

Research on the Current Situation and Marketing Strategy of Artificial Intelligence Products Based on the Value of User Experience

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ABSTRACT

As artificial intelligence (AI) has become a phenomenal hot spot and users have gained a general understanding of the concept of artificial intelligence, products based on the concept of artificial intelligence, such as intelligent speaker, have been active in the market. Yet they are still in a very preliminary stage at the level of actual perception. This study uses the Grounded Theory to explore the real situation and perception value of artificial intelligence products. It constructs the value model of artificial intelligence entity products perceived by users, analyzes the product value points of user experience, and puts forward the optimization path of artificial intelligence product marketing from the aspects of hardware nature, content expansion and scene making.

Keywords: artificial intelligence, user, experience value, Grounded Theory

I. INTRODUCTION

Today, the Internet is integrated in every aspect of human life and the big data algorithms and smart devices provide the driving force for "Internet +". Artificial Intelligence has become the new high ground of the tech Internet industry, fuelled by growing machine learning capabilities and network infrastructure. At the national level, during the Two Sessions in 2019, Premier Li Keqiang listed artificial intelligence in the government report for the third time, and proposed "intelligence plus" on the basis of deepening the "Internet plus", once again defining the position of artificial intelligence as a pillar industry in the future. At the end of 2018, Ministry of Industry and Information Technology approved China Telecom, China Mobile and China Unicom to start trials of the fifth-generation mobile communication system, which puts the use and promotion of 5G technology on the agenda.

II. THE MARKET FOR ARTIFICIAL INTELLIGENCE PRODUCTS IS ACTIVE

A wave of artificial intelligence has been raised at the industry level, and there are all kinds of products with artificial intelligence as gimmicks in the market. Preliminary AI technology has already begun to be used in the application market of education, home and so on. Far as this is from the true artificial intelligence, it is becoming productized. Speech is widely regarded as the

most natural form of human communication. Since 2012, the emergence of AI entities based on voice interaction technology has led to productization research and development of key technologies such as speech recognition, speech synthesis and NLP. In 2016, Internet companies launched the "smart speaker war". As the first batch of "artificial intelligence consumer products", smart speakers became the most common way for audiences to perceive artificial intelligence. At present, in the field of AI, voice interaction technology is relatively mature, but the essence of the so-called "man-machine conversation" is also limited to the process of data calculation and knowledge map construction, which is still far from the true artificial intelligence. In the concept of marketing communication, however, the product has been defined as artificial intelligence. In the minds of the general audience and users, such devices are equivalent to artificial intelligence. By virtue of the marketing and communication power of merchants, the concept of artificial intelligence has frequently entered the public's field of vision, becoming a hot Internet word and gaining popularity.

With the further development of technology, artificial intelligence at the level of user perception, combined with application scenarios, is gradually extended to functional areas, such as smart home. In the process of finding landing scene and user perception mode for smart home, "smart speaker" is considered to be an effective "pipeline" and an entry level scene of

smart life. In 2016, Amazon echo and Google home launched the first round of early consumption. Subsequently, the domestic manufacturers have entered the bureau of smart speaker war. By 2018, there were dozens of smart speakers with AI voice assistant as the core function in China, which seized the market from the aspects of timbre, appearance and price. Smart speakers are also combined with specific demand scenarios, such as children's education, hotel services, insurance, pension, etc., and become the label products of artificial intelligence in the public perception. In addition, service robots are also solutions for artificial intelligence combined with scenarios. Meanwhile, more and more AI hardware products are also emerging in vehicular and other fields. However, at present, there are still many technical nodes for such products to be overcome, such as far-field recognition, multi-round dialogues, learning ability, etc., which are not satisfactory in terms of experience. Nevertheless, brands of smart electronic devices are going "enclosure" and expanding other smart home products, such as table lamps and sweeping robots, by starting with easily accessible hardware and using mobile client platforms.

III. CONSTRUCTING THE EXPERIENCE VALUE MODEL OF ARTIFICIAL INTELLIGENCE PRODUCT — BASED ON THE GROUNDED THEORY

A. The process of model construction

1) *Methodology*: The Grounded Theory was put forward by the American scholars Barney Glaser and Anselm Strauss in the 1960s. Its biggest difference with other methods lies in generating theories from empirical data. The Grounded Theory has a relatively mature research paradigm, and its operating procedures include open coding, spindle coding and selective coding three steps. For this study, the acquired data tend to focus on user perception and user contact experience, which is basically consistent with the methodological requirements of the Grounded Theory. The development of artificial intelligence products is in the initial stage, and there are not many mature physical objects. There are three kinds of products, namely, intelligent speakers, intelligent robots and unmanned aerial vehicles, which are emerging in the market and fully contacting with users. However, the use groups of intelligent robots and drones are relatively limited, and the market size of intelligent speakers is also relatively considerable. Therefore, this study focuses on the networked intelligent speakers of voice interaction system.

2) *Data collection*: The empirical materials of this study are mainly composed of three parts. The first part is, using the python to capture network data, with the

sampling mainly considering the representativeness and influence in the market, selecting the five brands of Baidu, Huawei, Xiaomi, Tmall and Rokid, obtaining 7986 valid data by grasping the first 100 pages of purchasing comments for corresponding products in the Taobao platform and excluding general descriptions that don't include specific feelings such as "good", making analysis and generating the main categories. The second is getting involved in in-depth interview and follow-up investigation after the theory is found in an unsaturated state after the dimensions of the main categories is explored. Then the notes of the in-depth interview and follow-up investigation were further returned to the original data for coding.

B. Category extraction and model construction

Firstly, open coding is the first level of the grounded theory, which requires researchers to keep a completely open attitude towards the analysis materials and stick to the data. In this study, Maxqda.18.2 was used to encode word by word, and 6642 free codes were obtained. However, since many semantic duplication and crossover concepts were produced in the first encoding, such as "high sensitivity" and "strong recognition ability", the unified encoding of "recognition ability assessment" was used. After continuous comparison and recognition, and repeatedly focusing on the research problem, 6642 coding categories were classified into 48 concepts which were further categorized. Category is the summary of the concept, and 23 categories are obtained. Secondly, after the completion of the first-level coding, the clustering analysis of the results of the first-level coding was carried out, which revealed the potential logical relationship between categories, and a more general coding category was formed. Furthermore, the logical relationship within the category was further sorted out, and finally 7 main categories related to AI experience were formed. Finally, this paper sorted out things from the audience's contact with product information to all the value points generated in the process of post-use experience, attempting to construct the corresponding value model, as shown in the following "Fig. 1".

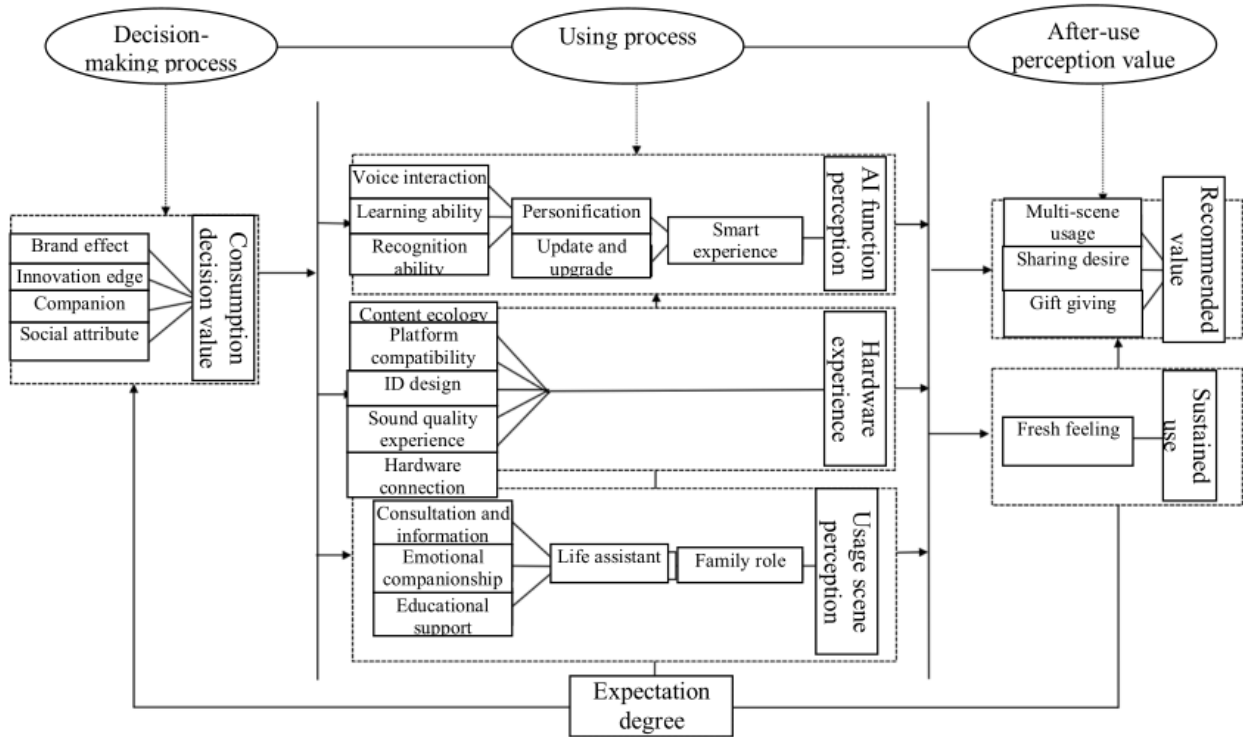


Fig. 1. Audience experience value model of AI products.

The content and conceptual relationship presented by the model is as follows:

1) *Experience value module of AI products:* According to the data coding and summarization, it is found that users' experience value of AI products mainly focuses on AI function perception, hardware experience, usage scene perception, consumption decision value, recommended value, and sustained use and expectation degree.

2) *The formation process of experience value:* The formation of the audience's experience value of AI products starts from the driving factors of the purchase decision. After the purchase behavior, the value of use process is formed in the use experience and the perception of use results after the use.

3) *Value points:* The value points of the decision-making process are reflected in factors such as brand effect; the value points of using process focus on the three aspects of AI capability perception, hardware experience and using scene perception. The after-use perception value is reflected in two aspects of recommended value and sustained use.

4) *The moderating factor of expectation on experience value:* The degree of expectation on new AI technology is an important moderating factor of

experience value. The lower the expectation value is, the more positive the experience evaluation will be.

IV. EXPERIENCE VALUE ANALYSIS OF ARTIFICIAL INTELLIGENCE PRODUCT BASED ON USER PERCEPTION

A. Social attributes: tech tags and functions as gift

It can be seen from the model that social tagging is an important part of the value of consumption decision, and the main value is focused on the two aspects of tagging and gift attribute. Those who buy and use AI speakers are not necessarily fans of technology products, but will consume the tag attributes of AI technology. In circle of friends, buying AI products means becoming the leader of new technology products or new lifestyle. Respondent D thinks that using AI products will show that he has "class", and sending them to friends will be "prestigious". In the research, it is found that the gift consumption attribute of AI speakers is very obvious. In the word-by-word coding process, the coding frequency of "gift" and "gift giving" is 11.3% of the total, indicating that the gift function of AI products has been relatively mature. It can also be seen from the value model that users' functional experience of gift attributes is concentrated in two situations. The first is to take gifting as the main factor of consumption decision in the case where the purchaser hasn't used the product before. And in the

second scenario, the purchaser gives the product as a gift after they have used it and wants to share it with others through gifting.

B. Core experience value: content ecology construction

There are three essential points of experience for AI voice interaction, namely, "the ability of hear", "the ability to understand" and "the ability to fulfill the directive". With the development of voice interaction technology, most AI voice technology manufacturers have solved the first two problems, and the "the ability to fulfill the directive" has thus become the core points of experience competition. And the decisive factor in the experience of "fulfilling the directive" is "content ecology". In the study, it was found that the main reason for negative comments on AI speakers was "insufficient resources". For a speaker product, most users will use the function of "ordering songs" after purchasing, yet the feedback of ordering songs is not ideal. "Hopefully the range of songs can be wider and extended to traditional (Chinese) opera, especially famous arias by famous old boy performers of Beijing Opera. The last thing I want to hear from Celia is that I don't like Beijing Opera, which is hard to accept! It is the quintessence of Chinese culture, after all!" (A-2113) The degree of intelligence of artificial intelligence products is determined by the background data. What resources are connected to them directly affect the user's experience. Rokid is connected to QQ Music and the Audiobook library of Himalaya, which is super nice. Its password authentication and multiplatform support are also good and I am super satisfied." (A-7236) It can be seen that the content ecology is also an important regulatory factor affecting the experience, and also the key to assess the intelligence degree of AI speakers.

C. The strong moderating effect of scene experience

By deeply optimizing the voice interaction requirements of specific scenes, and deeply combining functions with usage scenes, users can improve the completion degree of instructions issued by users and the matching degree of requirements, thus improving the experience. For example, if the main function of an AI product is parent-child companionship, it should have rich resources of children's stories and children's songs. In addition, the richness of the content also determines the continuous use experience. If every instruction gets the same or similar answer, users will lose their freshness, which is also the main reason why many AI products lose customers. However, the family use scenario of AI speakers determines that the speakers should have certain ability of resource integration and character superposition. Their function should meet the different needs of different family members, operas for the elderly, children's songs for

children and news and so on for adults. However, for other artificial intelligence products, such as educational robots, it is only necessary to enrich the content ecology of educational resources. At the current level of science and technology, it is unrealistic to blindly require the realization of intelligence in all fields. Therefore, in the competition of the speaker market, a number of product categories for different segmentation scenes have gradually emerged, such as the Tmall Magic Mirror for white collar makeup smart products and speaker functions for driving car rearview mirror, etc.

D. The concept is over-packaged and the experience unable to live up to the fame

The attraction of new technology to the audience is self-evident, but in the process of promoting artificial intelligence products, the brands exaggerate the concept of AI to some extent. [1] Advertising slogans such as "Respond Your Every Call and Understand Your Mind", "Your Need, My Honor" and "Smart Living Is Just Around the Corner", will undoubtedly make consumers have higher expectations. According to the expectation difference theory, consumers' satisfaction is determined by the direction and size of the expectation difference and the difference is the result of the comparison between the consumers' actual experience of whether the product meets their needs and the original expectation. When consumers' experience is lower than the expectation, the negative difference is generated and the satisfaction will be reduced. Consumers receive marketing messages exaggerating the intelligence of the product itself and found it unable to satisfy their expected needs. The endlessly emerging problem of "artificial amentia" and "irrelevant answer" results in negative reviews and low product satisfaction. Therefore, the over-packaging of concepts is a behavior of "draining pond to get fish" to consumers' perception, which is not conducive to the formation of positive experience value. After managing to be "early adopters", many consumers just leave the speaker aside. After using it, some netizens said, "It's just a machine, we can't ask for too much." However, a mature product cannot be sustained by lowering consumers' expectations, which is not conducive to the healthy development of the industry. AI is the future technology orientation of human beings, and the positive experience value of the audience is undoubtedly an important driving factor for the healthy development of products.

V. THE CONCEPT OF ARTIFICIAL INTELLIGENCE CONCEPT AND ENTITY OPTIMIZATION PATH FROM THE PERSPECTIVE OF USER PERCEPTION

At present, AI speakers, intelligent wearable devices, robots and other artificial intelligence products are in the status quo of high heat and poor experience. The essential reason is that the whole industry is still in a relatively early stage. Reviewed from their contact with the original smart phones to the use of smart phones, which have been fully integrated into the public's life, consumers experienced the process of experience upgrading, iteration and increasing consistency with the needs of consumers. Judging from the value of use, new technology products need to go through a long road of hardware and software optimization. In this process, the development direction of artificial intelligence from concept to entity should be viewed from the perspective of audience's actual perception.

A. *Returning to the nature of hardware, and increasing the core value of experience based on hardware*

The contact of AI technology and audience must be realized through the role of "conduit" played by physical products. The speaker, for example, is a conduit for voice interaction, and the experience is formed based on the coordination of conduit and AI technology. For speakers, sound quality, appearance, industrial design and so on are the essential attributes of their hardware. Meeting the user's needs in terms of hardware is the basis for a good experience. Taking Rokid as an example, its crescent design with frosted texture is the main reason for consumers' favor. Some consumers say that "it can even serve as an ornament". Speakers are a kind of product based on domestic scene, which demands it to certain face score as support in a furniture placing environment. In addition, it is a fact that current artificial intelligence products give users a feeling of "chicken ribs". The reason is that the functional experience of the hardware itself is poor. For speakers, listening to music is their basic demand for the hardware, but they have a low success rate of ordering songs, and "no record found" is a high-frequency result of the dialogue. Instead, some "fake demand" prevails. For example, a certain smart speaker has the function of "ordering takeout", which seems to meet the life demands of users. However, this function is based on the users being able to say the exact name of the dish, and they cannot be informed about the quality and reviews of the dish. And yet the fact that voice interaction is not smooth, the experience is extremely poor. However, users are unlikely to use the speaker to order takeout in their daily life. This function is better than nothing for AI speakers, and it will confuse the public and add negative experience.

Therefore, only by creating hardware-based core functions, can the use experience be fundamentally improved.

B. *OTA based upgrades and content extensions*

Under the condition of certain AI technology, how to improve the perception experience? This study believes that OTA upgrade and content ecology are the fundamental ways to improve the experience. As mentioned above, as an artificial intelligence platform with the entrance of a speaker, experience is by no means satisfactory when its song resources fail to meet the basic needs of the audience. Other AI products also face the same problem, and there is still a lot of room to upgrade the content resources. The content resources of AI are mainly determined by OTA upgrade and resource cooperation. Also known as over-the-air Technology, OTA is used to download data and services through the network, so that consumers can obtain more functions of the product while having the same product. In addition, resource cooperation is also a decisive factor. For example, while music platforms compete for song copyright, the music function of AI speakers is based on music platform resources. Therefore, the software optimization of AI products still needs to access effective resources and the key link of platform linkage needs to be overcome.

C. *Refining the vertical field to use the scene to optimize the experience*

As mentioned above, the origin of the design of AI products should be the user's usage scene, drawing the user experience map from the perspective of defining the scene, so as to build the content ecology under the requirements of the scene. Taking smart watches for example, consumers use smart watches mostly in sports scenes, so the key point of the first level is the health application; secondly, users will have the need to listen to music when they do exercise, so the second level of content ecology is based on music resources; third, when doing sports, it is not convenient to take a mobile phone, so the third layer of the content of the ecology should be message reminder. The above is a progressive relationship, with the first layer as the foundation and core of the experience. Only with the first layer of content, the basic needs of consumers do not come to nothing and form the beginning of a good experience. The basic methodology to improve the user experience is to focus on the vertical field, to meet the various requirements generated in the process of use in a sequential and quality manner, and the more basic the requirements are the better the satisfaction quality needs to be.

D. Strengthening social currency attribute, so as to achieve social attribute appreciation

Zhengzhou University (Philosophy and Social Science Edition), Issue 5, 2018. (in Chinese)

The earliest proponent of social currency was Pierre Bourdieu, who argued that it could be understood as the sum of actual and potential resources in social networks and communities [2]. Jonah Berger, on the other hand, pays more attention to the liquidity and interactivity of social currency. "Just as people use money to buy goods or services, using social currency can lead to more favorable comments and positive impressions from family, friends and colleagues [3]". And AI products are a new social currency in an interconnected environment. In the study, it is not difficult to find that some users are interested in the "high-tech label" given by the people around them after using such products. Therefore, this advantage can be used to enhance the social added value of AI products, enhance the gift attribute of AI products, and find the value points that match with consumers in the marketing communication link.

VI. CONCLUSION

Currently, artificial intelligence is in a situation of over-heated discussion and lagging experience. Through the exploration of Grounded Theory and sorting out the value of user experience, this study put forward that the experience value from the first contact with the products to the use of them focuses mainly on the seven dimensions of AI features perception, hardware perception, usage scene perception, consumption decision value perception, expectation degree, recommended value and sustained use and proposed relevant marketing communication strategy. Marketing communicators can also compare the value points of communication between artificial intelligence products and audiences through the value model proposed in this study.

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