

# Study on Key Strategy of Regional Auto Repair Shop's Service Items

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**Abstract-** Due to the rapid economic development of modern society, vehicles, motorcycles and other personal transport have become an indispensable item in modern society. Motor vehicles, motorcycles and other transport means need regular maintenance and repair, and transport repair is a professional field, which requires the professionalism from a professional repair shop. This study discusses the key strategy of the regional auto repair shop's service items. First of all, the study probes into the market operation, core technology and service human resources design literature. Following the literature review the study establishes a framework, and then utilizes the Delphi method to carry out 2 expert questionnaires, and build relevant measurement dimensions. The auto repair shop customers are set as the subject of interview. This paper uses the analytic hierarchy process to understand the relative weights of the auto repair shop's regional market operation dimensions from the view point of auto repair shop owner, and find out the important evaluation factors of the service items. According to the results of this study, the price of automotive materials should be the first consideration for the maintenance of all car owners, and also the main reason of market operation criterion. Service human resources is the secondary criterion; well-trained service specialist should be strengthened to properly understand the real needs of customers by customers' actions and behaviors. The core technology is the final criterion, because operating the auto repair shop belongs to the lowest-standard category. Market operation essentially is the maximization of customer satisfaction through the service items. There exists a trend that the customer is now more demanding towards auto repair shop, expecting auto repair shops to solve all the problems of the vehicle at once. The overall weight ranked from the 1<sup>st</sup> to the 3<sup>rd</sup> in descending order is automotive material prices (0.2116), maintenance hour cost (0.2070), and the speed and accuracy of service (0.1463); the main criteria have covered nearly 70% percentage, highlighting their significance.

**Keywords:** Auto Repair Shop, Regional Marketing Strategy, Delphi Method, Analytic Hierarchy Process

## I. INTRODUCTION

The economic development of a country requires transportation flow; the automobile industry not only drives the transportation of goods and passengers, from the beginning such as design, manufacturing, sales, after-sale service, even to the vehicle scrap and decomposition industry, all aspects of automobile industry produce economic value. Therefore, the automobile industry is one of the important pillars of the national economic development. According to the 2016 data from the Ministry of Economy, Taiwan Transportation Vehicle Manufacturers Association has summarized the continuous growth of the total output of the Taiwan vehicle industry; the output value of the automobile industry has increased from 2007's NTD 145.1 billion to 2016's NTD 190.6 billion. For auto parts industry it has increased from 2007's NTD 203.6 billion to the NTD 192.1 billion in 2016. Except for the 2008 financial tsunami, the rest of the year all witnessed remarkable growth. Automobile also affects the development of other industries, including the steel, rubber, plastics and other industries involved in vehicle manufacturing; there are automotive products insurance, vehicle financing, vehicle maintenance, second-hand car trading and other industries. In recent years, popular automotive electronics and Internet systems industry all have direct and indirect impact on the automobile industry, and thus substantially affecting the overall national economic output.

This study mainly discusses the market operation, core technology and service human resources of the auto repair shop, and based on the aforementioned study motives, the study takes an auto repair shop in Miaoli area as the subject of study. The purpose of this paper covers the following 3 aspects:

- (1) According to the results of this study, the paper puts forward some feasible suggestions on how to improve the market operation, core technology and service human resources of the auto repair shop.
- (2) Explores the customer's views on market operation, core technology and service human resources.
- (3) Explores the relationship between customer and 3 variables, which are market operation, core technology and service human resources.

This study is subject to human, material and time restrictions; it only takes an auto repair shop in Miaoli County, Taiwan as the subject of study, so the results may not be inferred to other regions. In addition, the study uses the Analytic Hierarchy Process (AHP) as the main model for study. When the level of hierarchy is increased, the number of two factor comparisons will be increased exponentially, which may lead to a decrease in the attention of the respondents due to too many questions, which might result in the loss of effectiveness of the model. Therefore, this study shall be verified by the consistency test.

## II. LITERATURE REVIEW

The main purpose of this study is to discuss the key factors of the market competitiveness and market outlook featuring the market operation, core technology and service human resources using the AHP method, and how to transform the key factors into the core development items of the enterprise by using the level procedure method, so that the final product can satisfy the customer's demand.

### 2.1 Definition of Automobile Repair Industry

According to the classification of automobile repair industry in Automobile Repair Industry Management Measures by the Ministry of Economic Affairs, automobile repair and maintenance industry refers to automobile maintenance shop and auto repair shop, which are further divided into 3 categories: (1) Automobile maintenance shop. (2) Type B auto repair shop. (3) Type A auto repair shop. The Measures are not in conformity with the current social-economic situation. The Ministry of the Interior and the Ministry of Transportation and Communications abolished the Measures on December 5, 2001, led by the Ministry of Economic Affairs. After the abolition of the Measures, the National Policy Agency under the Ministry of the Interior and the Department of Commerce of the Ministry of Economic Affairs recognized that the industry is no longer a specific industry and that there is no relevant requirement for the industry to be specifically regulated by any government authorities. According to the method and purpose of the establishment of auto repair shop, it is divided into 2 kinds: auto brand dealer repair shop and individual repair shop. [1]

### 2.2 Market Operation

#### 2.2.1 Market Orientation

Market orientation has become the focus of marketing management and strategy theory, and market orientation is of great value to enterprises in market observation, chiefly because it continuously concentrates on collecting consumer demands and unique ability of competitors. And Chen and Quester [2] confirmed that using market-oriented data collection method, researcher can create superior customer value.

Kohli and Jaworski [5] put forward the market-oriented action theory and defined the market orientation as "a series of activities and processes by all members of the organization who take the business objective as the first priority, collect the information of the existing target market customers and the future of the enterprise, and transmit the collected information to all the departments within the organization. Finally, the collected information is used for overall assessment and response.

Market-orientation concept evolves from marketing concepts, and Deshpand'e and Webster Jr [3] pointed out that "marketing concepts defined an organization's unique culture, granting it a customer-oriented way of coming up with strategies and assignments." Narver and Slater [6], by analyzing the continuous competitive advantage and market-orientation literature, regarded the market orientation as a culture within the organization.

### 2.2.2 Operating performance

Enterprise performance is the most important indicators to examine operational activities; enterprise performance makes sure that managers shall achieve their job objectives. The enterprise, when implementing a new strategy, must set aside the desired results, and through the enterprise performance, it can know the effectiveness of the implementation of the strategy [7].

There is no institutionalized theory developed in the measurement of organizational performance. In the past, scholars have used some scientific methods and models to find a measurement for organizational performance: CHAKRAVARTHY[1]'s classification and measurement of enterprise operation performance is divided into 4 categories (1) business objectives: the degree of business plan reached; (2) productivity: the plant, and equipment utilization; (3) operating profit: the enterprise's return on investment; (4) long-term advantageous resources: the sustainability of enterprises, or its reason for growth.

## 2.3 Core Technology

### 2.3.1 Definition and connotation of professional competence

1. Definition and connotation of competence: competence is generally defined as the behavioral representation of cognition, affection, skill, and judgment, which shows that the individual is capable of performing a task in all aspects, or in other words, a skilled behavioral trait [12].
2. Definition and connotation of professional competence: Hall&jones [4] pointed out that the specific definition of professional competence refers to "the comprehensive technology, behavior or knowledge displayed by the learner through a clear conceptualization of learning". Professionalism is the practice of highly specialized roles in society through specially strengthened education and the necessary training.

### 2.3.2 Factor and connotation of the professional expertise of automobile repairing and protecting

Chen [17] pointed out that the high-level car repair depends firstly on the technology, secondly on the quality, and then service. This is essentially the law of jungle. Without outstanding service, stable and good quality, and solid technical foundation, it will be difficult to retain owners and even shake the customers' confidence in an auto repair shop.

## 2.4 Service Human Resources

Human resource management refers to the use of modern scientific methods, to carry out reasonable training, organization and deployment of materials and human resources, so that the human, material resources shall strike the best proportion. In the meantime, appropriate induction will be performed on people's thoughts, psychology and behavior, for control and coordination purposes. This process gives a full play to the human initiative, so that the best talent obtains the most befitting post, the best utility of materials is reached, and organizational goals achieved [18].

2.4.1 The service process of an auto repair shop

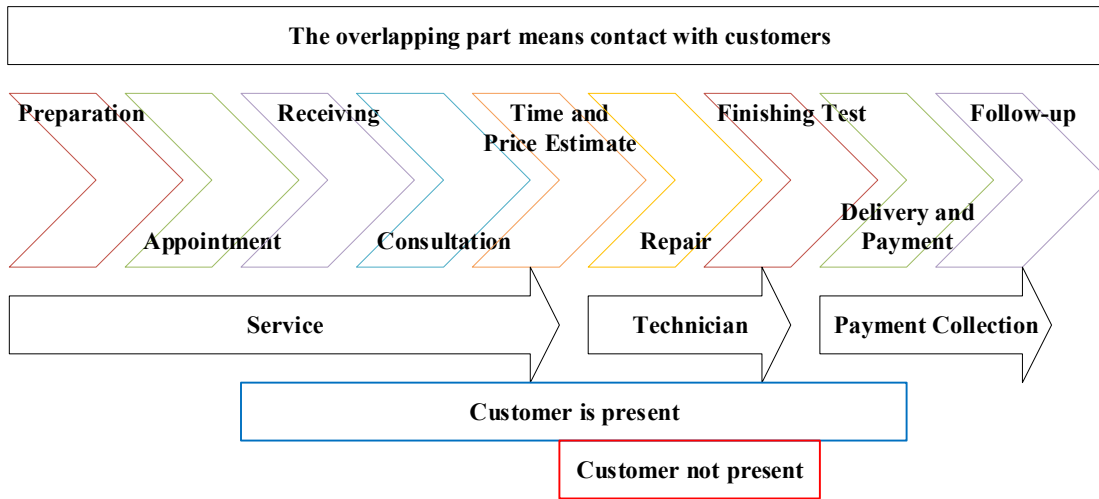


Figure 1 Contact time-point process table between service personnel and customers Source: Lo, 2015.

III. RESEARCH METHOD

This study intends to establish a criteria model which can be used as a key strategy to study the service items of regional auto repair shop. Through the analytic hierarchy process it confirms the study topic, establishes the assessment criteria, the questionnaire survey, the relevant weight, and eventually the decision-making suggestion is provided.

3.1 Research Subjects

The subject of this study is divided into 2 parts: one is the expert group of Delphi method, the other is the research subject of analytic hierarchy process (the customer of the area repair shop).

3.2 Research Steps and Implementation

Table 1 Target level and criteria level of service items of auto repair shop

Target Level	Criteria Level
Key factors of automobile repair service items	A. Market Operation
	B. Core Technology
	C. Service Human Resources

Table 2 Market operation criteria and sub-criteria level

Criteria Level	Sub-criteria Level
A. Market Operation	A1. Maintenance hour cost
	A2. Auto material price
	A3. Speed and accuracy of service
	A4. Set up customer lounge area
	A5 Bonus points and feedback
	A6. Other additional services (car inspection, tire positioning, insurance)
	A7. Completeness of warranty data

Table 3 Core Technology criteria and sub-criteria level

Criteria Level	Sub-criteria Level
B. Core Technology	B1. Provide car beauty and care service
	B2. Qualification of automotive materials
	B3. Special maintenance tools for automobiles
	B4. Additional free service (car wash, car cleaning)
	B5. Maintenance and care package
	B6. App for inquiring about the actual maintenance status of the vehicle and the repair completion time

Table 4 Service human resource criteria level and sub-criteria level

Criteria Level	Sub-criteria Level
C. Service Human Resources	C1. Repair and maintenance by service personnel
	C2. Familiarity with the car brands by service personnel
	C3. On time delivery of vehicle by service personnel
	C4. Confirmation of customer needs or decoration requirements by service personnel
	C5. Telephone tracking after vehicle repair by service personnel
	C6. Provision of rescue services and catering services by service personnel
	C7. Picking up calls to differentiate business scope by service personnel

IV. RESEARCH RESULTS

This research develops "Hierarchy analysis questionnaire" using the 2-on-2 comparison question as the medium, and proposes key factor weight order of service items of the auto repair shop, establishes the pair comparison matrix, and calculates each factor's characteristic vector value.

4.1 Analysis of the Results of the 1<sup>st</sup> Delphi Method Questionnaire

Table 5 Results of the 1<sup>st</sup> Delphi Method Questionnaire

Target Level	criteria Level	Sub-criteria	Standard deviation	Average mean	Delete/Save
The key factors to the service of auto repair shops.	A. Market Operation	A1. Maintenance hour cost	0.00	5.00	Save
		A2. Auto material price	0.00	5.00	Save
		A3. Speed and accuracy of service	0.00	5.00	Save
		A4. Set up customer lounge area	0.00	5.00	Save
		A5 Bonus points and feedback	1.05	3.89	Delete
		A6. Other additional services (car inspection, tire positioning, insurance)	0.83	4.22	Save
		A7. Completeness of warranty data	0.83	4.22	Save
	B. Core Technology	B1. Provide car beauty and care service	0.00	5.00	Save
		B2. Qualification of automotive materials	0.00	5.00	Save
		B3. Special maintenance tools for automobiles	0.00	5.00	Save
		B4. Additional free service (car wash, car cleaning)	0.83	3.78	Save
		B5. Maintenance and care package	1.00	3.33	Delete
		B6. App for inquiring about the actual maintenance status of the vehicle and the	0.83	3.78	Save

		repair completion time			
	C. Service Human Resources	C1. Repair and maintenance by service personnel	0.00	5.00	Save
		C2. Familiarity with the car brands by service personnel	0.00	5.00	Save
		C3. On time delivery of vehicle by service personnel	0.00	5.00	Save
		C4. Confirmation of customer needs or decoration requirements by service personnel	0.00	5.00	Save
		C5. Telephone tracking after vehicle repair by service personnel	0.00	5.00	Save
		C6. Provision of rescue services and catering services by service personnel	0.50	4.33	Save
		C7. Picking up calls to differentiate business scope by service personnel	1.74	2.44	Delete

4.2 Analysis of the Results of the 2<sup>nd</sup> Delphi Method Questionnaire

Table 6 Results of the 2<sup>nd</sup> Delphi method questionnaire

Target Level	criteria Level	Sub-criteria	Standard deviation	Average mean	Delete/Save
The key factors to the service of auto repair shops.	A. Market Operation	A1. Maintenance hour cost	0.00	5.00	Save
		A2. Auto material price	0.00	5.00	Save
		A3. Speed and accuracy of service	0.00	5.00	Save
		A4. Set up customer lounge area	0.00	5.00	Save
		A5. Other additional services (car inspection, tire positioning, insurance)	1.12	4.00	Delete
		A6. Completeness of warranty data	0.83	4.22	Save
	B. Core Technology	B1. Provide car beauty and care service	0.00	5.00	Save
		B2. Qualification of automotive materials	0.00	5.00	Save
		B3. Special maintenance tools for automobiles	0.00	5.00	Save
		B4. Additional free service (car wash, car cleaning)	1.01	3.44	Delete
		B5. App for inquiring about the actual maintenance status of the vehicle and the repair completion time	0.60	4.11	Save
	C. Service Human Resources	C1. Repair and maintenance by service personnel	0.00	5.00	Save
		C2. Familiarity with the car brands by service personnel	0.00	5.00	Save
		C3. On time delivery of vehicle by service personnel	0.00	5.00	Save
		C4. Confirmation of customer needs or decoration requirements by service personnel	0.00	5.00	Save
		C5. Telephone tracking after vehicle repair by service personnel	0.00	5.00	Save
		C6. Provision of rescue services and catering services by service personnel	1.32	3.67	Save

## 4.3 Analysis on the results of questionnaire of analytic hierarchy process

Table 7 Analysis of the significance of comprehensive factors

Criteria	Weight of criteria	Sub-criteria	Weight of Sub-criteria	Overall Weight	Rank
Market Operation	0.6870	Maintenance hour cost	0.3013	0.2070	2
		Auto material price	0.3080	0.2116	1
		Speed and accuracy of service	0.2130	0.1463	3
		Set up customer lounge area	0.2109	0.1449	4
		Completeness of warranty data	0.1538	0.1057	5
Core Technology	0.1006	Provide car beauty and care service	0.1759	0.0177	14
		Qualification of automotive materials	0.3322	0.0334	11
		Special maintenance tools for automobiles	0.2468	0.0248	12
		Additional free service (car wash, car cleaning)	0.2451	0.0246	13
Service Human Resources	0.2124	Repair and maintenance by service personnel	0.2202	0.0468	7
		Familiarity with the car brands by service personnel	0.2014	0.0428	8
		On time delivery of vehicle by service personnel	0.2205	0.0468	6
		Confirmation of customer needs or decoration requirements by service personnel	0.1792	0.0381	9
		Telephone tracking after vehicle repair by service personnel	0.1787	0.0380	10

## V. CONCLUSION AND SUGGESTIONS

The purpose of this study is to discuss the key factors of the service items of the auto repair shop, to summarize the reference indexes affecting the key factors of the auto repair shop owners by literature discussion and adjusted Delphi induction. The study establishes the weights of the key factors of the auto repair shop owners and customers in the repair shop, so as to understand the key factors of the service items.

According to the results of the study, the top 5 items are "car material price", "maintenance hour cost", "speed and accuracy of service", "set up customer lounge area" and "completeness of warranty data", which are the key factors for the owners and customers at an auto repair shop. The scope of this study is based on the customers of Miaoli County domestic auto repair shop. In the course of the research, the author puts in order the key factors of the customers' attention on the auto repair shop. And the hierarchy structure is suitable for the customer selection of service items at the auto repair shop. This research can be used to study the hierarchical structure for future studies, but because of the different urbanization, income, population structure are other different factors, the final results could vary greatly. In the subject of the auto repair service item project, this research has preliminarily completed the survey and analysis work, and it will be able to provide supporting information to the follow-up research on the related auto repair shop's service items in the future.

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