



How Information Technology Capabilities Drive Innovation in SMEs in The Context of the Sharing Economy

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Abstract. Based on the resource-based theory and dynamic capability theory, this paper studies the mechanism of information technology capability on innovation of SMEs. The research divides information technology capabilities into two dimensions: information technology flexibility and information technology integration, and introduces information sharing as an intermediary variable, and conducts an empirical test based on the survey data of 485 SMEs in China. The results showed that: Information technology flexibility and information technology integration play a role in promoting the innovation of SMEs, and indirectly drive innovation through information sharing. This conclusion provides a theoretical basis for SMEs to use information technology to improve innovation performance.

Keywords: SMEs; Innovation performance; Information technology capability; Information sharing.

1 The introduction

Limited by their own resources and capabilities, the innovation performance of SMEs is not significant. The rise of the sharing economy has brought about tremendous changes in the way enterprise resources are connected, the cost of connection, and the efficiency of connection. Searching and using external resources has become an important way for SMEs to innovate. Integrating the internal and external resources of the application and making it into the innovation process cannot do without the support of information technology. Information technology expands the sharing scope of information resources, promotes the transformation of cooperation mechanisms among enterprises, and lays a foundation for SMEs to use external resources to carry out innovative activities. Therefore, information technology capability is the key for SMEs to realize innovation resource sharing and improve innovation performance in the sharing economy environment (X Xie et al., 2018) ^[1].

2 Theoretical basis and research hypothesis

2.1 The role of information technology capabilities on SMEs' innovation

Information technology capability is the embodiment of the application degree of enterprise information technology, reflecting the invocation and deployment of information technology resources by the enterprise. Information technology flexibility and information technology integration are the main strategies of information technology application in SMEs.

The flexibility of information technology enables SMEs to quickly adjust information technology according to environmental changes, and at the same time realize rapid search and acquisition of external shared resources. Diversified and heterogeneous resources are conducive to the generation of innovative ideas and promote the development of innovative activities of SMEs. The integration of information technology helps SMEs to integrate internal and external data, information, technology and other resources, reflects the convenience of SMEs and external partners to communicate and conduct high-quality in-depth cooperation, and ensures the timeliness and reliability of information exchanges, to promote the transformation of innovation resources into innovation value. Based on this, the following assumptions are made:

H1a: The flexibility of information technology has a positive effect on the innovation of SMEs.

H1b: The integration of information technology has a positive effect on the innovation of SMEs.

2.2 Mechanism of information technology influencing SMEs' innovation: mediating effect of information sharing

Information technology flexibility emphasizes flexible information search and selection capabilities, enabling SMEs to break through service and geographical restrictions, exchange internal and external information through open access rights, and form innovative advantages. In addition, the various functional departments of the enterprise can also realize the sharing of information resources in a timely manner, and promote the generation of innovative ideas and the development of innovative activities of small and medium-sized enterprises.

Information technology integration helps SMEs integrate and share information and coordinate innovation activities. In the stage of idea generation, with the help of information on competitors and external environment, grasp market opportunities and lead the direction of innovation; in the stage of innovation and research and development, through deep links with partners (J Chang, 2017) [2], promote the diversified development of knowledge system and provide resource guarantee for enterprise innovation; In the stage of innovation commercialization, with the help of timely feedback of market information, we can accurately assess market potential and accelerate the transformation of innovation value. Based on this, the following hypotheses are proposed:

H2a: Information sharing has a partial mediating role in the relationship between information technology flexibility and SME innovation.

H2b: Information sharing has a partial mediating role in the relationship between information technology integration and SME innovation.

3 Research design

Taking Chinese small and medium-sized enterprises as the research object, the research was conducted through 485 valid questionnaires. innovation performance: drawing on the scales of G Bell (2005) [3] and making appropriate adjustments, four items were designed. Information technology: referring to the research of T Cui et al. (2015) [4], a total of eight items were designed from the two dimensions of information technology flexibility and information technology integration. Information sharing: referring to the research of Li Guanghong et al. (2018) [5], three items were designed. In addition, set enterprise size, industry type and development stage as control variables.

4 Empirical results and analysis

4.1 Reliability and validity test

According to the reliability and validity test results, the KMO value of each variable is above 0.674, the results of Bartlett sphere test in each dimension are highly significant, the total variance explained in each dimension is above 68%, and the factor loading range is 0.784-0.912, indicating that the scale has good construct validity. The Cronbach's alpha value of each variable is between 0.769 and 0.924, indicating that the overall questionnaire has high reliability.

4.2 Correlation analysis

The Pearson correlation coefficient shows that there is a significant positive correlation between information technology flexibility, information technology integration, information sharing and innovation performance of SMEs, providing preliminary evidence for H1 and H2. There was a significant positive correlation between information technology flexibility, information technology integration and information sharing, providing preliminary evidence for H3.

4.3 Hypothesis Testing

As shown in Table 1, in Model 1 and Model 2, information technology flexibility ($\beta = 0.480, p < 0.01$) and information technology integration ($\beta = 0.508, p < 0.01$) have significantly positive effects on innovation performance. To the effect, H1a and H1b were validated. In Model 3, information sharing ($\beta = 0.380, p < 0.01$) has a significant positive impact on innovation performance. In Model 4 and Model 5, information technology flexibility ($\beta = 0.321, p < 0.01$) and information technology integration (β

= 0.407, $p < 0.01$) had a significant positive impact on information sharing. In Model 6 and Model 7, information technology flexibility ($\beta = 0.416, p < 0.01$) and information sharing ($\beta = 0.208, p < 0.01$) have significant positive effects on innovation performance ($F = 31.513, P < 0.01$), information technology integration ($\beta = 0.431, p < 0.01$) and information sharing ($\beta = 0.189, p < 0.01$) had significant positive effects on innovation performance ($F = 28.680, P < 0.01$) After adding information sharing, the regression coefficients of information technology flexibility and information technology integration on innovation performance are still significant but decreased, indicating that in the process of information technology flexibility and information technology integration improving innovation performance, Information sharing played a partial mediating effect, and H2a and H2b were verified.

Table 1. The mediating effect test of information sharing [self-painted]

Variable	Innovation performance			Information sharing		Innovation performance	
	Model 1	Model2	Model3	Model 4	Model 5	Model 6	Model 7
Constant	1.413 *** (5.398)	1.433 *** (5.363)	1.976 *** (6.973)	3.834 *** (25.790)	3.850 *** (26.638)	2.638 *** (9.607)	2.726 *** (9.632)
Enterprise scale	0.174 *** (3.470)	0.154 ** (3.031)	0.145 (2.716)	0.106 (2.551)	0.087 ** (2.158)	0.152 ** (3.054)	0.137 ** (2.721)
Industry type	0.436 ** (2.342)	0.555 ** (2.973)	0.681 (3.468)	-0.244 (-1.592)	-0.177 (-1.189)	0.487 ** (2.645)	0.589 ** (3.180)
Development stage	0.083 (0.493)	0.075 (0.440)	0.031 (0.174)	-0.016 (-0.437)	-0.054 (-0.397)	0.096 (0.576)	0.085 (0.505)
Information technology Flexibility	0.483 *** (10.647)			0.321 *** (8.583)		0.416 *** (8.662)	
Information technology Integration		0.508 *** (10.207)			0.407 *** (10.292)		0.431 *** (7.919)
Information sharing			0.380 *** (6.966)			0.208 *** (3.808)	0.189 *** (3.331)
Max VIF	1.014	1.012	1.022	1.014	1.012	1.172	1.240
Adj.R2	0.218	0.206	0.122	0.140	0.187	0.240	0.222
F	34.786 ***	32.395 ***	17.875 ***	20.643 ***	28.834 ***	31.513 ***	28.680 ***

Note: *** indicates significant correlation at 0.01 level; ** indicates significant correlation at 0.05 level; * indicates a significant correlation at the 0.1 level.

5 Conclusion and discussion

Information technology flexibility and information technology integration synergistically promote innovation in SMEs. Information technology flexibility and information technology integration can not only directly promote the innovation performance of SMEs, but also indirectly promote innovation performance through information sharing. SMEs should pay attention to the development and training of information technology capabilities, promote the construction and application of information technology in an orderly manner, flexibly configure information technology strategies, and establish information sharing platforms in a timely manner. On the basis of accelerating the construction of informatization and improving the means of information technology, focus on the integration of internal and external resources, and build a collaborative innovation mechanism of internal and external resources.

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