



KNOWLEDGE CREATION IN RETAIL MARKET: THE ROLE OF ANALYTICS

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Abstract

Retail industry is transforming rapidly over the last decades. The combination of new channels and digital technology has not only created tremendous opportunities but also significant challenges. The mobile phones, internet and social media channels introduce new ways to reach out to the customers and there is no denying that it has also increased market competition equally. Retailers are not only competing with stores in their countries but also with the virtual entities from hundred miles away on the other side of globe. Understanding the need of these empowered customers has become more complex, as they can now easily compare the product price amongst the competitors by just one click. Thus, in order to draw the customer's attention, retailers need deeper their insight including knowledge about their preferences and life style to provide more personalized products and services. Analytics is one of the tools which assist the retailer in gaining access to such knowledge. Retailers can access the customers' data with the help of analytics and effectively process these data to their use which in turn lead them to win the war of competition.

Keywords: Knowledge, Analytics, Data driven Knowledge

1. Introduction

Knowledge is an important cornerstone of decision making in the field of marketing. Whether it is the knowledge of customer behavior, their preferences and attitude towards the product or about their competitors. "In the never ending battle to consumer wallet, organizations not only want the complete access to the information related to their consumers to lay their hands on, but also want it earlier than their competitors ever. The icing on the cake would be if they could get the information even before the consumer has any idea of what he wants!" (Jain, 2014). So, in the highly competitive environment where the innovation is at regular pace, it becomes identically important to get the information about what exactly customers want and how they will react to new product.

A cornerstone of such innovation in the knowledge-based economy is the information. But then the question arises how to reach out to the potential customer. To use this information to improve decision-making and encouraging innovation, we have to convert information in to knowledge. Tom Peters (1991) first identified the actual need of converting the knowledge in to information by stating that “we are drowning in the information and starved for knowledge!” Since last many years most of the information was either lost or disappeared and it was neither collected nor overlooked as resources. But it does not mean that such information was not useful.

Much of it had the potential of being valuable to the researchers as well as organizations. The information could not be collected because it was very costly and required huge amount of time and effort to collect, store and analyze or interpret. During the last decade of social media, a large number of people have started doing most of their work, playing, chatting and shopping through online mode. “Thus creating a mountain of digital data that once would have languished on scraps of paper or vanished as forgotten conversations. Many of such digital data are easily available on public domain; they are just begging to be analyzed.”(Goldman, 2006).

Today, virtually all organizations are able to convert the available data (what was a “waste by-product”, as stated by Hair, 2009) into a resource. That improves organizational decision-making capabilities and providing knowledge of value added customers. Thus, researchers have plethora of opportunities to identify and examine unique patterns within the information to create valuable knowledge for society because survival in a knowledge-based economy is derived from the ability to convert information to knowledge (Hair, 2009). To do so, researchers and managers are increasingly relying on the field of analytics.

According to Wikipedia, “Analytics is the discovery, interpretation, and communication of meaningful patterns in data. Especially valuable in areas rich with recorded information, analytics relies on the simultaneous application of statistics, computer programming and operations research to quantify performance.”

Retail is one of the areas where enormous data are being collected daily, “but the key to win the war is not just to collect the data but rather quickly access and blend all the disparate data, analyze it to distill new, micro level insight, and share those insight with relevant decision maker within the organization to facilitate timely, effective decisions” (Alteryx, 2014). Retail analytics is the process which helps the retailers in doing this. Thus, we can say “that retail analytics is comprehensive analytical solution, designed to improve retail decisions that drive profitable sales and growth for retail enterprises” (Kundeti, 2015).

According to Wikipedia, “Retail analytics is the process of providing analytical data on inventory levels, supply chain movement, consumer demand, sales, etc. that are crucial for making marketing, and procurement decisions.”

The primary objective of the study is to gain deep insights on analytics and its contribution in the knowledge creation in marketing. As the role of analytics vary across all sectors, this paper primarily focuses on the retail sectors through the various literature surveys. The idea here is to investigate the various analytics in practice in retail sectors and how well the available data in firms are utilized in to the knowledge so that the impact on the firms ‘performance can be described with the help of figures solely based on the information generated through the previous literatures.

After a brief discussion about the evolution of analytics and how analytics has been transformed into marketing over a period of time, this paper moves on to a discussion of research design used in the studying the review work. Several research papers related to analytics in marketing are analysed to find out the theme of analytics in retail marketing practices which are adopted by the firms to gain data driven knowledge. Subsequently the paper shifts its focus towards various techniques applied to the available data by the firms to convert in to knowledge and its impact on their performance. Finally, in the last section the paper concludes with a note about use of analytics in retail and its future scope of research untouched.

2. Evolution of Analytics

“The simplest definition of analytics is the science of analysis. However, a practical definition would be how an entity, e.g., a business, arrives at an optimal or realistic decision based on existing data” (Nawab, 2012). Business decisions entirely hang on either the past experiences or the basis of some frequently used qualitative methods of decision making to support it. But, unless these decisions are based on data, it is not considered as analytics based decision making process. The evidence of using analytics in business can be traced back in the late 19th century when the concept of time management was introduced by F.W.Taylor. Henry Ford also succeeded the use of analytics in measuring the pace of the assembly line, which later revolutionized Ford Company manufacturing.

However, the analytics concept and its use in businesses showed major progress with the introduction of use of computer systems in decision support system. “It evolved with development of Enterprise Resource Planning (ERP) systems, data warehouses, and a wide variety of other hardware and software tools and applications” (Nawab, 2012).

2.1 Fundamental shift toward analytics

The concept of analytics was based on the 2,500-year-old hypothesis: statistics. According to Wikipedia, evidence of the use of statistics found back at 5th century BC and then with the work of various statisticians like Karl Pearson, Galton and many more, the discipline developed and its use emerged in various areas like mathematics, physics, and business and now in marketing. However, the concept defined more in details in the work of Al –Kindi as on 9th century in his book “Manuscript on Deciphering Cryptographic Messages,” which explains in depth use of statistics and its key concepts to understand the various types of data relationships.

2.2 Analytics through Ages

In a report of EKN, Evolution of Analytics is defined through ages, which shows that this concept has evolved through the different ages and so its requirement in the business. So, that different tool was used to gain the advantages of analytics.

Business Focus	Wave 1:	Wave 2:	Wave 3:	Wave 4:
Investment	Visibility and	Infrastructure	Execution and	Customer Engagement
Wave	Control	and	Excellence	
		Operations		
Analytics Age	Stone Age	Bronze Age	Iron Age	Modern Age
Focused on	Improving visibility into key aspects of stock and sales	Integrating data across business functions	Building an enterprise data repository	Gleaning customer insights from enterprise and external data
Buzzword	Spreadsheet	Decision Support System (DSS)	Optimization	Big Data

Source: EKN (2013), “The Future of Retail Analytics”

3. Research Methodology

A Detailed Literature Review was carried out to gain a new insight in to the concept of marketing analytics. Literature that appeared on the theme of marketing analytics is thoroughly explored from different reputed sources and journals from marketing domain such as JSTOR, Emerald, AMA Publisher, Reports of Cisco co., Science Direct, Elsevier and Break Stream.

Some of the papers were selected for literatures review which is based on theme of marketing analytics, precisely retail analytics. This literature review was then analyzed to understand the concept of analytics and its evolution and implication in retail sector.

4. Knowledge and analytics

The analytics plays a crucial role in knowledge creation. For marketer, the information is the essential in decision making and analytics helps in collecting such information from data available to the firm known as “data-driven knowledge”. Most firms are stuck with abundance of data. Yet so far they have not developed the very capability that prompted them to collect the data and afterwards aggregate, analyze and use it to make more informed decision that can help the business to gain the value of data. (Davenport et.al. 2001)

“Data mining and predictive analytics are increasingly popular because of the substantial contributions they can make in converting information to knowledge.” (Hair Jr., 2007). With the support of top management team, analytical supportive culture of organization, skilled professional and last but not least availability of appropriate data enable the organization to deploy the marketing analytics which result in term of positive organizational outcome. (Germann et. al.2012).

Below table highlights on some of the selected and reviewed papers which show the level of the analytics are being used exhaustively in the organization and its immediate impact through well deployment of data in to knowledge in their performance.

Table 1

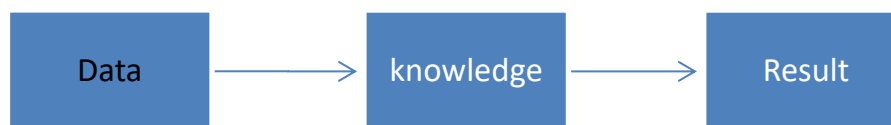
Authors	Themes on Marketing Analytics role on knowledge creation
Hair Jr., 2007	Knowledge in marketing developed through conversion of data in to information by using Data mining which searches for data patterns and identifies promising relationships based on searched data. Predictive analytics then uses relationships to predict future events, trends and behavior patterns.
Davenport et.al. 2001	Businesses are overwhelmed with data, thus need arises to transform data in knowledge, for which a model of analytics was developed. Factors like strategies, cultures and related skill of organization must be present. Data are to be analyzed which support decision making and on the basis of information changes in behavior should be done to reap the advantage of analytics.
Germann et.al, 2012	The deployment of marketing analytics produces positive organizational outcome in the environment of positive top management support and rapidly changing consumer needs and wants. It helps in predicting the consumer preference and consumer satisfaction even in highly competitive environment.
Davenport & Harris, 2007	With the use analytics most of the top performing firms gain profit and thus reaping the benefit of analytics. Analytics enable the organization to understand the relation among available data and analyze useful information from the data and use it for benefit of organization.

Source: Compiled by Author

As mentioned before, analytics plays a very crucial role in knowledge building. A well analyzed data not only enable marketer to better estimate the consumer behavior but also help in different areas of the marketing in arriving at favorable decision. However, this required a skilled, sophisticated and better learned analytics that plays this role of converting the data to knowledgeable information thereby helps in performance implication of organizations.

Retailers on daily basis are exposed to lots of data, even though, they are overwhelmed with data, and the real demand is to covert such data in to the valuable knowledge via analytics named a few: predictive analytics and data mining. Its deployment yields a positive impact on the firm's performance. The schematic transformation of these data in to successful result is shown in figure 1, which affirms that if firms permute their data in to desired knowledgeable sequence they certainly be able to attain positive response from it.

Figure 1: Transformation of data



Data in the organization are accumulated through various modes and tools e.g. Decision support system, online analytic processing, executive information systems and data mining (Davenport et al. 2001), through Wi-Fi and Video Cameras in store (Cornell et al., Rallapalli et al. 2014). These techniques were all explicitly designed to support the firms in fetching the data.

Knowledge transformation from data is mainly performed through analytics. The analytical process and the transformation process together form the entirely unknown yet super beneficial knowledge from the data. Further it requires the rigorous application of the tools and techniques made available to us from the centuries such as statistical analysis, hypotheses testing, mathematical models and data-based knowledge that are derived from human interactions. (Davenport et.al. 2001)

Desired outcome of organization in terms of profitable performance are achieved by deployment of these analytical solutions by targeting the right consumers and predicting their accurate behavior simultaneously, in advertising the attractive information to grow sales and thriving competition as well.

6. Arena of Analytics in Retail

“The retail industry is evolving drastically over the last couple of decades. Whether in terms of an explosion of choices or a more personalized shopping experience, retail chains are now forced to offer a differentiated experience to shoppers” (Shayinath, 2013). It provokes the firms to attract new customers in addition to retain the existing customers in absolute necessity. Sudden increase in competition and furthermore consumer’s anonymity give rise to a complex situation amongst retailers too. As they have very little knowledge about the customers and their choices of buying along with the retail space usage. They are also unaware of how the products are stacked and how to make store layout attractive and accessible enough. If such basic knowledge retailers can retrieve, their sales can hit another level of success. This is exactly where analytics solutions can play a crucial role.

Below Table 2 discusses more of the analytics usage in retail sector which provide vital insight about customers.

Table 2

Analytics	Source	Insight
Shopper Analytics	Cisco (2014)	Enable retailer to gain deep insight about their customers. It helps in retail marketing process by predicting resource requirement, personalization, remote management etc. Help inertial operation by managing on shelf management, labor efficiency and queue management and risk management etc.
In store Analytics	Brickstream 2014	Use of various tools in store help retailers in various ways like: Anticipate and understand customer needs and expectations Help in improve store operations Identify and plan new offerings for customers
Analytical business model	Matobobo and Osunmakinde 2016	Enable the organization to ascertain customer preferences toward different brands Assist in best arrangement of shelf product branch by branch so that customers will purchase more product than planned
Physical Analytics	Rallapalli et al. 2014	Behaviors of the customer during purchasing time are categorized as: purposeful walking, dwelling, gazing and reaching out. This help in understanding who enter for which purpose and thus focus on them accordingly and try to convert visitors in to customers It also help in assessing the customer attitude toward the store layout
Analytics for	Chen and Mersereau 2015	The visibility of store in term availability of product in right place at right time, contribute positive customer satisfaction

operational visibility		Demand sensing and inventory management help in better arrangement and store operation and create customer positive attitude toward the store.
Retail video analytics	Cornell et al. 2013	Earlier the camera in store is used for security purpose but by using the same security infrastructure in the store, video analytics now can answer questions like “How many people visited store today/this week/this month?” or “How many customers showed interest in the item on sale?”
Predictive Analytics in retail	Serendio 2013	Ability to <i>personalize the shopping experience</i> of individuals enable to be closer to customer and enhance sales and thus revenue Help in <i>target promotion</i> to select customer based on purchase data. It help in <i>better understand the purchasing behavior</i> of customers and high and low margin customers

Source: Compiled by Authors

As understood from aforementioned table, various analytics which are being practiced constantly in retail sector provide innumerable information about customer behavior during their purchasing periods thereby managing the retail store layout effectively and better arrangement of product on their shelves which ultimately enhances the sales and generates revenue of the firms.

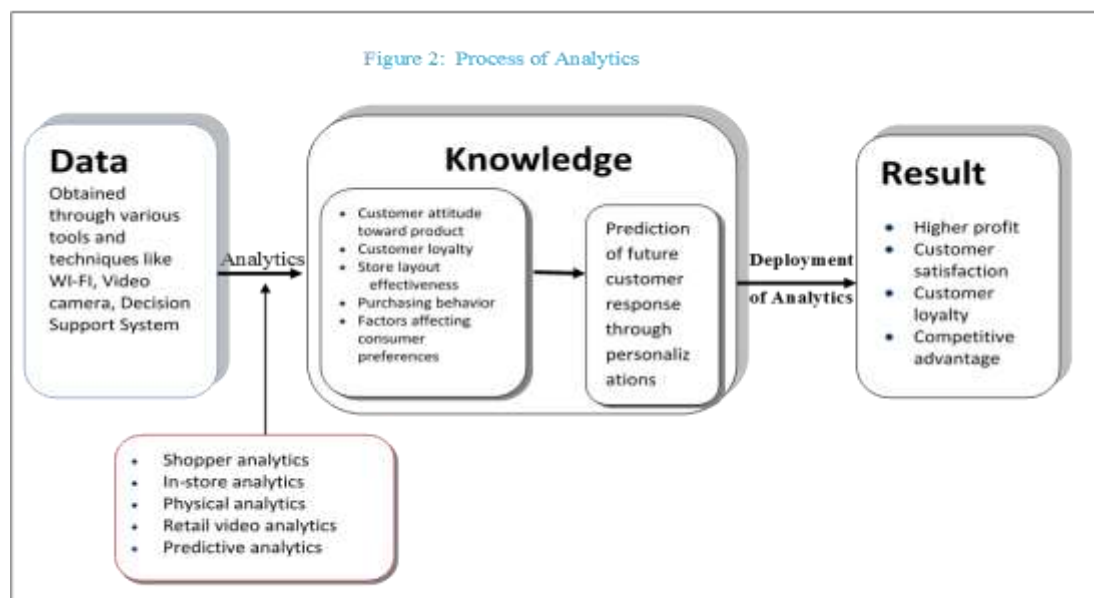
7. Process of analytics

The use of analytics in retail sector is growing at enormous pace. In this regard, one side various ways of retrieving the data are being developed and other side retailers also start realizing the current necessity of efficient manipulation of such data in to knowledge. In this context, we have reconstructed Figure 1 to make it more efficient without losing its original functionality. It runs through certain steps or processes to be followed to extract highly valued information from data available to the firms and its transformation into profitable knowledge by means of widely known analytics transformation processes which no less requires the skilled analyst, better and readily available technologies and analytics blended together to reap its outcome as grown organization performance.

The figure 2 shows the schematic diagram which highlights key processes of analytics, where the data are either easily available in retail store or are extracted by using various tools and technologies for examples: Wi-Fi in stores give precise insight about visitor’s movement, similarly video camera captures the image of customer response during purchase. It also

describes about the decision support system and many more and last but not least it touches upon requirement of the skilled analyst to flawlessly operate all the process.

Once the data are accessible, the real work of analytical process begins. This study quickly recap various analytics are used in retail to gain different insight about the visitors and customers for different perspectives which are explored in table 2 such as in-store analytics for judging the effectiveness of retail store layout, physical analytics for analyzing the effectiveness of arrangement of products on shelves, availability of product by predicting the demand and Retail video analytics for customer movement, and attention towards particular brands. It also takes care of security, efficient merchandising and customer response during purchase etc.



Source: Author

All these analytics methods ensure the importance of knowledge in the form of customer attitude towards brands and layout, their loyalty, response and behavior. On the basis of information, predictive analytics play its essential role in estimating the future response of customers and thus assist the retailers in developing their succeeding plan. Further deployment of these data -driven knowledge are adopted in the retail store which assure in higher profit margin, better customer relationship, extremely satisfied and loyal consumer and nevertheless enable the retailer to gain the edge over competition in the market.

8. Conclusion

Today retail industry is facing substantial uplifts. The combination of new innovative channels and digital media one side opens up new ways to create the opportunities for the retailers and on other, encounter unopposed challenges while moving forward. Retailers are experiencing

tough competition from online retailing and unaccounted demand of customers, so the dire need of analytics in this sector arises. Retail is a data-intensive industry and taking advantage of all that freely available data to operate and manage the business better requires one and only the analytics. This current study after reviewing various researchers shows that the implementation of analytics provides deeper insight about the customers and ultimately aids in solving various untouched problems.

Now, the core aim of retailers is oriented to understand customers better than anyone. Comprehending the wish of customers in this digital world has become extremely complex, as they can now easily compare the product specifications, prices with the competitors by just one click. Analytics is the one way which enables retailer in gaining access to such knowledge. This paper describes how retailers get benefited from analytics by dealing with the data related to the customers and by efficient means transforming such data in to desired knowledge which can be able to achieve their goal and win the war of competition.

While analyzing of various research papers and reports, this study emphasizes up on types of analytics which are currently in practice in retail sectors and its relevant insight gained by such analytics. On the basis of such review a schematic presentation of the process involved in the analytics are developed.

The current study aims to undertake the various phases of analytics in retail and the benefits arise by implementation of such analytics in retail. Conclusion of this study is entirely based on some of the renowned papers and journals. The further study can be performed to analyze the effectiveness of retail analytics in Indian retail market which is again very big and challenging market.

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