

The Dynamic Structure Of Big Data Inmanaging Crm

Sheetal Goutam

Assistant Professor, Pioneer Institute of Professional Studies

Abstract

The issue of big data brings a raw wave of Customer Relationship Management (CRM)'s strategies in supporting personalization and customization of sales, services and customer inspection and repairs. CRM needs big data for better customers 'experiences, particularly personalization and customization of services. Big data is a popular term applied to recognize data that is volume, velocity, variety, veracity, and value of data both structured and unstructured. Customer Relationship Management is experiencing a paradigm switch from a single channel relationship (organization-to customer relationship) to multi channels of relationships (customer-organization-organization-customer-machines) with the prominence on integration and collaboration. As theses paradigm shifts imply that global computing advances significantly companies' access to information by acknowledging them to get information at anytime, anyplace. Big data require new tools and techniques to capture, store and examine it and is used to improve decision making for enhancing customer management.

Keywords: *Customer relationship management (CRM); Big data; Smart mobile devices*

1. Introduction:

We are today in the 'Big Data era' as a new fuel of an important asset. Big data imply a vast amount of any data type with a high-speed data processing in which organizations derive value from it especially to make decision-making. Big data will make a big transformation in managing customers better, and it will affect long term customer relationship.

There is an obvious problem when sales and marketing teams spend much their time searching relevant information, but data is insufficient, and oppositely sometime they miss the opportunities because of information overloaded. In the data driven economy, data has become a critical asset for the development in business sectors, similar to the natural resources and human capital. Managing good customer relationship in an organization refers to the concepts, tools, and strategies of customer relationship management (CRM). CRM as a tool with Web/Apps technology provides the organization's ability to understand customers or potential customers its usual practices and thus deliver a particular activity that might convince them to make

transactions and decisions. CRM has been discussed in many fields such as business, health care, science, and other service industries. The massive adoption of big data in any sectors has triggered assessment of front-end perspective especially managing customer relationships. It is pivotal to examine the role of big data within CRM strategies.

Big data have quantum leap to a digital era where public generates a huge data in any sectors and industries. The amount of data is captured, collected, and processed by organization through digital sensors, communications, computation, and storage had captured information which was valuable to businesses, sciences, government, and society at large. A large amount of data streaming from smartphones, computers, parking meters, buses, trains, and supermarkets. Search engine companies collect enormous amounts of data per day and share these data into useful information for others as well as their own used.

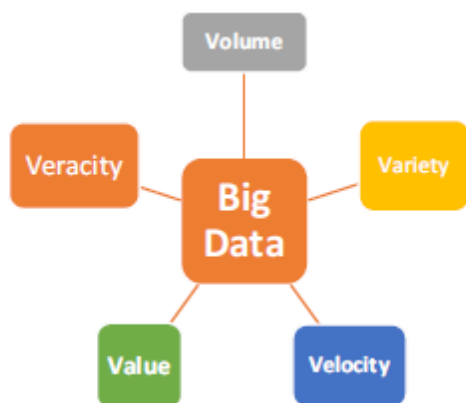
Conventionally, analytical CRM generally takes benefit of the structured data stored in data warehouse, which gathers through set-ups such as ERP, SCM or operational CRM, to generate knowledge and perceptions.

Global Computing is already more than a sheer technology vision. RFID has already reached a high degree of development and is entering more application areas. Currently, acknowledged shifts in E-commerce have taken place from I-commerce, to M-commerce, and to global commerce (U-commerce). Further it was pointed out that global computing improves considerably companies' access to information by allowing them to attain information at anytime, anywhere. Provide these variations on data collection swings due to global computing, traditional A-CRM frameworks seems not to match up this trend shift. In addition, there are less studies published on CRM in global context.

2. Big Data:

Big data is at an early stage, as most related technology and analytics applications were first Introduced only around 2010 (Gantz and Reinsel, 2012). Big data is a huge amount of data that is hardly processed with a Traditional processing tools for extracting its value. It has an impact in various fields like business, healthcare, financial, security, Communication, agriculture, and even traffic control. Big data creates opportunities for business that can use it for generating Business value. Big data is a new generation of handling strategies, technologies and architectures,

planned to carefully extract value from very huge dimensions of a wide variety of data by assisting high velocity Capture, discovery, and/or analysis. Its purpose is intended to gain value from volumes and a variety of data by allowing velocity of analysis. It is known as 5 Vs model; volume, velocity, and variety, value, and veracity. Volume means processing massive data scale from any data type gathered. The explosive of data volumes improve a knowledge sharing and people awareness. Big data is a particularly massive volume with a large data sets, and those data cannot be analysed its content using traditional database Tools, management, and processing. There are three main characteristics of big data: the data itself, the analytics of the data, and the presentation of the results of the analytics. Big data is defined as an extremely large volume of data that are analysed with technology to show the patterns of human development or anything related to the society since big data leads to more precise analysis thus helps to bring more accurate decision making and more efficient work. Big data is high capacity, rapid and variety material resources that mandate cost-effective, advanced forms of information processing for enriched vision and decision-making.



It is a new generation of handling strategies, technologies and manners, designed to carefully extract value from very huge capacities of a inclusive diversity of data by enabling high velocity Capture, discovery, and/or analysis. It focuses on analysing volumes of data involved and mining the data and calculations involved in large amount of computing. Finally, veracity refers to data authenticity with the interest in the data source of Web log Files, social media, enterprise content, transaction, data application. Data need a valid power of information to ensure its authenticity and safety.

The growth in big data is not only because a growing number of smartphone users, but also trigger by other smart mobile devices or pervasive computing abilities that is multiplying quickly. For instance, marketing officer in a remote area can collect and transmit real-time data on every transaction made. Many of these smart mobile devices are able to interact with their users over mobile networks namely pervasive computing. Pervasive computing exchanges data and interact with people or computers and other smart devices. More than 30 million interconnected pervasive computing are now deployed worldwide, in areas such as security, health care, the environment, transport systems or energy control systems, and their numbers are growing by around 30% a year. Big data also reduces the maintenance costs for instance, organizations deploy cloud computing approach where data are stored in the cloud. The emergence of cloud computing has enabled big data analytics to be cost efficient, easily accessed, and reliable. Cloud computing is robust, reliable and responsive when there are issues because it is responsible of cloud service provider. Since, service outages are unacceptable at the business. Whenever data analytic goes down impacting marketing activities are disrupted and customers have to question whether to trust such a system. Therefore reliability is competitive advantage of cloud computing in big data application.

3. CRM(Customer relationship management):

Client Relationship Management (CRM) is a strategy by utilizing ICT in attracting potential Customers, retaining existing customer and offering new services to loyal clients. The principal target of businesses is to gain profits by offering products and services, developing competitive Advantages, and satisfying customers and stakeholders through value.

Type of CRM	Dominant Characteristic
Strategic	Strategic CRM is a core customer-centric business approach that purposes at drawing forward and holding moneymaking customers
Usable	Operational CRM focuses on the automation of customer-facing processes such as selling, marketing, and customer service

Analytical	Analytical CRM focus on the intelligent meaning of customer-related data for strategic or tactical purposes
Collaborative	Collaborative CRM functional technology transversely organizational limitations with a thought to improving company, partner and client value

Any business requires Customer Relationship Management (CRM) to keep up and live on in the long term. CRM is a tool and strategy for managing customers' interaction using technology to automate business operations. CRM consists of sales, marketing, and customer service activities. The aims are to find, attract new customers, nurture and retain them for future business. Business uses CRM in meeting customers' expectations and aligning with the organization's mission and objectives in order to bring about a sustainable performance and effective customer relationships.



CRM with Web 2.0 (Social CRM) features can be utilized to empower clients, permitting them to access their financial activities-related information, interact with customer services professionals, or even interact with other clients. The emergence of Web 2.0 has been based on collaboration platform like wikis, blogs, and social media aiming to facilitate creativity, collaboration, and divvying up among users for projects other than just emailing and retrieving data. The concept of a social network defines an organization as a system that contains objects such as masses, groups, and other organizations tied together by a range of relationships.

Social CRM can be employed as a tool and strategy in meeting their customers' expectations. As such, Social CRM must be lined up with the organization's mission and objectives in order to bring about a prolonged performance of business aims and efficient customer relationship. Customers can own the data on the Web 2.0 site and exercise control over that information.

Marketing is one of CRM's activities or process of promoting and selling products or services, which also include research and advertisement. Social networks enable social marketing that is necessary efforts for marketing teams to expect going viral and

Receiving customers' attention. "Marketing, defines an the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.". Marketing should focus on establishing relationships and meanings. It also applies to sales and customer services where organizations use social networks as a tool to make sales as much as possible by handling customers' complaint at social media. Since social networks are part of the big data source, the next question, how big data will impact CRM strategies.

4. Discussion:

Job understands that their most valuable assets are relationships with customers and all stakeholders. In fact, building personal and social relationships become important area of marketing. The importance of relationships as market based assets that contribute to customers' value. With the amount of data increase, some business organizations use advanced, powerful computers with a huge storage to process big data analytics and to increase their performance resulting in tremendous cost saving. Businesses manage structured and unstructured information sources such as social marketing, retail databases, recorded customer activity, logistics, and enterprise data to demonstrate a character point of CRM strategies by having the abilities or knowledge on how to recognize big data and its advantage. While, big data analytics is a procedure to discover the kind of data characters in big data itself. On that point are some CRM strategies that can happen through big data and big data analytics.

In a highly competitive environment, business's awareness towards big data still needs much attention to cope with growing data requirements simply because big data will grow to eight

Zettabytes by 2015. Big data come from multi-channel data exchange of individual, community, business, and government. Customers that are voluntarily contributing a huge amount of digital footprints will generate a massive value in delivering business services. CRM with big data enabled is important because business sector is challenged not only to retain existing customers but also to acquire potential customers for the services, retaining them to use the services, and extending various services in the era of big data whereas big data transforms big value for organization as well as customers.

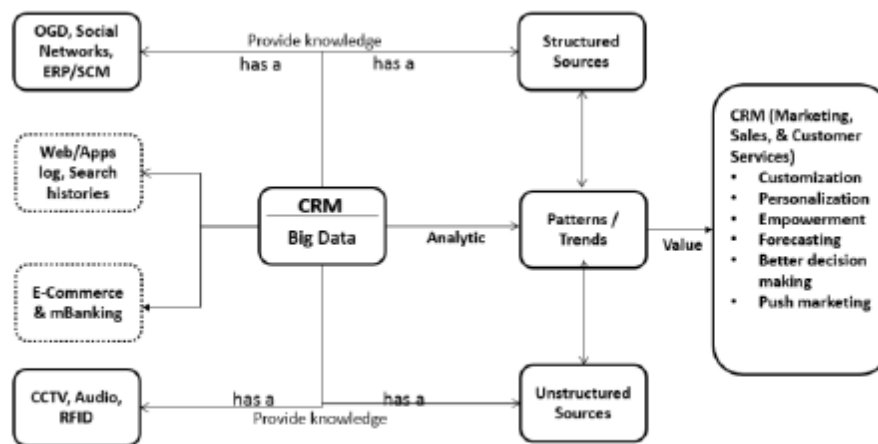
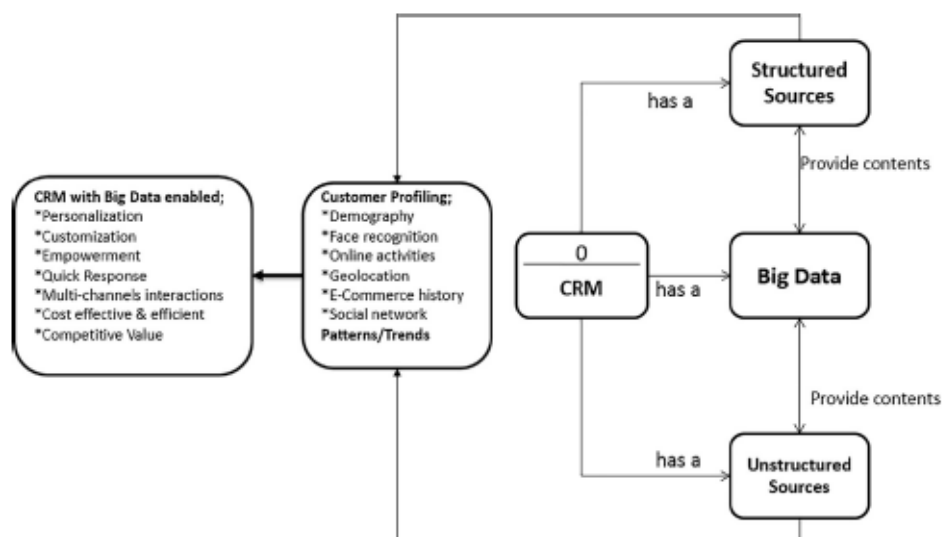


Fig. 1: CRM with big data enabled

Since big data can provide a pattern of customers' information, businesses can predict and assume what are the needs of their customers nowadays. Big data had helped shaped many industries and changed the way businesses operated nowadays. Big companies definitely benefited from this shift especially companies such as technology giants such as Amazon and googles and would continue to serve these giants from the sheer volume of data they generated. Data Velocity showed how marketers could have access to real-time data, for example real-time analytics of interactions on internet sites and also social media interactions. CRM with the big data influence, a new paradigm had been created to allow accessibility and availability of information which result in greater take up by big or small business alike. Big data offers pervasive knowledge acquisition in CRM activities. Big data will support long-term relationship through understanding customers 'life cycle and behaviour in

more comprehensive perspective. Customers voluntarily generate a huge amount of data daily by detailing their interest and preference about products or services to the public through various channels. Therefore, big data analytic can come up with a comprehensive views of customers so that organization can enhance service fitting with customer attention, engagement, participation, and personalization. The study introduces several fundamental concept of marketing with big data that are closely related to customer based CRM strategies in an organization by engaging customer life cycle.

From those multitude data sources, big data analytic works to form patterns, trends, habit, and behaviour of customers. CRM team design strategies for marketing, sales and customer services based on those personal habit and behaviour of customer. While customer will receive push message, alert, notification or suggestion based on their pattern. For business organization, CRM with big data enabled can be designed in many layers from the lowest level of social media monitoring to the level where business generates forecasting data, customers' trends, decision making, and personalize service based on customers' interest. Big



data analytic will gather any personalize information that draws interest of each customer.

4.1. Customer profiling

Whenever a business acquires a new customer through marketing activities, the customer will determine what the value of each activity received from the business. When the customer perceives the value is positive they will be happy and satisfied. Otherwise, they can consider

finding another business even from other competitors that may fulfil their requirements. Therefore, customer profiling for each and every customer becomes important for business to make sure that the whole CRM' life cycle (sales, marketing, and customer service) are offering personalized and customized services so that each customer will experience differently according to their needs and interest. Big data can help in delivering customer profiling since it includes business activity monitoring. Big data analytics have the abilities for tracking purchase histories and their online conversations about their product or services. Business will gain a more comprehensive view of the customer's expectation and can understand better for potential customers' interest. The impact of the big data analytics is significant, especially in the distribution of marketing channels between service providers and customers, whereas suppliers or service providers are engaging with customers directly, threatening the sustainability of intermediary marketing agencies.

Customers' profiling are possible through big data analytics because the organizations have access to more accurate data as big data can discover the value of the hidden data connections and pattern. In addition, it can improve business decisions because it provides as much knowledge as possible. The CRM team generates customers' knowledge profiling to enhance businesses and understand precisely target audience, personalize messages for each potential customer, and tailoring the message fits with customers 'interest and preferences. CRM with big data analytics can develop comprehensive knowledge of customers for decision making. Roll Royce, applies big data analytics in aircraft engine-manufacturing sector and use the result to predict when and where breakdown of aircraft engine might occur by installing sensors to collect data. Hence, they do not only sell engines, but also packages of both engines and monitoring services that generates profit by charging customers based on usage, repairs and replacements. This service currently accounted for more than 70% of their annual revenue In their aircraft engine division by leveraging big data to create a competitive advantage.

Customers' profiling is also possible because big data, with geolocation analytic promotes quick and appropriate marketing strategies. It can quicker than competitor in marketing product, appropriate in determining the price by understanding the purchasing power of potential buyers from data of financial abilities. Appropriate in displaying product means supplier has the best possible place to display the product which is easily reached by customers, the data come from

geolocation. The Netflix detects traffic details of customers' view to spot problems in the area and add systems that can help the future demand. They are also able to get more vision of their customer's desire.

4.2. Forecasting and decision making:

Big data analyses multiple data to recognize any patterns or trends, especially to user's behaviors and habit, which is generated from their online activities. Big data can be used to detect future problems such as business trends, product preference, and best route for travelling. This is due to its capabilities to gather data at a massive speed and able to distinguish the value of the data. For instance, with the aid of data generated from multiple sources like social networks or IM, business organizations have more control and understanding of their 'loyal customers' behavior based on their clicks, comments, sharing content, purchase, budget, etc. Understanding customers' behavior and pattern are possible for customers are voluntarily detailing their thought, opinions, interest, preferences, and they are voluntarily promoting best products and services to their circles. With the ability that they possess, CRM with big data is able to know what their customer's taste and personality is, and can predict what their next purchase might be, they can consider this and advertise or offer discounts of products that would fulfil the customer's desire.

4.3. M Commerce and big data:

The explosion of big data emerges from a variety of data sources, including from excessive using of smart mobile devices can extend the functionalities of Smartphone to become 'smarter M Commerce'. CRM with big data enabled may offer an extra service as a value added for customers. For instance, customers are offered big data in transport that can alert customers with Smartphone to find the best route in reaching the nearest business or intended destination without being trapped in jam due to accidents. Since big data are able to compile, integrate, and analyze and broadcast to the users who retrieve this information. If there is an accident in a specific location, then source of data that accident has happened can be generated from various means either structured data or unstructured data. The data by accident are recorded by nearest CCTV with the details, location then it is sent to the traffic controller system. Police who investigating also makes updating about the event from his mobile device to the central traffic

control system. People who pass by the location also broadcast the event by updating status in social media (Facebook, Instagram, Tweeter, etc.) and IM (WhatsApp, Line, etc.). Then, the big data analytic tool gathers all the data from those sources (CCTV, police report, social media, IM, etc.), then alert message will be pushed to each customers' Smartphone who going to pass the congested place. The 'smart message' can only send to Smartphone's owner based on the vehicle registration number that are captured and they are going in the direction where the accident happen. Therefore, big data offer a better service that intelligently advises the best value, velocity, volume and variety for users in users' Smartphone.

4.4. Push marketing strategy:

CRM with big data enabled should be able to manage conversations in any alert from multiple data sources for problem prevention because reacting to problems after they happen is usually more expensive than addressing them proactively. Proactive strategies will improve customer services. For instance, we give a simple scenario-identifying battlefield to win new customers or keep existing ones. Before customers engage in any service or product, customers spend a lot of time researching on their own, and gathering information takes place even before engaging with a marketing staffs or sales representative. It becomes the job of the marketing staffs to accurately predict what product or service will best fits, attract, and engage customers. Marketing staffs get connected with the potential customers in their social networks and trying to understand the views or type of person interest. Then, marketing teams design the most promising leads and develop highly targeted messages and campaigns through notification, push message, or alerts, responding to the needs of potential customers with personalized content that influences engagement decisions. A great customer support will increase loyalty, revenue, brand recognition, and business opportunity.

4.5. Value creation:

Big data bring new opportunities for discovering values, since it shows the behavior of customers' trend or anything related to the society, and leading to more precise analysis. Big data's source can come from geolocation of customers. Geolocation helps business to deliver the

right message to the right customers, whereas business understands what can and cannot be delivered to the people in the localities. While, geolocation facility helps customers to find the nearest place to reach the product or service. There are situations that marketing strategies are inapplicable due to different set of customs and conditions. Understanding local wisdom is an important factor in delivering effective message to the target customers. Business organizations spend a huge amount of budget for advertising without considering geolocation of potential customers turn into disappointment and rejection. Conventional marketing strategy prompts any marketing contents to random audiences which is potentially costing inefficient budget. These businesses do the strategies to find some marketing activities that work. By effectively marketing on the basis of geolocation to deliver value to the target customers, business provide cost-effective marketing activities of their desired objective to increase local based engagement. Promotions are based on users' records and histories either from web visit, customer's buying history, current GPS data, and conversation in social networks. Push notification has to provide option for users either allow or don't allow notification through their smart phone or web visit.

Organization should acknowledge the potential and promise of big data, the value and impact in realizing big data. For instance, customers are producing a massive of data every day. However, customers are very hard to realize the value of their own data produced voluntarily to the public. However, when organization has abilities, tools, and mechanism to store, retrieve, explore, and visualize the data then they could see value. Organization can comprehend of the value of data for better decisions such as understanding their customers' habits, forecasting marketing trends, managing their services effectively. Similarly, it is applied in the context of banking sector that is a vast quantity of data produced can be managed, retrieved, analyzed to solve common problems in a banking like consumer distrust, inferior products or services, financial disaster prevention and response, regional business trends and forecasting, consumers' demand and supply. Banking is challenged to come up with the initiative to provide Enterprise Resources (ER) solutions focusing on CRM with the capability of 'Big Data Enabled'. For instance, a new generation of CRM will be empowered with mining a real time all of customer data, the interactions of the sales force with them, and combines the results with external datasets on industry and news, social networks of the customers, geographic and demographic patterns, to determine which forecasts are the most likely to make a transaction in the near future. We also will witness more

Web technology adopts big data enabled that can detect patterns of users based on their clicks, visiting a web page, and even social media conversation.

5. Conclusion:

CRM is about understanding human behaviour and interests. Big data can be expected to improve customer relationship as it allows interactivity, multi-way communications, personalization, and customization. The recent developments of big data analytics have optimized process, growth, and generate aggressive marketing strategy and delivering value for each customer and potential Customer. CRM with big data enabled engage customers in delivering affective CRM activities where marketing teams at the organizations tune the ideas into executable marketing program. Big data enhance CRM strategies by understanding better customers' habits.

With the growing competition among banking service provider, managing the customer relationship and providing better services through big data CRM is a strategy that needs to be carefully planned. Big data in CRM could come from various sources like public, government, and business. People generate data from online conversations among people (SNS), interactions between people and systems and sensor-enabled machinery. The fast growing mobile and wearable technology fuels big data, which is commercially available data that users may well to share. Big data analytic shapes the pattern and behaviour of targeting markets and potential audiences since user-generated data are stored accessed and analysed. CRM with big, data is standing at a new business reality: those communities that can take advantage of big data as the valuable new resource it is will be in the best position to become players in high intense global market competition. Big data become a valuable asset for any organization because it helps them understand the things their customer behaviour and demands.

REFERENCES

[1] C. H. Liu, "A proposal of a typology of loyalty scheme," A paper accepted by Technology Innovation and Industry Management (TIIM) 2014 Conference, May 28-30, South Korea.

- [2] C. Kim, E. Oh and N. Shin, "An empirical investigation of factors affecting ubiquitous computing use of U-business value," *International Journal of Information Management* ,vol 28, pp. 436-448, 2011.
- [3] D. Peppers and M. Rogers, "Managing customer relationship- a strategic framework," John Wiley & Sons, Inc. Hoboken, NJ, USA, 2011
- [4] F. Buttle, "Customer Relationship Management- Concepts and Technologies", Butterworth-Heinemann, Burlington, MA, USA, 2009
- [5] J. Krumm, "Ubiquitous Advertising: The Killer Application for the 21st Century," *IEEE Pervasive Computing*, 10(1), 66-73, 2011.
- [6] J. Ranjan and V. Bhatnagar, "Role of Knowledge Management and Analytical CRM in Business: Data Mining Based Framework," *The Learning Organization*, vol. 18, pp. 131-148, 2011.