

# *Automobile Marketing System Based on Digital Media Technology and "Internet+" Web Services*

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**Abstract:** With the rapid development of the Internet and digital media technology, a new type of marketing method has emerged - internet marketing. Internet marketing is a new type of marketing method that utilizes digital media interaction to achieve marketing goals. This new type of marketing has unique marketing characteristics such as cross-temporal, high-efficiency, economical, etc, which better meets the information dissemination and exchange between enterprises and individuals. In this context, this article uses Internet technology to design an automobile marketing system based on digital media technology and "Internet +" web services, and conducts functional tests on the system. The results show that the performance of the system meets the standards. The system is applied to the automotive industry and found that the system's sales statistics module can clearly count the company's sales, and pointed out that in 2019, the company's highest sales record was in September, and its sales reached 37.53 million yuan.

## **1. Introduction**

At present, Internet marketing is rapidly expanding to various fields, and the automobile industry is also accepting the transformation of marketing model brought by the Internet. In developed countries, automobile Internet marketing has achieved good results. After China's accession to the WTO, the world needs to bring China into the world economy. The construction and improvement of the automobile Internet marketing system is exactly the need for China's automobile industry to be in line with the international standards. Therefore, designing an automobile marketing system based on "Internet +" web services has important research significance for improving the marketing management level of the automobile industry and stimulating economic growth.

Many scholars have conducted research on the design of the automobile marketing system of the "Internet +" web service, and have also obtained certain achievements. For example, in the process of implementing the localization strategy of the automobile industry, a scholar fully realized the fundamental changes in the corporate philosophy and management model brought about by the construction and utilization of information technology, and focused on the integration of information technology and corporate management, and slowly created develop a mature profit model based on the company. Through continuous research on the construction and utilization of information technology, it has promoted the improvement of the internal structure of the company, improved the company's ability to respond quickly to the marketing environment, and formed a

corporate learning mechanism, making the company difficult. Always maintain marketing vitality in the ever-changing market environment [1]. A scholar integrates various media on the web to create a marketing model, puts forward a customer-centric marketing plan, and points out that customers are business partners, and companies must maintain long-term business and customers with quality, service and innovation. Means of relationship. As customers and retailers maintain long-term strategic partnerships become more and more important, companies must improve their relationship management skills and change the direction of marketing research [2]. Although the research results on the design of the "Internet +" web service automobile marketing system are good, some functions of the system still need to be optimized to meet the needs of automobile marketing and improve marketing efficiency.

This article analyzes the advantages of "Internet +" web services in automobile marketing and the functional requirements of the marketing system. It is understood that the design of an automobile marketing system must not only meet the marketing management requirements of the automotive industry, but also meet the customer experience when applying the system. Therefore, the structure model of the automobile enterprise marketing system and the structure model of the user subsystem are constructed, and the functions of the system are tested to verify the feasibility of the system to realize the network automobile marketing.

## 2. Discussion

### 2.1 The Advantages of Automobile Marketing of "Internet +" Web Services

As an effective, fast, convenient, and inexpensive marketing method, Internet marketing has its advantages as follows:

(1) The cost of the enterprise has been effectively reduced

Internet marketing shortens marketing channels, and personalized services can not only improve service quality, but also reduce business costs for medium-sized enterprises. The Internet enables companies to share information about car commercialization activities, such as market research, product information provision, and low-cost advertising. At the same time, companies can make strategic transaction decisions based on the traces of information that consumers have seen on the marketing system, avoid loss of customers and cause sales losses, thereby improving marketing performance [3].

(2) Customers are more convenient to purchase

When users tend to buy vehicles online, they need to open the company's related webpages, not only to see the vehicle pictures, but also to find the performance data of different models, and then they can compare them by themselves. Users should not worry about not having time to go to the physical store to see the car. The vehicle information on the website can be viewed anytime and anywhere. The ability to buy a car online is one of the most important reasons for users to choose an online marketing system.

(3) Two-way communication can be achieved between enterprises and customers

Automobile network marketing can use the Internet to allow automobile companies and customers to communicate across time and space. Taking into account the needs of customers, auto companies pay more attention to customers' willingness to buy cars. Merchants and consumers can communicate online, and the Internet can also record data on car models that consumers like, and it can always store the data in a database to facilitate customer search. In this way, the customer relationship management is done well, and the various information required by customers is also learned, and personalized marketing services are realized on this basis. On the other hand, the popularization of the Internet enables customers to keep abreast of the latest product information in the automotive industry, compare the performance of models, and increase customer interest in

buying [4-5].

(4) Conducive to the sound development of the automobile industry

Internet marketing not only realizes real-time interaction between enterprises and consumers, but also information interaction between peers, enabling enterprises to obtain purchase information from users, as well as dynamic sales information from competing companies. The information interaction brought about by the Internet enables companies to have better flexibility and liquidity when formulating sales plans, and to find trading opportunities. Internet marketing can also promote cultural interaction between auto companies and learn from other companies' management models [6].

(5) Obtain better advertising media effects

Using Internet marketing can allow users to watch vehicle video displays, which brings great visual impact to customers, and advertising and marketing also enrich the information content of automotive products. In addition, with the popularization of the Internet, the increase in user coverage has enabled companies to gain more audiences. People can learn some information about auto products through advertisements, arouse their desire to buy cars, and tap more potential customers [7].

## 2.2 Analysis of System Functional Requirements

(1) Functional requirements of customer personnel

Through the system, users need to complete corporate news query, online car browsing, car maintenance information, online opinion submission, etc. Through the automobile marketing system, customers can learn about relevant car company information; secondly, customers who want to buy a car can find information about cars sold by the company. Once a vehicle product that meets the user's car purchase requirements is found, the user can add to the shopping cart and pay for the car online. When the customer needs the company to provide repair and maintenance services for their own vehicles, they can first check whether there are auto parts that need to be replaced in the vehicle parts warehouse on the system to ensure that the customer can pick up the repaired car with only one trip[8]. In addition, if customers have opinions or complaints about the sales of vehicles, they may also be able to submit them online.

(2) Functional requirements of sales managers

The sales management personnel of auto companies mainly need to complete the tasks related to car sales through the system, such as the management of vehicle order information, vehicle replacement information management, and sales statistical analysis. The sales management personnel process customer orders through the system, and they are dealing with some special tasks. When ordering, they may first confirm the completeness and correctness of the order information, and then receive the order to confirm that the order has been integrated and managed by the system. At the same time, to inquire about the replacement request made by the customer who needs to replace the vehicle, review the customer's replacement request, and the vehicle that meets the replacement standard set by the system, the company must process the customer's application and change the vehicle for the customer. Sales managers also need to manage the detailed vehicle information posted on the system webpage to facilitate customers' inquiries about relevant information. In addition, for automobile sales companies, annual or even quarterly automobile sales statistics are very important, including statistics on sales volume, sales models, and sales amount. Analyzing automobile sales can understand which models are more popular with consumers favor, which also reflects the company's operating conditions, is conducive to the adjustment of sales strategies and the formulation of new marketing plans [9].

(3) Functional requirements of corporate executives

Car sales company executives investigate and deal with customer feedback and complaints related information through the marketing system. During the sales process, business executives undertake after-sales service work. On the system, corporate executives mainly inquire about customer and corporate information, grasp the company's vehicle sales trends, assist the executive members in the company's decision-making process, and at the same time, they must keep abreast of the work quality of employees in each position of the company, and make timely adjustments when they encounter sales problems. In addition, according to customer complaints and feedback, managers need to deal with them one by one.

#### (4) Functional requirements of system administrators

The administrator of the automobile marketing system needs to maintain user information, set and assign user permissions, and process business-related information. In the specific sales process, the administrator needs to perform tasks such as adding new users and changing user permissions. In addition, important corporate information must be released in a timely manner to facilitate users to understand corporate dynamics [10-11].

### 2.3 User Satisfaction Evaluation Indicators

Predictability accuracy is the most important indicator for measuring system performance. It initially measures the degree of overlap between the predicted results and the actual values on the test set. Scoring prediction is to predict the final score value of users for items without score characters [12]. The accuracy of scoring prediction can be measured by root mean square error (RMSE) and mean absolute error (MAE):

$$RMSE = \frac{\sqrt{\sum_{u,i \in S} (r_{ui} - v_{ui})^2}}{|S|} \quad (1)$$

$$MAE = \frac{\sum_{u,i \in S} |r_{ui} - v_{ui}|}{|S|} \quad (2)$$

Among them, S represents the test set,  $r_{ui}$  and  $v_{ui}$  represent the actual score value and predicted score value of user u on item i, respectively.

## 3. "Internet +" Web Service Automobile Marketing System Design

### 3.1 Structural Design of Automobile Marketing System

The system mainly includes nine modules, namely, company introduction, news center, model display, accessory selection system, service center, market questionnaire survey, used car release system, and online message system. The core of the system is the service center, which contains three sub-modules, namely car purchase reservation, maintenance reservation, and test drive reservation (Figure 1).

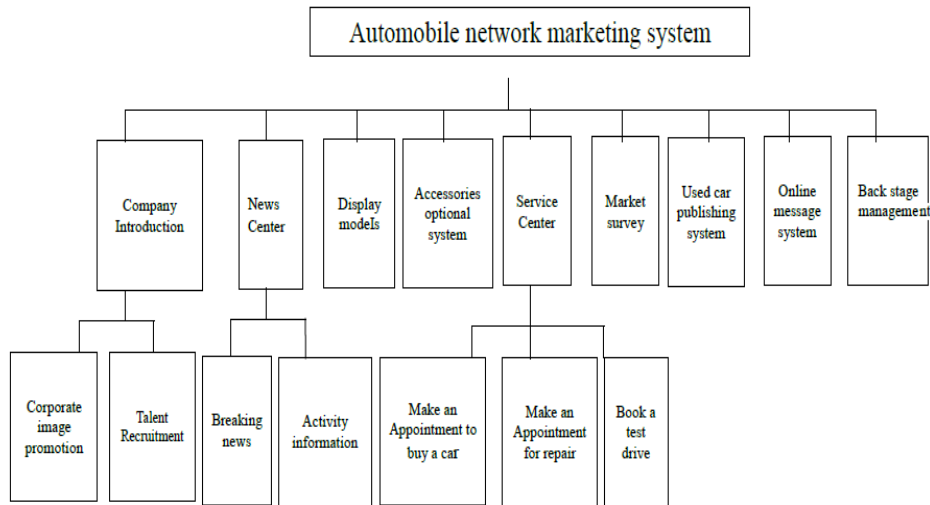


Figure 1: Structure diagram of automobile marketing system

### 3.2 User System Structure Design

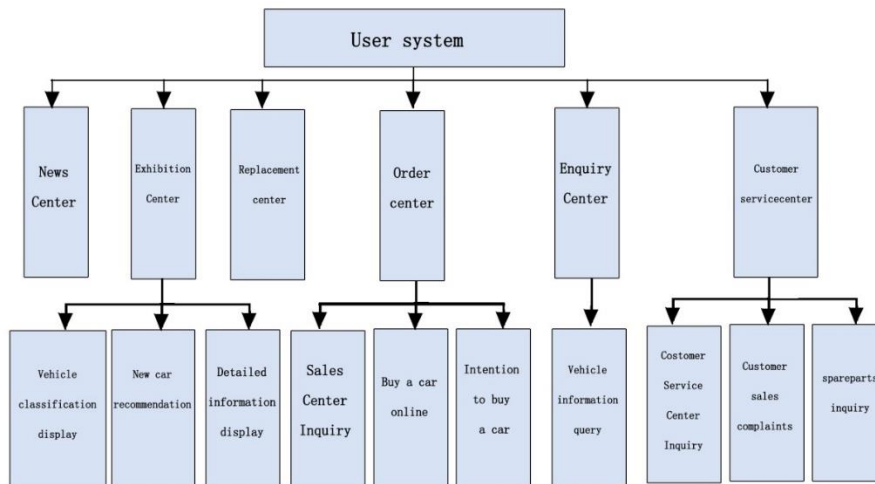


Figure 2: User system structure diagram

The main role of the user system is the customer. The customer logs into the automobile sales integrated service system to browse and query related information, as well as online ordering and other functions. Figure 2 shows the structure of the user system. After logging in to the system, enterprise customers can browse all kinds of news information released by auto sales companies in real time. The replacement center is mainly used for customers with replacement needs. Customers can log in to the system to use the replacement center to enter information on their own second-hand vehicles and submit replacement applications. The staff responsible for replacement management in the company can make replacement applications by querying replacement applications in the background Acceptance. The design of the inquiry center is mainly to facilitate the customer to understand the detailed information, parameters and performance of the intended vehicle before purchasing the vehicle. After the customer has a detailed understanding of the specific vehicle information, they can transfer to the order center to apply for an order [13].

## 4. Realization of Automobile Marketing System Based on "Internet +" Web Service

### 4.1 System Performance Test

As shown in Table 1, five performances of the automobile marketing system of the "Internet +" web service were tested. The system program response time should be less than or equal to 5 seconds, and the actual response time is 1.35 seconds. This performance meets the requirements; the system is successfully executed. The rate should be greater than or equal to 97%, and the actual value obtained by the test has reached 100%, indicating that the execution function of the system meets the requirements; the number of concurrent operations should be at least 20, and the actual number has reached 24; the CPU usage rate should be less than 75%, the actual test value is 63%; the memory usage should be less than 72%, and the actual test value is 50%. These properties are within the required range, so the system can be put into use [14].

Table 1: Performance test table

	Target value	Actual value	Pass or not
Program response time	$\leq 5s$	1.35	Test passed
Execution success rate	$>97\%$	100%	Test passed
Concurrent operation	20	24	Test passed
CPU usage	$<75\%$	63%	Test passed
Memory usage	$<72\%$	50%	Test passed

### 4.2 Implementation of Sales Statistics Analysis Module

The sales statistics analysis module is to conduct online statistics and analysis on the annual sales of automobile companies. This article takes an automobile company as an example and applies the system to corporate sales statistics. Figure 3 shows the company's monthly sales in 2019, reflecting the company's sales. It can be seen from the figure that March to May and September to November are peak sales seasons, and December to February and June to August are low sales seasons. The highest sales of the year reached 37.53 million yuan, and the lowest sales were 3.69 million yuan. Therefore, the system can realize the statistics of the enterprise's sales business.

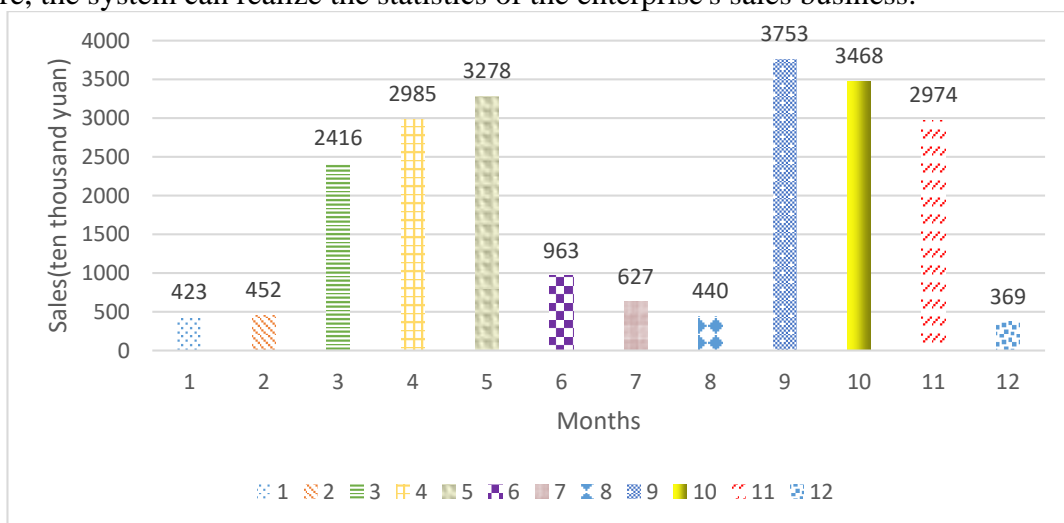


Figure 3: Annual sales statistics of an automobile company in 2019

## 5. Conclusion

This article designs an automobile marketing system based on Internet technology, and realizes the interaction between consumers and enterprises through modern technology. This system is used to analyze the annual sales of an automobile company. It can be seen from the statistical results that under the premise of meeting the performance standards of the off-season, the automobile company should vigorously develop sales plans during the peak sales season to increase automobile sales, thereby driving China's economic growth.

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