Platform Leadership and Platform Exploration and Innovation: An Empirical Analysis by Big Data on Mediating Role of Relationship Management Skills and Platform Openness

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Abstract. With the advent of the digital economy era, platform companies continue to tap the potential of big data, have more room for development, and give it the possibility of greater value. Therefore, we study the impact of platform leadership on platform innovation and the impact mechanism of platform leadership on platform innovation. Based on this, a dual-mediation influence mechanism model is constructed with platform leadership as the independent variable, platform exploration and innovation as the dependent variable, and platform openness and relationship management skills based on big data as the mediating variables. The platform enterprise data is collected by a questionnaire survey. By using the Hierarchical Regression for our empirical analysis, it is found that the stronger the platform leadership that platform companies have, the more conducive they are to carry out exploratory innovation activities.

Keywords: platform innovation · relationship management skill · platform openness · dual intermediary

1 Introduction

In recent years, the transformation from technological innovation to integrated innovation has become an important means for enterprises to enhance their comprehensive competitiveness. As an important organization for resource allocation, value creation, and benefit coordination, platform enterprises with big data are an important force to promote technological innovation and business innovation [1]. On this basis, the platform enterprise builds an open platform innovation ecology, the business boundary can be adjusted flexibly, and the innovation activities of the platform enterprise become more frequent. Exploratory innovation is a relatively radical innovation method, usually manifested as the exploration of new knowledge, new technology, new process, and new technology, which is powerfully disruptive, subversive, and complex [2]. At present, the theoretical research on platform innovation in academia mainly involves the evolution of platform organization, platform network, and platform architecture, while there are few research results on exploratory innovation of platform enterprises. Therefore, it is

necessary to conduct in-depth research on the influence mechanism of enterprise platform exploration and innovation, to realize the deep innovation of enterprises, and to improve their performance.

2   Theoretical Basis and Research Assumptions

2.1   Role of Platform Leadership in Platform Exploration and Innovation

Platform leadership influences platform exploration and innovation in multiple ways. First of all, when an enterprise has platform leadership, it promotes the platform enterprise to occupy a favorable position in the entire innovation network [3], let the platform enterprise give full play to its leadership advantages. Secondly, the acquisition of platform leadership and the strategic decision-making of platform companies become the common strategic goals of participants in the platform innovation ecosystem, which is conducive to platform companies integrating existing internal and external resources and capabilities for comprehensively and deeply controlling the management system. The stronger the platform leadership of the platform enterprise, the more key resources such as knowledge, technology, and big data can be obtained for the development of the platform, which is beneficial to platform enterprises for exploratory innovation[4]. Accordingly, the following assumptions are made.

H1: Platform leadership has a significant positive impact on platform exploration and innovation.

2.2   Mediating Role of Platform Openness

When the platform leadership of the platform company is strong, the platform company needs to integrate more external resources and capabilities, for example, big data resources. When the platform leadership is stronger, the platform company achieves a higher level of depth and breadth when cooperating with external parties to innovate, which promotes a higher degree of platform openness. When the level of platform openness is high, the number of users of platform companies in the innovation process also increases [5]. Then, platform companies have fewer restrictions on innovation subjects and use more external innovation resources. In this way, a large number of innovative subjects flood into the platform system, and innovative elements also gather to promote the exploratory innovation of the platform. In summary, the following assumptions are made.

H2: Platform openness plays a mediating role between platform leadership and platform exploration and innovation.

2.3   Mediating Role of Relationship Management Skills

When the platform leadership of a platform enterprise is high, it inevitably has more cooperation and exchanges with the outside world. Therefore, platform companies have platform leadership to expand their influence and strengthen their relationship management skills. Platform enterprises with strong relationship management skills can quickly
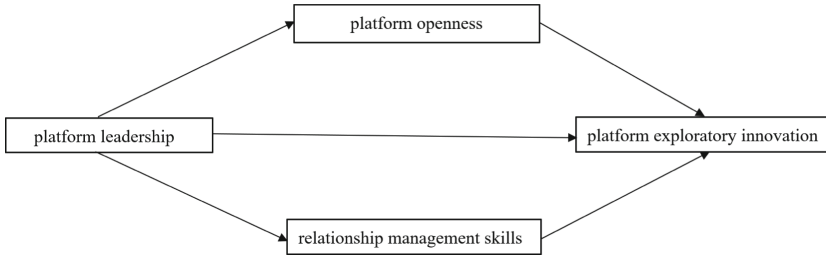
Fig. 1. Research Model for Platform Leadership and Platform Exploratory Innovation

Table 1. Descriptive statistical result of valid sample

Enterprise characteristics	measurement item	Quantity	Percentage (%)
Enterprise age	3 years or less	35	16.8
	4–6 years	84	40.4
	7–9 years	70	33.7
	10 years and above	19	9.1
Enterprise size	Less than 100 people	75	36.1
	101–500 people	84	40.4
	501–1000 people	33	15.9
	More than 1000 people	16	7.7

and efficiently obtain information and integrate external resources in their network relationships to improve the possibility of enterprise exploratory innovation [6]. In summary, the research hypotheses are put forward.

H3: Relationship management skills mediate between platform leadership and platform exploration and innovation.

In summary, the research model of this paper is shown in Fig. 1.

3   Research Design

3.1   Data Collection

As the research method, a questionnaire survey is used. The objects are managers and front-line employees of the enterprise. A total of 411 questionnaires were distributed and 261 were recovered. Excluding incomplete and unsatisfactory questionnaires, the number of valid questionnaires was 209, and the recovery rate of valid questionnaires was 50.85%. The basic information of the recovered samples is shown in Table 1.

Table 2. Reliability analysis results of variables

Variable	Item number	Cronbach's α
PL	4	0.884
PO	6	0.921
RMS	6	0.933
PEI	6	0.909

3.2 Variable Measurement

Variables were measured using a 5-point Likert scale, and the measurement items were all derived from mature scales in previous studies. Platform leadership refers to the research of Gawer et al. [7], including 4 items, platform openness refers to the research of Liu et al. [8], including 6 items, and the relationship management skills adopts the research of Wei [9] for 6 items. The platform explores and innovates referring to the research by Jansen et al. [10], including 6 items. In addition, we select the age and size of the firms as control variables.

3.3 Reliability and Validity Analysis

SPSS.26 was used for reliability analysis of the scale, and the results are shown in Table 2. First, the Cronbach's coefficient values of each variable were 0.884, 0.921, 0.933, and 0.909, which were all greater than the standard value of 0.7, indicating that the measurement reliability was good. Second, because the scales used were well-established and repeatedly validated, the content validity was considered to be good.

PL: platform leadership; PO: platform openness; RMS: relationship management skills; PEI: Platform Exploratory Innovation.

4 Data Analysis and Results

4.1 Correlation Test

The results of the correlation analysis between variables (Table 3) show the following: PL and PO ($r = 0.432$, $p < 0.01$), PL and RMS ($r = 0.379$, $p < 0.01$), PL and PEI ($r = 0.416$, $p < 0.01$). All showed a significant positive correlation. There was a significant positive correlation between PO and PEI ($r = 0.490$, $p < 0.01$). RMS and PEI showed a significant positive correlation ($r = 0.390$, $p < 0.01$). The above analysis results provide preliminary data support for theoretical hypothesis testing.

Table 3. Descriptive statistics and correlation analysis of variables

Variable	AGE	SIZE	PL	PO	RMS	PEI
AGE	1					
SIZE	.561**	1				
PL	.469**	.487**	1			
PO	.436**	.456**	.432**	1		
RMS	.388**	.461**	.379**	.394**	1	
PEI	.433**	.489**	.416**	.490**	.390**	1
Mean	2.350	1.950	3.094	3.718	3.583	3.718
S.D.	0.866	0.910	0.961	1.086	1.093	0.969

Notes: ** at 0.01 level (two-tailed), the correlation was significant

4.2 Hypothesis Testing

In order to test the influence of platform leadership on participating in platform exploration and innovation, a regression analysis was conducted. Model 4 in Table 4 shows that platform leadership has a significant positive impact on PEI ($\beta = 0.189$, $p < 0.01$), supporting H1.

Model 1 in Table 4 reveals that PL has a significant positive impact on PO ($\beta = 0.253$, $p < 0.01$). Model 5 proves that PO has a significant positive impact on PEI($\beta = 0.270$, $p < 0.001$). Model 6 shows that PO significantly affects PEI ($\beta = 0.247$, $p < 0.001$), while platform leadership has a significant decrease in platform exploration and innovation. Therefore, H2 is supported.

Model 2 shows that PL significantly affects RMS($\beta = 0.188$, $p < 0.05$). Model 7 reveals that RMS significantly affects PEI ($\beta = 0.156$, $p < 0.01$), Finally, the platform leadership and relationship management skills are incorporated into the regression model to return to platform exploration and innovation. From the data of Model 8, it is found that PL ($\beta = 0.164$, $p < 0.05$) and RMS($\beta = 0.134$, $p < 0.05$) both significantly affect PEI. However, the regression coefficient of PL on PEI It becomes smaller (from 0.189 to 0.164) and decreases significantly. RMS plays a mediating role in PL and PEI. Therefore, H3 is supported. In summary, H1, H2, and H3 have been verified.

Table 4. Regression analysis result of variables

Variables	PO		RMS	PEI					
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
AGE	.249**	.179	.260**	.200*	.171*	.138	.222**	.176*
SIZE	.281**	.362***	.381***	.316***	.282***	.247**	.315***	.268**
PL	.253**	.188*		.189**		.127		.164*
PO					.270***	.247***		
RMS							.156**	.134*
PEI								
R^2	.291	.257	.276	.301	.344	.355	.299	.318
Adjusted R2	.281	.246	.269	.290	.334	.342	.289	.304
F	27.908	23.500	39.008	29.217	35.665	27.894	29.053	23.614

Legend: *** $p < .001$

5 Conclusion

By discussing the path mechanism through which platform leadership influences platform exploration and innovation, the following conclusions are drawn. First, platform leadership positively affects platform exploration and innovation. Second, platform openness and relationship management skills are positively influencing platform exploration and innovation. Finally, platform openness and relationship management skills based on big data play an intermediary role in platform leadership and platform exploration and innovation, which indicates that enterprises should pay attention to platform openness and their relationship management skills when conducting platform exploration and innovation.

References

1. Trabucchi D, Buganza T, Muzellec L, et al. Platform-driven innovation: Unveiling research and business opportunities[J]. Creativity and Innovation Management, 2021, 30(1): 6-11.DOI:https://doi.org/10.1111/caim.12428
2. Dai Yong, Liu Yingjie. Research on internal governance factors and effects of digital platform ecosystem based on configuration analysis [J].Research Management, 2022, 43(02): 46–54. (In Chinese)
3. Zhang Yi, Liu Renhuai, Chen Haiquan. Influencing Factors of Platform Leadership in Business Ecosystem: An Exploratory Study Based on Grounded Theory[J].Nankai Management Review,2020,23(03):28–38+131. (In Chinese)

4. Zhang Yi, Liu Renhuai.The influence of platform leadership on exploratory innovation and the moderating effect of platform openness [J]. Journal of Management, 2020, 17(10): 1506-1513. (In Chinese)

5. Sun Yaowu, Zeng Yan, Zhai Yi. An Empirical Study on the Impact of Openness on Software Platform Innovation Performance [J]. Scientific Research Management, 2020, 41(03): 31-42. (In Chinese)

6. Wang Jie, Song Yun. Research on the impact of relationship management capability on enterprise innovation performance from the perspective of network structure characteristics [J] . Journal of the University of Electronic Technology (social sciences) , 2020,22(06) : 76-85. DOI: 10.14071/J. 1008-8105(2020) -4006.

7. Gawer A, Cusumano M A. Industry platforms and ecosystem innovation[J]. Journal of product innovation management, 2014, 31(3): 417-433.DOI:https://doi.org/10.1111/jpim.12105

8. Liu Renhuai, Zhang Yi. The impact of complementary assets on ambidextrous innovation and the moderating effect of platform openness [J]. Journal of Management, 2019,16(07) :949-956. (In Chinese)

9. Wei Chunbei. Research on the Influence of Network Capability on Enterprise Competitiveness [D]. Wuhan University of Technology, 2012. (In Chinese)

10. Jansen J J P, Van Den Bosch F A J, Volberda H W. Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators [J]. Management science, 2006, 52(11): 1661-1674.DOI:https://doi.org/10.1287/mnsc.1060.0576