

A Model of Agile System in Automotive Service Industry

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Abstract

In today's market demand, the inherent competitiveness amongst the service providers especially within the automotive industry has become increasingly tougher than before. Sustainability is the key agenda in order for business entities to stay relevant. Agile System is one solution towards achieving competitiveness for an organization as well as becoming sustainable in the market field. A study on the implementation of an agile system within the automotive service industry was conducted. A model of an agile system was developed, as an implementation guideline for all organizations within the industry. A survey was conducted through a collaborative effort with 60 automotive workshops within the Klang Valley (Kuala Lumpur, Malaysia) area. The consolidated data were then analyzed using the SPSS software in order to measure the relationships between the identified factors and their organizational performances. Based on this study, the implementation of an agile system is found to be important, to the selected industry which involves the firm's organizational structure, the way the firm treats its people, the partnerships with other organizations, and its relationship with their customers. An implementation model of an agile system is very useful to the automotive service industry, in order for the industry to improve their management performances as well as to remain competitive.

Keywords: Agile System; Automotive Service Industry; Organizational Performances.

INTRODUCTION

Automotive service industry has used the agile system as a solution of cost reduction by rapidly responding to unpredictable and ever-changing service demand, and support of rapid service changes by tailoring their service launches to ensure that the customer need is achieved and having an increase on the satisfaction level of their customer [1], [2].

The implementation of an agile system is still in its early stages whereby the strategies needed, in order to achieve a successful implementation whilst striving towards organizational performances need to be well developed.

The implementation model will allow the companies in having a rapid response viability towards changing demand and they

are also able to have an advantage in a competitive environment. This competitiveness is necessary for a company because it helps in identifying and to be able to analyze the company's strengths and weakness. Besides, to improve the quality of servicing, workers, and products, competitiveness is important because it ties in with the customer's satisfaction level, as this increases after that, it would turn into profitability for these companies. In addition, to improve the rate of failure of companies, they must be managed with strategies designed and conceptually idealized upon a long-term planning basis and to certify continuous success is achievable in this competitive environment. The implementation of an agile system is important to industry that involves the firms on the organizational which is better than the conventional system [1], [3]–[5].

The purpose of this research is to study on the levels of implementation of an agile system, within the automotive service industry and to develop a defined framework of an agile system that could be utilized as implementation strategies for organizations, that serves as a guideline. To ensure the organization can be competitive in this environment, the organization must accelerate their processes and must also be effective upon their process of production and servicing. This will also will clearly explain on how they treat the people, competitors, and to increase the customer enrichment. [6]

CURRENT PROBLEMS AT AUTOMOTIVE SERVICE INDUSTRY

The main problems that occurs within the automotive service industry, that can be a threat to the business performances, typically relates to companies continuously failing to achieve high customer satisfaction levels by having long waiting times for servicing and repair works performed.

In addition, the problem that is often encountered at workshops, are the rude attitude of workers towards attending customers. This happens because, when the work results are not at par with what the customer expects, dissatisfaction naturally occurs. The workers might also lack the communication skills and is unable to effectively explain to the customer, thus the customer becomes unhappy with the service that has been performed. The fact is, the company's

profitability will probably suffer due to opportunity loss, as repeat customer visits will only become viable through customer's satisfaction. Chronically if the problems is not be solved effectively, the organization will lose the customer's trust and which could result in lost of revenue, and further damage to the quality of reputation for the organization.[7], [8]

The automotive service industry must also be concerned about safety issues that relates to workers and customers. This is because, it involves a direct relationships between the customer and to the organization itself. If safety neglected, it will also affect the quality and profitability of the company as the customer would feel unsafe and questions the company's stance on the matter. This directly relates to the level of service provided and customers satisfaction.[9]–[11]

Thus, in order to increase the quality of services delivery towards achieving the customer satisfaction as well as to build the good reputation amongst the players in this industry, implementation of an agile system would be one of the alternative solution for the automotive service industry.

IMPLEMENTATION OF AGILE SYSTEM – A REVIEW

Agile system is a revelation of a system that undergoes an expansion originally stemming from the lean system concept. To become more responsive and to fulfill the customer needs, the condition for convenience and organizations must be implemented in automotive service industry. [2], [12], [13]

The breakdown of work in short, the organization of team, the frequent to finished the assessment, and the customer satisfaction level need to be increase by applying the conceptual characterized of agility. [14]

In addition, to improve the competitiveness of firms, the application of agile system can be used. There are several things that is important to consider in improving the profitability without ignoring the satisfaction of the customers. In order to lower unnecessary costs, firms must be able to improve quality and respond quickly to any competitiveness and the customer needs. [15]

The effectiveness of implementation of the agile system is subjected to extensive understanding of their structure, performance capabilities, and the practices. This is including the removal of non value activities that may affect the performance level of agility. [16]

An implementation of agile system had been successfully applied in many industries. The implementation which is more focused on goods productivity which includes the combination of unpredictable crisis happening. [15]

The agile system has an international significance but which is not all known to people, about its principle and the agility attributes. Generally, there are two reasons companies need to

implement the agile system. The first is to improve the quality, customer acceptability, and compliance with relevant standards. The other reason is to save development time and costs. [1], [6], [17], [18]

The advantages of agility is the cost of products or services and quality are good to the customers that they are prepared to accept. It would also increase the emphasis on the speed of response of the environment in creating new market opportunities. [5], [9] Thus, the advantages of an agile system is the ability to achieve the continuity in a competitive environment and encountering unanticipated change. It will also respond quickly to the rapid changes to the market according to the customer needs based on cost, services, and quality of the products. In addition, the organization must be able to find the correct arrangement that is necessary and make it to agile in certain factor which is culture, strategies, technology, and business practices.[16], [17], [19]

METHODOLOGY

A study of the implementation of Agile System at the automotive service industry was performed by conducting a survey at selected organization. In this survey, the awareness and implementation level of agile system were measured. In addition, several factors were identified and the important selected factors being assessed through this survey. The frameworks of the implementation of agile system was introduced at the end of this research.

1 Data Collection - Survey

Data collection was done through survey activities. A set of questionnaire was developed and distributed to 60 service centre in Selangor area. These organization were randomly pick based on the sample size calculation. The questionnaire was design and divided into 3 (Three) main section, the demographic part, the level of agile system implementation within an organization and the factors affecting the successful implementation of agile system in an organization. This includes how the organization had set up the pricing - either by the customer value or by the production cost, the data on knowledge about the principle of agile system which has enriched the customer value, how they cooperate with the competitors, how they organize on the organizational, and how they leverage the impact of performance in information and people. The aims of all questions were to assess the level of implementation and to identify the important factors of agile system. The category of questions were summarized in Table 1.

Table 1: Category of Questions in Survey Instrument

No	Category	Types of Questions
1	Demographic	1. Organization Background 2. Awareness of the implementation agile system
2	Implementation Agile System	3. Level of implementation the agile system
3	Factors of Agile System	4. Organize to master change. 5. Customer satisfaction. 6. Cooperation with competition. 7. Leverage people and information. 8. Major reason of implementing agile system.

implementation. It includes the automotive service centres and independent workshops.

From this research, the findings of demographic profile was examined through descriptive analysis. Table 2 show the descriptive analysis of the participated organization.

Table 2: Part 1- Demographic

No	Items	Freq	Percent age %	
1	Types of automotive workshop	Independent Workshop	26	90
		Manufacturer Service Centre	28	
2	Total of employee in organization	<50	48	88.9
		51-150	4	7.4
		>250	2	3.7
3	Years of established	<5 years	23	42.6
		5 to 10 years	23	42.6
		>10 years but <15 years	4	7.4
		>15 years	4	7.4
4	Level of familiarization of agile system	Very little	29	53.7
		Little	10	18.5
		Moderate	7	13.0
		Much	6	11.1
		Very much/Fully	2	3.7
5	Level on implementation of an agile system	Very little	28	51.9
		Little	7	13.0
		Moderate	10	18.5
		Much	6	11.1
		Totally implemented	3	5.6

DATA ANALYSIS

The collected data were analysed by utilizing Statistical Package for the Social Science (SPSS) version 24. The relationship between the identified factors were measured and the results were used to develop the framework of the agile system.

FRAMEWORK DEVELOPMENT

In the development of the implementation framework, the identified factors were analysed and the impact of the factors towards the organization were identified. It will include factors on implementation of agile system such as customer enrichment, co-operating to enhance the competitiveness, the organization to master change, and leveraging the impact of people and information.

The sets of activities in implementing the successful agile system were also highlighted in the framework development. These activities include continuous integration, extreme programming, kanban, scrum, and scrumban. [7], [17], [20], [21]

In order to implement an agile system in the automotive service industry, the process of improvements must be done at the service centre and independent workshop. By using the agile system, it should improve the communication at the workplace. The knowledge of agile system must be planned and be clarified to everyone to ensure that there will be a better working atmosphere among the workers and the management team. Besides that, it also will encourage knowledge sharing among the team members. [6], [13], [22]

RESULTS AND DISCUSSION

The questionnaire had been distributed to 60 companies and the data collected is from 54 companies. The percentages of respondent rates is 90% interested on the agile system

Based on the study that this researcher has conducted, all the automotive services industry were found to have implemented the agile system. To be different from the other companies on the level of implementation of agile system itself. From the data of 54 respondent, the total number of employee, where in automotive service industry are below 50 (<50) which is at 88.9%.

On the data of year established, they were relatively the same between below 5 years and 50 to 10 years which the percentage is about 42.6%. But, the more than 15 years has a percentage of 7.4% and same goes to more than 10 years but less than 15 years.

In addition, to what extend are the companies familiar with the conceptual idea of an agile system in which there is a slight increase in very little knowledge of agile system (53.7%). This is because, basically, the companies will implement the factors of agile, but they are not well familiar of what the

“agile system” really stands for. From that, in the observation, there were only 2 companies that are knows very well about the agile system which is at 3.7%.

By referring to the demographic analysis, a framework of agile system need to be developed as a guideline to the organization to initiate start-up on the implementation strategy in their organization. Hence, the second part of our analysis will be focusing on finding the relevant factors and activities of agile system in order to build a solid framework of implementation. [6]

Agile Activities

There are many agile activities that can be used. But, to implement that system, the team management needs to understand clearly what defines the meaning upon each agile activities is. The agile activities that companies are already using, such as Continuous Integration, Extreme Programming, Kanban, and Scrum. [2], [16], [20], [23]–[30]

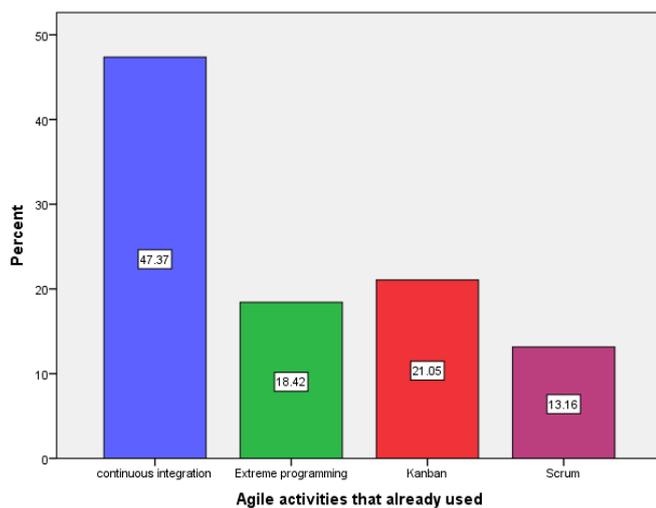


Figure 1: Selected Activities in Agile System

In Figure 1, there were 4 main activities of agile system being implemented in automotive service industry. Continuous Integration (47.37%) scored the highest implementation compared to Extreme Programming, Kanban and Scrum.

Factors on Implementation of Agile System

The success factors for the implementation of agile system is determined by measuring the total of mean value on each of the factors which is customer enrichment, cooperation with the competitiveness, organize to the master change, and leveraging the impact of people and information.

Referring to Table 3, organize to the master change scored the highest mean value. Then followed by cooperate to enhance

the competitiveness, leverage the impact of people and information and lastly, the mean value of 13.83 was the factor of customer enrichment.

a. Organize to the master change

It is shown that 50% of organizations will agree very much in the temporary organization that had been done within time frame allocated. This is important because, to ensure the project or repairing, the organization must be ensure that the progress will be done within the time frame allocated. So that, it will not be a pending project while repairing the major services such as engine overhaul and the others major services. The speed of organization should also be measured. From the data, it is shown that 55.6% much agreed that we need to measure the running speed of the project. Besides, to ensure the project is running smoothly, the employee need to be trained in multi-skill tasks. This is important because, when employees are inadequate, all employed workers must have the necessary know-how to perform all job functions that is required.

b. Co-operating to enhance competitiveness.

It is shown that 38.9% the workshop will moderately compare the level of customer satisfaction with the competitor. This is because, if competitiveness happens, the management team will need to ensure introduction of tactics to ensure the customer makes continuous visits to their workshop.

c. Leveraging the people and information.

The data had shown that 48% answered much agreed that organization sees training as an investment rather than cost. This is because, there is importance which relates the employee to the training. Without training, it will slow down the performance of business and the employee would not gain new knowledge. In the question about the management team that recognise and reward on teamwork, it shown that 42.6% answer much agreed and 9.3% answer a great deal agreed. Each company must provide some potential reward and recognise the effort in teamwork by the number of successful jobs done.

d. Customer Enrichment

The result had a slight increased as 40.7% companies were slightly agreeable by the pricing based on customer demands. On the lower percent which is about 5.6% a great deal of the companies agreed about the pricing based on customers’ demands. On the total of customer satisfy of the service expected time of the workshop, where had been the higher percentages at a moderate 38.9%. In addition, the question about the discount given to the regular customer, the

percentages was slightly high at 35.2%, in which companies were moderately giving discounts to the regular customer. In certain workshop, they were provided with cash voucher from the other organization and given to their customer.

Table 3: Mean Values of the Factors on Implementation of Agile System

Factors	Total mean
Organize to the master change	14.86
Cooperate to enhance the competitiveness	14.21
Leverage the people and information	14.17
Customer enrichment	13.83

Major Reason on Implementing the Agile System

It is important to identify the major reason on implementing the agile system within an organization. Based on the reasons, the organization can easily outlay their strategy of implementing the agile system. Based on the study conducted, there were 5 major reasons identified. The reasons were as follows: [5], [7], [11], [12], [19], [22], [23], [25], [30], [29]

- a. To improve in long term cost competitiveness
- b. To improve overall profit margin of companies
- c. To meet the customer demands
- d. To compete with the competitors
- e. To reduce the delivery time to customers

Framework on Implementation of Agile System

Framework of agile system is important when a certain company implements the system. By referring to the framework, the management team will know the path of the agile system implementation in an organization. Besides, it will also determine the changes of the factors towards achieving the successful implementation of an agile system in the organization. In addition, with this framework, it will be easy to find the details of the influencing factors that gives the impact to the business performance, teamwork, quality, and organization. Figure 2 shows the framework on implementation of the agile system. The framework was developed based on the 4 identified factors through this study. [6]

CONCLUSION

In conclusion, there are so many of companies that had not fully implemented the agile system. So that, with this study, the researcher had found the problem while surveying on the levels of implementation of agile system which has been done. By applying and performing these agile system, it will induce flow of profit for companies and the automotive industry itself.

By using the framework, it helps the next generation to improve profitability of the company. It also can improve the customer satisfaction whereby we had identified what is the factor of the agile factor that influences the customers. Then, we can improve the competitiveness among the industry market level between the service centre workshop and the independent workshops by adopting the principles of agile manufacturing system.

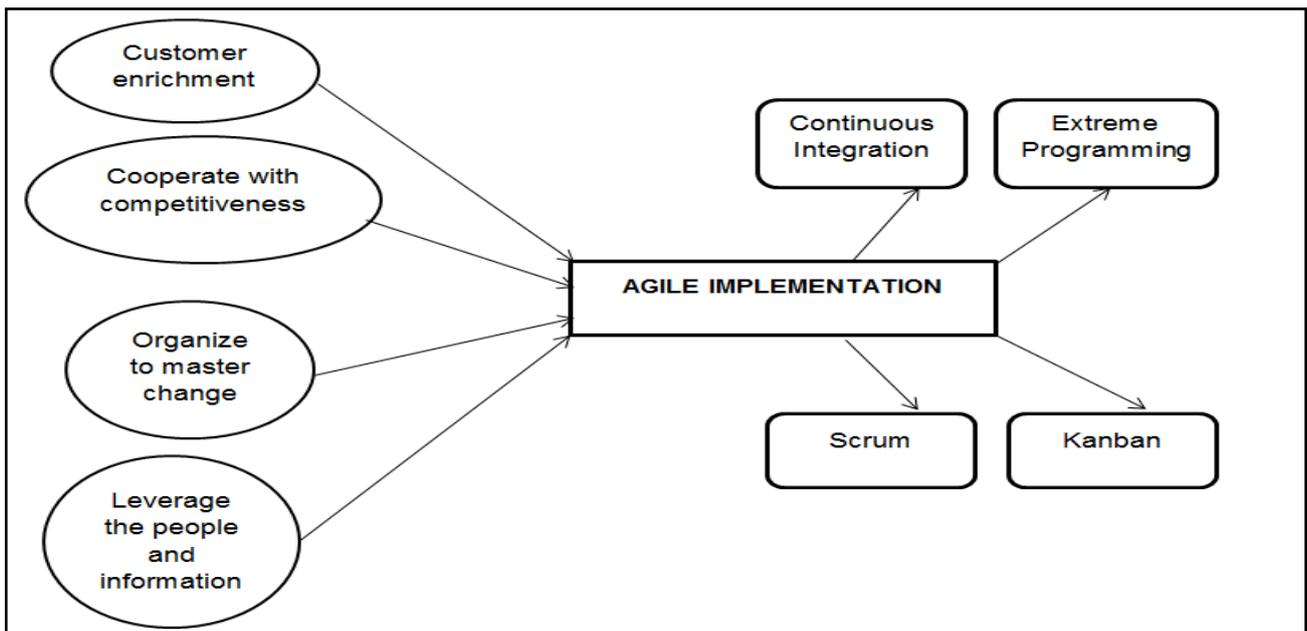


Figure 2: Framework on the Implementation of Agile System

The implementation of agile system is important to industry as it involves the firms organizational structure, the way the firm treats its people, the partnerships with other organizations, and the relationships with their customers. The implementation of an agile system is considered to be very useful in the automotive service industry, in order for the industry to improve their management performance as well as to remain competitive with others.

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