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The Research on Hotel Customization Capability Influence Mechanism Based on Biological Double Helix Gene

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Abstract

In today's hotel industry, how to effectively balance the benefit of the customer demand and the supply resources has received widespread attention. This article put forward the connotation of hotel customization capability and "double helix gene" structure model which integrates customer demand, the hotel product characteristics with standardization production factors for customers, and discusses the relationship of different customization performance and enterprise capability; accordingly summarize the influence mechanism of customization capability.

Keywords*: hotel customization capability; double helix gene; influence mechanism*

1. Introduction

"National tourism and leisure consumption in recent years is the leading consumer market of hotel industry" [1], the characteristics of hotel customer demand has been increasingly personalized, diversified (the hotel/restaurant/business/daily leisure life demand are coexist) and network (product reservation and experience sharing by online information platform), the change of the customers demand characteristics proposes the new task of hotel core competitiveness reconstruction in china. At present, the research contents of hotel core competitiveness are focused on the constitution and evaluation of competitiveness and [2-4], which is lack of research on balancing enterprise standardization benefit and customer personalized need. However, to provide customized product which is low cost, personalized and efficient is the important indicators of the contemporary hotel core competitiveness, this paper put forward the connotation of hotel customization capability and "double helix gene" structure model which integrates customer demand, the hotel product characteristics with standardization production factors for customer, and explore the influence mechanism of different customization capability. The research not only changes the perspective of the hotel core competitiveness, and proposes the new business logic of the hotel product value creation to effectively solve the problem of the hotel product homogeneity, in order to build the enterprise competence and enhance the whole competitive advantage of regional hotel industry.

2. Literature Review

2.1. Hotel Customization

Mass Customization emerged in the 1990s, it is not only a modern production mode which is the low cost, high efficiency way to satisfy customer personalized need, and gradually become competitive strategy [5], Qi Guo-ning put forward 4 customization types[6] which including order sale, order assembly, order manufacture and order design according to customer order separation point. Customized strategic goal is to give users the participation and priority option [7-8], and "transforms the uncertain market needs to the

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enterprise competitive advantage resources" [9]. Customization capability is the core driving force of the customization strategic implementation which is the integration of demand information retrieval, agile design, flexible manufacturing and management capabilities[10], the interaction design mechanism with customers involvement and fast delivery time are the important factors to enhance custom ability [11-12].With the coming of experience economy, the travel industry gradually appeared the customization service pattern such as the private customization and travel consultant. Tourism operators come to realize that they must transform from the "off-the-shelf" tourism resource organizer to the "service designer" [13], in order to provide exclusive products for customer. The research on the hotel customization is mainly about the implementation process and technology of customized service with the case study of Marriott hotel and Hangzhou Huang Long hotel [14-15].

2.2 The Enterprise Gene

The current research on enterprise biological gene is mainly about product gene and organization gene. The research on product gene which is primarily based on the biological genetic principle analyzes the genes [16] of product technology and the evolutional dynamic and evaluation system of the product family [17]. The research on organization gene is basically about the concept, components and the operational mechanism of everlasting organization genes [18-19] and so on. The enterprise should establish a new business model which adapting the latest trends of the industry to promote organization evolution and realize the strategic innovation [20-21].

At present, the research on the hotel customization capability influence mechanism is the state of scattered data in many areas, the research on hotel customization is focused on the concept and application of customization service, which is lack of research on customization service pattern; the research on customization capability is mainly about the connotation and evaluation of the customization ability, which is lack of systemic research on the customization capability influence mechanism; the research on enterprise biological genetic is focused on the product family design and organization operation mechanism, which is lack of the deeper analysis of different kinds of enterprise core competence influence mechanism. This paper based on the theory of double helix gene structure provides customized product as the breakthrough point to balance the benefit of enterprise and customer, and explores the hotel customization capability influence mechanism and cultivation tactics, in order to guide hotel management practice by the analysis of the existing literature and questionnaire data.

3. Hotel Customization Capability Definition and Structure Model

3.1 The Connotation of Customization Capability

Customization capability is the form of the hotel core competence, its typical characteristic is a dynamic "integrated service" capability [22] which integrate supply resource with customer demand by the way of low cost and high efficiency in a specific time and space situation. It is not only the key drivers of enterprise normal operation, but also the stable and sustainable industry boundary for the enterprise competition. Hotel customization capability is made up of management ability, design ability, combination ability, trading ability and producing ability. The management ability is expressed by the functions of planning, organizing, leading and control (coordinated), and include management thinking, organization structure and incentive policy *etc*; design ability includes to require the supply and demand information and plan the activity solution; combination ability includes the matching of supply and demand and product combination; trading ability includes trade contracts and ways; producing ability includes intelligent facilities and personnel services. The customized product is the integration of physical

entity, personnel service and environment atmosphere to meet the needs of the hotel customers in the destination space. It is the collection of resource and capability which are belonged to hotel and its alliance enterprise such as capital, facilities, technology, information and knowledge. The customized product includes core service (service are in hotel), affiliated service (housekeeping service and home decoration service is outside the hotel) and extended service (integrative solution and activity planning service to meet the hotel customer demand), as shown in Figure 1.

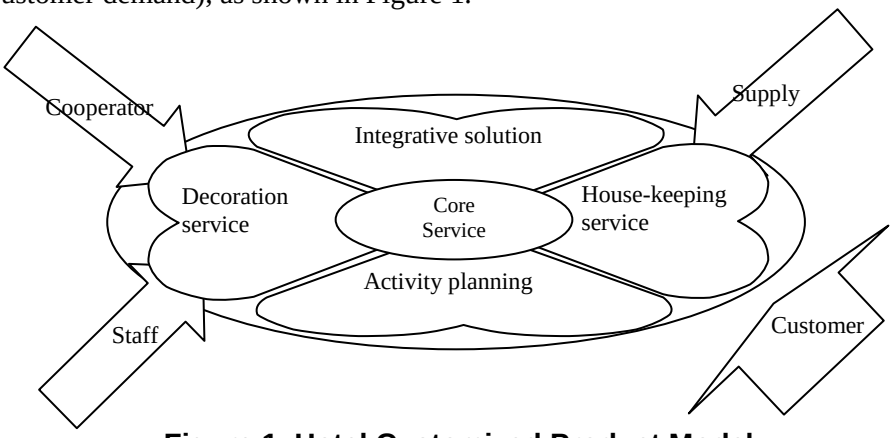

Figure 1. Hotel Customized Product Model

3.2. Customization Capability Structure Model

Customization capability is the system which has the self- duplicate, self-adaptive and self-evolutional character. Open and independent structure is the formational condition of the customization capability, the product value chains of the design-combination and trading- production constitute a double helix structure around the customer needs, the genetic and varied information of the product value chains are coordinate and allocated by management ability, consequently which constitutes the double helix model of customization capability.

3.2.1. The Formation Condition of Customization Capability:

Based on the principle of biological evolution, the formation condition of customization ability are as follows:

(1) The hotel is an open and independent system which can transfer information, trade product and transform the ability with the external environment. The each subsystem of the hotel can evenly get the resources such as material, information and ability from the outside environment, which reaches a certain threshold to form the customization capability.
(2) The resources and abilities which constitute the customized product are in a circumstance of imperfect competition, which can be organizationally allocated and combined. The resources and capabilities of each node enterprise are different and independent on the quantity and nature, which can constitute the customized product by the principle of win-win and business cooperation.
(3) The management system of the hotel alliance are more perfect, which not only can store up and duplicate the management methods conducive to the development of the system, but also can effectively eliminate the activities which blocks the development of the system.

3.2.2. The Double Helix Structure of Customization Capability:

Customization capability (organisms) is constituted by the product value chains of the design-combination and trading-producing (genes) which are around the central axis of customer demand. The product value chains are made up of the resources (DNA) such as personnel, capital, material, information, technology and knowledge which are related to the product value creation. The resources are the self-duplicated basis of customization capability, which is the repository of genetic information. The chains are coordinated and allocated by management capability (base group) to realize the heredity or variation of customization capability.

The gene which is made up of multiple DNA has different functions, and determines some characteristics of customization capability. Different gene combinations constitute the different types of customization capability, in order to determine the diversity of the customization capability. The double helix structure of customization capability ensures the characteristics of self-duplicate, self-adaptive and self-evolution. the product value chains of design-combination and trading--producing are located in the outer edge of the screw, and management ability is located in the medial of the screw which is perpendicular to the two product value chains which are bind by management function, in order to form the spiral and longitudinal axis. As shown in Figure 2.

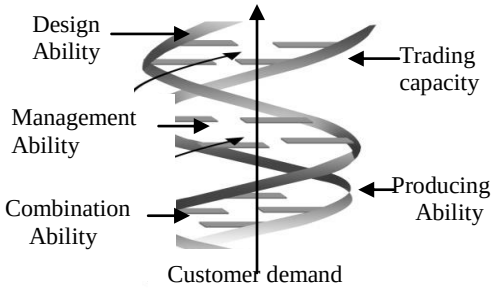

Figure 2. The Double Helix Structure of Customization Capability

4. Research Design

4.1. Research Hypothesis

4.1.1 The Hypothesis of Customization Types: Hotel product quality is the subjective perception of customers to the value of product. Customized products embody the customization capabilities of an enterprise. Among many factors, the delivery of service, product combination and the satisfaction from customer participation have significant influence to the evaluation of customization quality [23-25]. Therefore, the types of customization capability are divided into value delivery type, value integration type and value creation type.

H_1 The customization hotel of value delivery type provides the hotel alliance information, standard products and trading methods.

H_2 The customization hotel of value integration type matches the customers' demand and alliance members' supply, and provides the combinational products and the solutions of the integrated travel and leisure options.

H_3 The customization hotel of value creation type allows the hotel and customers cooperating to create the product values, and providing the planning service.

4.1.2 The Hypotheses of Sub-ability Influence on Customization Performance: Based on the structure model of customization capabilities and customization performance (CP), there are some hypotheses:

H_{1a}: The trading ability has a more significant influence on the value delivery type CP;
H_{1b}: The management ability has a very significant influence on the value delivery type CP;
H_{1c}: The producing ability has a significant influence on the value delivery type CP;
H_{2a}: The combination ability has a more significant influence on the CP of value integration type;
H_{2b}: The design ability has a very significant influence on the CP of value integration type;
H_{2c}: The management ability has a significant influence on the CP of value integration type;
H_{3a}: The design ability has a more significant influence on the CP of value creation type;
H_{3b}: The producing ability has a very significant influence on the CP of value creation type;
H_{3c}: The management ability has a significant influence on the CP of value creation type.

4.2. The Description of Samples

The chosen samples of this research are hotel customers mostly from Harbin, some from Changchun and Beijing October to November 2014. 220 questionnaires were sent and out of 193 were fed back. Among of those, 160 were available and the ratio is 73%. The samples features include genders, age and occupations. The male and female customers take 53% and 47%. The age ranges are mainly among 21~30 and 31~40, taking 37% and 56%. The occupations are mainly among the administrative facilities and company employees, taking 59% and 34%. The questionnaires are applied by Likert5 measurement to get data, super satisfaction given 5, very satisfaction given 4, satisfaction given 3, dissatisfaction given 2, very dissatisfaction given 1.

5. The Research Outcome and Analysis

5.1. The Calculation of Customization Performance

According to the Literature analysis above, the mass customization is a cost-effective method to meet the customers' personalized needs. Therefore, the customization performances are measured by the standard producing, customized service and timing respond in this article. By using the standard producing, customized service and timing respond data from 160 samples, the weighs of these three factors determined by information entropy, and get customization performance by the weighed sum method. The specifics can be seen in Table 1.

Table 1. Hotel Customization Capability Evaluation System

Destination Layer	First grade indicators	Second grade indicators	weight
Hotel Customization Efficiency	X_1 Standard producing 0.338	X_{11} Standardized design module;	0.1289
		X_{12} Provide accurate and efficient standardized service;	0.0964
		X_{13} Standardized delivery module;	0.1128
	X_2 Personalized service 0.444	X_{21} Design product together with customers;	0.1553
		X_{22} Provide customized service;	0.0629
		X_{23} Provide diversified product combination;	0.0702
		X_{24} Provide various trading way;	0.0766
		X_{25} Provide personalized service according to customer files;	0.0790
	X_3 Timing respond 0.218	X_{31} Provide convenient services by intelligent machines;	0.0812
		X_{32} Provide personnel service timely and moderately;	0.0645
		X_{33} The staff has strong strain ability.	0.0721

5.2. The Identification of the Customization Types

Based on the 160 customization data from questionnaires, using the K-means classifying method [26], the targeted samples are classified as 3 categories. The Design iterations are 50, and calculating iteration is 5, the minimum distance from the initial center is 1.346, the clustering achieves convergence. By analysis, the average number of categories is 3. The number of samples is respectively 29, 77 and 54.The average number of customization is respectively 2.89, 3.64 and 4.25. The threshold value is 0~3.25, 3.25~3.94, 3.94~5 which are seen as value delivery type, the value combination type and value creation type. The hypotheses of H_1, H_2, H_3 are proven.

5.3. The Calculation of the Customization Performance and Sub-ability

By Spss22.0 statistical analysis software, this article uses the linear, logarithmic, inverse and index models to reveal the relationship of the customization performance and sub-ability, in order to find out the best calculation model by the significance test results, which is shown in Table 2.

Table 2. The Type and Influence Factors of Hotel Customization Capability

Evaluation indicator / Customi-zation types	Number of samples	Customization performance Threshold	Manage-ment ability	Design ability	Combi-nation ability	Trading ability	Produc-tion ability
Value delivery	29	0~3.25	√ √ √	×	×	√	√ √
Value integration	77	3.25~3.94	√ √	√	√ √ √	×	×
Value creation	54	3.94 ~5	√	√ √ √	×	×	√ √

Note: "√ √ √ "show "more significant"; "√ √ " show "very significant"; "√ "show "significant"; "×"show "no significant".

5.3.1. The Calculation of Value Delivery Customization Performance and Sub-ability:

The management ability, trade ability and producing ability impact on value delivery type. The significance is 0.006.

Customization performance =3.182-0.876*1/ (management ability);
Customization performance =2.150+0.7*ln(trade ability);
Customization performance=1.602+0.435*(producing ability).

Given management ability, producing ability, trade ability are among 1 and 5, differential value of 1.74, 1.1266 and 0.7008.The 3 sub-ability has more influence rankly management ability, producing ability and trade ability. At the same time, design ability and combination ability has no significant impact on value delivery type. It certifies the hypotheses of H_{1a}, H_{1b} and H_{1c}, but the influence has different levels. The main reason is that value delivery type happens at the beginning stage of enterprise life circle. The reasonable structure and management instruction guarantee the operation, that is the management ability has a more significant influence on performance, the pattern of customization service is "standard product +diversified trade ways". Therefore, the standard service process and trade ability has a very significant impact on performance.

5.3.2. The Calculation of Value Combination Customization Performance and Sub-ability: The calculation result shows that management ability, combination ability and design ability has a significant impact on value integrated type. The significance is 0.005.

Customization performance=3.393+0.206*ln(management ability);
Customization performance=3.185+0.116*(combination ability);
Customization performance=3.416+0.067*(design ability).

Given management ability, combination ability, design ability are among 1 and 5, and the differential value of 0.332, 0.464 and 0.268. The sub-ability has more influence rankly combination ability, management ability and design ability. At the same time, management ability and design ability has no significant impact on customization performance of value integrated type. It certifies the hypotheses of H_{2a}, H_{2b}, H_{2c} concerning respectively the management ability, combination ability and design ability has a great impact on the value integrated type, but the influence has different levels. The main reason is that the enterprise of value integrated type is in the middle stage of life circle, the cooperation of supply resources is the core driven force, so the combination ability has a great impact on performance. Meanwhile the enterprises serve the service of "diversified combination + standard personalized service" which determined the management ability and service design ability has a great impact on performance.

5.3.3. The Calculation of Value Creation Customization Performance and Sub-ability: The calculation result shows that management ability, design ability and producing ability has a significant impact on value creation type customization. The significance is 0.004.

Customization performance=3.502+0.515*ln(design ability);

Customization performance=3.829+0.096*(management ability);

Customization performance=3.696+0.13*(producing ability).

Given management ability, design ability and producing ability are among 1 and 5, the differential value of 0.384, 0.829 and 0.52.The sub-ability has more influence rankly design ability, producing ability and management ability. Meanwhile, the combination ability and trade ability has no significant impact on value creation type customization. It certifies the hypotheses of H_{3a}, H_{3b}, H_{3c} completely. The main reason is that enterprises of value creation type is at the advanced stage of customized enterprise, they aim at developing the customers' potentials, enhancing customers' interest to involve the product creation. Design ability is very significant to performance. They serve the "personalized design + personalized service" as customized service pattern, so the producing ability and management ability has a great impact on performance.

6. Conclusions and Revelation

This article gives definition and "double helix genes" structure model of the hotel customization ability, and reaching the influence mechanism of customization capability by calculating the intensity of sub-ability to different types of customization performance. The value delivery type hotel should provide diverse trade methods; the value integrated should improve the cooperation and assign the resource; the value creation type should improve the design ability to encourage the customers into products design and create the product value. This article uses the micro and static analysis, lacking the historic data and the customization performance indicators, which should be improved. In conclusion, the hotel customization has a very important theoretic and practical meaning to hotel core advantage. And the cultivating pattern and management mechanism of the hotel customization capability based on the biological evolution theory will be the future trend which needs deep research.

Acknowledgments

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References

[1] D. Bin, "Hotel investment are moving into rational and critical period of adjustment",vol.12, **(2014)**.
[2] B. Wu, "A Research on the Competitiveness of China Midscale Hotels from the Viewpoint of Dynamic Capability", FuDan university Doctor dissertation, **(2012)**.
[3] B. Wen and Z. Zhang, "A Study ofDom estic Reserch on Tourism Competitiveness Evaluation: Based on M eta-analysis", Tourism Science, vol. 24, no. 2, **(2010)**, pp. 40-49.
[4] J. Yang and L. Lu, "A Comparison of Hotel Soft power Based on Employee Satisfaction: A Case Study of Local Hotel K and Foreign Capital Hotel H of Ning Bo City", Tourism Science, vol. 23, no. 6, **(2009)**, pp. 52-56.
[5] P. Gottfridsson, "Development of personalised services in small business: an iterative learningprocess", Managing Service Quality, vol. 20, no. 4, **(2010)**, pp. 388-400.
[6] G. Qi, X. Gu and L. Renwang, "The research on Mass customization and its model", Computer integrated manufacturing systems,vol. 6,no. 2, **(2000)**, pp. 41-50.
[7] I. Simonson, "Determinants of customers' responses to customized offers: conceptual framework and research propositions", Journal of Marketing, vol.1, no. 69, **(2005)**, pp. 32-45.
[8] L. X. Oksana and H.Wang, "Customization with Vertically Differentiated Products", Journal of Economics & Management Strategy, vol. 20, no. 2, **(2011)**, pp. 475-515.
[9] S. Ahm, K. Sami and P. Helo, "Collaborative customized product development framework", Industrial Management & Data Systems, vol. 109, no. 5, **(2009)**, pp. 718-735.
[10] X. Zhou and G. Zou, "Mass customization: competitive advantage, executive conditions and basic Tactics", Industrial engineering, vol. 4, no. 6, **(2003)**, pp. 236-242.
[11] S. Ahmad, G. S. Roger and N. M. Debasish, "The relationship among modularity, functional coordination and mass customization: Implications for competitiveness", European Journal of Innovation Management, vol. 13, no. 1, **(2010)**, pp. 46-61.
[12] J. L. G. D. Deitz, "Linking supply chain management with mass customization capability", International Journal of Physical Distribution & Logistics Management, vol. 41, **(2011)**, pp. 668-683.
[13] N. avlek, X. Zhang and H. Shu, "Changes in marketing strategies of tour operators: From "made in tour operators" to "made in the tourism value chain", Tourism Tribune, vol. 28, no. 2, **(2013)**, pp. 12-15.
[14] Q. Huang, "The accommodation service process reengineering and evaluation based on the internet of things-take the dragon hotel as an example", ZheJiang GongShang University master dissertation, **(2011)**.
[15] Y.-H. Zhao, M. Xin, G.-H. Nie and H.-Y. Xu, "Research on the operation of hotel based on mass customization", Wuhan Institute of Technology, vol. 30, no. 5, **(2008)**, pp. 80-83.
[16] J.-Q. Mao and J.-M. Han, "Study on heredity and mutation of product technology", Studies in Dialectics of Nature, vol. 28, no. 2, **(2012)**, pp. 34-38.
[17] H. Liang, W. Yong-ming, L. Rong-shen and H. Samuel, "Evaluation and driver analysis in product family evolution", International Journal of Advanced Manufacturing Technology, vol. 69, **(2013)**, pp. 863-874.
[18] G.Neilson, A. P. Bruce and D. Mendes, "What's organizational DNA", Harvard Business Review, vol. l, **(2005)**, pp. 73-74.
[19] G. Long, "Study on lasting Enterprises from the visua1Angle of Corporate Gene", Northwest University Master Dissertation, **(2009)**.
[20] M. Phil, "Get a DNA transplant Telecom Asia", vol. 22, no. 10, **(2012)**, p.18.
[21] G. Vijay and T. Chris, "Organizational DNA for Strategic Innovation", Management Review,vol. 47, no. 3, **(2005)**, pp. 47-76.
[22] H. Wang, M. Zhao, and X. X. Wang, "The research on the integrational management of Science and technology resource sharing service platform", Science public, **(2013)**.
[23] N. M. Suki,. "Examining Hotel Service Quality Elements Effects on Overall Tourists Satisfaction", European Journal of Social Science, vol. 30, no. 4, **(2012)**, pp. 646-653.
[24] A. R. Walls, "A cross-sectional examination of hotel consumer experience and relative effects on consumer values", International Journal of Hospitality Management, vol. 32, **(2013)**, pp. 179-192.
[25] C. F. Hochgraefe, V. Saskia and Michael, "Links Between Swiss Hotel Guests' Product Involvement and Brand Loyalty", Journal of Hospitality Marketing & Management, vol. 1 **(2012)**, pp. 20-39.
[26] S. Liu, K. Z. Lin, Sun Xudong, W. Chen and J. T. Li, "Scale-invariant Feature Transform Based on Clustering in Face Recognition", Journal of Harbin University of Science and Technology, vol. 19, no. 1, **(2014)**, pp. 31-35.

