IoT (Internet of Things) and CPSs (Cyber-Physical System) on industrial automation from an industry 4.0 perspective, used a survey of the current state of work on Ethernet time-sensitive networking (TSN), and shed light on the role of fifth-generation (5G) telecom networks in automation. Preuveneers and Ilie-Zudor prepared a survey and had an analysis of emerging trends, research challenges and opportunities in Industry 4.0.

Ellialtioglu and Bolat (2009) proposed a conceptual framework for building supply chain strategies to meet marketplace requirements and to give an insight into the managers of supply chains.

The Agile methodology was explained with Agile Manifesto in 2001. (Larson & Chang, 2016)

Kaur and Singh (2016) reviewed critical success factors in agile software development projects in India. Whitney & Daniels (2013) study the primary causes of IT project management failure and complexity. Khalid analyzed the application issues of SME' cloud computing.

Schumacher et al. (2016) define a maturity model for assessing industry 4.0 readiness and maturity of manufacturing enterprises. The first group of dimensions "Products", "Customers", "Operations" and "Technology" are formed to assess the basic enablers. In addition, the other groups of dimensions "Strategy", "Leadership", Governance, "Culture" and "People" allow for including organizational aspects into the assessment.

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