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User Value Co-creation Behavior and Service Innovation Performance of Manufacturing Enterprises

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Abstract: *Based on the value co-creation and dynamic capability theory, 319 questionnaires of manufacturing enterprises were selected as the research samples. Multiple regression analysis were used to explore the effect of user value co-creation behavior on manufacturing enterprises' service innovation performance, and the mechanism of the relationship between resource bricolage and capability restructuring. The results show that user value co-creation has a positive impact on service innovation performance, and resource bricolage plays a partial mediating effect between them. Resource bricolage and capacity reconstruction play a chain mediating effect. This study enriches the research perspective of user value co-creation behavior and service innovation performance of manufacturing enterprises, and provides inspiration for enterprise management practice.*

Keywords: *User value co-creation behavior; Resource bricolage; Capability reconstruction; Service innovation performance*

1. Introduction

In the era of digital economy, the "user-centered" development concept forces the service-oriented transformation and upgrading of manufacturing enterprises. Service innovation has become a key strategy for manufacturing enterprises to improve their competitive advantages and move towards the high-end value chain. This requires manufacturing enterprises to change the previous product-led thinking mode and shift their focus to user demand . The value co-creation of service-oriented logic provides theoretical guidance for the transformation and upgrading of manufacturing enterprises from product to service orientation. More and more scholars have noticed the positive effect of user participation in value co-creation on the service innovation performance of manufacturing enterprises . However, customer value co-creation under the service-oriented logic is still established under the value creation mode led by the service provider, and the way and process of customer participation are strictly limited, with low enthusiasm for participation, which is a passive participation[1]. Along with the development of digital technology, digital platform for customers to interact with enterprises get value environment and provide strong technical support, users are no longer passive recipients of service content, but a key provider of service resources, service the creative designers, the service product developers, playing a more active role in service innovation [2]. Therefore, under the background of digital economy, the research on the new effect of user value co-creation has an important guiding role in the mechanism of service transformation of manufacturing enterprises.

Comb through to the existing literature, found that the existing research still has the following two major limitations: first, although the existing literatures have noticed the resource management between user value creating behavior and service innovation performance in the middle of the effect, but mostly based on the perspective of resources integration, emphasize to optimize enterprise internal and external resources integration. However, enterprises transforming from traditional manufacturing to service-oriented are generally faced with the dilemma of insufficient service innovation resources, difficult grafting of original manufacturing resources, and mismatch of service processes [3]. Based on this, resource integration focusing on the extension of superior resources is no longer applicable, while resource bricolage emphasizing the creative use of idle resources at hand to solve new problems and identify new opportunities provides a resource use idea for manufacturing enterprises in the situation of service resource shortage . However, existing researches have not paid enough attention to the resource management mode of manufacturing enterprises under the shortage of service resources, which may hinder the practice of cross-border transformation of manufacturing enterprises. Secondly, according to

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the theory of dynamic capability, resource bricolage overcomes the over-dependence of manufacturing enterprises on production resources and original paths with its flexible resource utilization and efficient resource processing, and becomes the key for enterprises to build flexible core development capabilities. Although existing studies have noted the influence of different types of capabilities on service innovation performance, such as innovation capability, absorptive capability and digital capability , from the perspective of capability, most of them are based on a single type of capability and ignore the research on the influence mechanism of overall capability improvement on manufacturing enterprises' servitization transformation. At present, there is a lack of research on the mechanism of the interaction between user value co-creation and service innovation performance of manufacturing enterprises by the chain intermediary of resource bricolage and capability reconstruction. Therefore, this paper aims to open the capability process black box of service transformation of manufacturing enterprises by studying how to promote capability reconstruction of manufacturing enterprises through resource bricolage.

2. Theoretical analysis and research hypothesis

2.1 User value co-creation behavior and service innovation performance

Yang et al.[4] analyzed the essential differences between user value co-creation and traditional customer value co-creation, and believed that users play a stronger leading role in the process of value co-creation, rather than simply a subordinate role, and the result of value co-creation should be dedicated to meeting the value needs of users. User value co-creation behavior is divided into two dimensions: user value co-creation participation behavior and user value co-creation citizenship behavior. The behavior of users' participation in value co-creation reflects the role responsibilities that users should perform as the main body of value co-creation, which is conducive to enhancing the interaction between users and enterprises in the process of value creation and strengthening the connection between supply and demand. User value co-creation citizenship reflects the citizen behavior of users voluntarily creating added value, which has more positive intrinsic motivation and is conducive to the continuous creation of value.

With the advent of the era of big data, users' personalized needs and value proposition have been fully demonstrated. From users to users has become an important way for manufacturing enterprises to transform into servitization and obtain advantages in service innovation. According to the value co-creation theory, the user is the leader and the enterprise is the facilitator, and the two interact and create value together. The behavior of user value co-creation is an important embodiment of user's active leading in the process of value co-creation, among which the behavior of user participation can encourage users to interact with enterprises and reflect their demand information, interests, propositions and wishes to enterprises, so as to help manufacturing enterprises accurately respond to market demands in the rapidly changing market environment and improve the quality and efficiency of service innovation decisions. As the providers of important demand information, users are conducive to the manufacturing enterprises to be oriented by users' demands, so that users can participate in the practice of service transformation to the maximum extent, improve the market acceptance of service products, and reduce the resistance of manufacturing enterprises' service transformation[5].User value co-creation citizenship is an extra-role behavior based on deep interaction and close emotional connection between enterprises and enterprises. Based on the above analysis, this paper proposes the following hypothesis:

H1: User value co-creation behavior positively affects the service innovation performance of manufacturing enterprises.

2.2 The mediating role of resource bricolage

Resource bricolage is a resource utilization process that integrates and reconstructs resources at hand, creatively proposes solutions and ideas, identifies and utilizes new opportunities [6], focuses on fully mobilizing existing fragmentary and available resources of an enterprise, and creates new values through resource combination or restructuring. It can be seen that resource bricolage is a process in which enterprises combine all available resources innovatively or make good use of new resources to keep pace with the times and constantly innovate.

Value co-creation behavior of users not only can help enterprise according to the user's needs clear the direction of resource combination and construction, but also in-depth interaction between users and enterprises improves users' willingness to share tacit knowledge, which is conducive to enterprises'

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deep exploration of users' potential value, obtaining key knowledge and heterogeneous resources, reducing the cost of identifying key information from massive information, and providing high-quality resource supply for enterprises' resource bricolage [7]. And resource bricolage can provide a large amount of resource support for the development of service innovation through the effective utilization of the identified resources. First of all, the resource reorganization of enterprises is more consistent with the conventional path of innovation activities, which effectively reduces the incidence of errors and is more conducive to maintaining the stability of service innovation transformation in the manufacturing industry. Secondly, through the creative development and utilization of new resources, resource bricolage can expand and provide new services to enhance service competitive advantages. Finally, the timeliness of resource bricolage can effectively improve the efficiency of service innovation. By rapidly integrating the available internal and external resources, enterprises can give new value to the resources at hand, improve the response speed to the external environment, seize the market quickly, meet the needs of users, and improve the efficiency of service innovation. Based on the above analysis, this paper proposes the following hypothesis:

H2: Resource bricolage plays an intermediary role between user value co-creation and service innovation performance of manufacturing enterprises.

2.3 The mediating role of capability reconfiguration

Capability reconfiguration refers to the dynamic ability of adjusting and reforming organizational conventions and their interdependent elements to improve the adaptability to complex environment. Capability reconstruction can be divided into evolutionary reconstruction and alternative reconstruction. Evolutionary reconstruction emphasizes the process of improving organizational flexibility and promoting progressive innovation through the accumulation, integration, absorption and reuse of resources, adjustment and expansion of organizational practices under the premise of existing paths. On the other hand, alternative reconstruction is a process of "subrating". Through the absorption and creative application of heterogeneous resources, conventional elements that are not suitable for organizational development are eliminated, so as to realize the process of innovative development [8].

The difference of resource utilization will directly lead to the difference of enterprise capability construction. Resource utilization patchwork is a process of integrating homogenous resources available inside and outside the organization on the basis of existing resources to expand the boundaries of organizational resources. The utilization-type patchwork of resources is consistent with the idea of evolutionary reconstruction of capability. Based on organizational memory, enterprises can not only quickly identify the use of new patchwork resources and accelerate the absorption and utilization of new patchwork resources, but also facilitate the repair and improvement of existing capabilities and promote the evolution of organizational capabilities due to less obstacles and risks in the identification of homogeneous resources [9]. Rely on to the original organization ability evolution path of gradual adjustment, the continuity of effective use of technology, knowledge, etc. on the basis of the normal operation of enterprises, improving and developing new services, reduced the enterprise service transformation uncertainty of change in the process, is helpful to steadily promote the service innovation performance of the organization. Exploratory resource bricolage is a process of breaking resource dependence, exploring heterogeneous resources, and making creative use of organizational resources. This process make the enterprise to piece together the emphasis to external resources, more attention implies the new opportunities, new opportunity of heterogeneous resources, focus on new resources and creative reorganization not only effectively broaden the intellectual foundation of organizational development, and on the basis of new knowledge develop a new ability, promotes the core competence of the enterprise to break the rigid, overturn outdated old ability, promoting alternative refactoring of capabilities. Especially in today's drastic changes in the external environment, it is easier for the traditional manufacturing industry in transition to grasp the first opportunity and achieve breakthrough progress in service innovation by taking the initiative to change, breaking the inertia of core capabilities and realizing the iteration of new and old capabilities. Based on the above analysis, this paper proposes the following hypothesis:

H3: Capability reconfiguration plays a mediating role between resource bricolage and service innovation performance of manufacturing enterprises.

2.4 The chain-mediated role of resource bricolage and capability reconstruction

Combined with the analysis of hypothesis H2 and H3 and the path of users-enterprise interaction

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-resource acquisition -capability enhancement -value output based on value co-creation and dynamic capability theory, this paper argues that the user value to create the behavior of high willingness to more conducive to the user in the interact with the enterprise resource and tacit knowledge sharing key, in the heart of the common practice of resources together, can effectively overcome the bottleneck of traditional manufacturing service resources, to organize the construction of dynamic capabilities provide a rich resource base. The input of user resources makes it possible for enterprises to better carry out resource bricolage, which in turn provides a good resource base for the evolution of original capabilities and the construction of new capabilities. The two complement each other and promote the successful transformation of service manufacturing enterprises and the effective improvement of service innovation performance. Based on this, this paper proposes the following hypotheses:

H4: Resource bricolage and capability reconstruction have a chain mediating effect between user value co-creation behavior and service innovation performance of manufacturing enterprises.

3. Study design

3.1 Measurement of Variables

In order to ensure the reliability and validity of the scale, all variables in this paper refer to domestic and foreign mature scales, and make appropriate adjustments according to the actual situation. User value co-creation behavior mainly refers to the scales of Yi and Gong[10]. The measurement of resource bricolage can refer to the scale of Senyard[11] et al. The measurement of capability reconstruction refers to the scale of Feng Xiaobin [8] et al. For the measurement of service innovation performance variables of manufacturing enterprises, this paper refers to the scale of Cooper, Kleinschmidt[12] et al. . Considering that the years of establishment, scale and nature of the enterprise will have an impact on the way of resource integration and innovation performance, this paper selects the years of establishment, scale and nature of the enterprise as the control variables.

3.2 Data collection and sample selection

This paper collects data by means of questionnaire survey. The survey samples are manufacturing enterprises that provide service business, and the survey objects are senior executives who are familiar with both enterprise technology and service business. With the help of the local industry association, The research team contacted qualified business executives and conducted a combination of online and offline questionnaires. The survey was conducted twice, three weeks apart, lasting 64 days. A total of 372 questionnaires were collected. After eliminating invalid questionnaires, 319 valid questionnaires were finally collected, with an effective rate of 85.75%.

4. Empirical analysis

4.1 Testing of validity and reliability

As shown in Table 1, in terms of reliability, the coefficients of each variable are all higher than 0.8, indicating that the reliability of the scale is good. In terms of the validity of the scale, all the scales in this paper refer to domestic and foreign mature scales, so the scale has good content validity; The KMO values of all variables were significantly greater than 0.7, indicating that the scale had good structural validity. The combined reliability CR of each variable is greater than 0.8, AVE is greater than 0.5 and the factor loading of each item is greater than 0.5, indicating that the scale has good convergent validity. As shown in Table 2, the AVE square root of each variable on the diagonal is greater than the value of the relationship between the variable and other variables in the horizontal and vertical directions, indicating that the discriminant validity of the scale is good.

Table1: Reliability and validity test of each variable (N=319)

Variable	a	KMO	P	CR	AVE
User value co-creation behavior	0.887	0.825	0.000	0.905	0.548
Resource bricolage	0.859	0.864	0.000	0.862	0.557
Capability reconstruction	0.927	0.905	0.000	0.932	0.582
Service innovation performance	0.878	0.750	0.000	0.889	0.673

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4.2 Descriptive statistics and correlation analysis

Correlation analysis of control variables and main variables was carried out to obtain the correlation coefficient between the variables. It can be seen from Table 2 that there is a significant positive correlation between major variables, indicating that there is an internal correlation between variables.

Table 2: Descriptive statistics and correlation analysis of each variable (N=319)

Variable	Average	SD	1	2	3	4	5	6	7
Years of establishment	2.89	1.295	1	-0.203**	0.05	0.042	-0.023	-0.024	-0.045
Enterprise scale	2.96	1.317		1	0.076	0.033	0.024	0.028	0.084
Enterprise nature	2.66	1.568			1	-0.002	-0.023	0.013	0.003
User value co-creation behavior	4.782	1.299				**0.740**	0.256**	0.175**	0.329**
Resource bricolage	3.413	1.538					**0.746**	0.445**	0.422**
Capability reconstruction	3.961	1.483						**0.763**	0.385**
Service innovation performanc	3.739	1.645							**0.820**

** p<0.01, *p<0.05, the bold diagonal number represents the square root of AVE for each variable

4.3 Main effect and intermediate effect test

Control variables and observation variables were gradually put into the regression equation for sequential analysis, and the analysis results were shown in Table 3. According to Model6, there is a significant positive correlation between user value co-creation behavior and service innovation performance of manufacturing enterprises (β=0.313, p < 0.001). H1 is assumed to be valid.

According to Model8 , when the resource bricolage variable is added, the positive effect of user value co-creation on service innovation performance is still significant (β=0.243, p < 0.001), and the regression coefficient is significantly lower than that of Model6. It shows that resource bricolage plays a partial mediating role between user value co-creation behavior and service innovation performance .H2 is assumed to be true. Similarly, it can be seen from Model7 and Model9 that capability reconstruction plays a partial mediating role between resource bricolage and innovation performance of manufacturing enterprises, assuming that H3 is valid.

Table3: Regression analysis of main effect and mediating effect (N=319)

	Resource bricolage		Capability reconstruction	Service innovation performance					
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10
Years of establishment	-0.05	-0.071	-0.020	0.003	-0.029	-0.045	-0.008	-0.024	-0.009	-0.024
Enterprise scale	0.013	0.002	0.023	0.018	0.079	0.065	0.074	0.064	0.069	0.061
Enterprise nature	0.022	-0.020	0.012	0.021	-0.001	0.001	0.006	0.007	0.001	0.002
User value co-creation behavior		0.241**				0.313**		0.243**		0.226**
Resource bricolage				0.401**			0.349**	0.290**	0.249**	0.202**
Capability reconstruction									0.250**	0.231**
R^2	0.005	0.063	0.001	0.161	0.008	0.106	0.118	0.185	0.168	0.229
F	0.476	5.244**	0.138	15.092**	0.838	9.264**	11.644**	14.167**	13.888**	15.462**

** p<0.01, *p<0.05

4.4 Chain mediation effect test

On the basis of the above analysis, this study further tested the chain-mediated effect of resource bricolage and capability reconstruction. The Bootstrap method was used to repeatedly sample 5000 times and calculate the interval situation with 95% confidence. The analysis results are shown in Table 4. The total indirect effect is 0.110, the standard error is 0.030, and the confidence interval is [0.056, 0.174]. The effect of user value co-creation from resource bricolage to service innovation performance is 0.062, the standard error is 0.025, and the 95% confidence interval (CI) is [0.018, 0.116], excluding 0, indicating that resource cocreation has a significant mediating effect between user value co-creation

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and service innovation performance. The confidence interval of user value co-creation from capability reconstruction to service innovation performance is [-0.009, 0.066], containing 0, indicating that capability reconstruction has no mediating effect between user value co-creation and service innovation performance. The effect of user value co-creation to service innovation performance through resource bricolage and capability reconstruction is 0.027, the standard error is 0.009, and the confidence interval is [0.012, 0.047], excluding 0, indicating that resource bricolage and capability reconstruction have a chain intermediary effect between user value co-creation and service innovation performance, assuming that H3 is valid.

Table 4: Chain mediation effect

The mediation effect	Effect of value	Standard error	Lower limit	Upper limit
Direct effect	0.286	0.065	0.158	0.414
User value co-creation behavior → resource bricolage → service innovation performance	0.062	0.025	0.018	0.116
User value co-creation behavior → capability reconstruction → service innovation performance	0.022	0.020	-0.009	0.066
User value co-creation behavior → resource bricolage → capability reconstruction → service innovation performance	0.027	0.009	0.012	0.047
Total indirect effect	0.110	0.030	0.056	0.174
The total effect	0.396	0.068	0.263	0.529

5. Research conclusions and management implications

(1) User value co-creation behavior, resource bricolage and capability reconstruction all have significant positive effects on service innovation performance of manufacturing enterprises; (2) resource bricolage and capability reconstruction play a chain mediating role between user value co-creation and innovation performance of manufacturing enterprises. To sum up, manufacturing enterprises should become the supporters and service providers of user value creation, and provide support of technology, resources and services for users to better implement value co-creation. Change the idea and way of resource use, establish a flexible resource utilization mechanism, improve the effect of resource bricolage; Seize the opportunities brought by the development of digital technology, cultivate and construct the ability to adapt to the development of resources, and quickly respond to the changing needs of the market.

References

[1] Heinonen K, Strandvik T, Jacob Mickelsson K, Edvardsson B, Sundstrm E, and Andersson P. A. Customer-dominant Logic of Service [J]. Journal of Service Management, 2010, 21, (4) : 531-548.

[2] Heinonen K, and Strandvik T. Customer-dominant Logic: Foundations and Implications [J]. Journal of Services Marketing, 2015, 29, (6-7) : 472 -484.

[3] Feng Wenna, Jiang Mengna, Sun Mengting. Market Responsiveness, Resource Bricolage, and Service Transformation Performance of Manufacturing Enterprises[J]. Nankai Business Review, 2020, 23(04): 84-95.

[4] Yang Xuecheng, Tu Ke. Research on the Effect of Platform Support Quality on User Value Co-creation Citizenship Behavior under the Background of Sharing Economy[J]. Business Management Journal,2018,40 (03): 128-144.

[5] Wan Wenhai, Liu Longjun. Impact of internal and external collaboration between employees and users on innovation performance of platform enterprises: based on the perspective of value co-creation [J]. Nankai Business Review, 2021, 24(02): 72-84.

[6] Baker T, Nelson R E. Creating something from nothing: Resource construction through entrepreneurial bricolage [J]. Administrative Science Quarterly, 2005,50(3): 329-366.

[7] Dong Yuanyuan, Wei Zepeng. The Impact of Transboundary Ambidextrous Search on Ambidextrous Innovation Performance: Based on the Integrated Perspective of Knowledge Cooperation Chain and Strategic Flexibility[J].Science & Technology Progress and Policy,2021,38(22): 124-131.

[8] Feng Xiaobin, Li Huahua, Ma Xiaoshu. The Impacts of Ambidextrous Alliances on Firm's Capability Reconfiguration: The Moderating Role of Knowledge Aggregation[J]. Chinese Journal of Management.,2021,18(01): 99-109.

[9] Wogwu V E, Hamilton D I. Reconfiguration capability and competitive advantage: A study of port

ISSN 2616-5902 Vol. 4, Issue 15: 15-21, DOI: 10.25236/AJBM.2022.041503

Harcourt public health sector [J]. Management, 2018, 8(2): 47−53.

[10] Yi Y, and Gong T. Customer Value Co-creation Behavior: Scale Development and Validation [J]. Journal of Business Research, 2013, 66, (9): 1279-1284.

[11] Senyard J, Baker T, Steffens P, et al. Bricolage as a path to innovativeness for resource-constrained new firms [J]. Journal of Product Innovation Management, 2014, 31(2): 212-230.

[12] Cooper R.G., Kleinschmidt E. J. Winning Businesses in Product Development: The Critical Success Factors [J]. Research-Technology Management, 2007, 50(3): 52-66.