

CRM Reform of Logistics Enterprises in Big Data Environment

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Abstract. This paper introduces the connotation and background of big data and analysis the opportunities and challenges logistics enterprises confront in CRM; it looks into the CRM status of domestic logistics enterprises, analyzes the applicable fields of big data in logistics and proposes a way to promote CRM efficiency with big data technology.

Introduction

Word frequency statistics of SCI and SSCI database shows that few paper mentioned “big data” before 2011; but in 2012 and 2013, “big data” began to settle in the top of the word frequency list. It can be seen that in the last two years, both the academic and industrial circles have paid increasing interest in big data research and discussion and that big data tends to be a social and application issue.

A 2011 McKinsey report clearly explains the influence of big data on logistics development and reform. Regarded as the next frontier of productivity and innovation, big data brings about opportunities as well as challenges to multiple logistics enterprises. Since customer is vital to logistics enterprises, rational CRM has become a big concern. It is a matter of life and death in the age of big data to drive the business and handle CRM with data.

CRM Opportunities and Challenges Logistics Enterprises Confront in Big Data Environment

Background and Characteristics of Big Data. Although “big data” was proposed as a key word by Esther sudden early in 1978, due to the limitation of information technology and its application, it hasn’t attracted public attention until recently. There hasn’t been any consensus on the definition of big data in the industrial or academic circle, but it sure has a few recognized characteristics.

Generally speaking, big data is distinctive for several characteristics ^{[1] [2] [3]}. 1. Large amount of information: the development of Network technology has resulted in mass data because data is produced by people all the time; generally, regular data is measured with GB or TB. But big data shows in PB, EB and even ZB; 2. Diversity: with the constant development of information collection and transmission technology, various unstructured data emerges, such as audio, video and sensor data, which makes data diversified; 3. Complex correlation: at present, Internet is available in all aspects of social life and generates all kinds of connections. Owing to the huge volume of data, the correlation between data becomes more complex; 4. Low-density value: mass data isn’t equivalent to mass value. Big data mining technology must be employed to find data desired by logistics enterprises. It may be little but vitally significant. Comparatively, data has a lower density of value.

CRM Challenges to Logistics Enterprises in the Age of Big Data. CRM, short for Custom Relationship Management, has a lot of different definitions in the academic circle. But generally, it refers to a commercial strategy and management model aimed to provide better customer service, improve user experience and boost the profit of logistics enterprises. In the information era, people attach more importance to customer needs. Not only has the management model been applied to logistics, governmental departments also attempt to serve the people with CRM ideas to seek maximum interest and improve public service. Thus it can be seen that, the concept of “customer” becomes more generalized. It can be an individual either buying commodities or receiving services.

[4][5]

As the concept of customer gets generalized, customer needs begin to vary and show multiplicity and diversity. In the age of rapidly-increasing data and highly-developed information, data becomes the motive force that drives logistics development. Nevertheless, the “shortcomings” of data makes logistics enterprises and even governmental departments feel weak confronting their customers, which is mainly shown in the following aspects:

Contradiction between lagging CRM model and changeable customer needs: CRM still means traditional customer communication and management method to a large number of logistics enterprises or governmental departments, which seriously mismatches the situation of information age. As a result, they are “slow” to customer needs and leave them unsatisfied. In the cruel market competition, it is particularly important for logistics enterprises to keep the finger on the pulse of customer needs and provide better services. Otherwise, they could be ignored by potential customers and dumped by the regular ones, which means they could be driven out of the market.

Contradiction between customer loss control & inadequate prediction and insufficient data: customer loss has always been a major challenge to enterprises and the solution to it has been a long-term hot topic. In the times when information technology was underdeveloped, people had to control customer loss with existing information and customer data. But customers’ idea changed, and so did their needs. This data showed in social networks and commerce websites on the Internet through customer behaviors. However, due to the low-density value of data, it was difficult to fetch mass data. So they had to use relatively little and fixed data to make customer-loss-control strategies or conduct customer demand and market forecasting; but the effects prove to be unsatisfactory.

Contradiction between insufficient cluster/personalized service and data update: sales management and market management of logistics enterprises are closely related to CRM, for they are all customer-focused. It’s very important to conduct cluster analysis on different groups to carry out specific management and implement marketing strategies. For a data-driven logistics enterprise, the update of data is vitally significant. Single structured data, e.g., two-dimensional table, or data from the existing database is often outdated and mismatches the real-time customer needs, which, as a result, ends up in lagging CRM strategies and inappropriate marketing strategies. ^[6]

Contradiction between insufficient correlation analysis and single type of data: mass single customer data can be useful in analyzing needs of existing customers, yet it doesn’t really benefit the analysis on potential customer and related products. Most logistics enterprises have to rely on single types of data and are unable to understand the further customer demand or make prediction of relevant products or services and eventually ignore the potential market and get trapped in single profit model.

New Thinking about CRM Reform Based on Big Data. The emergence of big data technology has brought about new opportunity to solving the current CRM problem. First of all, it accelerates the understanding of current and potential customer needs with “big data set” extracted with big data technology. The mass data provides a strong data support basis for personalized service; secondly, in addition to single structured data, more semi-structured data as e-mail, webpage, text data and unstructured data as audio, video and sensor data can be got, which lays a foundation for extended service or developing potential customers.

In this age, rapidly growing data rocks the logistics on a large scale. Multiple governmental departments even reformulate CRM strategies for this reason. The advancing big data technology has blazed a trail for CRM. It won’t be easy and time-consuming for any logistics enterprise to become data-driven when it is unfamiliar or unconscious of big data. Generally it goes through six stages:

Stage 1: total ignorance of big data technology, during which some bold and innovative logistics enterprises make tentative attempt and do data programming at the early stage; stage 2: preliminary understanding, during which data is further managed; stage 3: trial run, during which message objectives are set and then preliminary tests and experiment accumulation are done; stage 4: logistics enterprise opportunity, during which infrastructure is constructed, including computer hardware & software, network equipment, big data system, etc; stage 5: logistics business reform;

stage 6: the final ideal stage of becoming data-driven, after the perfection of infrastructure, technology and human resource.

CRM changes when a logistics enterprise becomes truly data driven. It will become customer-focused and supported by latest and the most comprehensive data. Such change will also set off a chain reaction in the management of marketing, service, administration and sales, which symbolizes a genuine reform.

Generally speaking, the reform of logistics enterprises and CRM based on big data is in fact a new process, new technologies and new ideas. The “socialized” logistics project initiated by Alibaba and the logistics enterprises, specifically showing how big data is applied to logistics, may take 8 to 10 years to get thoroughly implemented.

Big Data Application in Logistics CRM

Technical Route Taken by Logistics Enterprises for Big Data Application in CRM. The application of big data technology in logistics CRM relies on the improvement and promotion of relevant technologies, including large-scale parallel processing of database, DI (data mining), DFS (distributed file system), DDB (distributed database), cloud computing platform, Internet technology and extensible memory systems. Meanwhile, there must be technical personnel and relevant infrastructures.

IBM has spent 16 billion dollars on 30 acquisitions concerning big data since 2005, which has guaranteed its stable and rapid-growing performance. Apache hadoop, which was developed by HP, takes over the lead in the industry with its good expansibility and flexibility. It processes data in a way generally known as “separating before combing”, which is worth learning. Technical routes taken by logistics enterprise for big data application are as shown in Fig. 1:

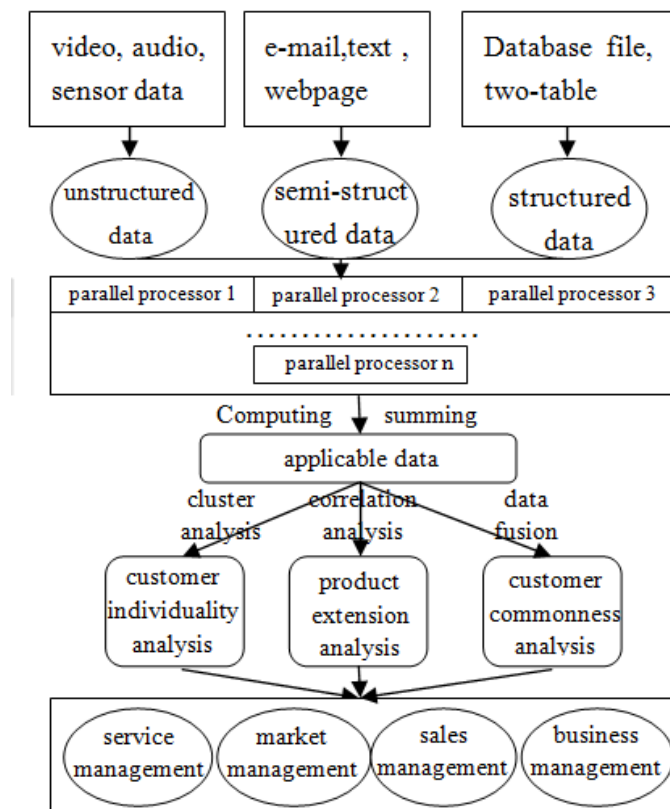


Figure 1. Technical route for big data application in logistics CRM

When big data is applied to logistics CRM, for step 1, sufficient types of data should be obtained with big data acquiring technology to form big data sets; step 2: the obtained big data sets should be computed and summarized with parallel processing technique so as to get applicable data; step 3:

customer individuality, product extending and customer commonness analysis should be done with cluster analysis, correlation analysis and data fusion, mainly to make up for the deficiency of personalized service and market tapping and insufficient market trend prediction of traditional CRM; step 4: focusing on customer analysis as specified in step 3, a feasible report should be formulated to be applied to the management of service, marketing, sales and administration.

In addition to realizing big data application technically, the whole technical route attaches particular importance to deal with the shortcomings of traditional CRM and to solve the problems raised in section 2.2 within the flow.

Key CRM Issues to be Solved by Logistics Enterprises in Big Data Environment. As suggested by Fig. 1, it is time-assuming to apply big data to logistics CRM, which must also be supported by remarkable base installation and reserve of technical talents. Apparently, it is difficult to apply big data to logistics enterprises in the initial stage of big data technology, which mainly concerns the following aspects:

Infrastructure construction: including software and hardware equipment, e.g., computing and memory device. Traditional computing and memory devices are no longer applicable to big data technology. The challenge is met by not only non-IT logistics enterprises but also the IT circle.

Talent reserve and training: Non-IT logistics enterprises, in particular, have to spend quite a lot of time and money to import or train technical talents. Meanwhile, they should pay close attention to IT and Internet development. It is necessary to cooperate with IT logistics enterprise too. All logistics enterprises should have their own all-round talents for data management and CRM.

Policy and legal support and challenge: Big data technology is emerging and not perfect in multiple aspects. Besides, data acquisition is likely to lead to privacy disclosure. To use big data technology to serve logistics enterprises without violating policies and legal regulations, relevant supportive and complementary policies should be issued by the state to make the whole process normative and impeccable, which is time-consuming and full of uncertainty. For instance, in the initial stage of cloud computing, the Department of Science & Technology MIIT asked public opinion on Code of Practice on Overall Service Construction of E-government Platform Based on Cloud Computing and other 17 national-standard communication plans.

The leadership attitude toward new CRM ideas and technologies: logistics operators should keep watching the market change in self-development. Additionally, they should be good at applying new ideas and technologies to logistics business to promote corporation development. Conservative leadership will miss the opportunity of development.

Conclusion

Big data blazes a trail for logistics CRM reform. Meanwhile, as an emerging technology, it brings about opportunities as well as challenges to logistics enterprises. Rational use of big data technology will have positive significance to the customer-focused management of service, customers and sales and administration of logistics enterprises. To become data-driven is a necessity for enterprises to gain further development in the age of big data.

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