

# Multi-Scenario Design of D Enterprise's Agent Driving Products Based on QFD

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## ABSTRACT

The arrival of the new consumption era has brought about rapid changes in the order fulfillment scenarios and consumer demands. Internet merchants have also begun to expand multi-scenario and flexible services. In the past ten years, the designated-driven market has flourished under the impetus of Chinese Internet companies, and designated-driven scenarios such as tourist chauffeurs and business chauffeurs have also been extended with the changing needs of users. However, with the normalization of the epidemic and the changing needs of users, the designated-driven industry is also facing many challenges. However, with the substantial growth in the market size of luxury cars and new energy vehicles, the consumption upgrade of the leading users of designated-driven services has provided opportunities for the multi-scenario expansion of designated-driven services. This paper studies from two perspectives of user experience and functional requirements. Combined with the Kano model and the QFD model, the factors that affect the user experience when users use the driving app are discussed. Based on the existing App of Enterprise D, the design points are proposed, and the optimization scheme for business growth is provided.

**Keywords:** Designated-driven app, Kano model, QFD model, User experience

## CURRENT SITUATION

### The Designated-Driven Market

The essence of designated-driven driving is that consumers exchange time with the chauffeured driver through money, and the chauffeured driver drives the consumer's vehicle to a preset destination. In recent years, with the changes in the lifestyle of contemporary young people at night, the indifference of workplace wine bureau culture and the national control under the epidemic, entertainment venues such as KTV and bars have been closed down one after another. The decline in the total amount of the drinking consumption market has forced the driving industry, which is dominated by the driving business after drinking, to find a second growth curve. The driving products of various platforms are becoming more and more similar to a certain extent, and it is difficult to experience product differentiation.

With the rise of the lazy economy, instant delivery has become a "sweet pastry" in the Internet industry. China's takeaway service scene has also changed from a single scene of food delivery by takeaways in the past, and now

takeaways can be completed according to the needs of users. Multiple scenarios for express delivery, purchasing items on behalf of others, etc. This also provides a very valuable idea for the business scenario expansion of the chauffeur service.

With the substantial growth of the luxury car and new energy vehicle market, the consumption level of the leading users of chauffeur-driven services has risen, and the existing car service market is showing a disconnection of service links, and digital transformation is urgently needed. Head users also put forward multi-scenario service requirements for chauffeur driving, such as surrogate maintenance, surrogate charging, etc.

### **Designated-Driven App**

D Enterprise is a world-renowned mobile travel platform, and the chauffeur service is a branch of its business. Due to its high service quality and high cost, the company's current chauffeur-driven business is gradually being squeezed by a number of competing products, and users' minds about the brand are still stuck in driving after drinking, so it is difficult to achieve breakthrough growth in GMV. Based on the perfect driver training system, chauffeur service system and strong brand endorsement of D company, D company has good conditions to expand business scenarios. This research takes the v products of enterprise D as the research object, and conducts product expansion planning and research on its chauffeur-driven business.

In recent years, other small and medium-sized travel companies in China have successively launched designated-driven products, but most of them focus on price advantages. In order to consolidate users, some car service companies and insurance companies have also launched services such as annual inspections, car washes, etc., but due to factors such as total user volume, service quality, and brand promotion, the results are modest. But it can also be seen that major companies have a trend of developing in the direction of multi-scenario driving.

## **RESEARCH METHODS**

### **Kano Model**

The KANO model is a useful tool invented by Noriaki Kano, a professor at Tokyo Institute of Technology, to classify and prioritize user needs. linear relationship. According to the relationship between different types of quality characteristics and customer satisfaction, Professor Kano divided the quality characteristics of products and services into five categories: Must-be quality, One-dimensional quality Attractive quality, Indifferent quality and Reverse quality

### **Satisfaction Index**

Customer Satisfaction Index (CSI) can be divided into increasing satisfaction index (SII) and decreasing dissatisfaction index (DDI), and the calculation formula is as follows. The smaller the absolute value of the two is, the smaller the impact on the user is; on the contrary, the greater the impact

**Table 1.** Primary user requirements.

Primary User Requirements						
A1	A2	A3	A4	A5	A6	A7
On behalf of charging	On behalf of refueling	On behalf of washing	On behalf of annual car inspection	On behalf of maintaining	On behalf of parking	On behalf of picking up children

**Table 2.** Questionnaire score table.

Function	Dislike	Accept	It doesn't matter	Deserved	Like
Provide	1	2	3	4	5
Do not provide	5	4	3	2	1

$$SII = (A + O)/(A + O + M + I). \quad (1)$$

$$DDI = -(O + M)/(A + O + M + I). \quad (2)$$

### QFD Model

Quality function deployment was proposed by Japanese quality management master Yoji Akao in 1966. It can transform user needs into design requirements, calculate key design requirements, optimize resource allocation, and design products that satisfy users. Its characteristics are that it pays attention to market research, obtains user needs through investigation, uses quality matrix to decompose user needs into various stages of product design, and promotes cooperation between departments related to products to jointly ensure product quality.

## RESEARCH PROCESS

### Demand Research

Through market research and face-to-face interviews with chauffeur drivers, the new requirements of current private car owners (including fuel vehicles and new energy vehicles) for designated-driven product functions are collected. Seven first-level user requirements are obtained through sorting are shown in Table 1.

### Questionnaire Design

The questionnaire is divided into two parts. The first part is the basic information of the user, and the second part is the Kano questionnaire. According to the first-level user demand table, the respondents are asked questions from the positive and negative aspects of a single demand to determine the user importance of the demand. Each evaluation has 5 options, labeled 1-5, as shown in Table 2. Substitute the results into the Kano evaluation table to get each requirement are shown in Table 3.

**Table 3.** Kano model evaluation table.

Function	Like	Deserved	It doesn't matter	Accept	Like
Like	Q	A	A	A	O
Deserved	R	I	I	I	M
It doesn't matter	R	I	I	I	M
Accept	R	I	I	I	M
Dislike	R	R	R	R	Q

In the end, a total of 103 valid questionnaires were recovered. Among them, 33.18% used chauffeurs more frequently, and the ratio of fuel vehicle owners to new energy vehicle owners was 6.6:3.4.

### Demand Importance Calculation

According to Kano's demand classification, the calculation formula of the user satisfaction index  $T_i$  is as formula (3). According to formula (1) and (2), it is derived that when the SII value or DDI value tends to 0, the demand for this demand is relatively high. The smaller the impact of user satisfaction; the greater the impact when it tends to 1.

$$T_i = \max(|SII|, |DDI|). \quad (3)$$

Then, using the 5-order Likert scale (1 means the least satisfied, 5 means the most satisfied), each tested user is asked to rate the current state of satisfaction and the target state, and the average value is taken as the current state. Satisfaction  $S_i$  and target satisfaction  $S_0$ , the calculation formula of the target improvement rate  $V_i$  of user demand satisfaction is as formula (4).

$$V_i = S_i/S_0. \quad (4)$$

In order to more accurately determine the importance of the user's needs, an adjustment coefficient  $k$  is introduced, with values 0, 0.5, 1, and 1.5, corresponding to indifference quality, must-be quality, one-dimensional quality and attractive quality, respectively. In formula (3) (4), the demand adjustment improvement rate  $IR_i$  can be calculated, such as formula (5).

$$IR_i = (1 + T_i)^k \cdot V_i. \quad (5)$$

Each user scores the weight  $H_i$  of each requirement, and the score ranges from 1 to 5, where 1 represents the least important, 5 represents the most important, and the average is used as the final score of the user's requirement weight. On the basis of the demand adjustment improvement rate  $IR_i$ , combined with the user demand weight  $H_i$ , the importance  $LR_i$  of the chauffeured user demand can be calculated, as shown in formula (6).

$$LR_i = IR_i \cdot H_i. \quad (6)$$

According to the product function requirements data of 103 car owners on the driving APP, the Kano classification of each user's needs is calculated

**Table 4.** List of the final importance (LRi) of user needs.

	Hi	Kano Quality Classification	k	S0	Si	Ti	Vi	IRi	LRi	Ranking
A1	4.3	A	1.5	3.72	4.5	0.59	1.21	2.43	8.9	4
A2	4.4	I	0	3.1	4	0.68	1.29	1.29	4.35	6
A3	4.4	I	0	3.02	3.98	0.69	1.32	1.32	4.47	5
A4	4.6	O	1	3.5	4.5	0.73	1.29	2.23	10.86	1
A5	4.4	O	1	3.78	4.62	0.58	1.22	1.92	9.27	3
A6	4.5	O	1	3.67	4.3	0.82	1.17	2.13	9.94	2
A7	4.5	I	0	2.94	3.78	0.63	1.29	1.29	4.1	7

according to Table 3, and then the final importance LRi of the user's needs is calculated according to formulas (3)-(6). The Carnot analysis results of the functional design of APP products are shown in Table 4.

### House of QDF Matrix

Convert the needs of chauffeur users and car owners (potential users) into design requirements, use the KJ method to sort out the design requirements, fill in the sorted design requirements into the quality function expansion matrix table, and determine the design requirements and the requirements of chauffeur users. See The relationship  $y_j$ , requires users to rate the degree of correlation between the two on a scale of 1, 3, and 5. The higher the correlation, the higher the score. Based on the LRi in formula (6) obtained from the House of Quality expansion matrix, formula (7) can be used to obtain the design requirement importance  $W_i$ , and then the key design requirements are determined according to the size of the important  $W_i$  values of the design requirements.

$$W_i = \sum_{j=1}^n L R_{ij} \cdot y_j (j = 1, 2, \dots, n). \quad (7)$$

Based on the design requirements of the driver app user interface formulated by professional designers within D company based on experience, and according to the quality function development matrix and enterprise development goals, the user needs are now transformed into initial design requirements, and then they are summarized and graded. , so as to obtain 4 first-level design requirements and 11 second-level design requirements in Table 5.

## RESEARCH RESULTS

### Questionnaire Results

The results of the questionnaire show that among the 7 product functional requirements, 1 requirement is attractive demands: A1, 3 requirements are One-dimensional Quality: A4, A5, A6, and 3 requirements are Indifferent Quality: A2, A3, A7. The highest absolute value of SII is A1 and A5, which means that the better the APP does in these three aspects, the higher the user satisfaction. The absolute values of DDI are A4 and A6 respectively,

**Table 5.** The design requirements of the designated driver.

Primary Design Requirements	The Secondary Design Requirements	Serial Number
Information architecture	Information classification	a
	Interface navigation	b
Visual Design	Character size	c
	Picture size	d
	Color combination	e
Function Design	Recommended design for nearby stores	f
	Commonly recommended design	g
Value perception	Privacy	h
	Preferential strength	i
	Membership service	j

**Table 6.** Relation matrix of APP design requirements and user needs.

	a	b	c	d	e	f	g	h	i	j
A1	5	5	3	5	5	5	5	5	5	5
A2	5	5	3	5	5	5	5	5	5	5
A3	3	5	3	5	3	5	5	5	5	5
A4	3	5	5	5	5	3	1	5	3	5
A5	3	5	5	5	5	5	3	5	5	5
A6	3	5	5	5	5	1	1	5	5	5
A7	3	3	1	3	3	1	1	5	1	3
Total score	182.17	251.25	181.11	251.25	242.31	181.57	141.31	259.45	221.33	243.05
Ranking	6	2	8	2	4	7	9	1	5	3

which means that when the APP does not do well in these two aspects, user satisfaction will drop rapidly.

### Kano-QFD Matrix

Table 6 presents a matrix diagram of the relationship between user requirements and design requirements. As can be seen from the matrix diagram, user privacy, interface guidance, and image size are the top three design points in order. Privacy, price and efficiency are the most important things that users value when using chauffeured products, so they need to be paid attention to in the design of the entire experience link. Ranked fourth and fifth are interface colors and discounts. Content design belongs to the content layer, including distance information, price concessions, and operational pictures. Information architecture belongs to the structural layer, focusing on whether the information presented to users is reasonable and meaningful, which is a key factor in enhancing user experience.

### DESIGN POINTS

Based on the above data and conclusions, combined with the brand advantages and product tone of D enterprise, the design points of the driving app are drawn.

1. Improve the function of transparent transmission of the billing card on the home page.

The tab stream is added on the top of the billing card to display the transparent transmission of business information such as driving, annual inspection, and parking, so that users can know the addition of new functions at the first time. When users have such needs, they only need to switch the function mode on the billing card. The launch of new functions requires a lot of investment in development resources. Therefore, effective function transparent transmission is very important. If the function module is hidden too deeply, the user will be unaware of the new function, and it is not conducive to the collection of effective data feedback in the later stage.

According to the analysis of the QFD model, the demand for agency annual inspection, agency maintenance and agency parking is the highest. Therefore, these three functions can be launched first, and users' feedback on the functions of universal replacement products can be observed after half a year of launch, and then optimized in a timely manner. upgrade. When the feedback of the current three types of functions is good, the charging function can be launched in a targeted manner. Because this function requires a certain proportion of new energy vehicles and high-income white-collar users, first-tier cities such as Beijing, Shanghai, Shenzhen and Hangzhou can choose to open the pilot function.

2. Optimize the link for users to issue orders.

For functions such as car washing, charging, and refueling, users will only place orders when there is such a demand at the moment. Therefore, shortening the user's billing path will help improve the final order completion rate. In the service product content display area, recommendation rules can be added: if the old user has a purchase record, match whether the current location is a store that has been visited, and sort based on the order, location, and last purchase time. For new users, refueling, car washing, charging, and maintenance stores are sorted based on the user's current location, allowing users to quickly select categories and place orders on the homepage.

3. Increase the protection of the owner's vehicle privacy and security.

For agency products, the car owner needs to hand over the car and car keys to the platform driver, and the driver replaces the car owner to complete the corresponding needs. Therefore, some users will inevitably have certain concerns. Therefore, in the head operation poster area of the homepage, the quality of the platform drivers and the amount of accident claims will be transparently transmitted to users to provide users with psychological protection.

Secondly, after the order-receiving link of the driver-end App, the vehicle inspection link is added: the driver needs to take a video of the owner's vehicle, check the current interior items with the owner, etc., and when the owner's key is delivered during the vehicle change phase, the owner cooperates with the driver to conduct vehicle inspections. , to avoid unnecessary accidental losses. If there is any loss, you can immediately report the problem to the customer service through the reporting function, and let the platform solve it.

## CONCLUSION

This paper first uses the kano model to qualitatively analyze the user requirements, and then uses the QFD model to quantify the requirements, sort the design points, and provide guidance for App design. Although price is a sensitive factor affecting user consumption, service quality is still the most important for chauffeured products, especially for the head users who contribute the most GMV to chauffeured products. At present, domestic multi-scenario driving is still a blue ocean market, and there is no price advantage in the initial stage of promotion. Therefore, in order to improve product revenue, it is necessary for enterprises to strengthen cooperation with relevant enterprises to reduce costs.

## ACKNOWLEDGMENT

The authors would like to acknowledge myself and my team.

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