Chapter 42

Balancing Exploration and Exploitation Through Customer Development Model:
Leveraging Industry 4.0 for Sustainable Performance

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ABSTRACT

Balancing exploration and exploitation in entrepreneurial ventures enabled by Industry 4.0 has not been the focus of the existing literature. It is because the phenomenon is emerging and the focus has been to use practitioners' best practices in studying such phenomenon. In this chapter, the author combines the literature in balancing exploration and exploitation with the practitioners' best practices such as customer development model and lean startup. The author proposes that the existing models are good in principle but in order to really solve the problem in such an uncertain environment driven by big data, cloud computing, internet of things (IoT), and artificial intelligence, managers need to embed optimization algorithms in their decision making.

INTRODUCTION

The recent developments triggered by the accelerated pace of technological change famously labeled as Industry 4.0 (i4.0) is becoming a new economic and social force. Not only that a new paradigm is emerging where old business models are being transformed, strategies are becoming more and more real-time and fact-based, and all new processes based on optimization algorithm are taking place. Bughin, Chui & Manyika (2015) argued that the major differentiating factor in competition would come from the Internet of Things (IoT). This changing landscape in competitive strategies triggered by IoT and in general from Industry 4.0 (i4.0) demands that senior leaders and board members must think at

the system level to solve the challenges created by the technological disruption. The opportunities are many but gathering data together from different IoT systems may not be enough. This triggers analytical challenge for which developing or purchasing, customizing, and then deploying analytical software to get insights for decision-making is highly important. IoT enabled new business models would be the norms rather than exceptions.

The implications of i4.0 are tremendous for companies like Alibaba.com from China and 'sharing economies' such as Uber and Airbnb. All of these new enterprises are transforming traditional business models and enabling entrepreneurship at the mass level. Balancing exploration and exploitation (March, 1991) in this emerging landscape becomes even more important. Exploration means searching for new business models and experimenting the future. But the only exploration will not make one successful, one needs to exploit or capture the value in the emerging phenomenon. One of the processes used in navigating such a changing landscape is called customer development model (Blank, 2013). The customer development model has four steps: customer discovery, customer validation, customer creation, and company building (or scaling up the company). The balance of exploration and exploitation, however, depends on how fast a build-measure-optimize-learn (BMOL) loop is executed in the pursuit of customer development.

Key terms used in this chapter are exploration, exploitation, i4.0, customer development model and build-measure-optimize-learn (BMOL) loop. Exploration is defined as activities related to search, experiment, explore, innovate and aspire. This is good for long-term but detrimental in short-term as perpetual search trap leads to firm failure. Exploitation is defined as activities related to efficiency, productivity, and optimization. This is good for short term but bad for a long term as success trap leads to firm failure (March, 1991). Loosely defined i4.0 is an umbrella concept where internet of things, automation, cloud computing, 3D printing, digitalization, and mobile technologies that enable new business models and drive innovation and efficiency at the same. Taken from Blank (2013), customer development model has four phases: customer discovery, customer validation, customer creation and company development. Based on Ries (2011) BML loop is the development cycle to experiment and learn. But in this chapter BMOL loop with extra O as optimization is used. The unit of progress is validated learning. Managing under uncertainty needs dynamic capabilities (Teece, D. J., Pisano, G., & Shuen, A. 1997; Teece, 2007) where sensing, seizing and reconfiguring activities are important for sustainable performance. Marr (2016) illustrated that how the technological waves shaped our life in the human history. From steam engine and the first machines that improved productivity to electricity which enabled assembly line and mass production. The third wave came from the computers that enabled automation. Now is the i4.0 wave with robotics connected remotely to computer systems and machine learning algorithms which can learn and control the robotics as the realization of "smart factory".

Based on the *McKinsey Quarterly Industry 4.0* has become more than just a popular discourse at least in the manufacturing sector (Baur & Wee, 2015). There is a growing convergence of trends and technologies with a potential to change the manufacturing landscape. Executives have started to understand that it is no more a hype as it reveals the power of disruption in the way factories work. Some authors have called it the next industrial revolution. Thus, executives must embrace this change and plan for actions to sail the ship in the right direction. This could be achieved by learning the new possibilities but at the same time exploiting the certainties in the current realities. March (1991) coined the term balancing exploration and exploitation for a winning mindset.

The latest systematic literature review by Liao, Deschamps, Loures and Ramos (2017) on the fourth industrial revolution suggested that there are top 5 keyword clusters emerging in the existing literature

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