

## The Application Method of CRM as Big Data: Focused on the Car Maintenance Industry

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**Abstract.** The application direction of the big data should focus on the meaningful information offering for creating the customer. If the car maintenance industry is associated with the big data and the car maintenance record management system can be implemented, the independently performed customer management program by maintenance enterprise and database will be able to be integrated and it will be able to systematize. First, the integrating database construction of the auto repair shop customer management program is proposed. Second, the person cloud computing system connected with the Smart phone to the method that customer can confirm the real-time analysis data, that is the advantage of the big data analysis. Third, for the existing customer maintenance with the part of the improvement, the service which the customer desires based on the exact customer information has to be provided.

**Keywords:** Big Data, Car Maintenance Industry, CRM, Cloud Computing

### 1 Introduction

At the present time, the reason why the big data rises suddenly as the social concern is due to be the tendency that the demand active for the company increases along with the improvement of every kind big data software technology analyze data of the huge quantity unlike the past. As to the big data, the problem solving consciousness of the new concept is needed based on the thorough data analysis. In other words, the company is faced with the problem that it is the new business item excavation through the analysis of the big data for the reform and securing future competitiveness. And it has to face up to be the point of time to be the preparation breaking this. The company maintains the business in the continuity of the continuous decision-making. In the situation of this decision-making, when being offered the profitable information than the experience of the person and intuition through the exquisite presuppose model of the optimization plan including the prediction and simulation, the efficient decision-making can be taken. If the basic company reason for being says as the profit maximization through the customer value creation, the application direction of the big data should focus on the meaningful information offering for creating the customer. It

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is concluded to the word that it can read the customer's desire, and hidden as the big data it can create the opportunity of the new business.

The data analysis is the tendency that the change of recognition that it is the core ability business controlling the company success or failure is rapidly unfolded. Afterward, it is expected to settle down as the duty in which the management big data analysis is important in the management strategy overall[1]. In the complicated competitive environment, the point that data analysis capability becomes the core base of the competition will shouldn't be disregarded. Presently, in the car maintenance business domain, the necessity to it presents conspicuously what the field of decision-making through the big data analysis is felt.

In short, it can be said to be the purpose to try to enhance the accident prevention effect by uncovering for the failure part which it can be generated in the near future in overflowing data through the preparatory signal of the car trouble and will introducing to the operator in advance. Since this research considers the big data utilization possible area in the viewpoint of consumer in order to seek the grafting in the various field the real big data environment and car maintenance industry coming to the front it tries to present the practical implication.

## 2 Literature Review

The big data collects data with the existing database management tool, and means the technology which extracts the value from a large amount of structured data or exceeding the storage, administration, and ability which it can analyze unstructured data and this data and analyze the result[2]. If the concept of the existing big data meant that there are just lots of amount of data, the concept of the recent the general big data is so massive and means the method or generally using structured data or unstructured data which is difficult to do the collection, storage, search, analysis and visualization with the tool in comparison with old data. The value of the big data utilization started in the process of has been created the customer-focused value. And it is considered as the starting point of the repair big data analysis handled in this paper to utilize with the inside organization now. In the component of the big data, the feature mentioned in common is 3V (Volume, Velocity, Variety)[3]. However it is the tendency that the concept of the new value is added. According to the Gartner, data complexity is added to common 3V and the big data is illustrated with four concepts. In this paper, the big data tries to be embodied on the side of five elements of 4VIC including the value to be differentiated from old data.

If the car maintenance industry is associated with the big data and the car maintenance record management system can be implemented, the independently performed customer management program by maintenance enterprise and database will be able to be integrated and it will be able to systematize. Therefore, the effect that it implements the maintenance record management system which can share the maintenance information and which it can utilize efficiently and it improves in order to be available in the practical affairs is presented. This can be interpreted as the dimension of CRM providing the profitable information to the customer through the big data analysis[4].

The device for including all information of the car is ECU. In ECU, all information of the detail including the automotive engine, transmission, ABS and airbag are included. Basic data which can check vehicle all sensor conditions and determine the abnormality are provided.

The diagnostic equipment grasping this all detailed information is the electric diagnostic system. The diagnostic system comparing the definition value of all sorts of sensor with numeric data of the current state, the abnormality is determined. Since as the car capability is advanced, the attachment of many sensors is essential and the tens kinds of sensors perform each role satisfactorily the safe driving is mortgaged. The degradation of each sensor become the main cause of the car trouble among the causes for many malfunctions.

### **3 Grafting of Car Maintenance Industry**

There are five fields which utilize the big data and create the result differentiated from the existing method. The car maintenance area and content that it can combine tries to be presented according to each application field[5].

First, the accuracy of the prediction is enhanced by the real-time prediction and automatic update due to the improvement of the future prediction ability. As to the car maintenance, by analyze the pattern of the malfunction symptom which is basis it will be able to prevent from being connected to the large-scale malfunction previously. Second, the new pattern is discovered by the detection of the ducked needs from the consumer's driving habits and the ducked needs is discovered. The automobile manufacturers analyze the customer's driving habits and can grasp the consumer needs of the new car. Third, it is the alleviation realization of the risk. The range of the manageable risk and accuracy will increase by securing the qualitative information drastically. Forth, it is the personalized service offer. It differentiates according to the individual customer and the useful information not being spam can be provided. Fifth, the real time monitoring of the customer and management condition and immediate correspondence becomes possible with the real time countermeasure. It watches and whether it analyze the maintenance breakdown information on a real time basis and the inappropriate driving distance contrast efficient repair was made or not it informs immediately to the customer and the spread of problem will be able to be minimized.

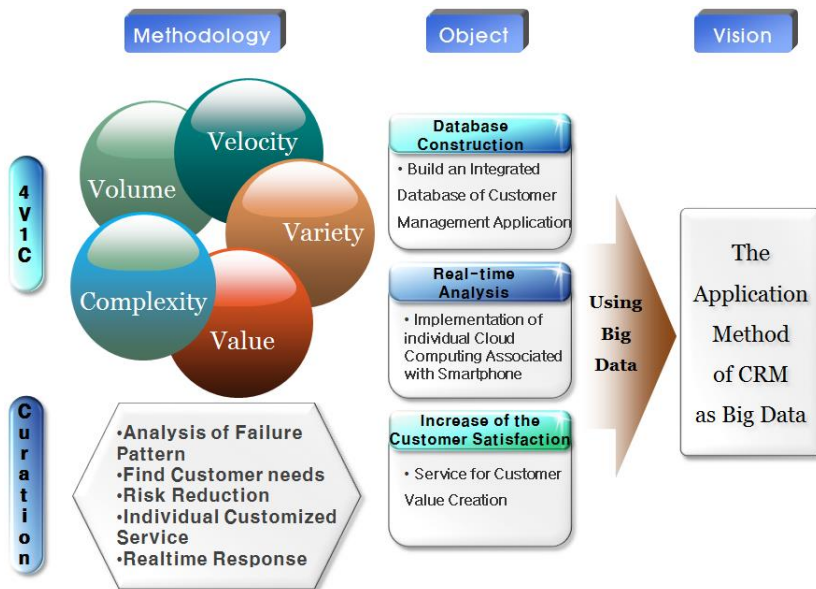
As a result, if the big data Curation is the activity controlling the total process at the field of car maintenance till the analysis through the optimization of the big Data construction and application, it can be guaranteed the more and more stable service and the confidence of the repair culture is built[6].

### **4 Conclusion and Implications**

It is obvious if it what is in the customer relationship management view that we can obtain ultimately through the big data analysis of the car maintenance industry. It has to become the company object it ducks in data pattern to guess the customer's mind

and grasp the needs of the ultimate customer and itemize the business. Concretely, the customer satisfaction through the big data analysis the improvement plan is same like the next.

First, the integrating database construction of the auto repair shop customer management program is proposed. The method receiving the person customization big data service which can be broken away from the danger to the failure through the big data platform is due to be needed. As to this, the fault detection case-by-case analysis is useful from customer data which the motorcar manufacturer manages. However the program share for auto manufacturer the malfunction case analysis is not easy. Therefore, the necessity to it integrates and manages data through the integration of the customer management program of the much the most diffused auto repair shop is proposed. The construction of the customer database may be connected to the profit enhancement through the customer satisfaction management of the small-sized auto maintenance service provider.



**Fig. 1.** Structure Framework of Big Data Application

Second, the person cloud computing system connected with the Smart phone to the method that customer can confirm the real-time analysis data that is the advantage of the big data analysis is proposed. It will be delivered the diagnostic system that is the equipment for distinguishing vehicle trouble whether or not and failure part through the vehicle ECU. The system construction which vehicle failure part and abnormality is transmittable through the quantified data analysis of the diagnostic system to the operator on a real time basis will be urgently needed. In case of operating the repairing system of the web based with through each maker and repair coalition and operating the separate diagnostic system analysis becomes available. The construction

of the individual cloud computing system which determines the relative importance of the fault detection and deliver realize the urgent repair or no to the operator on a real time, so this might make basis of the safe driving. The system construction which will notify failure part statistical data for each driving distance to the customer from the integrated database in advance or which previously it can manage with the preventive maintenance through the alerting service through the Smart phone will be needed. Because the profitable information which is needed to the individual customer can present the exact statistics about the case by malfunction of the past same car mode, the big data analysis should become the basis.

Third, for the existing customer maintenance with the part of the improvement, the service which the customer desires based on the exact customer information has to be provided. The requirement in the car repair job will need the system in which directly the customer can inquire into the thorough maintenance record administration along with the maintenance fee which is clear than what at the point of time when the change to is needed it has to provide the reliability to the customer. As a result, the customer database is accumulated and it utilize actively for the customer to be wanted maintenance record inquiry and malfunction case causal analysis.

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