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## Editorial: Exploring digital innovation: emergence of the new, transformation of the old, and the impact of institutions

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## 1 Introduction

Advances in information and communications technologies (ICTs) in recent years have given rise to myriad new applications (in, e.g., artificial intelligence, the internet of things and intelligent manufacturing) and new business models (e.g., electronic commerce, the sharing economy, platforms). Together, they could become the basis for a fourth industrial revolution, making significant contributions to economic growth in the new millennium (Bilozubenko et al., 2020; Li et al., 2019). In the past, most technological innovations were born in developed economies (Vernon, 1966), but the active role of emerging market enterprises in this round of industrial revolution is rather striking. Taking it as an opportunity to leapfrog, some emerging market enterprises are actively engaging themselves not only in importing advanced digital technologies from developed countries, but also in indigenous digital innovation and mass domestic application. World-leading digital innovators such as Tencent and Huawei not only originated from emerging economies, but also built their early market power there before they expanded to more advanced economies.

How do emerging market enterprises make digital innovations and build competitive advantage? That is the question to be addressed in this special issue. In a digital economy, enterprises must cope not only with frequent technological disruption, but also with the need for constant changes in organisational structure, inter-organisational relationships and relevant management skills (Yoo et al., 2010). Not all emerging market

enterprises can do so. Despite a large number of successful digital innovators from emerging economies, many others have been left even further behind (Nipo et al., 2018). This issue's reports will therefore pay especial attention to firm-level processes, both conceptually and empirically, and both qualitatively and quantitatively. They will try to identify the factors that explain the heterogeneity in emerging market enterprises' digital innovation.

The call for papers for this special issue was published in the summer of 2019, and we collected more than 20 papers by the end of the year. Due to the COVID-19 pandemic, the Paper Development Workshop was delayed until November of 2020. After the first round of anonymous peer review, 13 papers were treated at the hybrid Paper Development Workshop hosted by School of Economics and Management at Tsinghua University. The offline sessions were held in Beijing, and online sessions were held via Zoom. At least one of each paper's authors attended the offline sessions. At the workshops, the guest editors and others suggested possible revisions. All of the papers were then sent back to the reviewers for at least one more round of double-blind review. By October of 2021, 11 papers had been selected for publication in this special issue.

Digital innovation is a broad concept that takes in the digital aspects of product innovation, process innovation and organisational innovation (Yoo et al., 2010). The specific institutional environments in emerging economies hinder, accommodate or facilitate it to varying extents. The papers were classified into three groups based on the objective of the innovation discussed. The first group of four discusses new business models and applications enabled by technical innovations in ICT in the digital era. The first paper reviews the previous research on multi-sided platforms, with special attention to those developed in emerging economies. The other three papers discuss an online labour platform, cross-border e-commerce and applications for mobile phones.

There are three papers in the second group, all of which investigate how traditional industries have embraced digital innovation or experienced digital transformation. With either qualitative or quantitative evidence, the three papers all show the antecedents, mechanisms, and performance implications of such developments. The final four papers constitute the third group, discussing the impact of institutions on digital innovation in emerging market firms. They bring in insights from disciplines such as economic geography, international business and cooperative strategies. Together they confirm that partner networks, peer pressure, local protectionism, and the institutional diversity of a firm's customers all play important roles in influencing firms' digital innovation efforts in an emerging economy.

## **2 The emergence of the new**

One of the most important contributions of ICT innovation has been to reduce communication costs. Physically distant participants in a transaction can connect online and work together frequently and inexpensively. Online platforms have emerged as intermediaries where such exchanges can take place (Cusumano et al., 2019). Starting from match-making, online platforms have developed more functions including making information more widely available, online payments, social interactions and more. But such platforms have now raised concerns about the potential for monopoly power as a result of network effects and also governance problems (Gonzalez et al., 2017; Koskinen

et al., 2019). These problems could be more salient in emerging markets where institutions are weak or even yet to developed (Mansell, 2001; Xie and Li, 2013, 2015).

Numerous empirical studies have been devoted to studying such platforms. Jia et al. have prepared a bibliometric analysis which opens this special issue. They reviewed 578 peer-reviewed articles published over the past 30 years dealing with multi-sided platforms. They found that scholars have addressed seven different topics relevant to online platforms from three different levels of analysis: the business level, the corporate level and as an ecosystem. There have been few platform studies focusing on emerging economies, though more are now beginning to appear. Those which have appeared tend to suggest that this new business model creates opportunities as well as threats for emerging economies. Better-developed capabilities, infrastructure and institutions would make such platforms more beneficial for emerging economies.

The mechanisms through which online platforms facilitate transactions have long been an important topic in platform research. A traditional belief about online platforms is that they can only support transactions involving relatively simple and standardised products or services (Ding and Keh, 2017; Kittur et al., 2011). Zhou and Mao challenged that stereotype in their analysis of how Z-network, China's largest online labour market platform, facilitates online hiring for knowledge-intensive and creative tasks. Their in-depth case study showed that the right digital tools and appropriate regulation can support complex and customised transactions online.

As more and more transactions have moved online, enterprises operating online have had to adapt to a new market structure and competitive environment. Whether the theories developed to explain offline competition can be generalised to online environments raises interesting academic questions (Deng and Wang, 2016). Ma and Liang examined the life cycle theory's applicability to exporters operating on a cross-border e-commerce platform. They found an inverted U-shaped relationship between an exporter's online tenure and its export performance that was contingent on the intensity of the competition on the platform. Ren and Li applied the concept of life cycles to mobile applications and found that the determinants of app developers' innovation performance varied in different stage of their apps' life cycles.

### **3 The transformation of the old**

Digital innovations can create new businesses, but they can also transform old ones. Traditional industries seek digital engagement to different degrees, usually seeking to improve economic efficiency or as a response to institutional pressure (Grover et al., 2020; Yang et al., 2012). There are certain born-to-be-digital sectors where the application of ICT innovations seems natural, but it is far from taken for granted in traditional industries where resource allocation and organisational routines have been well established long before the fancy new technologies were available. The pioneers of digital transformation tend to encounter legitimacy challenges (Belingheri and Neirrotti, 2019) on top of the organisational inertia, resource obsolescing, and mismatch with both the internal and external environments that make any innovation difficult (Constantinides et al., 2018; Hengstler et al., 2016; Li, 2013; Li and Xie, 2011, 2016; Ukobitz and Faullant, 2021).

Three papers in this special issue discuss the antecedents, processes, and consequences of digital transformation. Wang and Su focus on the antecedents. They studied three Chinese manufacturing enterprises which tried to adopt artificial intelligence. The findings show that government support was a relatively a minor factor in their decision-making compared with efficiency considerations and having the necessary intellectual resources available. Zhou et al. studied the acquisition of digital technology-related firm by one which had not previously been very involved in digital technology. They found that the acquisition significantly improved the acquirer's innovation performance. But they also note that better digital infrastructure would help acquirers benefit more from such acquisitions.

Zhang et al. looked into the digital transformation of a traditional industry rather than any specific traditional enterprises. In their case study, an entrepreneurial start-up brought a new product with digital technology to an established industry. The start-up's major difficulty was not organisational inertia as might be supposed, but rather uncertainty about the legitimacy of the product and also of the venture itself. Only after the new venture employed several legitimacy-building measures was the new product finally accepted by the traditional industry, though it clearly created value for customers as well as other stakeholders in the ecosystem. The economic efficiency was clear, but social acceptance came only slowly.

#### **4 The impact of institutions**

Apart from economic development, a salient difference between emerging and advanced economies is usually in their institutional environments (Mansell, 2001). Institutions provide constraints and structure that shape human interactions and reduce behavioural uncertainties (North, 1990). Firms conform to an institutional environment in order to gain legitimacy and reduce risks, especially when they face technical uncertainties such as new technologies (DiMaggio and Powell, 1983; Pan et al., 2019). Institutions can also be a resource that can be exploited for competitive advantage (Jackson and Deeg, 2008; Lundan and Li, 2019). Four of the papers in this special issue focused on the impact of institutions on different aspects of emerging market enterprises' digital innovation.

Zhang et al. and Zhao et al. discuss the impact of local networks. Zhang et al. found that network breadth tends to influence the effectiveness of knowledge co-creation between enterprises in China. Zhao et al. discusses how local protectionism may set geographical boundaries on knowledge spillovers so that distant firms can hardly benefit from knowledge-intensive business services. With panel data covering 2003–2013 period, they found that 250 kilometres as about the limit for knowledge spillovers in China. Only large firms can overcome the boundary and benefit from knowledge-intensive business services from further away.

The institutional diversity of customers is the focus of the study by Wang et al. They studied why Chinese digital manufacturers exporting a large proportion of their products to less-developed markets and turned very innovative. They argue that customers with diverse institutional backgrounds force enterprises to learn and adapt, which in turn encourages them to combine diverse knowledge and innovate. Two different sources of institutional pressure are discussed in the paper by Chen et al. Technological innovation is inherently risky, and their work found that firms investing in innovation tend to

conform to the practice of peer firms with higher social status to reduce both social and technical uncertainty. Further, they found that such imitation tendencies depend on digital coverage. Both groups found state-ownership to be a significant contingency in China, either as an indicator of agency costs or social status.

## **5 Future research directions**

The COVID-19 pandemic has created great difficulties for offline economies, just as it has created great opportunities for digital business. Sales of electronic devices have been at a record high. Much communication and many transactions have moved online in response to social distancing measures. The pandemic has shown how ICT can accelerate a firm's accommodation of new market demands. As the digital economy comes to constitute an ever-greater contributor to economic growth, the diverging interests of different stakeholders and institutions still unable to regulate the digital economy successfully intensify controversies. Fears of monopoly, intellectual property, data security, privacy, taxation and even national security can all be contentious domestically and internationally. The 11 papers collected in this special issue mainly focused on digital innovation before the pandemic when many new phenomena were not as salient as they have since become. Future research will have a fast-developing field for study.

To be specific, digital enterprises nowadays need capabilities beyond pure technological muscle to be commercially successful. Today, institutions are beginning to significantly limit the potential economic returns to new digital technology and to raise the bar for its successful commercialisation. As more intense international competition tends to limit the scope for economies of scale for most digital innovations, anti-trust and data security legislation tend to reduce the economies of scope for digital giants. Digital enterprises need to deal with complex stakeholder relationships and changing institutional requirements in addition to technology obsolescence. In addition, institutions in both emerging and developed economies are taking steps to help their indigenous firms to grasp digital opportunities and to protect their markets. Public investment in IT education, internet infrastructure and policies favouring digitalisation capture some of such institutional efforts. Institutions' manoeuvres in the digital sphere and their impact on enterprises deserve more academic attention in the future.

Despite its focus on emerging economies, this special issue aims to contribute to theory about digital innovation more generally. Compared with enterprises from advanced economies, emerging market firms typically suffer from limited capital, limited knowledge beyond the scope of their traditional activities, and weak market-supporting institutions. At the same time, some emerging markets have a deep pool of information and communications talent that relatively inexpensive. And their markets are often large without incumbent competitors. New technologies and new business models can mature in emerging economies almost as fast as in better-developed markets. The findings reported in this special issue may perhaps help managers in both emerging and developed economies to better cope with the challenge of digitalisation and to better grasp the opportunities it brings.

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# DIGITAL INNOVATION IN EMERGING ECONOMIES

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## **Contents**

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### **SPECIAL ISSUE: DIGITAL INNOVATION IN EMERGING ECONOMIES**

**Guest Editors: Professor Jiatao Li, Professor Jizhen Li, Dr. Zhenzhen Xie and Professor Jie Jiao**

- 105     **Editorial: Exploring digital innovation: emergence of the new, transformation of the old, and the impact of institutions**  
*Jiatao Li, Jizhen Li, Zhenzhen Xie and Jie Jiao*
- 113     **Multisided platform research over the past three decades: a bibliometric analysis**  
*Xiao Jia, Michael A. Cusumano and Jin Chen*
- 145     **How do online labour markets facilitate transactions of knowledge-intensive tasks? A service productisation perspective**  
*Xiaohao Zhou and Ji-Ye Mao*
- 171     **Industry competition, life cycle and export performance of China's cross-border e-commerce enterprises**  
*Shuzhong Ma and Qihui Liang*
- 205     **The performance and innovation speed of utility applications in China**  
*Jie Ren and Xibao Li*
- 229     **Driving factors of digital transformation for manufacturing enterprises: a multi-case study from China**  
*Yanyu Wang and Xin Su*
- 254     **How can digital technology-related acquisitions affect a firm's innovation performance?**  
*Jianghua Zhou, Chenrui Liu, Xiaoqiang Xing and Jizhen Li*
- 284     **How does a new venture build a new product's legitimacy? Evidence from digital innovations in an established industry**  
*Wei Zhang, Steven White, Liyan Wang, Yongyi Zhao and Qixin Ye*
- 315     **How does value co-creation behaviour affect enterprise innovation performance?**  
*Baojian Zhang, Pengli Li and Xiaohang Yue*
- 339     **Do KIBS facilitate innovation in manufacturing firms in China? Evidence on production-based linkages**  
*Ting Zhao, Guanxu Wan, Meng Yang and Yunlong Duan*
- 384     **Learning from institutional diversity to innovate: a study of Chinese exporters in digital industries**  
*Jiayi Wang, Zhenzhen Xie, Jiatao Li and Delin Yang*

*Contents*

412	<b>Reducing uncertainty through imitation in technological innovation: the different moderating roles of digitised and traditional coverage</b> <i>Xuanjin Chen, Xin Pan and Xibao Li</i>
429	<b>Contents Index</b>
431	<b>Keywords Index</b>
434	<b>Author Index</b>