

Chapter 8

Industrial Guidelines for Stimulating Entrepreneurship with the Internet of Things

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ABSTRACT

Entrepreneurs are known as the engine of economic growth and prosperity. Entrepreneurs have relocated resources for the aim of introducing new economic, social, or socio-economic values. Revolutionary technologies such as the Internet of Things (IoT) have provided opportunities for entrepreneurs. The IoT is globally known as a new paradigm that rose from the world of ICT and changed dynamics of businesses and communities. However, there has been a lack of guidelines for promoting entrepreneurial initiatives by using of the IoT in industries. By conducting a comprehensive investigation of more than 120 commercialised IoT-based cases, this chapter identified 80 opportunity areas, and categorised them into the 13 main industries/sectors. Analysing 29 Iranian corporate, social, and SME entrepreneurs with the use of Analytic Hierarchy Process (AHP) technique, this chapter measured the importance of each industry. Based on the results, this chapter presents recommendations to promote entrepreneurial activities.

INTRODUCTION

The IoT is a paradigm that aims at enhancing our awareness of the environment. The IoT is not in infancy anymore and it has been adopted rapidly by many industries. For example, the IoT has played a significant role in the transportation sector with several capabilities such as navigation, vehicle to vehicle connections, fleet management, vehicle controls, and infrastructure monitoring. The IoT has

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also been a great source of improvement for the supply chain partners. Real-time monitoring and tracking has improved visibility of material flows and facilitated collaborative activities of the supply chain partners. In addition to the positive impact on the established businesses, the IoT can be a great source of innovation for entrepreneurs.

Entrepreneurs aim to create new values by identifying unexploited opportunities and relocating the resources to achieve a higher level of productivity. One of the bottlenecks for having a successful entrepreneurial process is opportunity recognition (Jones & Butler, 1992; Kirzner, 1985). Recognising the valuable opportunities with a high ability or potential of commercialisation is crucial for all kinds of entrepreneurship. In spite of the significant implications of the IoT on the entrepreneurship, there have been few guidelines for entrepreneurs to exploit the IoT. The purpose of our study is to provide evidence-based guidelines to stimulate entrepreneurship with the IoT. To achieve our purpose, entrepreneurial opportunities of the IoT were identified by conducting a survey and analysing a number of industrial IoT adoption cases.

The remaining parts of this chapter are as follows: first the literature review of the definition, challenges and economics of the IoT is presented. Next, corporate entrepreneurship, social entrepreneurship, and small and medium-sized (SME) entrepreneurship are discussed. Then, the research methodology and the Analytic Hierarchy Process (AHP) model are elaborated. Finally, the research findings and various challenges are discussed.

LITERATURE REVIEW

Definition of the IoT

Atzori et al. (2010) discuss the very first definition of the IoT as a things oriented concept which includes Radio-Frequency IDentifications (RFIDs) tags and smart devices. Jara et al. (2011) suggest the IoT has an ability to provide a global connectivity and a management architecture of several devices. Vermesan et al. (2011) describe the IoT as an integrated part of the Future Internet with the capability of self-configuration. Xu et al. (2014) refer to the IoT as a dynamic global network infrastructure based on the protocols where virtual and physical things such as sensors and RFIDs have identities, and can be integrated in the information network. Gubbi et al. (2013) depict the IoT as an infrastructure for enabling the innovative applications by connecting devices from different platforms through a unified framework. Some components are large scale ubiquitous sensing, data analytics, and cloud computing. Wu et al. (2014) refer to the IoT as a new network paradigm and interconnected physical/virtual things with the minimum intervention of humans that pursue two main goals: 1) bridging the physical and the social world together to form an intelligent physical-cyber-social system, and 2) enabling smartness – from resource allocation to automatic network operations. Vermesan (2013) believes that, the full use of things will be attained by offering several distinguished services.

The IoT in Industries and Its Applications

Several industries/sectors which adopted the IoT have been mentioned by various IoT studies: Healthcare and life science (Al-Turjman et al., 2013; Atzori et al., 2014; Gubbi et al., 2013; Perera et al., 2014; Zheng et al., 2011); Transportation (Xu et al., 2014; He et al., 2014; Kortuem et al., 2010; Vermesan et

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