IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

LITERATURE REVIEW AND TECHNIQUES OF MACHINE LEARNING ALGORITHM USED IN BUSINESS INTELLIGENCE FOR INVENTORY MANAGEMENT

Sagar Malik[*1] & Rashmi Jeswani[*2]
[*1]Bachelor of Business Administration, St. Paul Institute of Professional Studies, Indore, India (M.P.)
[*2]Bachelor of Business Administration, Devi Ahilya Vishwavidyalaya, Indore, India (M.P.)

ABSTRACT

In a global market that makes room for more competitors by the day, some companies are turning to AI and machine learning to try to gain an edge. Supply chain and inventory management is a domain that has missed some of the media limelight, but one where industry leaders have been hard at work developing new AI and machine learning technologies over the past decade. Many well-known companies are now using machine learning to optimize business processes in ways that might have been deemed science fiction 30 years ago, from customer service inquiries to planning for next month's shelf supply based on satellite data. Supply chain and inventory management is primed to embody the concept of smart automation over the next five to 10 years. In this paper, we have investigated the research made till date and proposed a way to improve the inventory management so that it can benefit the customer as well as organizations.

KEYWORDS: Marketing, Inventory Management, E-Commerce, Business Intelligence.

I. INTRODUCTION

Effective inventory management translates to having the right amount of the right product at the right location delivered just in time to satisfy customer needs at minimum cost. Implementing an inventory improvement solution driven by business intelligence (BI) can help retailers improve their business in five key areas: assortments, replenishment, vendors, supply chain and markdowns. Detailed data related to physical and calculated inventories, inventory receipts and adjustments, supplier shipments and intra-enterprise item movements, sales, plans and forecasts, replenishment targets and safety stocks gathered in a centralized data repository serve as the foundation for the solution. With the explosive growth of data, it is one of the most important challenges of modern businesses to develop data-driven infrastructures. Scientific breakthroughs in artificial intelligence (AI) have opened the door for a broad range of applications, which can leverage vast amounts of data into real business value. One area that is particularly affected by this development is retail. The number of purchases made online is steadily increasing, which allows companies to gather detailed data on the whole customer experience: what they look at, in what order, for how long, on which day, which questions they might have, what they eventually buy, or how they rate and review products. With AI, this data can then be used to improve this experience to make it easier, more efficient, more engaging, and more adapted to personal needs. In the wholesale distribution of non-perishable goods, big data is helping to integrate business systems to improve operational efficiency enterprise wide while delivering higher profits than ever before. Innovative leaders in the supply chain industry are realizing the following benefits that are the result of harnessing big data analytics across supply chains.

To address the challenges of doing more with less, competing for funds in a tighter credit market, and reassuring cautious stakeholders and investors, you need to increase visibility into your financial and operational performance. This paper addresses how Business Intelligence can help you reduce costs, make smarter operational decisions, and continue innovating so you can survive even thrive within an uncertain economy.

Reduce costs: Business Intelligence can reduce costs in two ways: It helps you root out wasteful, expensive inefficiencies and it automates routine processes, saving you valuable time and resources.

Find inefficiencies: To identify areas of inefficiency, you need complete insight into your financial and operational performance. Powerful business intelligence tools improve financial visibility so you can better analyze your operations. Take for example, Culver Franchising Systems, Inc. (CFSI), a company that operates hundreds of restaurants and franchises throughout 17 states. With the help of Microsoft Business Intelligence solutions, CFSI helps franchisees lower food costs and improve the speed of service. The solution provides CFSI with better visibility into the performance of Culver's restaurants and menu items, and identifies areas where restaurants can reduce costs without compromising quality or speed of service.

Save money: Another way to cut costs is to automate routine processes so that you can reduce time consuming manual intervention. Consider TAC America, a company specializing in energy management. It no longer manages multiple charts of accounts or relies on a host of macros to consolidate and report the numbers. The company now uses a Microsoft Business Intelligence solution to simplify and automate its consolidated results.

Operate smarter, more strategically: With effective Business Intelligence you not only reduce costs, you operate smarter and more strategically, building a foundation you can grow on when the economy picks up. A robust Business Intelligence solution supports your ability to operate smarter by helping you:
  - ❖ Get real-time information to the right employees
  - ❖ Find profitable customers
  - ❖ Pivot on a dime

Innovate to create a condition for growth: In any economy, innovation is essential to business success. While the economic downturn lasts, you need to cut costs and make better strategic decisions. You also must continue creating products and services that will drive greater revenues when the economy improves. With an effective Business Intelligence solution, you can identify buying patterns so that you can focus your resources on creating and producing only in-demand products.

Below are 4 ways Big Data is changing the way companies manage inventory.
  1. **Improved Operational Efficiency:** Operations managers have a minute-to-minute overview of the operation helping to remove bottlenecks and improve efficiency, owing to better access to metrics. Big Data enable supply chains to proactively enhance efficiency and performance compared to older reactionary models.
  2. **Maximized Sales & Profits:** In the wholesale distribution industry, access to real-time data is helping finance directors to manage traditionally tight profit margins with greater insights to ensure that maximum profits can be realized from investment into inventory.
  3. **Increased Customer Service Satisfaction:** Having access to real time customer demand pattern data helps service managers match inventory and inventory levels to customer orders accurately, helping to increase customer satisfaction. Data can be analyzed to predict seasonal trends, spikes or depressions in customer demand to ensure the right levels of inventory are on hand at all times.
  4. **Reduced Costs by Migrating to the Cloud:** A Software-as-a-Service (SaaS) approach to IT management means that the cloud-based nature of big data reduces hardware and maintenance costs. It can also be seamlessly integrated to existing systems with a minimum of expense.

II.   COMPETITIVE ADVANTAGES OF BUSINESS INTELLIGENCE
  1. Business intelligence helps businesses refine and assorted inventory and optimize supply quantities and inventory allocation across stores, by analyzing detailed historical data such as buying patterns and the demographics of customers.
  2. Minimize the risk of out-of-stock situations by analyzing safety stock data and inventory and sales information to create accurate forecasts business intelligence provides the valuable data that a forecasting tool for small business needs.
  3. Predict over-stock situations before they become a major problem by drawing on replenishment, sales, and forecasting data.
  4. Reduce in the long-term the number of inventory items with a slow turnover or which simply gather dust, by measuring demand and sale levels on a per-location and per-season basis, while taking into account the impact of price changes.

5. Use physical inventory counts to generate inventory verification schedules and thus maintain highly accurate inventory data that can be used to inform the ordering process.
6. Analyze and monitor inventory levels for both finished goods and the materials used to product the finished goods and better understand buyer behavior, in order to improve the cost-effectiveness of the inventory control process.
7. Determine the most time-effective and cost-effective way to get rid of slow-selling inventory by identifying the discounts that have had the most significant impact in the past as well as the locations where specific products have sold best.

III.   PROBLEM OF MANAGING EXCESS INVENTORY

As mentioned in previous sections, one business challenge that many businesses face is excess inventory. Excess inventory is an indicator of improperly functioning inventory management. Inventory management is not an isolated function, it is a key component of logistics and supply chain management (Murphy and Wood 2014). Other logistics functions as well as costs are affected by inventory management in many ways and vice versa (Rushton et al. 2011: 177). Refining inventory management requires a process that balances inventory relevant functions to prevent sub-optimization, and eventually land in a cost-effective total solution (Rushton et al. 2011). Therefore, it is important to review those areas that may affect this balance (Rushton et al. 2011). Inventory means stocks of products that are maintained to mainly satisfy customer demands. (Murphy and Wood 2014) Excess inventory opposite of inventory shortage, occurs when the amount of stocks ordered are more than actual demand, due to inaccurate demand forecasting. Inventory management is a key element of logistics and supply chain management. Inventory management decides on when to order, how much to order and how much stock to maintain (Murphy and Wood 2014). To identify those areas that affect the balance between inventory and inventory relevant functions, first and foremost is to understand the purpose of inventory. The most common purpose of keeping inventory is to satisfy customer demand patterns (Murphy and Wood 2014). In a holistic view, customer demand is fulfilled through collaborative planning, forecasting and replenishment (CPFR) combining multiple trading partners, as shown in Figure below.

In terms of inventory control and management, Rushton et al. (2011) suggests products to be categorized by their selling profile. Thus, despite of being different types of products, SKUs with same order or usage patterns may be categorized into same groups or "families". For instance, typically SKUs can be categorized into four main groups, namely vital expensive, desirable and expensive, vital and inexpensive and desirable and cheap.

Table explains this categorization suggested by Rushton et al. 2011 with A, B, C, D indicators.

A. Vital and expensive products need to be closely monitored and controlled. Sources of supply should be reliable and quality of delivery should be good and steady. Continuous review inventory policy is generally suitable for this category.
B. Desirable and expensive products should be maintained at minimum inventory level. Continuous review inventory policy is applicable for this category.
C. Vital and inexpensive products may be held at maximum inventory level and be monitored closely. Sources of supply should be also reliable as vital and expensive products with consistently goods delivery performance. For this category, it is appropriate to apply a weekly periodic review inventory policy.
D. Desirable and cheap products should be ordered or purchased least frequent over the year. They should be applied monthly periodic review inventory policy. Inventory should be at maximum level.

In addition, one and most commonly used criterion for ABC analysis is dollar value. By value criterion, A products are highest in value, C products are least in value and B are in between. Other criteria include lead time, importance, scarcity, substitutability, numbers of supply sources, modes of transportation, obsolescence and so on (Ravinder & Misra 2014). Combination of several criteria are also used to evaluate items overall performance in a multi-criteria framework, items are first evaluated by different criteria with weights given to those criteria, then sorted by descending order of weighted score (Douissa and Jabeur 2016). For example, multi-criteria ABC analysis can be used to categorize products by demand as one criterion and cost as the second criterion, products that fall into both top 80% of demand and top 80% of cost can be considered as A, while products fall into top 20% of demand but 80% of cost are considered as B etc.

IV.   INVENTORY STRATEGY
1) **Inventory allocation for customer orders**: On an order-by-order basis, how will you achieve the highest fill rate without having to ship from multiple DCs for a single order, increasing your costs? This needs to be done online with business rules in the software and without manual intervention.
2) **Additional inventory required**: If you are using a multi-DC strategy, how much additional inventory is required? Our experience is that the second DC adds 30% more inventory and the third adds more than 50% in addition to that.
3) **Organization**: Do you have strong inventory management analysts? Are they skilled in working with your systems? How can your staff be organized differently to plan and manage inventory tasks more effectively? These include pre-season planning, purchase order processing and re-buy functions, as well as liquidation of overstocks and slow-moving product. When we look at the payroll and benefit costs of the personnel involved in these functions it totals far less than 1% of net sales. This is a small expense compared to the importance. Many companies are still looking at inventory management as a clerical activity when having the right inventory availability plays a much more important role. Do you have sufficient and experienced personnel in place considering the importance?
4) **System support**: Including exception reporting, inventory on hand and on-order availability by location, as well as projection of how SKUs are selling vs. when purchase orders need to be placed to prevent stocks-outs. This also includes having the ability to reserve a SKU quantity to a customer order, and vendor management to monitor and track vendor-shipped orders.
5) **Use of drop ship vendors:** many direct businesses are gaining sales without having to own the inventory. This is a great way to extend an assortment without a huge inventory risk.
6) **Sales goals:** if your stores are experiencing slow or no growth while direct-to-customer sales are booming and are being filled from the sales floor, does the store get credit for these sales? Or are the sales shown only as direct? Each company needs to work through what is fair and reflects the sales and stock goals store management is responsible for.
7) **Process improvement:** With the large SKU counts in many businesses, we find it benefits them to look at the entire process of planning and managing inventory. It will be important to change the systems used to support inventory to gain efficiency.
8) **Metrics monitored:** What KPIs do best-in-class companies use to manage their inventory investment? Do you have these in place?
9) **Supply chain improvements:** many distribution functions are looking at the total supply chain for improvement rather than just within the warehouse. These include vendor portals for exchanging purchase orders, vendor scorecards, invoices, other electronic data interchange (EDI) transactions and abstract syntax notation (ASN).

V.   STRATEGIC PLANNING PROCESS

Formal strategic planning calls for an explicit written process for determining the firm's long-range objectives, the generation of alternative strategies for achieving these objectives, the evaluation of these strategies, and a systematic procedure for monitoring results. Each of these steps of the planning process should be accompanied by an explicit procedure for gaining commitment. This process is summarized in Figure given below.
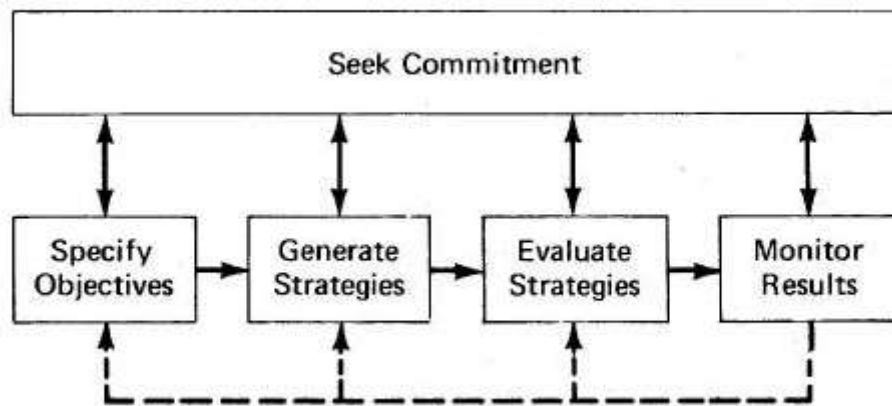

Figure1: Process Planning Strategy

A.   Specify Objective

Formal planning should start with the identification of the ultimate objectives of the organization. Frequently, companies confuse their objectives (what they want and by when) with their strategies (how they will achieve the objectives). For example, suppose that a company desires to make money for its stockholders. To do this, it decides to build a tunnel through a mountain in order to charge tolls to automobiles. They plan to complete the tunnel in five years. On the way through the mountain, they strike gold. To mine the gold, activities on the tunnel must be suspended. Does the company pursue its objective of making money or does it stay with its strategy of tunnel building? What would your organization do?

B.   Generate Strategy

A strategy is a statement about the way in which the objectives should be achieved. Strategies should be subordinate to objectives. That is, they are relevant only to the extent that they help to meet the objectives.
The planning process is not complete until the company has at least one (and preferably more than one) operational strategy. An operational strategy describes:

1.   What tasks must be done
2.   Who is responsible for each task
3.   When each task must be started and completed
4.   The resources (time and money) available for each task
5.   How the tasks relate to one another

C.   Evaluate Strategy

Once sufficient strategies have been proposed, the evaluation of alternatives can begin. This requires a procedure by which each alternative plan is judged for its ability to meet the objectives of the organization. Such a process is not simple, because conflicting objectives usually exist among stakeholders. Furthermore, the presence of uncertainty complicates the choice of a strategy. For example, one should consider not only how well the strategy does for the most likely situation, but also how well it does against other possible situations, especially those that are dramatically different.

D.   Monitor the Results

The monitoring system should allow for corrective action. To do this, the following items should be measured in a systematic way:

1.   Changes in the environment (sometimes called "environmental scanning")
2.   Changes in the organization's capabilities (and in their competitors' capability)

3. Actions that were actually taken by the organization (did they implement the desired strategy?)
4. Actions by major competitors
5. Results

VI.   EXISTING SYSTEM

Since India is moving towards digitization wherein we are promoting cashless India, Online marketing has become the upcoming trend where all the business firms are shifting their business online. All online marketing websites are in a race to improve their business. This requires a lot of efforts; in our system we have tried to automate the manual efforts. It is very essential to analyze the sale of an e-commerce website in order to manage the stocks and also to obtain trends and patterns of sale. In our system we perform analysis on the transactions data then by using various machine learning techniques we will obtains the trends and patterns of products sold. Now after obtaining patterns we can optimize the sales of the system and thereby we can manage the inventory of our system.

1.   QuickBooks

Just about everyone would agree that QuickBooks is a great introductory system for new and very small businesses. One of the most important considerations to make when starting a business is what (if any) software is required to manage the business. For the most part, the first software purchase is based around the need for managing accounting and financials, and in this situation QuickBooks is the logical choice.

Limitation with QuickBooks:
A. Limited reporting and transparency of your business health.
B. Double entry and keying errors.
C. Limitations with file size and data.
D. Generic and impersonal support.
E. Standalone application Lacks integration.

2.   Zoho Inventory

Zoho Inventory is an online application that enables you to manage orders and inventory. With multi-channel selling, shipping integrations and powerful inventory control, you can now optimize your inventory and order management, right from purchase to packing, to payments.

Limitations:

3.   Jazva Inventory

Jazva [7] has a powerful single platform enterprise solution that helps online retailers and wholesalers simplify, synchronize, and automate multichannel selling. It is the back-end system. It acts like invisible pieces of the jigsaw that binds everything together and without which an effective multichannel business cannot happen. Jazva's inventory software helps retailers to sell, scale, and sell more without the need to use multiple software's to run their business.

Limitations:
A. The report generator in this software is not intuitive.
B. It requires a good understanding of the logic behind the system.
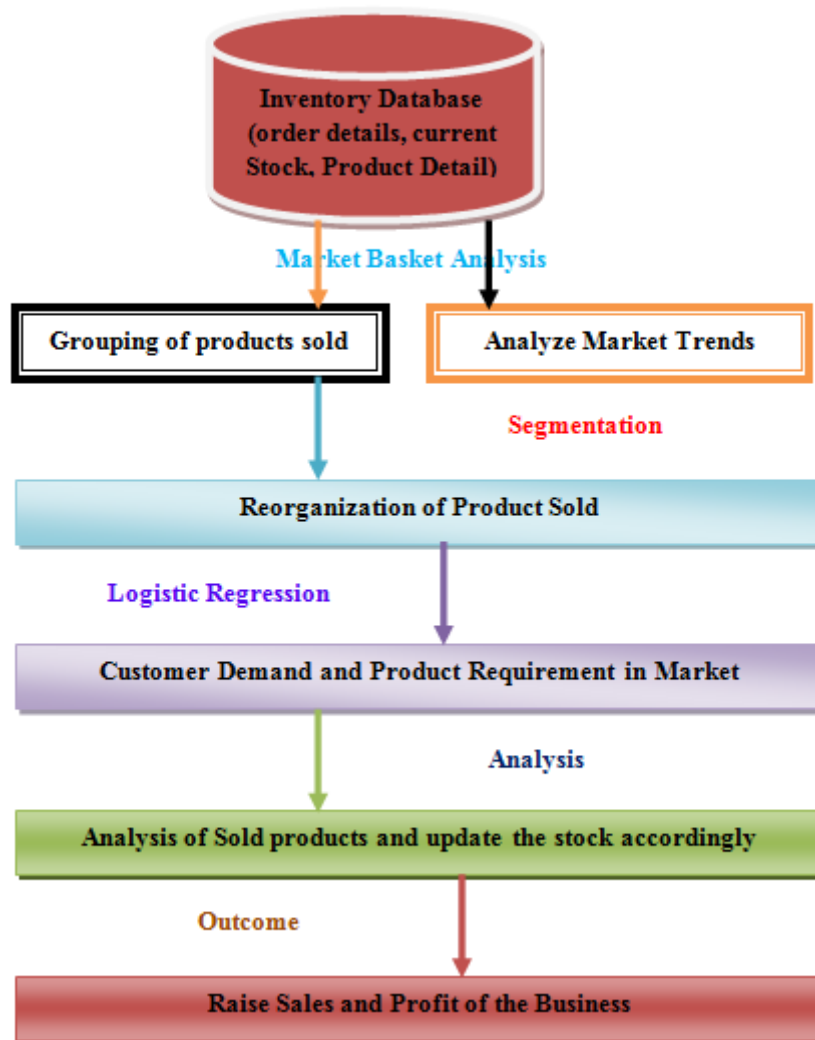
VII.   PROPOSED FRAMEWORK FOR INVENTORY MANAGEMENT

Figure 2: Block Diagram for Inventory Management System

Logistic Regression: Logistic regression is a frequently-used method as it enables **binary** variables, the **sum of binary** variables, or **polytomous** variables (variables with more than two categories) to be modeled (dependent variable). It is frequently used in the medical domain (whether a patient will get well or not), in sociology (survey analysis), epidemiology and medicine, in quantitative marketing (whether or not products are purchased following an action) and in finance for modeling risks (scoring). The principle of the logistic regression model is to link the occurrence or non-occurrence of an event to explanatory variables. In our work, we are using logical regression to predict whether the product is sold or not.

Market Basket Analysis: Market Basket Analysis (also called as MBA) is a widely used technique among the Marketers to identify the best possible combinatory of the products or services which are frequently bought by the customers. This is also called product association analysis. Association analysis mostly done based on an algorithm named "Apriori Algorithm". The Outcome of this analysis is called association rules. Marketers use these rules to strategize their recommendations. To put simply Market Basket Analysis looks at the purchase coincidence with the items purchased among the transactions. i.e., what is purchased with what? For example, in a foot-wear store, a shoe is often purchased with a pair of socks. When two or more products are purchased, Market Basket Analysis is done to check whether the purchase of one product increases the likelihood of the purchase of other products. This knowledge is a tool for the marketers to bundle the products or strategize a product cross sell to a customer.

In order to understand the concept better, let's take a very simple dataset (let's name it as Coffee dataset) consisting of very few hypothetical transactions. We will try to understand this in simple plain English.
The Coffee dataset consisting of items purchased from a retail store.
Coffee dataset:

Transaction	Item 1	Item 2	Item 3
1	Milk	Sugar	Coffee Powder
2	Milk	Sugar	Coffee Powder
3	Milk	Sugar	Coffee Powder
4	Milk	Sugar	
5	Milk	Sugar	

The Association Rules
For this dataset we can write the following association rules: (Rules are just for illustrations and understanding of the concept. They might not represent the actuals).
Rule 1: If Milk is purchased, Then Sugar is also purchased.
Rule 2: If Sugar is purchased, Then Milk is also purchased.
Rule 3: If Milk and Sugar is Purchased, Then Coffee powder is also purchased in 60% of the transactions.

Generally association rules are written in "IF-THEN" format. We can also use the term "antecedent" for IF and "Consequent" for THEN.

From the above rules, we understand the following explicitly:
1. Whenever Milk is purchased, Sugar is also purchased or vice versa.
2. If Milk and Sugar is purchased then coffee powder is also purchased. This is true in 3 out of the 5 transactions. In other words we can say that we have a support of 3 out of 5 transactions for this rule. (60% possibility).

VIII.   FRAME WORK FOR SUPPLY CHAIN RISK
In order to classify and analyze these articles, we develop a conceptual framework of supply chain risks as shown in Figure 3. In synthesizing various points of views from the literature, we discover that supply chain risks can be divided into two categories – macro-risks and micro-risks (referred as catastrophic and operational by Sodhi, Son, and Tang (2012Sodhi, M. S., B. G. Son, and C. S. Tang. 2012. "Researchers' Perspectives on Supply Chain Risk Management." Production and Operations Management 21: 1–13.10.1111/poms.2011.21.issue-1[Crossref], [Web of Science ®], [Google Scholar]); disruption and operational by Tang (2006aTang, C. S. 2006a. "Perspectives in Supply Chain Risk Management" International Journal of Production Economics103: 451–488.10.1016/j.ijpe.2005.12.006[Crossref], [Web of Science ®], [Google Scholar])). Macro-risks refer to adverse and relatively rare external events or situations which might have negative impact on companies. Macro-risks consist of natural risks (e.g. earthquakes and weather-related disasters) and man-made risks (e.g. war and terrorism and political instability). On the other hand, micro-risks refer to relatively recurrent events originated directly from internal activities of companies and/or relationships within partners in the entire supply chain. Generally, macro-risks have much greater negative impact on companies in relation to micro-risks. Furthermore, micro-risks can be divided into four subcategories: demand risk, manufacturing risk, supply risk and infrastructural risk. Manufacturing risk refers to adverse events or situations within the firms that affect their internal ability to produce goods and services, quality and timeliness of production, and profitability (Wu, Blackhurst, and Chidambaram 2006Wu, T., J. Blackhurst, and V. Chidambaram. 2006. "A Model for Inbound Supply Risk Analysis." Computers in Industry 57: 350–365.10.1016/j.compind.2005.11.001[Crossref], [Web of Science ®], [Google Scholar]). Demand and supply risks refer to adverse events at the downstream and upstream partners of a firm, respectively (Zsidisin 2003Zsidisin, G. A. 2003. "A Grounded Definition of Supply Risk." Journal of Purchasing & Supply Management 9: 217–224.[Crossref], [Google Scholar]; Wagner and Bode 2008Wagner, S. M.,

and C. Bode. 2008. "An Empirical Examination of Supply Chain Performance Along Several Dimensions of Risk." Journal of Business Logistics 29: 307–325.10.1002/jbl.2008.29.issue-1[Crossref], [Web of Science ®], [Google Scholar]). In order to ensure the healthy functioning of a supply chain, information technology (Chopra and Sodhi 2004Chopra, S., and M. S. Sodhi. 2004. "Managing Risk to Avoid Supply-chain Breakdown." MIT Sloan Management Review 46: 53–62. [Web of Science ®], [Google Scholar]), transportation (Wu, Blackhurst, and Chidambaram 2006Wu, T., J. Blackhurst, and V. Chidambaram. 2006. "A Model for Inbound Supply Risk Analysis." Computers in Industry 57: 350–365.10.1016/j.compind.2005.11.001[Crossref], [Web of Science ®], [Google Scholar]) and financial systems (Chopra and Sodhi 2004Chopra, S., and M. S. Sodhi. 2004. "Managing Risk to Avoid Supply-chain Breakdown." MIT Sloan Management Review 46: 53–62.[Web of Science ®], [Google Scholar]; Wu, Blackhurst, and Chidambaram 2006Wu, T., J. Blackhurst, and V. Chidambaram. 2006. "A Model for Inbound Supply Risk Analysis."

Computers in Industry 57: 350–365.10.1016/j.compind.2005.11.001[Crossref], [Web of Science ®], [Google Scholar]), are also of critical importance. Any disruptions in these systems can also lead to serious problems in a supply chain. Therefore, we classify the risks relating to these three systems as infrastructural risk.
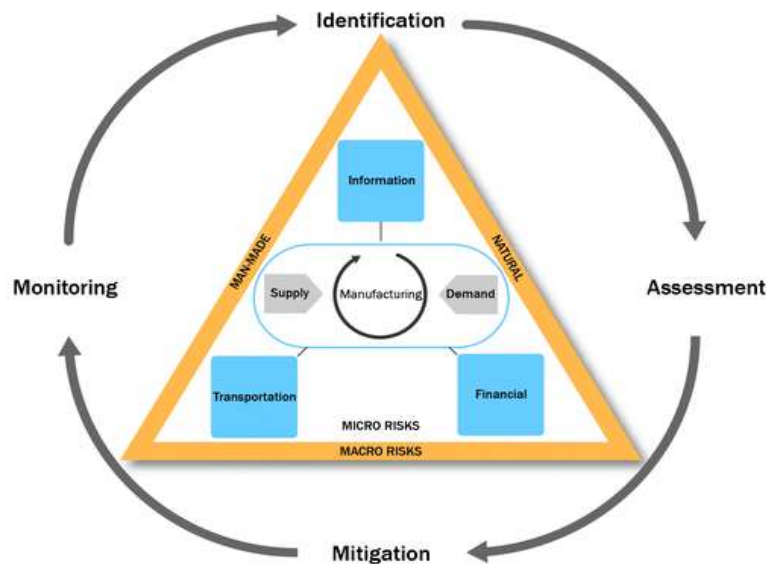

Figure 3: Conceptual Framework for Supply Chain Risk

IX.   BRAND EQUITY MEASUREMENT
- Returns to the Share-Holders.
- Evaluating the Brand Image for various parameters that are considered significant.
- Evaluating the Brand's earning potential in long run.
- By evaluating the increased volume of sales created by the brand compared to other brands in the same class.
- The price premium charged by the brand over non-branded products.
- From the prices of the shares that an organization commands in the market (specifically if the brand name is identical to the corporate name or the consumers can easily co-relate the performance of all the individual brands of the organization with the organizational financial performance.

Factors contributing to Brand Equity
1. Brand Awareness
2. Brand Associations
3. Brand Loyalty
4. Perceived Quality

X. INDUSTRY GLOBALIZATION DRIVERS

Globalization can be defined generally as the growth of economic activity spanning politically defined national and regional boundaries. It finds expression in the increased movement across the boundaries of goods and services, viz. Trade and investment, and often of people via migration. It is driven by the actions of individual economic actors – firms, banks, people – usually in the pursuit of profit and often spurred by the pressures of competition. According to Theodore Levitt (1983), new commercial reality – the emergence of global markets have come up because of advances in technology, communication, transport, etc. Those corporations geared to the new reality, benefit from enormous economies of scale in production, distribution, marketing and management. By translating those benefits into reduced world prices they can decimate competitors that still live in the disabling grip of old assumptions about how the world works. An industry does not globalize on its own and every industry cannot be a global one. There are certain drivers which determine the potential for industry globalization.

There are four broad groups of industry globalization drivers – market, cost, Government and competition (Table-1 below). Together, these four sets of drivers cover all the major critical industry conditions that affect the potential for globalization. Drivers are primarily uncontrollable by the worldwide business. Each industry has a level of globalization potential that is determined by these external drivers
.

Table 1: Industry Globalization Drivers

Market Drivers	Cost/ Economic drivers
• Convergence of lifestyles & taste • Increased travel creating global consumer • Growth of global and regional channels • Establishment of world brands • Push to develop global advertising • Shortening product life cycle	• Continuing push for economies of scale. • Accelerating technological innovation • Advances in transportation • Emergence of NIC • Increasing cost of product development
Government Drivers	**Competitive Drivers**
• Reduction of tariff barriers • Creation of trading blocs • Decline in role of government • Reduction in non-tariff barriers • Shift in open market economies	• Increase in level of world trade • Increase in foreign acquires of corporation • Companies becoming globally centered • Increased formation of global strategic alliances • Globalization of financial markets

However, as mentioned earlier, every industry cannot be a global industry, and some have to adopt 'multidomestic strategy'. Table-2 lists five dimensions and their respective positions under pure multi-domestic strategy and a pure global strategy. For each dimension, a multi-domestic strategy seeks to improve worldwide performance by maximizing local competitive advantage, revenue or profits. On the other hand, a global strategy seeks to maximize worldwide performance through sharing and integration.

Table 2: International Marketing Strategy

Dimensions	Setting for Pure Multi-domestic Strategy	Setting for Pure Global Strategy
Market Participation	No particular pattern	Significant share in major markets
Product offering	Fully customized in each country	Fully standardized world wide
Location of Value-added Activities	All activities in each country	Concentrated one activity in each (different) country
Market Approach	Local	Worldwide uniform
Competitive Moves	Stand-alone by country	Integrated across country

Strategic Implications of Globalization As pattern of international competition shifts towards globalization, there are many implications for strategy formulation. In a global industry, functions of finance, marketing, business and Government relationship change according to global configuration and co-ordination.

- **International Alliances:** International alliance is another implication of globalization. International coalition, linking firms of the same industry based in different countries have become an even more important part of global strategy. Organizational Challenges : The need to configure and co-ordinate globally in complex ways creates some obvious organizational challenges such as organizational structure, reporting hierarchies, communication linkages and reward mechanisms.
- **Government Relations:** In the globalized era, the selection of foreign market to enter and the mode of entry will, by and large, depends on the negotiations with the foreign Government, and the 'muscle power' of the global firm can be crucial in deciding the shift of power equilibrium. A global firm must 'manage' its relationship with the foreign Government to its advantage. A shining example of what happens if it fails to do so is Enron in India.
- **Competition:** A global firm may be in a better position to compete with its global rival as it can augment its resources globally. These implications of globalization will lead companies to take care of these issues forcing them to formulate an appropriate strategy to handle them.

XI. CONCLUSION

Today's world relying on business intelligence applications in that organizations are collect data from internal and external sources, prepare it for analysis, develop and run queries against the data, and create reports, dashboards and provide more informed decisions making strategies. Hence large organizations should tackle BI strategically, because they have valuable data that can tell them about performance, Market strategy, customer behavior, process efficiency and important trends. Also the various machine learning algorithms such as market basket analysis and linear regression are used to track, manage and organize product sales, product purchases and also help to produce patterns of product sales. In this paper, we have provided a framework to increase the product sales rate and benefit to the organization. Many more combinations of machine learning and data analytics algorithm can be used in some other manner to improve the growth of selling of product of an organization.

Apart from it the paper consists a way big data can be useful in inventory management system, strategic planning and execution will play a crucial role not only for any start up but also to existing business. We have also put light on global competition and planning to grow any business

XII. REFERENCES

[1] W Xu, D.P.Song, Roe M. 2010 Supply chain performance improvement using vendor Management Inventory Strategy, 2010 IEEE International Conference on Industrial Engineering and Engineering Management.
[2] Malek Sarhani, AbdellatifAfia EI. 2014 Intelligent system based support vector regression for Supply chain demand forecasting, IEE Second World Conference on Complex Systems (WCCS).
[3] Fang Tu, Sudipto, Ghoshal Jianhui, Luo Gautam, Biswas Sankaran, Mahadevan Link Jaw, Kelly N. 2007 PHM Integration with Maintenance and Inventory Management System, IEEE Aerospace Conference.
[4] Yoo P.D., M.H. Kim, Jan T. 2005 Machine Learning Techniques And Use of Event Information for Stock Market Prediction on: A Survey and Evaluation, International Conference on Computational Intelligence for Modelling, Control and Automation and International Conference on Intelligent Agents, Web Technologies and Internet Commerce (CIMCA-IAWTIC'06).

[5] Pradip Kumar 2010 Decision tree based demand forecasts for improving inventory Performance, IEEE International Conference on Industrial Engineering And Engineering Management.

[6] https://quickbooks.intuit.com/inventory-management/

[7] https://www.jazva.com/features/inventory-management

CITE AN ARTICLE

Malik, S., & Jeswani, R. (n.d.). LITERATURE REVIEW AND TECHNIQUES OF MACHINE LEARNING ALGORITHM USED IN BUSINESS INTELLIGENCE FOR INVENTORY MANAGEMENT. *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY, 7*(1), 230-241.