The Impact of Big Data Capability on Supply Chain Dynamic Capability and Dynamic Innovation Capability

Guangqian Peng  
College of Business Administration, Capital University of Economics and Business, China,  
gqpeng@cueb.edu.cn

Yan Zhang  
College of Business Administration, Capital University of Economics and Business, China; Wealth Department, Beijing Fengtai Branch, Bank of Ningbo, China, zhangyan@nbcn.cn

Ping Gao  
School of Environment, Education and Development, The University of Manchester, United Kingdom

Junfeng Yin  
Patent Examination Cooperation (Beijing), Center of the Patent Office, China

Follow this and additional works at: https://aisel.aisnet.org/whiceb2022

Recommended Citation
Peng, Guangqian; Zhang, Yan; Gao, Ping; and Yin, Junfeng, "The Impact of Big Data Capability on Supply Chain Dynamic Capability and Dynamic Innovation Capability" (2022). WHICEB 2022 Proceedings. 83.  
https://aisel.aisnet.org/whiceb2022/83

This material is brought to you by the Wuhan International Conference on e-Business at AIS Electronic Library (AISeL). It has been accepted for inclusion in WHICEB 2022 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
The Impact of Big Data Capability on Supply Chain Dynamic Capability and Dynamic Innovation Capability

Guangqian Peng1, Yan Zhang1,2*, Ping Gao1, Junfeng Yin4

1College of Business Administration, Capital University of Economics and Business, China
2Wealth Department, Beijing Fengtai Branch, Bank of Ningbo, China
3School of Environment, Education and Development, The University of Manchester, United Kingdom
4Patent Examination Cooperation (Beijing), Center of the Patent Office, China

1. INTRODUCTION AND RESEARCH FRAMEWORK

Big data is being produced from all industries at an unprecedented rate[1]. However, very few companies in practice have obtained benefits from big data, though with surge of investments in it[2]. Meanwhile, empirical research on the value of big data is still at a rudimentary stage. There is limited understanding about how the investments in big data may lead to measurable business value, and what is the impact of big data capability (BDC) of a company on its the other capabilities. This article aims to partly address these issues.

BDC is the big data awareness presented by companies in the process of big data development, management and utilization[3]. The BDC of a company keeps changing over time with the improvement of analysis technology and market changes. Thus, BDC is an important dynamic capability of companies. In order to realize the potential value of big data, companies need to develop BDC to extract relevant information and take use of it to make decisions[4].

In order to address the critical gaps in the literature and the practice, and to explore the potential value of BDC, this article focuses on the potential impact of big data capability on companies. Specifically, what is the impact of big data capability of a firm on its supply chain dynamic capability (SCDC) and dynamic innovation capability (DIC)? Grounded on resource-based view, supply chain theory, innovation theory, and expert interview, the hypotheses and research framework are proposed as below (Figure 1):

*Corresponding author. Email: zhangyan@nbcn.cn (Yan Zhang); gqpeng@cueb.edu.cn (Guangqian Peng). Gratitude goes to the National Natural Science Foundation of China (Grant 71472128).
2. **MAJOR FINDINGS AND CONCLUSIONS**

Grounded on dynamic capabilities view and empirical study, this article found:

- A sub-capability of BDC, resource integration capability, has positive and significant impact on all of the three sub-capabilities of SCDC.
- However, the other two sub-capabilities of BDC, namely, in-depth analysis capability, and real-time forecasting capability, do not show significant impact on any of the three sub-capabilities of SCDC.
- Meanwhile, all of the three sub-capabilities of SCDC have shown positive and significant impact on all of the two sub-capabilities of DIC.
- Further, according to total effect, resource integration capability has positive and significant impact on all of the two sub-capabilities of DIC.
- However, the other two sub-capabilities of BDC have not shown significant impact on any sub-capabilities of DIC.

3. **CONTRIBUTION AND FUTURE STUDY**

This study makes several contributions to the literature. BDC is a new type of competitive capability. This paper is one of the first with attempt to explore the impact of BDC of a firm on its other important competitive capabilities. Further, this paper is the first trying to explore further the impact of sub-capabilities of BDC on the sub-capability of SCDC and of DIC.

First, we believe that BDC is a kind of rare and intangible knowledge capability of a company. Then we proposed three dimensions of BDC based on existing research, including: resource integration capability, in-depth analysis capability, and real-time prediction capability. Further, we designed the measurement items of these three dimensions, and with which to measure and assess the levels of BDC and its sub-capabilities.

In addition, we proposed a big data-supply chain-innovation Model, which include three main parts: BDC, SCDC, and DIC. The model can be used to understand and assess how each sub-capability of BDC helps to improve each sub-capability of SCDC, and further contribute to a higher level of each sub-capability of DIC with the mediating effects of the increased SCDC.

Considering that BDC is at initial stage currently and will continue to develop quickly in the foreseeable future, we believe the influence of (sub-capabilities of) BDC on companies’ other capabilities is dynamic and changing with its own development. Thus, it would be meaningful to check the influence of (sub-capabilities of) BDC further at different development stage of big data technology in future study.

**REFERENCES**