

Case Study of Integrated Strategy Development Model for After-Sales Service of Heavy Machinery Industrial

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ABSTRACT

The heavy machinery is widely used from the agricultural applications to the majority of construction projects. The present study integrates the strategy analysis and propose a integrated strategy developmental model (ISDM) of after-sales service in heavy machinery industrial. The ISDM which developed in present study not only can apply in after-sales service, marketing, finance, R&D, and others fields of heavy machinery industrial in Taiwan, but also can apply in others countries.

Keywords: Case Study, Integrated Strategy Development Model, After-Sales Service, Heavy Machinery Industrial

I. INTRODUCTION

The heavy machinery (Haycraft, 2002) is widely used from the agricultural applications to the majority of construction projects. The imported of heavy machinery also relative with the economic development of a country. The correlation coefficient between the imports value of heavy machinery with the next year's GNP was about 0.92 in Taiwan (Lee et al., 2002). Table I shows the imported numbers and brands of heavy machinery during 2003-2011 of Taiwan.

TABLE I

THE IMPORTED NUMBERS AND BRANDS OF HEAVY MACHINERY DURING 2003-2011 OF TAIWAN (ERG, 2012)

Year Brand	2003	2004	2005	2006	2007	2008	2009	2010	2011
CAT	13	35	54	73	97	118	108	94	102
Komatsu	62	111	129	101	129	92	54	89	95
Hitachi	41	61	90	95	89	85	40	43	31
Kobelco	20	23	25	30	25	25	25	28	20
Volvo	8	7	1	5	8	5	4	7	10
JCB	0	0	0	0	1	5	3	7	5
Liugong	0	0	0	0	0	0	0	2	4
Case	36	1	7	2	0	0	1	4	0
Daewoo	0	2	0	0	0	0	0	0	0
Doosan	0	0	0	0	0	0	0	1	0
Total	180	240	306	306	349	330	235	275	267

The CAT had the largest market share since 2008. The case company is the unique agent of CAT in Taiwan. However, the Japanese companies had the second to the fourth place of market shares due to the lower price than CAT. Moreover, the China's company (Liugong) also entering the Taiwan market from 2011. Therefore, increase the competition intense of the heavy machinery market in Taiwan.

In recent years, the design and manufacturing of heavy machinery has followed the trend of high efficiency, high productiveness, meeting the requirements of the environment protection agreement, and related to the higher quality level for the service request. Therefore, how to strengthen the enterprise's competitiveness and improve the service level of after-sale had become more important for the agencies.

In after-sales service market of heavy machinery industrial, agent must face with both of high quality demand from customer and low price compete from non-original maintenance plants. Hence, due to the price competition weakness in after-sales service of the original plant. How to strengthen the supply chain management of parts to shorten the service time and reduce logistics costs in order to reduce the price gap to

the non-original maintenance plants at price advantage will become the key competitive point of the after-sales service market.

Therefore, the present study has the following aims: (a) Investigation the industry status and its structure of after-sales service of heavy machinery industrial. (b) Investigate the after-sales service strategy of case company. (c) Proposed the procedure of integrated strategy development.

II. STRATEGY FROMED PROCEDURE

A. Establish Structure of Integrate Strategy Development

Figure 1 shows the ISDM structure of present study. The present study firstly conducted SWOT (Strength, Weakness, Opportunity, and Threaten) analysis (Weihrich, 1982) and forecast the market of the business relative environment. Secondly, develop the SO, ST, WO, and WT strategies. Third, the expert in-depth interview was to identify the SO, ST, WO, and WT strategies which developed in present study. Finally, formed the SO, ST, WO, and WT of the after-sales service strategies of the case company.

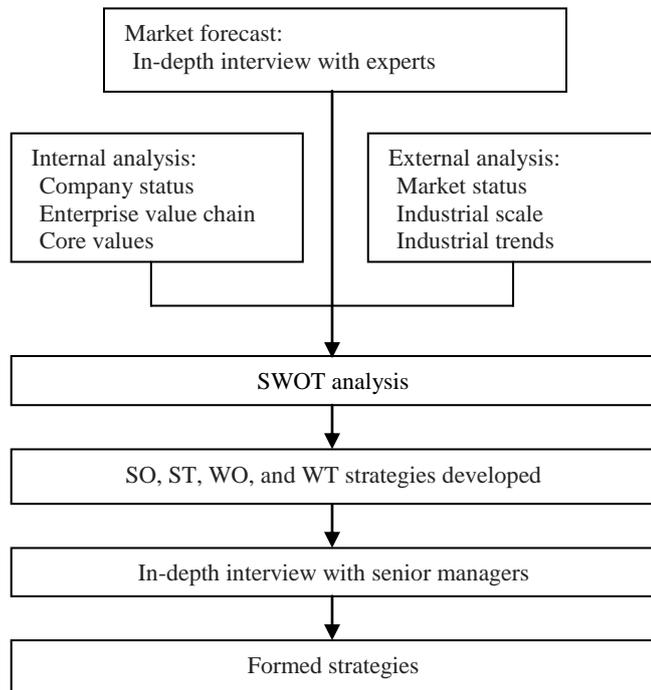


Figure 1: ISDM structure of the present study

B. The profile of the Experts

The profile of the experts who in-depth interview in present study were shows in Table II.

TABLE II

THE PROFILE OF THE EXPERTS WHO IN-DEPTH INTERVIEW IN PRESENT STUDY

Department	Job Title	Experiences
Taoyuan	General manager	>20 years
	Director	>10 years
Taichung	General manager	>15 years
	Manager	>10 years
Tainan	General manager	>20 years
	Manager	>10 years
Kaohsiung	General manager	>15 years
	Director	>10 years
University A	Professor	>20 years
	Associate professor	>15 years
	Assist professor	>10 years
University B	Professor	>20 years
	Associate professor	>15 years

The purpose of in-depth interview and analysis are to get the following contents:

- (1) The core values of after-sales service.
- (2) The leadership factors of after-sales service.
- (3) The competitive conditions of after-sales service.
- (4) Direction of strategy making of the case company.

C. The Evaluation Form of the Strategy Implement Performance

Table III shows the key performance indicators of after-sales services of case company after expert in-depth interview. The four key domains are: service access, customer satisfaction, parts business, and service capacity.

TABLE III

THE EVALUATION FORM OF THE KEY PERFORMANCE

Core Business	Business Classification	Past	Now
Service Access	Numbers of service shop		
	Full-Function service shop		
	Population of machines		
Customer Satisfaction	Overall satisfaction		
	Average trip per field service		
Parts Business	Parts satisfy rate		
	Parts turnover rate (Year)		
Service Capacity	Staff capacity (NT\$/Month)		
	Jobs turnover rate (day)		

D. Establish of Integrate Strategy Development

The vision and goals are the direction guild of the enterprise. Without vision and targets, the development of the enterprise will not appropriately changes response to the external environment.

Human resource, finance, and management are the main compositions of after-sales service in heavy machinery industrial. Though the judge of top managers to achieve the vision and targets of an enterprise. Therefore, the

human resource, finance, and management are the bases of the ISDM.



Figure 4: The structure of ISDM

To achieve the vision and goal of the business, must through the implementation of the strategies. Analysis the internal and external environmental of the industry, the strengths and weakness of the business and the opportunities and threats of the internal and external environment, such as the establishment of the two pillars of the arch can be found future industry trends. Use of cross SWOT analysis, identify the four quadrants of the strategies. Use these strategies to achieve the company's vision and goals.

However, the external environment of industry is not static, when the environment changes, the strengths and weakness of the business and the opportunities and threats of the internal and external environment also changed. Therefore, the business must be corrected or changed their strategies.

When the business do not has the vision and goal, just as removed the keystone in the middle, the arch well collapse. Therefore, the business did not know how to set the strategies.

III. INTRODUCTION OF CASE COMPANY

E. Company Culture

Case company emphasized the executives must learning based on modern methods and practices to improve the management and leadership skills. At the same time the company also encouraging the positive feedback; mistakes and constructive criticism within the organization is able to be accepted. Establish a learning organization culture, the company offers employees a

variety of learning and training platform, also encourage colleagues to actively help others more development-oriented.

F. Vision

Excellence is the benchmark to do everything.

G. Mission

The five missions of the case company are shows below:

- 1) Though providing high-quality products and services to support CAT as the most outstanding all-round solution provider.
- 2) Provide employees a safe, helpful, caring, and productive working environment.
- 3) Keep the company to continue profitable growth and increase the shareholder additional remuneration.
- 4) Establish good relations with partners to create a win-win situation.
- 5) Fulfill the social responsibility and become a respected organization.

H. Content of After-sales Service

- 1) Service access: The case company had established national wide service net in Taiwan.
- 2) Service of parts sales: The service about parts of the case company includes: free call of parts service / parts real time quoted price / maintenance options / Preventive Maintenance and soon.
- 3) Factory repair services: The maintenance plants of case company all have passed ISO 9000 and four stars standard of pollution control of CAT.
- 4) The site maintenance service: Technicians usually must to maintenance the heavy machinery in site. Therefore, carrying spare parts and special tools must be required. In addition to the construction site specifically for the maintenance of vehicles to create, do not have the entire equipment to the factory.
- 5) Project maintenance service: Follow the proper plan in advance for the heavy machinery into the factory maintenance process to reduce downtime. According to the arrangements of the progress in production lines, according to heavy machinery operating life of the original proposal, provided in accordance with customer needs to choose maintenance mode.

6) Customer operation and maintenance training: The case company had provided regular study for customers to help customers understand the knowledge needed proper operation and maintenance. The case company also provides special training courses according to customer special circumstances need.

IV. SWOT ANALYSIS

I. Strengths and Weakness of After-sales Service of Case Company

- 1) Strengths: (a). Complete and consistent agent system. (b). Health finance of agent's parent company. (c). The company positioning is clear. (d). High-quality customer service. (e). Advanced maintenance strategy: implement lean production program (Lin et al., 2015a) and Six Sigma program (Lin et al., 2015b) to improve production performance. (f). Continued to maintain good customer relations. (g). Good brand image and word of mouth. (h). Adhere to the concept of "we are the industry leader". (i). Case company with professional service team, plant, and equipment. (j). National-wide service network.
- 2) Weakness: (a). Equipment suppliers to develop highly involved in sales strategy. (b). Delivery time is too long of partial of parts'. (c). Inventory unable to match the diverse needs of parts. (d). Technical employee training is difficult. (e). Excessive concentration on large institutions and over reliance on the main product sales model.

J. Opportunities and Threats of External Environment of Case Company

- 1) Opportunities: (a). New purchase and logistical service opportunities from military. (b). The annual new investment plans of public construction. (c). The maintenance market of used heavy machinery is the 4-5 times of new heavy machinery. (d). Customers' demand became more refined.
- 2) Threats: (a). Vulnerable to regional economic fluctuations. (b). The cheap parts and products come from China and South Korea. (c). The new need of heavy machinery industry is gradually saturation. (d). The parallel imported parts from traders.

K. Concept of Strategy Matrix

When the opportunities and threats of the external environment and the strengths and weakness of the internal environment are analyze. The cross strategies (ST, ST, WO, and WT) were conducted (Porter, 1980).

1) SO (Max-Max) strategy: Invest resources to enhance the strength and capacity for the opportunity. Such strategy is the best strategy. Able to work closely with internal and external environment, companies can take advantage of resources to make a profit and expand.

2) ST (Max-Min) strategy: Invest resources to enhance the strengths and reduce the threats. Such strategy is usually used when the company faced to the threats.

3) WO (Min-Max) strategy: Such strategy is to take advantage of external opportunities of the enterprises to overcome their weakness.

4) WT (Min-Min) strategy: Invest resources to improve the weakness and reduced threats. Such strategy often used when enterprises are facing difficulties, such as reduce scale.

V. DEVELOPED STRATEGY MATRIX

The developed of SO, ST, WO, and WT strategies of after-sales service of case company were showed in Table IV.

TABLE IV
THE STRATEGY MATRIX OF AFTER-SALES SERVICE OF CASE COMPANY

	Opportunities	Threats
Strengths	SO: Growth strategy 1. Increased maintenance service of the parallel imported heavy machinery. 2. Increased maintenance service to other brands' heavy machinery. 3. Combined the sales and after-sales services.	ST: Leadership strategy 1. Anew market segment. 2. Expand the distance with the competitors.
Weakness	WO: Reverse strategy: 1. Get more discount program to original parts supplier 2. Provide more maintenance	WT: Defensive strategy: 1. Adhere the major customers on existing basis. 2. Initiative provided the benefit

	options to customers based on technology advantages.	maintenance project to customers to increase customer satisfaction and loyalty.
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VI. IMPLEMENT THE STRATEGY MATRIX

The case company has improved service planning and hardware facilities, as there is a solid foundation arches. However, the external environment changed all the time, companies need to constantly examine their environment and competitor trends to modify their strategies. Table V shows the results of case company after implement the strategies. Table V shows the evaluation performance all have significantly improved.

TABLE V

THE RESULTS OF EVALUATION PERFORMANCE FORM AFTER STRATEGY IMPLEMENT

Core Business	Business Classification	Past	Now
Service Access	Numbers of service shop	2	4
	Full-Function service shop	2	4
	Population of machines	979	1552
Customer Satisfaction	Overall satisfaction	7.2	8.3
	Average trip per field service	3.5	1.25
Parts Business	Parts satisfy rate	76.3	81.9
	Parts turnover rate (Year)	3.4	6.7
Service Capacity	Staff capacity (NT\$/Month)	60,000	120,000
	Jobs turnover rate (day)	5.8	2.8

Although the result is positive, but the implementation of the future strategy must be further examine, and make necessary amendments strategy to enable enterprises to continue to the vision and goals.

VIII. CONCLUSION

In the present study, SWOT model was carried out to investigate the external industrial environment and strategy analysis. Through a more complete thinking to understand the problems of heavy machinery service and provide strategic planning reference for managers when decision making.

L. Conclusion in Industrial

- 1) The core value of after-sales service lies in the professional of maintenance capacity: In fact, the core values of after-sales service must to meet customer needs.
- 2) The upgrade of after-sales process is the main factor to ensure the leadership position of a brand: Provide variety of service options to customers to increase the maintenance value and improve customer satisfaction. While many service policies may not meet the investment returns, but is testing the vision and wisdom of managers is to be a leader or a follower.
- 3) The recruit and training of talent staff are the important competitive factors: Human resource, finance and management are the three bases of a services business and the human resource is the main factor for the success of control of the business. Therefore, enhance the communication ability of the service employees is the most current important thing.
- 4) From passive to initiative service mode: The after-sales services of heavy machinery usually provide passive services in the past, the main purpose of after-sales service is to deal with the problem that has occurred based. However, when the occurrence of high maintenance costs or warranty disputes, often resulting in distrust or misunderstanding of customers. In recent years, due to the advance in electronic monitoring systems, the heavy machinery itself can correctly reminder and record failure scenario. Heavy machinery manufacturers can remote monitoring the heavy mechanical condition, according to the heavy machinery using frequency to schedule maintenance, can timely initiative to provide necessary services.
- 5) Replicable ISDM: The ISDM which developed in present study not only can apply in after-sales service, but also can apply in marketing, finance, R&D, and others fields in heavy machinery industrial. Further, it can apply to others countries.

M. Conclusion in Case Company

- 1) After-sales service affected the re-purchase of new machines: After completing the purchase, an important determinant of whether the customer will

buy again is the "quality" and "service". When the differentiation of product is slight, customer satisfaction of after-sales service is the most important factors that will influence customers to re-purchase new machines in the future.

- 2) After-sales service is an important source of enterprise profits: The usage period of heavy machinery usually up to 15-20 years. The parts and maintenance demand are the same with usage period. After-sales service is an important and stable source of profit for case company.
- 3) After-sales service is the key factor to develop enterprise strategy: provide service to meet the needed of market will affect the sustainable development and of enterprises.

VI. REFERENCES

- [1] ERG, 2012, Equipment Research Group Report, <http://www.erginternational.com.au/>.
- [2] Haycraft, W. R. 2002. "Yellow steel: The story of the earthmoving equipment industry", University of Illinois Press, Urbana and Chicago.
- [3] Lee, C.-J., Pan, T.-L. & Lin, C.-C. 2002. Case studies of the implementation of benchmarking in heavy machinery agents, 2002 Symposium on Cross-Strait Business Management, Lunghwa University of Science and Technology (in Chinese)
- [4] Lin, C.-C., Lee, C.-J. & Kuo, H.-Y. 2015a. Case study on overhaul performance of excavator CAT 320 series by lean production program, *Scholars Journal of Engineering and Technology*, vol. 3, no.4A, 390-396. ISSN: 2321-435X.
- [5] Lin, C.-C., Lee, C.-J. & Chueh, L.-Y. 2015b. Case study of overhaul performance of CAT 3412 marine engine by Six Sigma program, *International Journal of Scientific Research in Science and Technology*, vol.1, no.2, 85-90, ISSN: 2395-602X.
- [6] Porter, M. E. 1980. "Competitive strategy: Techniques for analyzing industries and competitors", N.Y.: The Press.
- [7] Wehrich, H. 1982. "The SWOT matrix - A tool for situational analysis", *Long Range Planning*, London, Apr, vol.15.