International Journal of Innovation Studies xxx (2018) 1–13

Contents lists available at ScienceDirect

International Journal of Innovation Studies

journal homepage: http://www.keaipublishing.com/en/journals/international-journal-of-innovation-studies

Holistic Innovation: An Emerging Innovation Paradigm

Jin Chen [a, b], Ximing Yin [a, b, c, *], Liang Mei [a, b]

[a] School of Economics and Management, Tsinghua University, Beijing 100084, China
[b] Research Center for Technological Innovation, Tsinghua University, Beijing 100084, China
[c] SC Johnson College of Business, Cornell University, Ithaca, NY 14853, USA

ARTICLE INFO

Article history:
Received 7 January 2018
Accepted 13 February 2018
Available online xxx

Keywords:
Holistic innovation
Innovation paradigm
Chinese context

ABSTRACT

This paper systematically reviews the current typical innovation paradigms worldwide and their shortcomings. Based on eastern wisdom and best innovation practices, this paper introduces a new paradigm of innovation, holistic innovation (HI). It provides a definition and theoretical framework for HI, discusses its connotations, and summarizes the theoretical contribution and policy implications. HI is total and collaborative innovation driven by strategic vision. This new innovation paradigm is a complex of strategic innovation, collaborative innovation, total innovation, and open innovation, which reflects wisdom from the Chinese context and Eastern culture. The four core elements of holistic innovation, "strategic," "total," "open," and "collaborative," are inter-related with an organic integration with the helix of HI. HI is an original innovation paradigm that conforms to the needs of firms' technological innovation management in the strategic innovation era and supports the implementation of the Innovation-Driven Development Strategy. It also helps China's enterprises build global innovation leadership and improves national innovation ability. Finally, it optimizes the innovation policy design and action mindset to achieve global peace and sustainable development.

1. Research background

Innovation has been widely regarded as the central process driving economic growth and the sustainable competitive advantages of both companies and nations, in addition to driving global sustainable growth (Chen, 2017a; Hu & Mathews, 2005). With the recent advancement of the global and regional economies, the orientation towards Grand Challenges[1] creates a big challenge for science, technology, and innovation (Kuhlmann & Rip, 2014). Though researchers in the field of innovation made many advances (Martin, 2016), issues such as the Sustainable Development Goals (SDGs)[2] induced more reflection on the paradigm of innovation and development (Kuhlmann & Rip, 2014). The traditional paradigms of innovation

* Corresponding author. School of Economics and Management, Tsinghua University, Beijing 100084, China.
E-mail addresses: chenjin@sem.tsinghua.edu.cn (J. Chen), yinxm.11@sem.tsinghua.edu.cn (X. Yin), meil@sem.tsinghua.edu.cn (L. Mei).

[1] The Grand Challenges defined by the European Union are: health, demographic change, and wellbeing; food security, sustainable agriculture, marine and maritime research, and the bio-economy; secure, clean, and efficient energy; smart, green, and integrated transport; climate action, resource efficiency, and raw materials; and inclusive, innovative, and secure societies.

[2] As of January 1st, 2016, the 17 SDGs of the 2030 Agenda for Sustainable Development adopted by world leaders in September 2015 at an historic UN Summit officially came into force. As presented by the Unite Nations, in the next fifteen years these new goals will apply universally, and countries will mobilize efforts to end all forms of poverty, fight inequities, and tackle climate change while ensuring that no one is left behind.

https://doi.org/10.1016/j.ijis.2018.02.001

Please cite this article in press as: Chen, J., et al., Holistic Innovation: An Emerging Innovation Paradigm, International Journal of Innovation Studies (2018), https://doi.org/10.1016/j.ijis.2018.02.001

typically introduced by Western scholars are rooted in the industrial revolution and information technology. These traditional paradigms focus mostly on science, technology, and the economy, and has limited responses the process of global economic and institutional change (Jay, 2013). The recent paradigm of technological innovation shifted towards a broader dialogue between scientific research, technological innovation, and social development (Stilgoe et al., 2013). Additionally, beyond achieving scientific and technological progress and economic growth, the goals aim for ethical and social fulfillment (Pandza & Ellwood, 2013), therefore achieving a sustainable transformation.

Even it takes a long time for a country to reach the technological frontier, where innovation becomes a principle driver (Hu & Mathews, 2005), innovation has undoubtedly become an important theme in economic and social development. All developed economies are aware that only innovation can continuously stimulate new economic growth, while developing countries are also pushing toward continuously upgrading its industrial structure through innovation to improve their national competitiveness (Acs, Audretsch, Lehmann, & Licht, 2017).

As a representative emerging economy, China replies on its continuous investment in its national capabilities and public governance based on wisdom rooted in Eastern philosophy (Chen, 2017a). In 2017, General Secretary Xi Jinping declared that China will enter a new era at the 19th National Congress of the Communist Party of China, in which the principal contradiction facing Chinese society evolved into one “between unbalanced and inadequate development and the people's ever-growing need for a better life.” The original development mindset of “the rich first pushing those being rich later” turned into a balanced development mindset. Even worldwide, following the financial crisis of 2008, the main measurement of development, GDP, ignores social costs, environmental impacts, and income inequality (Costanza et al., 2014). We see that economists and national leaders are increasingly talking about measuring a country's status with other metrics, and even with a soft concept like “happiness” (McGregor & Pouw, 2017). National development currently shifts its focus from economic needs to the people's needs for a better life, which calls for more attention to an overarching, balanced, and systematic innovation paradigm and innovative thinking. To effectively implement an innovation-driven development strategy in the new era of development requires a more comprehensive way of innovation with a larger scope and a strategic vision to support and improve the regional innovation system (Su & Chen, 2015) and technology transfer system (Cowan & Zinovyeva, 2013). Thus, we can combine the vison of “truth-seeking” through science and technology development and the vision of “beauty-seeking” through art and social science development to meet the longing for well-being or “happiness” by applying the new vision of “innovation for well-being” (Costanza et al., 2014).

However, there is growing concern that currently dominant frameworks in economics and innovation no longer provide a way to adequately address and analyze the problems of today's globalizing and rapidly changing world (Martin, 2016; McGregor & Pouw, 2017). On the one hand, most countries rely on the traditional Western paradigm of innovation to discuss and govern major global challenges. Although developed economies refined their major innovation paradigms — such as the role of organized innovation for renewing America's prosperity (Currall, Frauenheim, Perry, & Hunter, 2014), and the strong national innovation systems in Finland and Sweden (Acs et al., 2017) — they ignored the innovation governance experience from emerging economies, such as China and India.

On the other hand, the contribution of Asian civilizations represented by China to global development has been gradually increasing. For example, after the global economic crisis of 2008, China contributed to the growth and stability of the international economy. The value of China's innovation and governance, represented by the new “One Belt One Road” strategy and well-developed internet-based shared economies such as Alibaba and Tencent. Regarding China's innovation practice and its promising theoretical contribution to international development, scholars need to refine and summarize the innovation paradigms emerging from China relevant to promoting the scientific and technological innovation capacity of emerging economies. In doing so, scholars can provide a more comprehensive theoretical framework and strategic tool for both China and other emerging economies to create world-class innovation enterprises, and to enhance and consolidate China's global innovation leadership, which in turn provides knowledge and wisdom for firms and new ventures worldwide to build sustainable competitive advantages.

2. Literature review: innovation paradigm shift

While the word “innovation” is derived from the Latin noun *innovates*, the modern interpretation and traditional paradigms of innovation originates from Schumpeter's work (1934). Schumpeter defined “innovation” as “new combinations” of new or existing knowledge, resources, equipment, and other factors. It is about the new changes that occur in the development of products, production processes, markets, resources, materials, and organizational forms. Beginning with Schumpeter's (1934) definition of innovation, innovation as a scientific discipline emerged in the late 1950s, and has been developing rapidly, with thousands of researchers now forming part of this community (Chen, 2017a).

2.1. Innovation paradigm shift by country/region scholars

Thomas Kuhn's (1962) book, *The Structure of Scientific Revolutions*, brought about a paradigm shift in how philosophers thought about science. Drawing from Kuhn's classical perspective of a paradigm shift, we can here observe paradigm shifts related to innovation by country or region (see Table 1).

Since Schumpeter introduced his theory of the innovation economy (1934), American scholars conducted the first research and exploration from the perspectives of the economics of technological change (Mansfield, 1968a); that is, the relationship

Please cite this article in press as: Chen, J., et al., Holistic Innovation: An Emerging Innovation Paradigm, International Journal of Innovation Studies (2018), https://doi.org/10.1016/j.ijis.2018.02.001