



Retail Industry Adopting Change

Adaptation: Automation: Benefits

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<p>Abstract:</p> <p>This thesis contains the research on the key change adoptive agents/forces and the solutions to the world's rapidly growing and one of the most consumer facing industry. The trillions worth retail industries are undergoing the period of important restructuring internally and externally. The author highlights the key factors that force the retail industry to adopt modern technologies for their daily business processes in order to be more competitive. The factors have been viewed in two perspectives 1-Internal (store/warehouse management, human capital) and 2-Externally (customers, suppliers). In response of these factors, the research presents state of the art 1-Self Checkout System 2-RFID 3-Cloud Computing as tested and proven technologies that has been observed and implemented in the "Future Stores" by big box retailers. Finally the author discusses the tangible and intangible benefits to the retail business derived from the implementation of mentioned technologies. To meet the research demands, the writer constructs a theoretical framework by using the descriptive and exploratory research method as a secondary resource; while empirical research was conducted through semi structured phone interviews with experts from the retail industry and the retail management consultants.</p> <p>The results derived from theoretical study and empirical research show that the use of updated retail management technologies like Self-checkout System, RFID and Cloud Computing can reduce cost and management pain fairly. While the bigger impact of such adoptions is to build a seamless supply chain, customer experience management and business intelligence system; which plays a vital role to prolong the competitiveness and life cycle of retail business against future economic setbacks.</p>	
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List of Abbreviations

ARTS	Association of Retail Technology Standards
BI	Business Intelligence
BPA	Business Process Automation
BPM	Business Process Management
CAGR	Compound Annual Growth Rate
CC	Cloud Computing
CEM	Customer Experience Management
CGM	Consumer Good Manufacturer
CPFR	Collaborative Planning, Forecasting and Replenishment
CPG	Consumer Packaged Goods
CPM	Corporate Performance Management
CRM	Customer Relation Management
CSR	Case Study Research
CTM	Collaborative Transport Management
DSS	Decision Support System
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
FIM	Fresh Item Management
FMCG	Fast Moving Consumer Goods
GMA	Grocery Manufacturer of America
HRM	Human Resource
IT	Information Technology
KPI	Key Performance Index
LOHAS	Lifestyle of Healthy and Sustainability
LP	Loss Prevention
MRP	Material Requirement Planning
NFR	National Retail Foundation
OLAP	On-Line Analytical Processing
POS	Point of Sales
PSA	Personal Shopping Assistant
RFID	Radio Frequency Identification
ROI	Return on Investment
SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference-model
SKU	Stock Keeping Unit
TCO	Total Cost of Ownership
TDC	Total Deliver Cost
UPC	Universal Product Code
USD	United States Dollar
VMI	Vendor Managed Inventory

1 INTRODUCTION

1.1 Background

During 1950s to 1960s technologies initiate a clear shift from manual to automatic. According to James R. Bright (1958) “The simplest technologies involve the use of human labor only or human labor and hand tools; the more complicated do not require human interference in the selection and identification of the appropriate action; the most sophisticated correct performance during the operation or after the operation is completed, or they even anticipate required action and automatically make adjustments to provide for it”. Detroit automation, assembly line, closed loop process and MRP (Material Requirement Planning) are the early examples of automation (Froomkin, 1968). Along with general technological progress, Information technology plays a parallel role in automation and get involved in every business process. Since IBM introduces first Personal computer (1981) (Alfred, 2008); the growth in IT is remarkable and today according to Gartner, Inc. “*The reign of personal computer as the sole corporate access device is coming to a close, and by 2014, the personal cloud will replace the personal computer at the center of user’s digital lives*” (Gartner, 2012) Fundamentally these evolutions bounds the individual users and corporations to adapt and synchronize themselves with new updates in automation and applications/processes.

In comparison with other sectors, retail industry have significantly higher technology adoption rate for several good reasons for instance; anything that has been manufactured needs to go through the process of delivery for retailing, while retailing involves many complex operations of logistics and supply chain, warehousing, customer experience management and decision making. With the increasingly globalized operations of retailing, many retail organizations either gets help of modern and efficient technologies or outsource their business processes and focus on their core activities. Wal-Mart is one of the biggest U.S’s importers from China, 7.6 billion USD directly from china and same amount of imports from other suppliers (Heal, 2008). It is unconditional for all the global retailers to get help of advanced technologies to manage their global partners smoothly.

International grocery stores have been used as a reference environment in this research, because they have to manage a large number of walk-in customers, a variety of products and their transactional data every day, therefore they are quick adoptive towards modern technologies. It is impossible for international chains to deal with large number of checkouts manually and manage their extensive amount of data traditionally (*without business process automation*), as it is not a cost effective and wise decision. In this study “Self-checkout System”, “Radio Frequency Identification” and “Cloud Computing” have been presented as most modern and rapidly growing technologies that can help the retailers to reduce human efforts and transform their business data into “Business Intelligence”. Any technological implementation brings two kinds of benefits to organization 1- Tangible benefits 2- Intangible benefits. For instance in scenario of above mentioned technologies, it reduce cost and increase savings dramatically as retail chains does not have to hire much sales and IT staff and also don't have to invest on IT infrastructure (tangible benefit). On the other hand, it enhances the shopping experience with 40% efficient processing, because it helps to build a real time data management environment as Cloud has ability to receive, manipulate and store data in real time and also accommodate the additional future workload (Intangible benefits). In perspective of POS (point of sales), UPC bar code scanning/ RFID (Radio Frequency Identification) and SCM (supply chain management) and CC (cloud computing), the IT budgets have been increased and play considerably important role in management of these operations. According to Gartner the IT budgets of retail sector has increased about 13% CAGR from 2000 through 2004 (Syntel Inc., 2012, Chu et. al. 2002).

Any discussion on adoption of new automations and IT should first decide that how it will empower the human capital and facilitate customers with efficient processing and greater business insights. “A “Connected Retailer” not only leverages a flexible, economical technology platform that drives results, but also focuses primarily on its greatest asset; people empowered with the right solutions to act on the right information at the right time. The adaptive solutions for business process automation (BPA) provide the tools, technologies, and infrastructure to automate complex business processes end to end in order to help increase competitive advantages and deliver tremendous value and visibility to your business, customers, and trading partners” (Microsoft, et al. 2006).

1.2 Motivation

The economic recession of 2009 affects globally both buyer and seller, in fact when it directly affects the purchasing power of a consumer, which ultimately becomes a reason of decrease in sales of the retail sector. A general motivation in that scenario is to re-search the core elements that can rescue the retail industry in such crucial situations and the worthwhile idea was “Adoption of Automation” and “well informed decision making”.

Another attraction for the author was to research on implication of modern technologies in the global retail industry, specifically from the perspective of customer experience, global sourcing and collaborative information sharing. Technology’s own rapid growth bring exited changes in the business when it comes in practice; while it has been observed that the research on these changes and their effects on businesses continuously increase knowledge, as it is a never ending process and rapidly growing part of any business.

Last but not the least, the writer’s ultimate interest and future plans to get further higher education in the field, is another reason to choose that topic. Moreover the topic is very current and motivates the researchers to fill the research gap.

1.3 Research Objectives and Questions

Although theory unanimously supports the modern automation as a key element in the retail Industry; but many retailers are still not receiving the desired benefits of implementations. On the other hand many retailers are still underway to implement the retail automation properly and could not even realize the cost effectiveness of automation in this sector.

Considering the nature of business, retailers must align their automation needs with their business objectives. The contradiction between theory and practical implementation enables the retailer to understand the prerequisites and key business objectives before adopting the modern technologies.

This thesis has two main objectives; the first core objective of the research is to describe the role of modern retail management technologies in transformation of retail industry. This objective leads the author to investigate **Q1: *What are the major factors that convince the retailers to adopt modern technology?*** There are several different factors that have transformed the industry from traditional to modern retailing.

The second important objective is to research on the benefits derived from the latest and commonly used retail management technologies. Therefore this objective convinces the author to find the answer of **Q2: *Which automation solutions bring what kind of tangible and intangible benefits to the retail chain?*** Normally technological implementation benefits are not directly measurable, but there are also certain cost benefits that comes along with such implementations, therefore benefits have been discussed in two parts this paper.

1.4 Methodology

There are two research methods have been used in this research

1.4.1 Exploratory Research Method

Exploratory work is a preliminary stage in the research, which possibly leads to the actual results sooner or later. This method consumes a long period of time, and needs the personal interest of research in the topic (Stebbins, et. al. 2001). Exploratory research has different ways of research like literature survey, experience survey and study of problems for specific and deep knowledge (Panneerselvam, 2006). Therefore in this paper, the exploratory research method has been used to analyze the already existing literature about retail industry automation. The selected method is commonly used by researchers; in this case exploratory method has been used to advance the understanding of “change adoptive factors in retail industry” among the people that are interested in this concept. Because the approach requires proper and relevant literature study and ensures that the collected information is up to date and valid (Stebbins, et. al. 2001). The subject area of the thesis provides information regarding the change adaptive forces, the benefits of these changes in a retail chain, technologies used, strategic goals, structure and the direction in which it is orienting in future etc.

1.4.2 Interviews

The real life research, which is likely to give an up to date picture of the topic, cannot be completed without interviewing the experts. Here the only controversy is, the skills of interviewer that how he/she prepares the questionnaire and how he/she extracts the knowledge from respondents (Gillham, 2005). In this research, the existing knowledge of the prevailing technologies provides a good ground to interview the experts of both technology users and developers. In phone interviews the author has discussed different benefits and the impacts of adoption of the mentioned technologies from the consultants of technology companies and the experts from retail industry.

LITERATURE REVIEW

This part consists of three chapters. 1- Retail industry overview and change adoptive factors, 2- Future store's technologies 3- Tangible and Intangible benefits of Implementation

2 RETAIL INDUSTRY AND CHANGE ADOPTIVE FACTORS

Modern technology's adoption benefits are not yet well understood in many sectors, while the retailing in 21st century is more complex and challenging especially in developed and as well as in advanced economies. So far the most commonly considerable factor of technology adoption by the industry is "Cost Reduction". It has been observed that often companies neglects the other essential factors like customer, supplier and their own global appearance, that is why they cannot enjoy the real benefits of technological innovations. Innovative technologies are equally beneficial for retailers, consumers and suppliers. It has been researched that the retail sector is one of the rapid technology adoptive sectors. Top retailers e.g. Wal-Mart, Tesco, Metro are currently presenting good examples of modern technology implementation in their "Future Stores" (Krafft, 2010)

** In this study author focus is on European and U.S retail industry.*

2.1 Retail Industry overview

Retailing is direct sales of goods or services to the end-user, general stores and kiosks are the initial forms of retailing points; where only nearby community usually shops their daily necessities. But today the growing trends of “One Stop Shopping” and “Retail Consolidation” has changed its shape dramatically and today we have hypermarkets, supermarkets, variety stores, specialty stores, discount stores and convenience stores etc. The retail industry is one of the industries, with the largest number of businesses and employees in the world, According to the U.S. Bureau of Labor Statistics, only in America retail sector owns more than 14.4 million employees. According to the latest annual report from the U.S. Commerce Department, the total retail sales of U.S in 2011 were \$4.7 trillion, while in 2010 it was \$4.4 trillion, which represents about 8% increase over a year in the total retail sales (including food service and automotive). The year 2011 was the greatest year of the retail sales growth after the year 1999 (Farfan, 2012). The mentioned figures and the trend of opening versatile stores, shows a quite clear improvement in the retail sector of U.S, even in the time of recession. The world’s top 10 retailers are either from U.S.A or Europe, while five retailers are from USA and the remaining five are from Europe and the Wal-Mart (USA) is leading so far. According to Deloitte these top ten retailer’s combined sales were \$1.5 trillion in 2009 (Deloitte, 2012). Overall global retailing has been slow since 2007 and continues through 2009 due to fall in food and non-food item. Like the US market, European Retail has also recovered a little bit. According to the Eurostat, Europe grew up by 0.5% in first quarter of 2012, while the major performers were Nordic countries and United Kingdom (Moss, 2012). It shows that the retail industry is still growing even the international competition and global presence has created more pressure on retailing.

2011, Top 10 Global Retailers

Retail sales rank (FY10)	Name of company	Country of origin	2010 retail sales (US\$m)	2010 group revenue* (US\$m)	2010 group net income* (US\$m)	Dominant operational format 2010	#countries of operation 2010	2005-2010 retail sales CAGR**
1	Wal-Mart Stores, Inc.	U.S.	418,952	421,849	16,993	Hypermarket/Supercenter/Superstore	16	6.0%
2	Carrefour S.A.	France	119,642	121,519	754	Hypermarket/Supercenter/Superstore	33	3.9%
3	Tesco PLC	U.K.	92,171 ^e	94,244	4,131	Hypermarket/Supercenter/Superstore	13	9.3%
4	Metro AG	Germany	88,931	89,311	1,243	Cash & Carry/Warehouse Club	33	3.8%
5	The Kroger Co.	U.S.	82,189	82,189	1,133	Supermarket	1	6.3%
6	Schwarz Unternehmens Treuhand KG	Germany	79,119 ^e	79,119 ^e	n/a	Discount Store	26	9.8%
7	Costco Wholesale Corporation	U.S.	76,255	77,946	1,323	Cash & Carry/Warehouse Club	9	8.0%
8	The Home Depot, Inc.	U.S.	67,997	67,997	3,338	Home Improvement	5	-2.5%
9	Walgreen Co.	U.S.	67,420	67,420	2,091	Drug Store/Pharmacy	2	9.8%
10	Aldi Einkauf GmbH & Co. oHG	Germany	67,112 ^e	67,112 ^e	n/a	Discount Store	18	5.9%

Figure 1 Source: Deloitte, 2012 Global Retail Ind. Trends

The above figure shows the top retailer of 2011 in perspective of retail sales and group revenue. According to figures all big giant of retail industry either belongs to U.S or Europe, categorically hypermarkets and superstores have higher market share. Wal-Mart is still leading the market with higher sales revenue. Although both regions are leading global retail industry but both regions have quite different market characteristics in term of consumer behavior and marketing strategies. There are two major differences in the European and U.S markets, the European market is customer driven market, which mean “*Experience Innovation*” is the key change agent, and there are four different driving forces behind this change agent, which have be discussed in detail later in this chapter. While the U.S market is “*Classic Competitive*” market based on low cost and differentiation/unique merchandising. “The U.S retailers are developing approaches to lower down their costs (through the economies of scale, supply chain management and technology) to provide lower prices, or they try to offer customize and personalize deals to better satisfy the needs of specific market segments by providing the unique merchandise and services” (Krafft et. al. 2010). There is no doubt that the future of retailing is quite complex and challenging; busy customers expect that the companies must use some innovative approaches to facilitate the customer efficiently and economically along with some value added shopping experience. Customer’s ever changing demands

and the future technology innovations and adoption trends make it possible; because after the initial automation phase of the UPC bar code scanning system of 80's and then the second phase of CRM based Loyalty cards and now retail industry is underway towards the third phase called "market intelligence" based on "customer experience management". Mr. Hans Joachim Körber (*The CEO of METRO*) says that over the last few years, the retail industry has been changed dramatically, retail operations of companies like Carrefour, Tesco, Wal-Mart, and METRO Group have gained more complexity and sophistication in their business, today the retailing sector is one of the leading industries in adopting of new innovative technologies such as radio frequency identification (RFID) and self-service technologies (Krafft, et. al. 2010). What are the main agents to adopt these technologies and how these technologies impact on retail industry?, have been discussed in detail, later in this paper.

2.2 Processes Involved in Retailing

Globalization of the retail industry has gathered more complexity and competition; daily retail operations and processes have become more complex and require some innovative solutions. Before moving further towards the technological adoption; it is important to have understanding of processes involved in an international retail chain. "A business process is any system or procedure that an organization uses to achieve a larger business goal. When you break it down, you see that a business process is actually a series of individual tasks, and each task is executed in a specific order" (IBM, 2006). There are three kinds of business processes 1- Management processes, which concern with the policy and strategic planning, 2- Operational processes, such processes contains the core business activities such as marketing, customer relations, procurement and manufacturing etc., 3-Supporting processes, these processes supports the core activities with the procedural documentations and the data management activities of each operational process (McSweeney, 2010). Any international retail chain has multi-operation activities from global sourcing to supply chain and marketing/promotions to customer experience management, therefore there are various processes and documentations involved. People, process and technology are the main characteristics of any operation; this research is more technology centric, because technology empowers the workers by reducing their work efforts and management pain, while on the other hand it brings accuracy and effi-

ciency in the process (Weldin et al. 2012). In other words technology optimizes the business operations. A typical retailer has to take care of three major actors' 1-Suppliers 2- Distributors and 3- Customers.

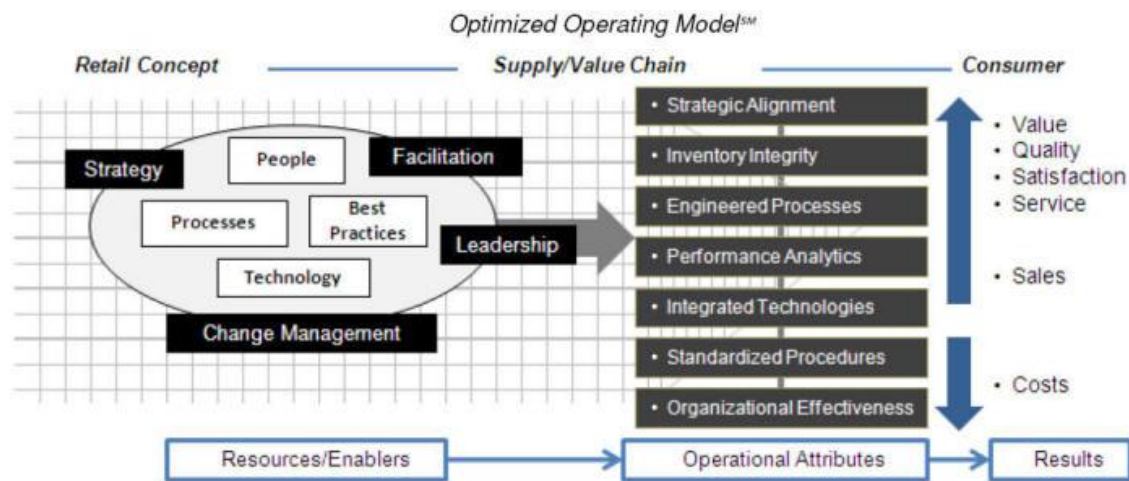


Figure 2, Source: Weldin 2012, Operational, Organizational, and Technological Solution for Retail.

Figure 2, presents the essential steps to reach the desired results; first thing first, the resources allocation (people, technology), then utilize these resources with strategy and leadership and put them together with the best practices of operational attributes (strategic alignment, inventory integrity, engineered processes, performance analytics, integrated technologies, standardized procedures and organizational effectiveness) to get the value, quality, satisfaction, services, sales and costs. Just a few decades ago the retail processes were quite manual and it was hard to monitor and evaluate the transactions, but with the prestige of time handling of these processes have become easy and automated along with technological advancements.

2.3 Business process Automation (BPA)

“The automation of the retail process and the adoption of innovative business practices save time, money and improve customer service. However, these benefits are offset by significant risks associated with reduced direct control and increased opportunities for shrinkage throughout the inventory life cycle” (sensomatic, 2007)

Today the agile enterprises are going through the period of rapid changes. *“Most change initiatives that end up going nowhere don’t fail because they lack grand visions*

and noble intentions. They fail because people can't see the reality they face. Likewise, studies of corporate mortality show that most fortune 500 companies fail to outlast a few generations of management not because of resource constraints but because they are unable to "see" the threats they face and the imperative to change". (Pal et. al. 2005) Technology is the biggest change agent in the retail sector; especially "Information Technology" has gathered a considerable fame to manage the retail processes in recent decades. The commonly used term "Business Process Automation" (BPA) leverages the business processes and its effectiveness supports in time decision-making. "Business Process Automation is a process of managing information, data and processes to reduce costs, resources and investment. BPA increases productivity by automating key business processes through computing technology" (Janssen, 2010). Technologies like POS, IRFD, Cloud are the most innovative technologies that have brought a new breakthrough in retailing activities like supply chain, logistics and the multi channels retailing in order to keep the processes efficient and cost effective, therefore retailers must build a change adoptive behavior, because the continues adoption of changes combine the best and up-to-date business practices that leads to the competitiveness (Krafft et. al. 2010). The traditional ways to use business automation solutions like CRM, SCM or HRM are still effective, but the adaptation of the next generation business practice is essential to prolong the business life cycle and to face future economic setbacks. *"Retail management technologies are involved throughout the whole retailing process from vendor management to customer dealing. Therefore the retail processes are updating with the advancement of technologies"* (Samuel, 2012). The BPA has been used for years to handle the flow of information in businesses, while the ERP applications are the best examples of BPA to add value to information. The information is normally collected from the first contact with a prospective customer and continues through delivery of a finished product (Krafft et. al. 2010). Never the less business automation can help the retailer to control the workflow of business like routing, recording, processing, evaluation and reporting. BPA also improves the efficiency of workers by providing the accurate and in-time information to the right user and ensures the standardization of business reporting.

2.4 Change Adoptive Factors

This part includes the most urging change adoptive factors that have been divided in two parts 1- Internal Factors 2- External Factors

2.4.1 Internal Factors

2.4.1.1 Multi-Channel Retailing

Multi-Channel retailing and the increasing customer awareness is evolving the retailing into a complex organizational structure. *“The retail industry is shifting from traditional selling channels to the modern selling channels; now retailers are looking for new channels to reach the both walk in customer and online shoppers”*. (Samuel, 2012) In fact consumers have high expectations, therefore retailers’ needs a customer focused and integrated multi-channel strategy to cover all the operational and technological aspects in order to fulfill the customer expectation and gain the market share (Capgemini, 2008). *“Modern technologies open new channels of retailing and give new customer experience and reduce the retailer’s cost”*. (Stephaney, 2012) Multi-channel retailing is a the modern approach to provide a new buying experience to the customers through stores, catalogs, websites, calls centers, interactive TV, e-mails, cell phones and comparison shopping sites. The important factor behind offering such shopping channels is to explore and manage the customer’s shopping behavior/experience, which ultimately fulfill the purpose of retailer e.g maximize profit and gain customer loyalty (Linton, 2012).

Retailers cannot be successful in their purpose of multichannel retailing unless they integrate their channels at one location for collaborative information sharing. Integration of these channels is the major factor that forces the retailers to adopt technologies like RFID, POS and Cloud. Now retailers have realized that adoption of channels just for fashion without proper integration can drive them to the consequences of lost sales. An Integrated multichannel retail strategy must focus on four elements 1- Customer 2- Organization 3- Operational excellence 4- Technology integration as shown in the figure 3 (Capgemini, 2008).

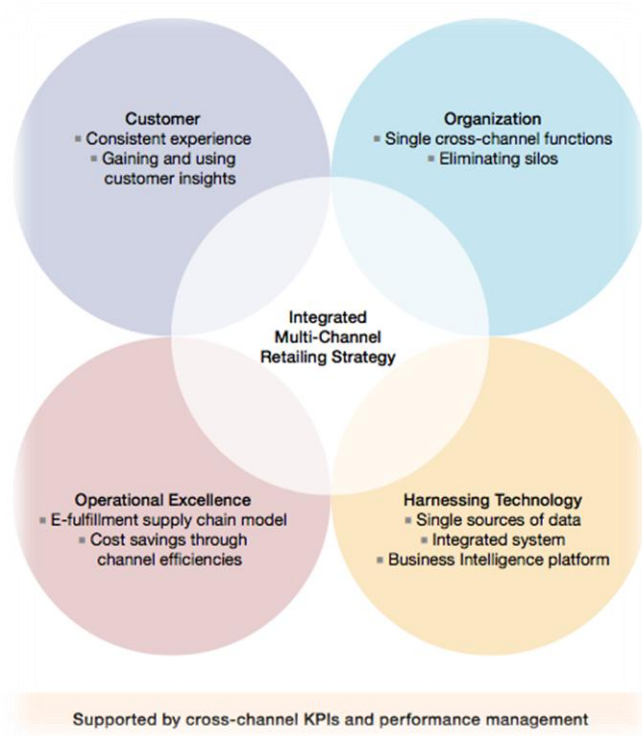


Figure 3: Key Elements of Integrated Multi-Channel Retailing, Source: Capgemini, 2008

“Future Consumer” is the center of shopping behavior insight, while a successful retailer uses these insights to range, develop and select their products in order to give the new customer experiences. The organization and selection of channels is another challenge, therefore to gain benefits from multi-channel strategy, an appropriate approach of implementation is necessary. After having the consumer’s insight “Operational Excellence” is required to maintain the customers’ turnover by offering the right products with good range on competitive price with quality customer services. “Technology and Data” plays a key role here, because the adoption of technological solutions delivers the multi-channel capabilities with business intelligence platform. (Capgemini, 2008)

2.4.1.2 Supply chain excellence and Global resourcing

Supply chain and global resourcing is the backbone of the retail industry, while the technology and well informed decision making plays a vital role to strengthen this backbone in order to carry the burden of economic setbacks and the global competition. “Sourcing experts must reach across the globe to design and source the most desirable products at the most economical unit prices” (Bonebrake, 2009). The recent shift in retail sector, not only effect business to consumer but also business-to-business relations, because retail management technologies substantially support retailer for smooth sup-

ply chain process, logistics and out sourcing. (Samuel, 2012) Modern technology helps the sourcing experts to find the right product from the right supplier and then supply it to the right store, in right quantity and at the right time. In current scenario, retailers are uncertain about growth and profit shrinking, therefore retailers must define the strategies to compete for supply chain management in order to survive and thrive (Bonebrake, 2009). The motive of supply chain excellence and global resourcing is lower delivery cost. According to a survey by “Institution of supply management” respondents received delivery cost reductions of 19% and reductions in total cost of ownership (TCO) 12% (Monczka, et.al. 2006).

To shorten the supply chain cycle is another reason to implement the modern techniques of supply chain management (SCM), because disconnection or delay in supply is the main cause of the conditions like out-of-stock. A shorter supply chain cycle saves the retailer from obsolescence and decrease working capital on that product, on the other side it optimize the inventory by minimizing the out of stock and over stock conditions. A longer supply chain (Which normally belongs to global resourcing) contains risk of high cost and low profits, if retailer’s sourcing strategy is not properly synchronized with well-planned supply chain and logistics. (Bonebrake, 2009)

Impact of Global Sourcing on Supply Chains

Factor	Domestic Supply Chains	Global Supply Chains
Cycle Time	Short	Long
Total Landed Cost	Clear	Ambiguous
Numbers of Parties Involved	Few	Many
Inventory Risk	Low	High
Regulatory Risk	Moderate	High
Intellectual Property Risk	Low	High
Overhead Costs	Low to Moderate	High
Information Availability	Moderate to High	Low
Processes	Well Defined	Less Defined
Internal Company Expertise	Moderate to High Expertise	Moderate to Low
Security and Risk	Low to Moderate	Moderate to High

Figure 4: Source: Bonebrake 2009, Impact of global sourcing on supply chain.

Above cited figure, draws a clear line between domestic and global supply chain. To handle a local supplier is comparatively easy than a global supplier, while for competitive price offering, global sourcing and supply chain is an essential part of retailing. In global sourcing scenario IT plays a crucial role in collecting information about supplier

and its manufacturing progress and quality, logistics, quality of packing etc. Therefore retailers should well plan their supply chain strategy with intentions to reduce the cycle time, landed cost, number of parties involve, inventory and regularity risks and overhead cost and on the other side retailer must be well informed about logistics situations (Bonebrake, 2009). Retailers who are seeking supply chain excellence and global sourcing benefits can identify and reduce these risks with knowledge, process, technological tools and well-informed decisions.

Capturing sufficient information about the key elements (e.g global resourcing and supply chain partners, logistic process, destinations and regulations) is essential in the whole supply chain process and it is quite challenging as well. Without collection of transactional data and supply chain process information, it is harder to get control over the supply chain process and lower down the deliver cost (McCormack et. al. 2008). “When Steve Jobs has announced about the new revolutionary mobile communication in his Macworld presentation, the iPhone was judged a triumph of design and functionality, not to mention its X-factor. Similar to other hot electronic products such as Xbox, PS3, Wii – analysts expected big shortages when the iPhones would go for sale across counters, but that didn’t happen, instead iPhone turned out to be the triumph of inventory management along its supply chain. Selling 270,000 iPhones in 30 hours of the transaction and a million units in 3 months, and 3.75 million in 6 months shows the meticulous planning of its inventory control and management along its entire supply chain. The key to this success was choosing the right suppliers and partners Establishing synchronization in the value delivery chain” (Karnam, 2009) Therefore the adoption of the technology is essential for retailers to get real time information which helps to make well-informed decisions before launching and during the normal sales period and also support retailer to locate the best resources globally and to lower down the delivery cost. Significant opportunities are there, if the retailers skillfully establish their technological infrastructure to cater global resourcing and supply chain issues.

2.4.1.3 Optimized Inventory management system

Offering variety of products from different bands is the important retailing sequence, but without having a complete automated infrastructure, it is rife with challenging situations like “Out of Stock” and “Over Stock”. Changing consumer preferences are increasing the numbers of products on shelves and bring more operational complexities.

“Consumer demands and tastes change frequently, calling for innovation across an extensive range of products and services” (Wuller, 2010).

Beside the issues of "Out of Stock" and "Overstock", other important reasons for the global retailers to adopt an optimized inventory replenishment system is cost reduction on handling and storage of inventory, forecasting of exact replenishment quantity and accurate timings of reordering (Juan, 2008). Inventory issue has been on top at Wall Street's concerns of analysts and as well as a major issue for CEO's and CFO's of the retail companies. In the global retail industry first step towards the inventory optimization was taken by Wal-Mart in 2006, by implementing "Inventory Deload Program", when they realize that their inventory level is rising higher in comparison with their sales growth. In fact in 2004, the Wal-Mart's inventory growth was about 90% of their sales growth. But after implementation of Deload, Wal-Mart's store division show inventory trend, with inventory growth of just 0.7% verses a sales growth of 5.8% (Gilmore, 2008). Furthermore, in current scenario retailers can think about the possible reduction in working capital employed in their supply chain by forecasting the exact quantity and replenishment period of orders.

To keep the inventory optimized, intelligent forecasting and replenishment techniques are required. Traditional approaches like, algorithm based statistical data analysis or single criterion (like obsolescence) overlooks many aspects of the inventory management in the current global scenario. To get the long lasting results from inventory optimization, it requires some innovative approaches like SKU ("Stock Keeping Unit", *determinant the profitability that which item should never be out of stock*) and the other forecasting techniques are important which can manage the processes, global sourcing and supply chain together to obtain optimize inventory (Slater, 2008).

“Market leaders invest heavily in technology and advanced planning system – Leading companies like Wal-Mart and Dell, who make use of advanced SCM solutions have higher inventory turns than their industry competition” (Lewin, 2012)

Inventory turn widely differ in industry

	Leader – Inventory turns	Laggard – Inventory Turns
CPG Supplier	Procter & Gamble – 6.43	Johnson & Johnson – 3.07
Technology	Dell – 64.34	Compaq/HP – 14.84
Contract Manufacturers	Flextronics – 8.86	Solectron – 4.92
Retailer	Wal-Mart – 7.2	K-Mart – 4.39

Figure 5: Inventory in different industries (Source: Lewin, 2012)

Forecasting and information sharing are the main characteristics of optimized inventory system, which can be better obtained through technology implications like RFID and cloud computing.

2.4.1.4 Assortment optimization

In retail stores; products on the shelves changes, according to season, fashion, customer’s tastes, new arrivals etc. “Assortment Optimization” gives a wonderful opportunity to the retailer to improve their gross margins by less budgeting for heavy purchases and maximum usage of shelf spaces and also can manage more than one vendor of one product at the same time (Kök, et. al. 2006). It also saves the retail worker’s time and efforts by logical design and division of space for articles in a warehouse and store, so workers can locate the articles within seconds. On the other hand it also supports the perpetual inventory system by updating the stock quantity and availability in real time (Anand, et. al. 2009).

Because of space constraints, usually global retailers build their warehouses in different locations than their retail stores are, therefore for maximum utilization of the space and financial resources; an assortment planner has to make choices among two major elements, 1- Retailer’s breadth (How many categories of one article should be displayed) 2- Retailer’s depth (In these categories how many SKU’s they have to keep and how much stock of these SKU’s they have to maintain). (Kök, 2006)

SKU selection depends on the capabilities of retailer, how better they use technology to get the information about the product’s sales performance and customer preferences. “Retailers face difficulties assessing product sales performance, maintaining a competitive mix and hitting revenue and profitability targets due to inadequate information regarding store segment, individual store and overall assortment composition” (Business Objects, 2012). There are many traditional methods for the assortment for instance, exogenous demand model, Multinomial Logic model, Exogenous Demand Model, and Kök and Fisher model etc. According to A.G kök, the formula of assortment is simple “Assortment planning at a retailer is to find the optimal set of products to be carried and set the inventory levels of each product,” (Kök 2006).

To get the highest return on the inventory, retailers require some innovative solutions of assortment rationalization, store clustering and consumer behavior management. According to Paula Rosenblum, (*Director of retail research, Aberdeen Group*) The proactive merchants “Use the science-based procedures, including science-based forecasting tools and the techniques to optimize the financial and assortment planning, buying, allocations and replenishment, and pricing and optimization.” (Jeanette, 2008)

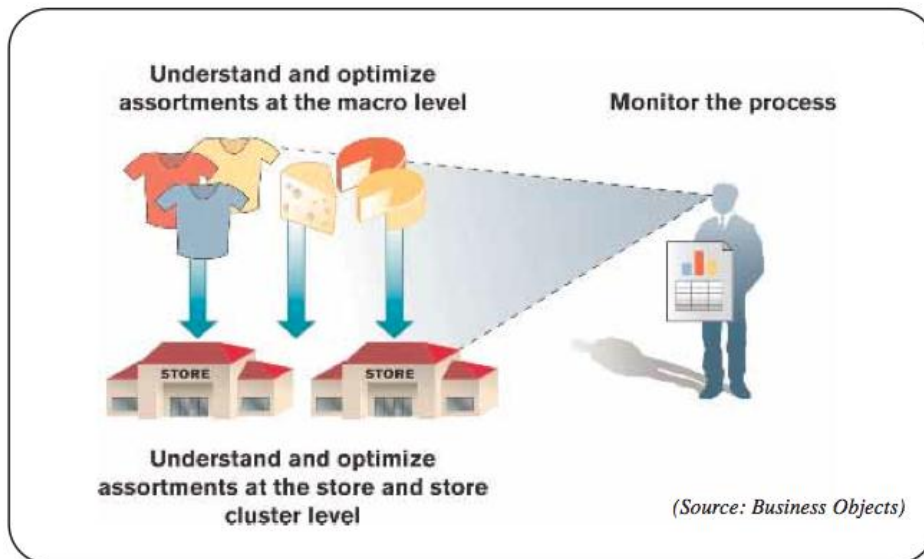


Figure 6: Improving Channel Store Visibility (Source: Business objects, RIS)

The guesswork has been over; today retailers require technology investment to equip their selves with advanced tools and techniques like RFID and cloud computing for monitoring the processes and store clustering in order to optimize assortment and maximize the profits.

2.4.1.5 Marketing intelligence & Promotions

Decisions on new products and promotions could be difficult and challenging without having knowledge of consumer behavior and historical data of products or its substitutes, even sometime historical data cannot help, if it is false or misunderstood. “Marketing Intelligence” is a very popular term now a day, especially for retail and consumer industry. “Market Intelligence is the process of acquiring, formatting and maintaining key information about customers and prospective customers” (Nix, 2012). The consumer is quite conscious to spend their hard earned money; especially U.S and European consumers search best possible price and good quality. So retailers have to respond sharply to customer shopping behavior and interact with them through better offerings and store format. Say if a retailer knows that on weekend’s men usually buy nappies and they put beers next to nappies in the store and offer good discount on beers, it can increase the sales and customer traffic (Hall, 2012).

Promotions are the key drivers to pull the traffic in stores; it increases profits and market share especially in holiday seasons. Therefore presentation and communication of new promotions to the potential consumers in ideal season need effective measures and data measurements from previous promotions. (Krafft et. al. 2010) Old promotion’s data provide a base for new promotions, but if a retailer cannot manage to produce their last promotion’s data then it is difficult to know the effectiveness of techniques used previously and what changes retailer can make for new promotions. “Without advanced technology most retailers won’t have an accurate understanding of how well their promotions performed until a month or two after the season is over” (Pahomi et. al. 2012). Moreover, consumers have also been shifted from print media to social media like Facebook, dealfind etc. Therefore in this rapidly changing scenario, retailers can get the benefits of advanced technology implementation by collecting and analyzing the historical data, which enable retailer to forecast consumer’s preferences, buying patterns and trends and more insight of the customers.

2.4.2 External Factors

2.4.2.1 *Economic Uncertainties and Increasing Cost Factor*

In comparison retailing costs are 2 ½ times higher than wholesaling. (Hosken D., 2000)
“This is the new era in sourcing with higher prices.” (Jacob, 2011)

Economic uncertainties and cost factor are directly proportionate and at first it affects the “fast moving consumer goods” (FMCG) industries, Therefore retailers have to find some innovative solutions to cater the situation. “Retailers are struggling to react swiftly and smartly to current conditions in the economic downturn” (Bonebrake, 2009). In the uncertain economic conditions, ever-changing customer demands and increasing cost of operations, retailers are more active to adopt new techniques to face the current situation. Due to the recent economic recession consumers have lost their purchasing power significantly because of inflation and high prices. In that situation customers are with little cash, therefore retailers are facing challenges of retaining customers and maintain their sales volume with low cost operations. On the other hand retailers are losing the benefits of cheaper outsourcing and low taxes, because cost base is changing due to high-energy cost. According to a recent Deloitte’s survey in the last 18 months 3/4th of UK firms has taken cost reduction programs, but only 17% reported sustainable changes (Deloitte, 2012). The cost reduction programs and business consultancies can be beneficial as well, but in current scenario this is the game of new customer experience and shortens the supply chain through latest technology implementations. Marks and Spencer’s CEO Mr. Marc Bolland was also insisting to hold the line on margins despite higher commodity costs, he said “We are trying to mitigate the cost increase by managing the supply base and getting efficiencies,” (Ward et. al. 2011). In conclusion, cost reduction is the serious matter, therefore retailers have to replace their old strategies with the new strategy of “Do more with less” by adapting the latest technologies like RFID, POS and cloud computing for lower total deliver cost (TDC) and customer experience management (CEM).

2.4.2.2 New shopping experience and increasing consumer's sophistication

Increasing sophisticated customers and intense competition force the retailers to add little more innovation in their store's format. "Retailing industry is changing its shape rapidly into "Future Stores" and "E-tailing" to give new customer experience" (Stephaney, 2012). Today's consumer expect beyond good prices and quality, like the specialty grocery chains provide friendly environment, supportive staff, unique products discovery, innovative shopping methods and fast checkout systems that convince the customers to increase their shopping cart. The "Future Stores" of Wal-Mart, Metro, and Tesco gives a brand new shopping experience with RFID tags, self-checkouts, personal sales assistants etc. On the other hand build a bear, American girl dolls, Bass pro shops and Jomo gas stations are few examples of innovative retailing. The reason to give a new shopping experience is to gain customer loyalty and their future return for more. (Krafft et. al. 2010)

In the busy schedule, customers don't want long checkout lines, many retailers are now providing self-checkout facilities and RFID scanning system, but a very latest innovative shopping experience came in my knowledge, that has been offered recently by Tesco (A British retail chain), they build a billboard on subways with a feature rang of products, where people can scan QR codes of products via cell phone and retailer deliver the things at their door step. (Jaffe, 2012)

Another unforgettable consumer segment is "Lifestyle of Health and Sustainability" (LOHAS), they are health and environmentally conscious consumers, they prefer to buy energy efficient, recyclable material, organic, toxicity etc. Therefore to focus on these standards retailers have to offer a sophisticated store format and products. (krafft et. al. 2010)

2.4.2.3 Global presence

Brand and accessibility bring a broad image of a retail chain and convenience to customers. "Retailers seeking to go global or expand their international footprint must ask themselves how they will get into the game or win it before they're outmaneuvered by rivals. The answers lie within their international operating model". (Bellin et. al. 2010) Wal-Mart operates more than 10,000 stores with 69 different brands in 27 countries (Wal-Mart, 2012b) and Zara is operating with 1,680 stores in 72 countries (Bereit, et. al.

2009). Because of advancement in IT, global economies of scale and homogeneous pattern of consumption “Global presence” has become easier for retailers. (Lopez, et. al. 2009) There are two major factors that force the retailer for Internationalization 1- Push factor (factor that force retailer to look for opportunities outside origin) 2- Pull factor (factors that attract retailer to operate in host country). (Moore at. al. 2004) Of course there is risk and a cost factor involves, but when the retailer has limited opportunities in the local market or if other markets are growing, it could be a better idea to search for new opportunities.

To develop an integrated hub between international branches, retail management technologies brings the retailers to the next level of integration and fills the communication gap and also free the retailer from traditional retail structure boundaries. (Lopez, et. al. 2009) “As retailers expand their international footprint through acquisition or organic expansion, regular recalibration becomes still more critical, because opportunities for cross-country and cross-business operational efficiencies multiply”, to gain synergies over across border operations, retailers now have the facility of advance technologies that gives them a virtual control over international branches (Bellin, et. al. 2010).

2.4.2.4 Customer connection and information

Innovative retail marketing and consumer’s changing lifestyle have changed their needs and choices, today’s consumers seek more updated information before they make their purchases; therefore retailer can get success by good marketing and right information. (Isaac, et. al. 2009)

Understanding of consumer choice improves the ability of retailer in drawing new strategies. Few decades ago only traditional and time consuming practices (Postal survey or phone calling) were the only way to know consumer preferences and their changing behaviors, while chances to get accurate information were even low as well. A decade ago online survey become new way of data collection, but it was still time consuming and people usually don't participate (Anderson, 2012).

Today emerging technologies enable the retailers to get up-to-date and real time consumer data through social media and loyalty cards. “Oracle Retail” is researching on the

social media to give a comprehensive look across the industry. “Oracle collect statistical data of selected retailers from the major social media sites, with deeper qualitative reviews of a subset of retailers to identify the sources of success and failure in this medium”. Oracle recommends the presence on Facebook, Twitter and YouTube, Just to refresh the content daily and put some new updates and respond to the comments of fans or followers (Berman, 2010).

Multi-Functional smart loyalty cards are another medium of consumer’s information collection. Customer personal card gives a specific customer’s transactional record, purchasing behavior, spending trends etc. (Leenheer et. al., 2003). The basic idea is that the retailers have to keep in touch with the consumer in order to get bigger share of consumer spending and here technology help retailer more than ever.

2.4.2.5 Formidable competition

Today consumers like “one stop shopping” with seamless experience. To fulfill such consumer’s desires and to maintain profits retailers have to handle the variety of different non-format items. “Format blurring” is a situation, that retailer sells the items, which did not belong to their line of merchandise. Format blurring is proof of each year increasing competition in retail industry, because the purchasing power of consumer due to the recession is low, the retail format is also changing and offering maximum variety of products under one roof (Berman, 2010).

Four decades ago people only found their prescribed medicine from local independent drug stores, but today consumer can get medicine from the superstores, mass merchants or even can order online. (krafft et. al., 2010) Now pharmacies are selling greeting cards, chocolates, soft drinks and cosmetics to cover their sales lost to Wal-Mart or other mass merchants. According to Mr. Bill Bishop (president of Willard Bishop Consulting) “There is almost a game of musical chairs being played as the market share of the general purpose supermarket is reduced by all sorts of players that are taking a fraction of that business.... You can buy an awful lot of groceries at places other than grocery stores” (Berman, 2010).

Besides the variety and assortment; the store environment e.g architecture, layout, signs and displays and shopping convenience also play a prominent role in the competition. In reality the increasing number of purchasing options, heightened consumer’s expectation

are possible, because of efficient distribution of goods and global sourcing, while these efficiencies can be better achieved with technological advancement.

3 FUTURE STORES TECHNOLOGIES

Retailers are facing increasingly low margins and high competition situation, in such crucial circumstances smart investment on innovative technologies like self-checkout, RFID and Cloud Computing can help the retailers. “Traditional strategies and tactics are still effective, but innovative uses of business and technology strategies can make an even bigger impact on an organization”. (Krivda, 2007) *“New technologies have made shopping easy, it saves customer’s time and facilitate them with better choices. The PSA and Self-checkout POS and RFID are the common technologies that are being used in “Future stores” by big retailers” (Stephaney, 2012).*

The use of modern technology in the retail sector is not new, but it has been developed dramatically in recent decades that today we have the concept of “Future Stores”. In 2003 Metro Group opened its first “Future Store” in Rheinberg Germany; it was a new breakthrough of innovative technologies in retailing that brings a shopping experience of tomorrow. The modern retail technologies entail advantages for both retail industry and consumers, for the retailer it makes the supply chain, global sourcing and data management efficient and for the consumer it brings shopping convenience and new experience. (Krafft, 2010)

3.1.1 Automated Self-checkout System

Self-Checkout technology has travelled a long way and developed rapidly, since 1998 when NCR installed its first self-checkout at Ball’s Food store in Kansas, USA. (Anand, 2011). “A customer-operated point-of-sale (POS) also called a "self-checkout," customers pay for and bag their own merchandise without interacting with a human cashier, although a support person is typically nearby and available.” (PC Mag, 2012). Almost every big box retailer like Wal-Mart, Metro, and Carrefour etc., has used self-checkout system to become a 21st century retailer.

According to retail banking research data, NRC (A leading self-checkout system supplier) sold 83000 units of self-checkout systems to more than 150 retailers around the world in 2010, which cost 25000 to 35000 USD. (Anand, 2011) In fact there are two kinds of automated self-checkout system adopted by the retail industry

3.1.1.1 Personal shopping assistant (PSA)

PSA is a thick mobile tablet device mounted on a shopping cart with store integrated and user-friendly interface along with bar code scanner. (IBM, 2005) With PSA customer can scan the items s/he buy and collect them in the cart, while for checking out, customers just press the payment button on PSA screen and the data transfer automatically to the cashier screen and the cashier print the receipt for payment, so customers can just pay there for his/her shopping without picking the items out of cart for scanning on cash counter. Beside this major function of shopping and time saving payment, PSA has many value added services like, customer can access online the shopping lists made at their home or office, during shopping it automatically update the list of shopping to show the customer what he/she has shopped and what's left. Furthermore customers can call up their own shopping history of the last couple weeks through a loyalty card (Krafft et. al., 2010). During shopping customer can place orders to pharmacy, flowers or deli beforehand and device let them know, when their orders are ready. By product scanning customer can get the further information about product i.e price, quality, size etc. Moreover PSA has a built in store's navigator which guide customers to the exact location of the desired product in store. (IBM, 2005)

3.1.1.2 Self-checkout system

The self-checkout system is just like a cashier counter but without the presence of the cashier, with 360-degree scanning system. In this system customer shop in a usual way with normal shopping cart, while the major difference between PSA and Self-checkout system is; here customer has to take the things out of the cart and scan and pay by their own self. System packs and weights the products automatically, which is monitored remotely by monitoring employee located in separate rooms and if weight deviate from the actual weight of scan products then the employee gets an error message. Normally one employee can monitor four self-checkout counters at a time. (Krafft, et. al., 2010)

Both interactive retail technologies provide personalized and convenient shopping experience to the customer; on the other hand it is efficient and cost effective for retailers. Therefore retailer can implement one or combination of both, according to their strategic plans and customer preferences. “Apart from the direct cost-savings associated with cashier pay, what appeals most to retailers is the enhanced labor productivity that self-checkout systems facilitate. By directing labor resources out of the cashier lanes, retailers can optimize their utility in other departments through sales assistance, replenishing inventory on shelves, bagging purchases and so forth” (Vanchesan, 2009).

To sum it up “Automated Self-checkout System” is an integrated and interactive shopping system, which enhance the customer shopping experience and can help the retailer to increase sales and reduce costs. Therefore it can optimize retailing at “Future Store” of the 21st century.

3.1.2 RFID

Online shopping (Amazon, eBay etc.) is becoming challenging for bricks retailer and force them to adopt innovative technologies like cloud computing and RFID tags. (Samuel, 2012) RFID is one of the emerging technologies of today and is in practice in inventory management, SCM, assets tracking and information sharing. RFID adaptation overall improves the business process of the retail sector. (Bhattacharya et. al., 2008) “RFID (radio frequency identification) is a technology that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency (RF) portion of the electromagnetic spectrum to uniquely identify an object, animal, or person.” (Rouse, 2007) A RFID system communicates through radio frequency and carries three main components 1- Antenna 2- Transceiver 3- Transponder. The antenna is embedded in a tag/label along with single computer chip. There are two types of tags 1- Passive tags (which are normally used in retail supply chain and use radio energy) 2- Active tags (Normally for assets management, aerospace, as they have batteries and are used for long range radio communication). There are low and high frequency RFID systems, the low frequency RFID can communicate within the range of 6 feet while high frequency RFID has ability to communicate within the range of 90 feet (IT Reseller, 2004).

But many organizations are still waiting for the technology to become mature; the reason is they are still not well aware of ROI on RFID investment (Bhattacharya et al.,

2008). While RFID technology has improved impressively that the big box retailers like Wal-Mart, Metro, Tesco and Carrefour are already getting the benefits of RFID integration between their stores, warehouses, supply chain and ERP systems and also report initial success. In January 2005 Wal-Mart declares RFID tags as mandatory for its top 100 suppliers (USA strategies, 2005). “More than half of European retailers and U.S organizations surveyed have implemented the radio frequency identification (RFID) or plan to do so before the end of 2006. RFID is a technology whose time has come, and it is here to stay”. (BEA System Inc., 2006) According to Frost & Sullivan’s report in 2005, the RFID revenue in the retail sector was \$400.5 million and expected to grow \$4169 million by 2011. The Gartner group predicts that the RFID spending will increase by six fold in the next five years from \$504 million in 2005 to more than \$3 billion by 2010. In fact RFID tags are taking place of Universal Product Codes (UPC) rapidly even generation-2 RFID technology is in use by many industries. The major advantage of RFID over UPC are 1-RFID does not require line in sight view or human intervention like barcode scanner 2- RFID has ability to read products in bulk, so you don't have to scan each single product 3- RFID tags are more durable than tags 4- RFID tag has more capacity of data storage 5- RFID tags have the ability to update information in real time (Staples, 2005).

RFID implementation bring numerous benefits to retailer for instance a- Remote controlled electronic price tags b- efficient store operations like product detail and locations access remotely c- Improve store format d- increase customer service with new experience e- improve security, other significant benefits are with brief detail as under.

3.1.2.1 Inventory Management

Regarding inventory; every retailer is conscious and wants every second update of the SKU. Harvard studies shows that in 29 countries retailer lost their sales up to 4% due to out of stock situation. RFID implementation reduces the out of stock level by 8% approximately. “Paul J Grieger, the director of supply-chain innovation at P&G recently noted that if the company could reduce stock-out levels from 8 to10% to more like 2 to 3% of sales, the return on investment in RFID would more than pay for itself” (USA Strategies Inc., 2005). Besides tracking the product movement, RFID can make replenishment actively and easy to locate the lost stock.

3.1.2.2 Supply Chain Benefits

Throughout the supply chain, retailers want to know the status and condition of their good, RFID tags on products and pallets, stores and update the real time information like temperature of products during logistics. According to Aberdeen Group “For the first time ever, [RFID] offers companies the opportunity to monitor and manage the location, state, status, and condition of products, assets, and even people, bringing process automation to a level unthinkable just a few years ago” (BEA System Inc., 2006).

3.1.2.3 Cost and Time Saving

Manual stock taking for big box retailers is the huge waste of time and labor. RFID devices reduce the labor effort and increase the efficiency while receiving, cycle and physical counting and distributing. According to Accenture RFID solution can reduce the cost widely in term of receiving stock by 50% to 65%, stocking by 22 to 30%, and check-out by 22 to 30% cycle counting by 40 to 60% and physical counting by 90 to 100%. (BEA System Inc., 2006).

3.1.2.4 Information sharing

As RFID tags can hold much more data than UPC and allows the user to read, write or remove the information in real time, so RFID tags can also work as dynamic data stores. (IT Reseller, 2004) Therefore retailer can have real time information of inventory and can update the prices in real time. Furthermore retailer can track the customer purchases in real time before they leave the store and can use the cross selling techniques to increase the sales. (USA Strategies Inc., 2005)

3.1.3 Cloud Computing

The days of having huge IT budgets are over, retailers are constantly looking for the best IT solutions with low cost. *Retail is a low margin industry, and in such uncertain economic conditions, retailers need cost effective and customize automation solutions.* (Elizabeth, 2012) Manage large and complex portfolio of applications is becoming burdensome and expensive, while every year retailers adds new capabilities and try to enter in new market segments with new challenges, which usually increase the complexity of

IT infrastructure, database size, and requires more computing power, therefore they have to update their applications and IT infrastructure; and sometime it overlaps and cause huge cost. Every year there is a visible growth in retail assortment, which increase 54% shipment storage every year. But the retailer has to manage this increase with the same IT infrastructure, according to IBM's estimation, 70% of the retail IT budget is spent in the maintenance of current infrastructure (Ganapathy et. al., 2010).

In 1999 a company called "Salesforce.com" delivers application service over the web and gives a rather clear idea of "Cloud Computing" even still it's a buzzword for many retailers. (Crawford, et. al. 2012) *Cloud is becoming more adaptive for all kinds of IT solutions and there is still huge thrust of research and development. In future cloud will be enabling the retailer to interact with consumer more socially and personally.* (Elizabeth, 2012) Cloud computing is still evolving; Elastic Cloud Computing (EC2) was started in 2006 while cluster instance was introduced in 2010. According to NIST (National institute of science and technology) "Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell et. al., 2009).

Cloud Computing is an emerging computing model, which allows the user a range of flexibility in global access, customized applications, on demand storage etc. The major focus of Cloud Computing is on virtualization of infrastructure and services, on demand elastic scaling, customized applications, increase integrated system. According to Ms. Cathy Lasser, (Vice President and CTO of IBM Distribution Sector) "We feel that it's important to inform retailers on the benefits of Cloud Computing including cost reduction and improved service delivery to help eliminate concerns during holiday and major promotional business peak." (Grannis, 2009) To better understand the benefits of cloud it is important to have a brief overview of cloud computing. A cloud service has been typically broken down into Software as a Service (SaaS), Platform as a Service and Infrastructure as a Service and can be delivered using private, public or hybrid clouds. There are three types of cloud infrastructures available

1-**Public** is a commercial cloud owned by some other organization, so it is always off premises; it is usually shared by different subscribers and charged on a per-user basis.

2- **Private** is a personal cloud owned privately by an organization or third party can be hired to handle, therefore it could be on premises or off premises. A private cloud is dedicated for a single company and has more abilities of authentication, security and customization than public cloud

3- **Hybrid** is a combination of public and private cloud, usually companies use hybrid cloud when they use applications from public cloud and store the sensitive data on private cloud. It depends on the nature of the organization but any cloud of them can better help retailers (Ganapathy et. al., 2010).

Furthermore cloud offers three different kinds of services regardless of its nature of infrastructure

1- SaaS (Software as a Service): SaaS is the most common and sophisticated use of the cloud, as apparent clear from the name in SaaS cloud provides different types of applications to users through a web browser, therefore users don't have to install anything locally. These applications are normally tailor made, according to the user's specifications. Through SaaS retailers can be free from the worries of IT infrastructure and staff and other common IT problems. Common examples of SaaS are Salesforce.com, Google's apps, Skype etc. (Mehmood et. al., 2011, Burford, 2010).

2- PaaS (Platform as a Service): In PaaS vendor provides a platform to run an existing or develop a new application through the Internet. Here vendor take care of the user's data and applications health and smooth communication. PaaS removes only the IT infrastructure worries of the user, while in PaaS retailers have to manage the applications by their selves. SAP hana, Microsoft Azure, Salesforce.com, ADP payroll processing are the typical examples of PaaS (Mehmood et. al., 2011, Burford, 2010).

3- IaaS (Infrastructure as a Service): This is just a virtual server on demand, where user has to configure and manage. Therefore in IaaS retailer can only save

time and expenses but cannot be free from entire IT management pain. Normally users switch to IaaS when they have high data storage demand. Elastic Cloud Computing (EC2) by Amazon can be one example of IaaS (Mehmood et. al., 2011, Burford, 2010).

Because of economic uncertainties “Do more with less” has become unconditional requirement of every business. “Cloud Computing, which effectively lowers IT costs for retailers, is an emerging computing model by which users can gain access to their applications from any location, through any connected device, making the infrastructure transparent to the user.” (Grannis, 2009) *Cloud technology is playing a multi-tenancy role, which means many global users are connected with the same efficient source. Therefore it cost effective for retailers to manage the current operations and accommodate the future growth. (Elizabeth, 2012)* Retailers can get numerous benefits of using cloud, few major of them are

3.1.3.1 Real-time Insight Using Cloud

Retailing has got more excitements than ever before, now it requires prompt and well-informed decisions. The traditional methods of gathering, storing and analyzing data is no more valuable. The information took place several hours ago has risk of inappropriate decision making due to stale data processing. With the advancement of cloud, now retailer can access the business application/information through the Internet anytime, anywhere and on any smart device. Aside from real time insight, the advance ERP applications for instance, SAP Hana, Microsoft Azure helps the retailer in predictive data modeling. Furthermore cloud and RFID can work in collaboration and can resolve the issues of supply chain and inventory management, so retailers can re-organize the supply chain to make sure the delivery of right product, at the right place, at the right time (Mehmood et. al., 2011).

3.1.3.2 Collaborative Working and Information Sharing

Cloud provides a platform for the retail workers to share information freely. Facebook is quite a general example of such cloud services, most of the retailers have employees page on Facebook. Many employees of international retailer travel intensively and need a platform to interact with other employees regularly or in real time. Now with modern tools from SAP and Microsoft this feather is quite strong. (Bentfeld, 2010)

3.1.3.3 Focus on Core Competencies Not IT

Smart retailers are now focusing on their core retail competencies rather than getting lost in IT problems. Now retailers are free from maintaining, updating and monitoring the IT operations and can focus on global sourcing, new customer experiences, innovative store formats, new promotions and meeting unpredictable demands. Cloud has almost removed the communication time between different stores of any international retail chain. According to NRF (National Retail Federation) in 2010, 67% of retailers will prioritize customer databases/data mining (Bentfeld, 2010).

3.1.3.4 Increase Savings

Cloud computing not only reduces complexity but also decreases the capital and operational cost of IT, as retailers don't have to build new IT infrastructure, buy new software licenses and pay the IT experts. Retailers just pay as per use of the cloud, furthermore they can increase or decrease the services according to their current and future demands (Ghalimi, 2010). Here is an example of cloud investment, U.S. federal government IT budget was \$76 billion in 2010 and was expected to increase up to \$88 billion by 2011, while 25% more of the total spending they have to spend on maintenance of IT infrastructure. Booz Allen and Hamilton (BAH) calculate the ROI if federal government invests in cloud. According to BAH

- The Net Present Value (NPV) = out years cost saving – upfront investment
“Life cycle costs that are 65% lower than current architecture”
- The Benefits Cost Ratio (BCR) = out years cost saving / upfront investment
BCR varies from 5.7 to 25 app (depends on cloud deployment model)
- The Discounted Payback Period (DPP) = Time of investment required to be recouped from the year out savings
So the breakeven came in 3 to 4 years, (BAH, 2010).

Cloud computing has already made its place among small and medium retailers, while big box retailers have started to understand the abilities of cloud computing. A recent announcement of significant enhancements by Association of Retail Technology Standards (ARTS) for Fresh Item Management (FIM) standard, which provides the retailer a traceability of food items from farm to store, essentially needs a cloud computing system integrated with IRFD system. (Grannis, 2012) In a recent Microsoft-commissioned survey of approximately 3000 business decision makers in U.S, where 48% respondents

from retail industry told that they are already using cloud computing, while 32% respond that they seriously considering to adopt cloud computing. (Bentfeld, 2010)

4 BENEFITS OF AUTOMATION TO RETAIL INDUSTRY

The management of different processes or operations is very essential and crucial part of any organization, therefore organizations invest heavily in the improvement these processes and then it is important to measure the output of these processes. Normally tangible benefits are considered, the only benefits that can be measured in monetary terms. While Intangible benefits are the ones, which cannot be felt or measured but it helps to increase the efficiency. *"Technology by itself doesn't do anything,"* (Robert Benson, a professor of information management at Washington University in St. Louis) (Violino, 1997).

4.1 Tangible Benefits

The days have gone when CFO's easily get agree to allocate a certain budget for IT and technology investments. Now they require the executives to justify these investments. In other words, senior management needs to be convinces for such technological investments. (Sidana, 2006)

4.1.1 Cost and Benefit Analysis of Retail Management Technologies

If you ask 20 different analysts or CIO's about the ROI (Return on Investment) on Technology investments, probably you will get 20 different answers. Now several analysts are agreed with this new philosophy of ROI saying, "it's the things that are most difficult to measure that matter most of all" (Violino, 1997). If ROI is not the best answer for the measurement of technology investments, then it would be reasonable to ask, "What is?" A general answer that you can get would be "Value", value that you get by improving your business processes. (Plummer, 2012) *"It's what the organization does to use information and reach out to customers that matters. The purpose of IT is to change the behavior of its users to better achieve their business objectives."* (Robert

Benson, a professor of information management at Washington University in St. Louis). (Violino, 1997)

It is difficult to convert the “Value” gained from technology investment into “Hard Money”, but what is the meaning when a retailer invests on self checkout POS and save by hiring less sales persons? Of course then he is lowering down his Total Cost of Ownership (TCO) by investing on new POS rather to hire new employees. (Intel, 2009) Moreover, When POS’s transaction monitoring leverage the complex event processing (CEP) software’s, which saves retail from the situation like Out-of-Stock and ultimately provide the opportunity to sell more. A comprehensive study conducted by GMA (Grocery Manufacturer of America) and Food Marketing Institute (FMI) in 2002 “Out-of-stock rates averaged 8.3% and ranged to 40% for promoted products, faced with an out-of-stock, most consumers refrain from purchasing any product, delay their purchase, or purchase a competing brand.” Out-of-Stock situation cost the retailers \$170 billion in U.S alone and damage the financial performance of CGM brands (TIBCO, 2011).

A research conducted by Accenture suggests that exceptions are well founded, with the updating of POS systems or software’s, or in other words by investing in new technological innovations; retailers can achieve significant ROI and increase the store efficiency within one year.

Research from AMR clearly demonstrates the ROI of new POS software for both store productivity and training costs in the grocery sector

Productivity gains per store	Value	Training cost savings per store	Value
Average number of transactions per store per week	12,000	Training cost per cashier on existing PoS application (8 hours basis)	\$120
Average number of transactions per store per day	1,714	Annual training cost per store on existing PoS application	\$2,280
Average transaction time	125 seconds	Training cost per cashier on new PoS application (2 hours)	\$30
Number of seconds saved per transaction	4 seconds	Annual training cost per store on new PoS application	\$570
Number of seconds saved per day per store	6,856 seconds	Annual training savings per store	\$1,710
Number of hours saved per store per year	693 hours		
Annual \$ savings of cashier time per store	\$10,395		
Annual savings in a 500-store chain	\$5,197,500	Annual training savings for 500-store chain	\$855,000

Note: Based on 50,000 sq ft grocery store with 10 staffed checkout lanes, 35 cashiers, 19 of which are new each year

Figure 7: Maximizing the potential POS system, Source: Accenture, 2007

Figure: 7 gives a great idea of saving 963 hours per year that ultimately saves \$10,395 per year per store, while on the other hand, the new system is that easy to handle and user friendly that it significantly save the training hours as well. In conclusion, it depends on the retailers that how they want to see the results of their technology investments, in figures or in values. But it is quite obvious that properly implemented and aligned with the business objective technological investments bring numerous benefits to retailers.

4.2 Intangible benefits

4.2.1 Collaborative information sharing and unified data management system

Increase visibility into information and value chain across entire retailing process requires tighter collaboration from manufacturer/vendor to customers. (TIBCO, 2012) Collaboration takes place when more than two persons work together and share their knowledge, information and coordinate their activities in order to accomplish a common task. Retailing involves various different process and very many users/partners attached with these processes. “Users participation seems especially important in the development of collaborative work systems, where the technology used by work group to coordinate their joint venture” (Doll et. al. 2001). These users require timely and accurate information, which is a critical success element for both consumer goods manufacturer and retailer. (TIBCO, 2012)

It has been observed that information sharing from retailer side brings quite significant benefits in supply chain process by reducing bullwhip effect. (Lee et al., 2000) In retail business, collaborative information sharing and unified data management system has three major benefits 1- To develop the environment of “Collaborative Planning, Forecasting and Replenishment” (CPFR increase visibility of supply chain through upstream and down-stream data sharing) 2- “Collaborative Transportation Management” (CTM objective is to eliminate the inefficiencies in the transportation process) 3- Vendor Managed Inventory (VMI reduce the purchasing cost, as vendor directly collect data through “Electronic Data Interchange” (EDI)) (Siefert, 2012., Chen et al., 2000). “Product launches, store operations, financial planning, merchandising, and warehouse operations – all rely on the accuracy and timeliness of product information” Among the bene-

fits of CPFR are sales and demand forecasting, smaller inventory buffer across the supply chain, less human errors, process efficiency, coordinated pricing and promotions with supplier and timely decision making. According to TIBCO, some independent studies show 10% high out-of-stock, 30% increased invoice error rate, and 30% high product update error and product promotion schedule mismatch are the common situations of retailers without implementation of CPFR, which is not possible without real time collaborative information sharing system (TIBCO, 2012).

A CPFR system implementation, specifically in retail industry requires three major technologies (POS, RFID, Cloud), as mentioned earlier in this paper and also recommended by TIBCO. “*TIBCO Collaborative Information Manager*” an application that is specially designed for CPFR and also has been offered through cloud. The figure is complex but self-explanatory; According to figure, 7 sourcing, procurement, merchandising, order management, logistics, supply chain and item management are the major retailing processes that are interconnected through a collaborative and unified data sharing system. While that system is also attached with POS in the retail stores and with RFID throughout the supply process till warehousing and handle multichannel retailing as well (TIBCO, 2012).

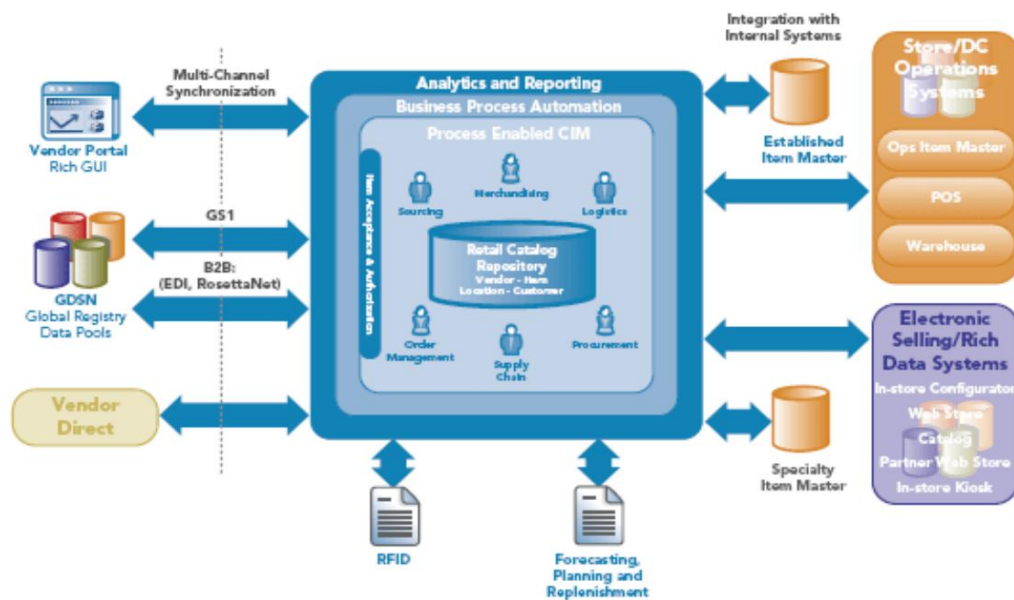


Figure 8: Collaborative Information Sharing System, (Source: TIBCO, 2012)

Collaborative information sharing environment helps to achieve system efficiency, inventory and cost reduction, on the other hand it enable users to produce more useful in-

sight through information sharing. The below cited self-explanatory figure, 8 shows few major advantages of CTM and VMI.

Metric	Example
<i>Reduced transportation costs</i>	<i>Eliminate excessive empty backhauls and dwell time</i>
<i>Increased asset utilisation</i>	<i>Reduced empty miles that are unpaid to the carrier</i>
<i>Improved service levels</i>	<i>Higher on-time performance</i>
<i>Increased visibility</i>	<i>Identifying location of freight in the supply chain</i>
<i>Improved end-customer satisfaction</i>	<i>Increased number of 'perfect orders'</i>
<i>Increased revenues</i>	<i>Improved fully load miles, better on shelf performance, increased order quantity</i>

Figure 8: Collaborating Across the Supply Chain, (Source: John 2001)

Collaborative information sharing facilitates retailer and vendor with collaborative forecasting, which is essential for efficient supply chain management.

4.2.2 Business Intelligence

Analyze the historical data and forecast the future is an unconditional requirement of retailer. For real insight and valuable actions, the retailer needs fast and unfettered access to customers, products and vendor's information. (Bittner, 2012) The economy in IT has enabled the retailer to gain the high quality information through the "Business Intelligence" (BI) tools like data warehousing, data mining, OLAP (On-Line Analytical Processing). (Rao et. al, 2001) "Business Intelligence is the process of transforming raw data into meaningful information to enable more effective business insight and decision-making" (MicroStrategy, 2011)

BI plays a crucial role almost in every function of retailing. It analyzes and generates different useful reports of customers, supply chain, finance and HR etc. "Technology has played a key role in retailers' effort to compete in this volatile market. Sophisticated retailers have quickly evolved from basic automation to embrace new technologies like CRM, business intelligence, etc." (Rao, et. al. 2001). In the new era of IT the most sophisticated technologies like mobile technologies and cloud computing should be

aligned with business objections for BI and analysis. (Moore, 2012) According to MicroStrategy, over 10,000 users of Metro Group across globe access 70 TB (Terra Bytes) data warehouse and generate different reports and analyses. (MicroStrategy, 2011) According to a survey of 200 retail companies in December 2007 by Aberdeen revealed that the “best in class companies” are employing BI to improve their performance and capabilities. Aberdeen distinguishes best in class companies among average and laggard companies, due to their best in class performance gained by BI implantation

- An average year over year sales increased by 11.7%
- An average increase in the profit margin by 9.3%
- An average increase in customer retention by 12.2% (Jeanette, 2008).

In the surveyed companies 67% were already using BI solutions, while 26% were planning to implement BI solutions. (Jeanette, 2008) Among the numerous benefits of BI, few majors are

4.2.2.1 Customer intelligence

Customer intelligence is the key driving force behind adoption of BI solutions by retailers. It is equally important for retailer to retain the existing customer or develop new customer base. State of the art BI analysis of data from the sources like POS transactions and social media gives the unprecedented access to the customer’s mind. (Rao, et. al. 2001) “Customer analytics enables retailers to integrate and analyze the ever-expanding universe of data to obtain valuable insights about customer behavior, buying patterns, and consumer preferences” (MicroStrategy, 2011) Customer intelligence identify the unique characteristics of customer, which helps retailers to measure

- Customer’s response to new promotions
- Customer’s response to new product launches
- Customer’s response to discount offers

Moreover through customer intelligence, retailers develop an effective customer retention program to gain customer loyalty, to make cross selling, to target a certain consumer class. (Jeanette, 2008) Once retailers reach to customer analysis then it could be easy for them to develop a customer base by offering holistic shopping experience.

A shared characteristic among leading retail and Consumer Packaged Goods (CPG) manufacturing companies is to interact with their customer and focus on enterprise-wide

planning and monitoring. *The retail industry is becoming more social, now retailers are using modern techniques to interact with the consumer and even with their employees, like a client of salesforce.com, “Burberry” a famous French fashion chain has completely updated their system with the social cloud of salesforce.com (Elizabeth, 2012)* Technology has rapidly evolved to better enable this advantage even as increased globalization has added complexity. Decision support systems (DSS) represent one important class of tools used for this purpose (Bonebrake, 2009).

4.2.2.2 Supply Chain/Vendor Intelligence

To manage vendor effectively, it is necessary to observe supply chain movements in real time, because it enables the retailer to make prompt decisions of supply chain optimization and support the retailer to negotiate with vendor on price, quality and delivery. (MicroStrategy, 2011) “With cash registered (POS) equipped with bar code scanner, retailers can now automatically manage the flow of products and transmit stock replenishment orders to vendors. The data collected for this purpose can provide deep insights into the dynamics of the supply chain”. (Rao, et. al. 2001) Alcon, Inc. (An eye care company) reduce back orders, save staff time, optimize inventory levels and saves \$6 million in inventory cost through the implementation of the vendor intelligence system of SAS without making unrealistic investments on inventory. (Keathley, 2012) Vendor intelligence facilitates retailer with

- Vendor’s performance analysis on the basis of factors like cost, delivery time and quality
- Control over inventory level, safety stock and lead time through inventory indicators and analysis
- Helps to keep an eye on product movements from vendor to customer
- Make easy, a complex demand forecasting models (Rao, et. al. 2001).

BI’s integrated view of inventory and supply chain through dashboards and reports can provide supply chain/vendor intelligence. This could become the reason of the ultimate growth of retailer.

4.2.2.3 Front Store Intelligence

Stores are the most effective places to get the consumer’s updates and store performance. “The information needs of the store managers are not restricted to the day to day operations”. (Rao, et. al. 2001) Now mobility of information has made store managers more active in the stores rather in offices. Store intelligence enables the store managers

to be informed with store performance at regular interval throughout the day and be ready to make inventory, promotion, pricing, loss prevention (LP) and staffing decisions in real time (MicroStrategy, 2011). Store intelligence provides numerous tips to the store manager to manage the store's efficiency, like

- Demands of consumer's compelling shopping experience
- Market basket analysis for natural affinities between products like beer-diapers two product affinities example
- Adequate and effective choice/combination of Stock Keeping Units (SKUs) to maximize the category profitability
- Prepare store manager for labor scheduling, customer service, merchandise display, promotional signage, potential stock shortfalls caused by local market conditions (Rao, et. al. 2001).

Moreover the Loss Prevention (LP) through vendor fraud, theft, processing and administrative errors, variance between actual and physical stock, UPC ticketing error, POS ringing error, return processing error etc. can be avoided by implementation of store intelligence.

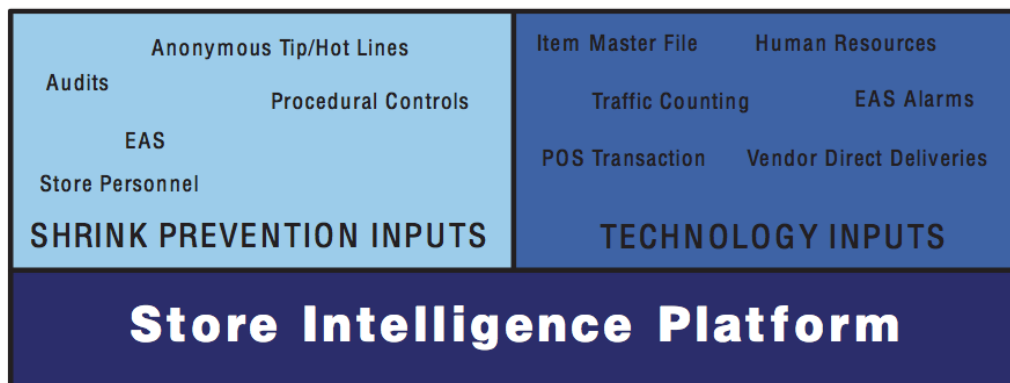


Figure 9: Store Intelligence (Source: Sensormatic, 2007)

To shrink the opportunities of potential theft, fraud and error, technology inputs are essential along with precautionary measures (sensormatic, 2007). Beside the typical retail advantage there are lots of general advantages of Business Intelligence implementation that a retailer can enjoy.

4.2.2.4 A Quick Insight and Prompt Decision Support

With a capable and efficient BI solution, an organization receives the desired information at all department levels, which make the decision-making faster and well in-

formed. Therefore retail management technologies include BI as one of the important technological elements (Browne, 2010).

4.2.2.5 A vigilant Eye on Business

From demand forecast to customer loyalty, BI helps the retailer to keep vigilant eye on business activities by estimating the long and short-term demands, notifications of low inventory and monitoring the factors that influence the customer loyalty. (Chee, 2009)

4.2.2.6 Improved Business Strategies and Planning

BI provides improved business management and operational processes, such as planning, controlling, monitoring, change management, and fraud detection for a sack of increased profit and/or reduces cost. (Williams, 2003)

4.3 Performance Management

Organizations that are not moving forward with performance management, means that they have lack of thorough understanding of Business Performance Management's (BPM) benefits. (Schiff, 2005) Performance can be defined as a value contributed to achieve predefined business goal and that contribution can be made by a group of employees or business partners. The past performance management was limited to the internal sectors like finance and HR, and due to the lack of performance transparency and information delay it was hard to overcome the performance limitations, but with the latest developments in BPA and IT, companies are able to control their performance in real time (Hoffmann, 2002). The major idea of performance management is to develop control over different business processes and departments by collecting and analyzing data of these processes to increase the performance and to make necessary decisions. (Melchert, et. al. 2004) The "National Performance Management Advisory Commission" identifies the characteristics of better performance management system

- Provide the information transparent and easy to access, use and understand
- Align the goals, program, activities and resources with priorities
- Help to make accurate decisions with meaningful data (Mucha, 2010).

The retail managers should be problem solvers through numerical analysis of facts and data on day-to-day basis, (Dunne, et. al. 2011), therefore the top executives usually rely on "Dashboards" and Key Performance Indicators (KPI's), which provide the latest

trends of the organization. (Eder et. al. 2006) “An executive dashboard is a computer interface that displays the KPI’s that corporate officers need to effectively run an enterprise” (Rouse, 2006). The retail tools for Corporate Performance Management (CPM) like dashboards and KPIs gives insight into how money is being spent in term of category, location, and brand. (Eder et. al. 2006) A Standardize CPM dashboards brings various benefits to retailers

- CPM dashboards work proactively to align organization’s resources, people, information and decisions with organizational goals
- The CPM dashboards verify business processes, highlights anomalies, provides audit trails and performs due diligence analysis
- It increases the business agility by seeking opportunities and mitigating risks.
- CPM creates a holistic CRM by using KPIs, which helps to understand potential clients needs and design tailor made services to increase profits
- Provide a standardize Supply Chain Operations Reference-model (SCOR)
- Through EPM retailer can identify the potential capabilities of employees and leverage their capabilities to address client’s needs (Eckerson, 2011).

Retail executives want to see “Big Picture” of business in real time and that can be viewed through dashboards provided by a business intelligence framework of cloud computing.

The technology transformation has entirely changed the Business Process Management (BPM). Business processes have dramatically changed over the last ten years: from the automation of POS transactions to the reliance upon electronic data interchange for most inventory transactions, retailers are changing the way they order, receive, stock and sell their merchandise”. (sensormatic, 2007) The benefits of this change are quite obvious

The top executives usually need the “Big Picture” of the firm’s, while one of the most common management approaches that rely on performance management information is the “Stat system”. Stat system is performance information and problem identifying system, which improve the existing system by forcing executives to keep focus on performance and take corrective actions. (Mucha, 2010)

RESULTS AND DISCUSSION

Since competition heated up and consumer spending cooled down, retailing has become a low margin industry. In this scenario, technology is an intense focus area of the retail industry, as the retailer has to be extra conscious and well informed about their future saving and spending decisions. Therefore just to know the benefits of retail management technologies are not enough, one cannot reach to the real benefits of such adoption, until and unless the technology adoption is not aligned with the business objectives. Retailers must prioritize their business needs and look for the suitable technology in order to get the desired output. This paper has discussed five internal and five external most key influencer change adoptive factors that are changing the “Traditional Stores” to “Future Stores”.

The research on rapidly changing retail industry brings into our knowledge and clearly answers the first research question by telling us that the “Change Adoptive Factors” for “Future Stores” are actually more than just cost reduction and increased efficiency. 21st century retailers have challenges like customer experience management, multi channeling, marketing intelligence, seamless and short supply chain, inventory optimization, assortment management, collaborative information sharing and finally a complete business intelligence system. Big box retailers like, Wal-Mart, Carrefour, Tesco and Metro cash & carry, have greatly increased in complexity in operations and sophistication in shopping. The retail sector has become one of the leading industries in adoption of latest innovations like radio frequency identification (RFID) and self-service (POS) technologies. Retailing has been the industry that has principally fostered breakthroughs in SCM, logistics and global sourcing. Retail industry leads other sectors in collaborative information sharing, customer data capturing, data warehousing and analyses.

The findings of this study broaden the knowledge of the author and enable to draw a below-sited figure that can better present the results and gesture of the whole research in one glance.

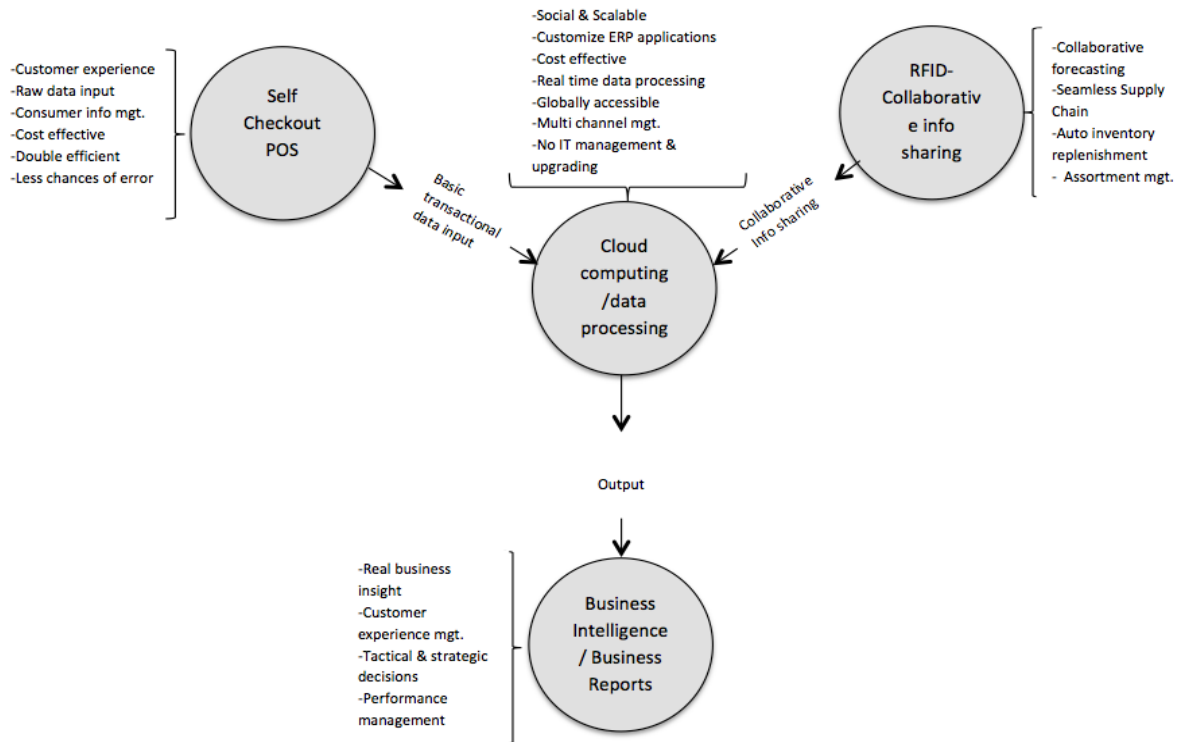


Figure 10: Retail Industry Adopting to Change Source: self-created

Today's consumers have ever changing behavior, and they are more aware than before, therefore retailer has to be more conscious regarding collection of consumer data. Most retailers collect their sales data from POS and work on that data for future analysis. To face the above mentioned challenges to retailers; This research reaches to the conclusion and answer the second research question that the available retail management technologies like 1-Self Checkout (POS) 2-RFID 3-Cloud Computing helps the retailer by providing a real time integrated and collaborative information system that facilitate the retailer with a strong business intelligence system to keep vigilant eye on business performance. Although the retail management technologies are still evolving but it is unconditional for retailer to use such technologies throughout the retailing process, because these are the best technological combination for any retailer.

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APPENDICES

Consultant and Retailers Interview

Respondent Details

1. Ms. Elizabeth Bitsch Christensen (November 16th 2012)
(*EMEA Marketing Program Manager, Salesforce.com*)
2. Mr. Matt Samuel (November 9th 2012)
(*Global Media and Analyst Lead, Retail and Consumer Goods & Services, Accenture Inc.*)
3. Ms. Stephaney Mathey (November 2nd 2012)
(*Development Manager, Carrefour S.A*)

Questions and Comments

1. How do you see the retailing in 21st century?

Elizabeth: Retail industry is becoming more social, now retailers are using modern techniques to interact with the consumer and even with their employees, like a famous client of salesforce.com “Burberry” a French fashion chain has completely updated their system with social cloud.

Stephaney: Retailing industry is changing its shape rapidly into “Future Stores” and “E-tailing” to give new customer experience.

Samuel: Retail industry is shifting from traditional selling channels to the modern selling channels; now retailers are looking for new channels to reach the both walk in customer and online shoppers.

2. What kind of role technology is playing in this change?

Elizabeth: Cloud technology is playing a multi-tenancy role, which means many global users are connected with the same efficient source. Therefore it cost effective for retailer to manage the current operations and accommodate the future growth. (Elizabeth, 2012)

Stephaney: New technologies has made shopping easy, it saves customer’s time and facilitate them with better choices.

Samuel: Retail management technologies are involved throughout the whole retailing process from vendor management to customer dealing. Therefore the retail processes are updating with advancement of technologies.

3. What are the technologies of “Future Stores” or “21st century retailing”?

Elizabeth: Can’t say much about other technologies, but off course cloud is the future IT solution for industry.

Stephane: PSA and Self-checkout POS and RFID are the common technologies that are being used in “Future stores” by big retailers.

Samuel: Online shopping (Amazon, eBay etc.) is becoming challenging for brick retailer and force them to adopt innovative technologies like cloud computing and RFID tags.

4. What are the major reasons to adopt these technologies?

Elizabeth: Retail is low margin industry, and in such uncertain economic conditions, retailers need cost effective and customize automation solutions. The key reasons to adopt cloud is the cost efficiency, flexibility/on demand and tailor made solution.

Stephane: Modern technologies open new channels of retailing and give new customer experience and reduce the retailer’s cost.

Samuel: The recent shift in retail sector, not only effect business to consumer but also business to business relations, retail management technologies substantially support retailer for smooth supply chain process, logistics and out sourcing.

5. Do you think these technologies have entered the maturity phase, if not then what kinds of improvements are needed?

Elizabeth: Cloud is becoming more adaptive for all kind of IT solutions and there is still huge thrust of research and development. In future cloud will be enabling the retailer to interact with consumer more socially and personally.

Stephane: So far these technologies are performing well and developing with prestige of time.

Samuel: Today technology is digital, mobile and social, much of the gap has been evaporated but there is always room of improvement

6. Any other suggestion/thinking you want to share or general comments on interview?

Elizabeth: Cloud is 5 times faster than traditional IT solutions and the salesforce.com customers among fortune 500 are growing 48% faster than the non-users.