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Revista de Cercetare si Interventie Sociala

ISSN: 1583-3410 (print), ISSN: 1584-5397 (electronic)

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Revista de cercetare și intervenție socială, 2024, vol. 85, pp. 197-206

<https://doi.org/10.33788/rcis.85.12>

Published by:
Expert Projects Publishing House



On behalf of:
„Alexandru Ioan Cuza” University,
Department of Sociology and Social Work
and
HoltIS Association

Critical Success Factors in AI Healthcare Industry Executing Service Marketing

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Abstract

The popularity of telecommute and telehealth care models as well as people's changes in consumption patterns accelerate the transformation and reform of healthcare industry. Under the catalysis of real needs and technologies, smart healthcare will become the mainstream in the future. Under the specific time and space background, solutions for medical technology innovation has to keep pace with times. Current marketing strategies do not simply rely on external publicity, but also stress on the promotion of service quality for customers actually experiencing good service attitudes. Aiming at customers of AI healthcare industry as the questionnaire analysis objects, total 300 copies of questionnaire are distributed, and 241 valid copies are retrieved, with the retrieval rate 80%. The research results show that external marketing is the most emphasized dimension in AI healthcare industry executing service marketing, and top five indicators, among 12, are ordered information system, customer oriented service process, internal training, media communication, and regulations for service personnel. Finally, conclusions and suggestions are proposed according to the results, expecting to deeply understand critical success factors in AI healthcare industry executing service marketing and provide valuable information for AI healthcare industry making management decisions in the execution of service marketing.

Keywords: AI healthcare industry; service marketing; critical success factor; organizational goals; healthcare.

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Introduction

An enterprise, when facing obstacles to management, would generally enhance customers' purchase intention through marketing, expecting to increase revenue and customers' repurchase intention. When facing difficult medical business environment, how healthcare industry reduces costs, enhances efficacy, and adjusts business strategies is the problem which healthcare industry managers have to reconsider in the decision making. Early medical care institutions focus more on results in the business performance, but ignore the healthcare process. Healthcare industry also presents bureaucratic, arrogant, and indifferent perception; and the improvement still cannot be compared with enterprises. As a result, it becomes more important to educate interior employees and reinforce the sense of identity to the organization with marketing strategies in order to serve customers with sincere, kind, and enthusiastic attitudes, enhance customer satisfaction, and shorten the distance between healthcare industry and customers to further promote the image of healthcare industry.

Healthcare, life science, and digital technology present explosive growth in past years, such as AI, 5G, blockchain, cloud computing, and big data. Besides, the popularity of telecommute and telehealth care models to cope with the epidemic and people's changes in consumption patterns accelerate the transformation and reform in healthcare industry. Under the catalysis of real needs and technologies, smart healthcare will become the mainstream in the future. Rapidly developed healthcare and science, explosively growing digital technology, the advance of healthcare data use and analysis, consumers' emerging empowerment concept and changes in preference and behavior, the wave turning from disease treatment to preventive healthcare, as well as the attack of COVID-19 epidemic rapidly promote the reform and transformation of healthcare industry. Under the specific time and space background, solutions for medical technology innovation urgently need to keep pace with times. Current marketing strategies do not simply depend on external publicity, but emphasize the promotion of service quality so that customers could actually experience good service attitudes. To realize such a goal, the interaction between service personnel and customers should be reinforced to form the service triangle among enterprises, employees, and customers. Accordingly, the research motivation allows us deeply understanding critical success factors in AI healthcare industry executing service marketing, expecting to provide valuable information for AI healthcare industry making management decisions in the execution of service marketing.

Literature review

Healthcare service marketing

Marketing implies the design of detailed plans to guide the value of voluntary exchange in target markets as well as the analysis, planning, execution, and control to further achieve organizational goals. The point is to design products or services which an organization can provide to satisfy the needs and desire of target markets and apply proper prices, communication, and distribution to achieve the needs of target service markets (Duan *et al.*, 2022). The functions of marketing is classified into: (1) exchange functions: referring to various activities involved in the ownership transfer process, including buying and selling; (2) physical distribution functions: activities involved in the process of products being actually transferred from sellers to buyers, and (3) facilitating functions: various activities assisting in the transaction execution and physical distribution functions (Zhou & Yao, 2023). Kao & Dacko (2019) considered three major functions of (1) selecting beneficial target markets, (2) designing products or services according to consumer needs, and (3) drafting effective distribution channel plans and message dissemination plans. It aimed to increase product sales, enhance customer satisfaction, and further achieve a company's business objectives. In face of fierce competition, the operation of medical care institutions becomes more difficult. In order to satisfy the needs of patients and the family members, effective service marketing strategies are required to achieve goals. "Hospital service marketing" provides consumers (community residents) with high-quality healthcare through marketing so as to satisfy the needs of patients and the family members (Kiatkawsin & Han, 2019). Health service marketing does not simply spend money on making advertisement and exaggerate promotion, but applies the idea of marketing to assist patients in receiving the most appropriate healthcare services (Huang *et al.*, 2021). In addition to patients and the family members, marketing objects also contain residents in communities served by hospitals, physicians, nurses, and other employees in hospitals, people donating hospitals, as well as the mass (Olaisen *et al.*, 2020). Regarding the objective of marketing, it enhances consumers' use of products and services of medical care institutions and covers marketing organizations and the service philosophy. In other words, it aims to communicate the positive image of hospitals with target customers or the public through external marketing (Li *et al.*, 2020) and to communicate the operation ideas with medical personnel and service teams through internal marketing so as to serve patients with professional and friendly attitudes and satisfy the needs.

Factors in AI healthcare industry executing service marketing

Since the service marketing of hospitals is different from marketing of general enterprises, healthcare industry aims to provide services but do not make profits. Besides, the marketing content is restricted to Medical Law that a lot of hospitals would ignore the importance of marketing (Eberle *et al.*, 2021). The restrictions of Medical Law and social & moral responsibilities to healthcare services on marketing (Huat *et al.*, 2019) are described as below: (1) *Restriction of Medical Law*: Articles 84-87 in Medical Law indicate many restrictions to medical advertisement (e.g. non-medical care institutions shall not make advertisement for medical care; advertisements containing content implying or suggesting medical practices shall be regarded as advertisements for medical care); (2) *Hospitals' social and moral responsibilities for marketing*: Based on professional ethics and respect for life, the activity scale and objective should be conscientious.

Marketing communication could develop three functions of (1)enhancing old customers' reuse, (2)facilitating old customers' word-of-mouth to attract new customers, and (3)directly attracting new customers (Suleiman & Abdulkadir, 2022). For this reason, medical care institutions, through marketing, often provide high-quality healthcare for consumers in the market and satisfy the needs of patients and the family members to achieve organizational goals. Aiming at service industry, Fleming *et al.* (2020) proposed the core structure for service marketing, Heskett called it as "service triangle", which divided service marketing strategies into three parts. (1) External marketing: An organization's marketing activities aim at external customers. (2) Internal marketing: An organization inculcates the concept of marketing orientation and customer service to all employees, and trains and excites employees to really understand the image and how the job influences customer satisfaction and corporate image. (3) Interactive marketing: It refers to service personnel, with professional knowledge and skills, providing services for consumers (Yaghoubian *et al.*, 2018).

In order to promote health service marketing, AI healthcare industry should understand the essence (Wu *et al.*, 2022). Lin & Wu (2022) mentioned that the content of health service marketing in AI healthcare industry could be explained from external marketing, internal marketing, and interactive marketing: (1) *External marketing*: referring to general external marketing. Medical care institutions in AI healthcare industry should develop the characteristics with professional techniques, and the medical marketing personnel could have patients better understand the characteristics of the organization through various tactics, such as issuing hospital news (hospital journals), health education handbooks or leaflets and even actively participating in or holding various charitable activities; (2) *Internal marketing*: As a functional marketing, it emphasizes that healthcare services in AI healthcare industry should first complete the psychological communication and construction of internal employees and then develop the power of teams through reasonable systems and effective methods to have all service personnel in AI healthcare

industry sincerely serve patients; (3) *Interactive marketing*: It refers to the frontline service personnel in AI healthcare industry providing healthcare services to patients by standing on the position of patients. When judging the healthcare service quality, patients should take technical quality into account and pay more attention to functional quality (e.g. the degree of physicians or service personnel caring about patients' illness). Accordingly, in addition to techniques, healthcare service personnel have to learn interactive marketing to keep good and friendly interaction with patients.

Methodology

Research method

Hosseini & Keshavarz (2017) pointed out four common ways to confirm critical success factors, including (1)Regression Analysis, (2)Factor analysis, (3) Delphi, and (4)Analytic Hierarchy Process (AHP). Maria Garbuzova-Schlifter (2016) explained the meaning of using Analytic Hierarchy Process as to collect the opinions of scholars, experts, and participants, through group discussions, to simplify complicated problems into a hierarchic evaluation system with simple elements, and, according to experts' brainstorming, to calculate the contribution or priority of elements in each layer corresponding to the elements in the upper layer. Garbuzova-Schlifter & Madlener (2016) explained that the target tasks, through objectively interviewing relevant department supervisors, were first confirmed according to management procedure and individual critical success factors were proposed according to individual practical experiences and needs; critical success factors in achieving such a goal were organized through analyses and selection and then sequenced to have resources being effectively distributed in critical factors; and, finally, indicators were built for measuring the practice effectiveness.

Experts' questionnaire survey is adopted in this study. In consideration of the problems of mean, decision attribute related, and group decision inaccuracy in traditional Delphi, Fuzzy Delphi Method (FDM) and Analytic Hierarchy Process (AHP) are introduced into this study for data analyses to definitely select critical success factors in AI healthcare industry executing service marketing.

- Fuzzy Delphi Method (FDM), first appearing in 1985 when Murry *et al.* integrating fuzzy theory into traditional Delphi, applies the value of variables corresponding to different human semantics for expression. For instance, semantic weights in human's natural language could be regarded as a language variable with the value of "extremely low", "low", "medium", "high", and "extremely high"; or other words with different degrees are given different weights for estimation. Murry *et al.* proposed it to evaluate fuzzy semantic variables aiming to solve the fuzziness in traditional Delphi. Nevertheless, more specific calculation was not proposed that successive

researchers proposed solutions, such as range, fuzzy integral, triangular fuzzy number, and double triangular fuzzy number.

- Analytic Hierarchy Process: After integrating experts' opinions, the complicated decision system is constructed a hierarchic system to clarify problems layer by layer, and the dual evaluation is completed with paired comparison to evaluate the importance of factors.

Establishment of evaluation indicators

The questionnaire is delivered to experts in various fields through email. The first-time expert feedback is organized the considerations for AI healthcare industry executing service marketing. Factors with similar properties are classified and mailed back to the experts for opinions. The inquiry is emailed back and forth to eventually achieve the consensus. With major categories, an expert meeting is then called to set the critical success factors in AI healthcare industry executing service marketing, including external marketing, internal marketing, and interactive marketing. Such critical factors are then regarded as the AHP dimensions, and the corresponding classifications are regarded as the principles to build the AHP questionnaire. The research principles, through the revision with Delphi, are summarized as below.

- External marketing: information system, promotional advertising, community free clinic, and media communication.
- Internal marketing: holding symposium, network-based communication, organizational learning seminar, and internal training.
- Interactive marketing: regulations for service personnel, customer oriented service process, higher quality services, and customers' confidence and affirmation.

Research object

Aiming at customers of AI healthcare industry as the questionnaire objects, face-to-face questionnaire survey is practiced with convenient sampling. To make sure of the accuracy of samples, the research objects are orally asked about the consuming purpose before the questionnaire survey so as to ensure the research objects being customers of AI healthcare industry. Total 300 copies of questionnaire are distributed, and 241 valid copies are retrieved, with the retrieval rate 80%.

Results and discussion

After completing all hierarchic weights, the distribution is preceded according to the relative importance of indicators to show the importance of indicators in the entire evaluation system as well as to generate the overall weight of factors in AI healthcare industry executing service marketing, Table 1.

Table 1. Overall weights of factors in service marketing in AI healthcare industry

dimension	Hierarchy 2 weight	Hierarchy 2 order	indicators	overall weight	overall order
external marketing	0.357	1	information system	0.121	1
			promotional advertising	0.052	12
			community free clinic	0.080	7
			media communication	0.093	4
internal marketing	0.319	3	holding symposium	0.060	11
			network-based communication	0.064	10
			organizational learning seminar	0.084	6
			internal training	0.102	3
interactive marketing	0.324	2	regulations for service personnel	0.089	5
			customer oriented service process	0.114	2
			higher quality services	0.068	9
			customers' confidence and affirmation	0.073	8

According to the result analysis, the following conclusions are acquired in this study.

The most emphasized dimension in Hierarchy 2 is “external marketing”, with the weight 0.357, about 35.7% of overall weight, followed by “interactive marketing” (weighted 0.324) and “internal marketing” (weighted 0.319). The results review external marketing as the most emphasized dimension for AI healthcare industry executing service marketing.

The hierarchic weights of evaluation indicators in Hierarchy 3 are ordered as below.

- The evaluation indicators, under external marketing, are ordered information system, media communication, community free clinic, and promotional advertising.
- The evaluation indicators, under internal marketing, are ordered internal training, organizational learning seminar, network-based communication, and holding symposium.
- The evaluation indicators, under interactive marketing, are ordered customer oriented service process, regulations for service personnel, customers' confidence and affirmation, and higher quality services.

From the overall weight of critical success factors in AI healthcare industry executing service marketing, top five indicators, among 12, are sequenced information system, customer oriented service process, internal training, media communication, and regulations for service personnel.

Conclusion

Above research results show that people are enhancing the needs for healthcare information and demands for healthcare quality, along with advanced technology, smooth network, rising consumer awareness, and people' knowledge standard. Domestic healthcare resources are quite rich so far. Business strategies for AI health service marketing is the trend in the fiercely competitive business environment. in order to present good business performance, AI healthcare industry therefore needs good equipment and healthcare personnel, and effective service marketing communication strategies for good interaction with people in society, internal personnel in AI healthcare industry, as well as patients and the family members to reinforce employees' sense of identity to the organization, improve doctor-patient relationship, promote image of AI healthcare industry, and further enhance business performance. Using proper marketing and management skills to develop the operation niche in AI healthcare industry, promote service quality, improve doctor-patient relationship, promote image of AI healthcare industry, and enhance business performance in AI healthcare industry is the point, which cannot be ignored, for developing competitive advantages in AI healthcare industry. This study expects to provide valuable information for AI healthcare industry making management decisions for the execution of service marketing. Between AI healthcare industry and customers, quality service image of AI healthcare industry could be shaped through various service marketing measures to build good interaction with people. Between employees and customers, employees' kind explanations and services allow customers realizing the merits and characteristics of AI healthcare industry to achieve customer satisfaction and recommendation to other customers; customers therefore become successful spokespeople of service marketing in AI healthcare industry. In this case, AI healthcare industry could satisfy the needs of internal and

external customers through service marketing; besides, the professional image and the service philosophy of AI healthcare institutions could be promoted to enhance customer satisfaction, reinforce customer loyalty to further promote the image and business performance of AI healthcare industry.

Suggestions

According to the conclusions, the following suggestions are proposed in this study, expecting to provide definite guidance and direction for AI healthcare industry executing service marketing.

- AI healthcare industry setting up free medical consultation service window and regularly holding free clinic and medical teaching & learning of health and education could enhance direct communication between AI healthcare industry and people and facilitate doctor-patient relationship.
- AI healthcare industry could apply AI technology to actively deliver clinic schedule and offer meals and health tea for customers' overtime consultation to enhance customers' good impression of AI healthcare industry and promote the image of AI healthcare industry.
- Reinforcing the healthcare webpage information of AI healthcare industry and providing customers of AI healthcare industry for search and complaint (e.g. Dean box) could enhance people' knowledge and understanding of AI healthcare industry and the healthcare services offered, promote customer satisfaction, as well as enhance repurchase intention to create better business performance of AI healthcare industry.
- AI healthcare industry reinforcing the communication channels for employees and managers, allowing proper complaint and opinion exchange opportunities for employees, paying attention to the needs of employees of AI healthcare industry to relieve employees' unsatisfactory mood, enhancing the satisfaction of employees of AI healthcare industry to promote service quality could result in better doctor-patient relationship and interaction to achieve doctor-patient win-win.

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