IT Application Maturity, Management Institutional Capability and Process Management Capability

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ABSTRACT

This article studies the influence of enterprise core competence on IT application maturity (ITAM) from the perspectives of management institutional and process management capabilities. The roles of firm ownership and international organization of standard (ISO) certifications are also studied. Based on reliable and valid measurements of IT applications maturity, management institutional capability, and process management capability, the authors collect corresponding data from 123 companies in China. They find a positive relationship between capabilities and ITAM. Management institutional capability has a stronger relationship with ITAM in Chinese state-owned enterprises or public companies; while multinational companies or joint ventures witness a stronger relationship with process management capability. ISO helps companies with low management institutional capability to improve ITAM. However, for companies with higher management institutional capability, ISO mitigates the relationship and poses a shift of the importance to process management capability in improving ITAM.

KEYWORDS

Higher Management, IT Application Maturity, Management Institutional Capability, Process Management Capability

1. INTRODUCTION

The extensive application of information technology (IT) has dramatically changed traditional business modes of production, service, and operations management. With continuous growth of IT investments, lots of organizations have experienced improved performance from efficient utilization of IT applications. However, it is also observed that, some organizations could not fully utilize IT applications, or even had failed IT projects, resulting in a low return of IT investment. For example, in the past 20 years, the companies in China have extensively adopted IT applications to facilitate business operations. A huge amount of investments has been spent in advanced hardware and software technologies by many state-owned enterprises. However, comparing to multinational companies, the utilization of IT applications is less efficient, the response to market is slower, and the cost

of management is higher. In this study, we intend to reveal the mechanisms of how management capabilities influence the utilization of IT application, and consequently, provide guidelines for businesses to achieve higher return on investment and maintain competitive advantages.

The concept of IT application maturity (ITAM) stems from that of software capability maturity model (CMM) (Humphrey, 1988). In fact, IT application can often be viewed as a process of utilization of information technology, and thus ITAM can be defined as the maturity level of such process. According to Xiao and Xie (2007), ITAM can be categorized into five levels, which are, from low to high, basic level, partial integration level, complete integration level, enhanced coordination level, and strategy driving level. An appropriate level of ITAM based on enterprise' resources and management capabilities can enable business to utilize IT applications efficiently, reduce production cost, streamlining operation processes, and eventually yield a high return on investment. Different organizations, even within the same industry, might have different levels of IT application maturity. It is thus critical for business to identify the main management capabilities influencing the level of IT application maturity.

The essence of enterprise competence theory includes the explanation of how to gain, maintain, and enhance enterprise competitive advantages. From enterprise's capability perspective, Yu (2004) concludes from 161 related papers that there are eight types of enterprise core capabilities. Among them, there are two types of capabilities gaining a wide range of research and industry attention as the critical factors. They are management institutional capability and process management capability. First, management institutional capability has been widely studied under institutional theory which plays a very important role in economics research and consequently, in business strategy and management research. Second, based on Porter's value chain model, business process is an important source of generating values for enterprises. Information technology serves as a tool to facilitate business process, and it can create more value for enterprises by streamlining and optimizing business processes. Therefore, the two capabilities – management institutional capability and process management capability – are the core capabilities for enterprises, and they should directly influence enterprise' choices of IT application maturity.

To empirically investigate the relationship between IT application maturity and management capabilities, data are collected from face-to-face interviews with IT personnel after careful survey instrument design and validation. 123 firm-level samples are obtained to construct measurements for IT application maturity, management institutional capability, and process management capability. In the regression analysis, we find that both management institutional and process management capabilities have positive significant impacts on IT application maturity. Also, both capabilities have significant positive impacts on majority of the dimension variables of IT application maturity. Furthermore, for a same level of management institutional capability and process management capability, process management capability has a stronger positive impact on the dimensions of technology, functional management, strategic support, and man-machine synergy. On the other hand, management institutional capability has a stronger positive impact on the dimensions of data and operations. We also investigate the difference of impacts of both capabilities based on ownership type of a company. Given a same level of management institutional capability and process management capability, management institutional capability has a stronger impact in improving IT application maturity in state-owned enterprises or public companies; while multinational companies or joint ventures witness a stronger impact from process management capability in improving IT application maturity. Finally, by incorporating interaction effect of the presence of ISO (International Organization for Standardization), the comparison of the impacts of both capabilities on IT application maturity becomes dynamic. It can be concluded that companies rely more on management institutional capability to improve IT application maturity when they don't have ISO, and the presence of ISO can help companies with low management institutional capability to improve IT application maturity. However, for companies with a high-level management institutional capability, the presence of ISO is in fact mitigating the impact of this capability and might pose a shift of the importance to process management capability

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