

Chapter 3

The Role of Universities in Industry 4.0 Era: Entrepreneurship and Innovation Perspectives

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ABSTRACT

In every industrial era, one of the most important issues is the adaptation of business conditions to operational and administrative processes. Nowadays, as in every field of business-life, globalization and high competition highlighted the importance of entrepreneurship and innovation. The focal point of competition has changed to the position to innovate products at desired and required amounts, times, and quality with affordable price so taking advantage requires integrated management skills. Universities play a key role at this point thus entrepreneurs and researcher universities has emerged. In this study, after a general overview on evaluation of innovation and entrepreneurship concepts, the importance of them are explained in the view of industry 4.0. Then, a model of entrepreneurial and researcher universities is explained in detail with the analysis of several countries' models. The study reveals the role of universities in the innovation and entrepreneurship framework and to generate awareness about industry-university collaborations in the new industrial era.

INTRODUCTION

In today's business environment, creating and sustaining competitive advantages require an effort beyond cost reduction and operational efficiency. While globalization offers wider markets for industrial companies, improved purchasing conditions and opportunities for more comfortable production, it also presents some challenges for the industrial sector. Global competition is more intense, and actors must be constantly more flexible and efficient in order to stand out in this competitive position. According to the sector, several methodologies can be used however the key point is customer. It is a well-known fact that, today customer is the focal point of the business world and the power of the customer changes traditional management approaches. In this process, it is a necessity to offer target products in a shorter time as well as having the ability to produce new, high quality, efficient and personalized products.

Nowadays in the beginning of the industry 4.0 era, as in every field of business-life practices, globalization and high competition highlighted the importance of entrepreneurship and innovation. In the first industry era, water and steam power is used by the industry. Thus, steam powered machines were developed and used in factories to mechanize some of the work. The second industrial revolution came about by the use of electricity in production systems and the control of electrical power on assembly lines. The main application of the system was serial production lines which installed at Ford Motor Plants. This system applied by Ford Motor Plants in automobile production led to the enlargement of the production scale and thus the lowering of costs and prices. Techniques applied in these factories led to the rewriting of business management models. By the 1970s, a microprocessor-based programmable logic circuit was developed that transfers the information from the sensors to business units within a program framework. By applying this system to production systems, automation of the production system becomes possible. This development has greatly reduced human contribution and minimized the error. Thus, a new industrial revolution, the third era, started from the beginning of the 1970s to the present day. In this period, the use of computers, smartphones and the widespread use of the internet has affected and shaped the production in every way. The developments in communication and transportation, trade and industry are globalized. Overall, industry 3.0 can be defined as the reduction of human labor in production and the automation of production. At finally, the industry 4.0 era introduced as smart factories where data and knowledge integrated and cyber physical systems monitor the physical processes. It is not wrong to say that the 4th industrial revolution is building on the third and digital revolution is started. Schwab (2016) stated that the way of life and work will alter with these technological revolutions in the industry 4.0 era.

Industry 4.0 was first introduced into Germany as a concept which was a project of the German government to encourage traditional industries like manufacturing and to equip them with high technology. According to the Boston Consulting Group (BCG) analysis, Germany has begun to implement Industry 4.0, achieving productivity gains in industrial production, while reducing total production costs by 5 to 8 percent (Moment Expo, 2017). The concept of industry 4.0 integrates data and knowledge to contain several new technologies and related paradigms. Since the industry 4.0 also creates a competitive advantage with its cost advantages, countries that adapt quickly to this evolution and adapt it to production processes seem to be looking for a new economic system. New product development and optimizing existing products and services are the greatest areas of growth potential for analytics and big data using Industry 4.0 technologies. The primary goal is reorganizing the production systems with information technologies to have advantage in global competition. In this new industry era, cost and time efficiency gains much more importance and quality of the product /service becomes crucial. From this point of view, industry focuses on entrepreneurial an innovative studies in terms of gaining advantage among rivals.

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