. Review Of Literature

B.M. Beamon(1998) - In this study number of different performance measures have been used in the design and analysis of material handling systems. Although traditional manufacturing system measures, such as job throughput, have commonly been applied to material handling system independently. In these instances, the performance of material handling system is confounded with the performance of manufacturing system.

Ramazan Yaman(2001)-This study is about a knowledge based system for material handling equipment selection and pre design of material handling system. This comprises two section. First related to the selection material handling equipment for related product requirement and second related to decision making for equipment between department. Author compared the selection of material handling equipment and design of material handling system by means of traditional selection and using analytical method by means knowledge based approach. The author preferred knowledge based approach.

Oladiran (2008)-The author highlighted the effect, method and solution for material storage and handling for building projects. Descriptive statistics like frequency and mean item score curve used to achieve the objectives. Six solutions are identified for material storage and handling. The study therefore recommends these solutions to solve poor material storage and handling in the building projects.

San et al.(2008)-Author has argued does the labour quality matter on productivity growth by mentioning case of the Taiwanese manufacturing industry. It was found that labour quality is the important contributing factor for the growth in productivity.

Seraj Yousef Abed (2008) -In this report a case study conducted for improving productivity in food processing industries using simulation. To analyze the effect of the process involved on the productivity of production line an Arena simulation model was developed. Changes in the production line resolved all bottle necks, eliminate the queues,
best utilization of all machines. Production increased about 50% and average total time decreased 11.4%. The payback period of the new capital investment from the additional net profit is realized is estimated to be 35 days.

**Chaudhari et al. (2010)** - Author stated the role of **productivity and capital investments**. Suggested there is a need to manage productivity improvements from the growth point of view and not only based on efficiency improvements. Industry should use right mix of capital and labour and train the industries on their needs. Author also stated that firm size and interest rate on long term loan are the other factors affecting investment growth.

**Dolage et al. (2010)** - Authors investigate the influence the **influence of flexible manufacturing technology adoption on productivity of Malaysian manufacturing industry** based on total factor productivity growth. Here two situation were analyzed one with the dummy variable and other without these are contrasted which account for greater variation in flexible manufacturing technology shows positive and more significant relationship with the total factor productivity growth.

**Murugesh et al. (2010)** - In this study authors in their paper called **Review and preview of productivity research and applications** discussed the ignorance towards productivity during last two decades. Recent new developments in total Quality control, flexible manufacturing process, Computer integrated manufacturing and information technology have made the productivity improvements technique obsolete.

**Sharma & Mishra (2010)** - In this study authors have examined the relationship between export and productivity performance to find out whether the **export and productivity linkage exist**. Sample of Indian manufacturing firms were analyzed and concluded that entering into export market does not improve the productivity and it is also observed that exit from the export market does have an adverse effect on the productivity.
C.N.Agulanna et al. (2011)-This study highlights the **improving productivity in Soyabean processing through the design and fabrication of double action decoating and separation machine**. This will solve productivity. It has been concluded that the dry decoating is better option to wet decoating.

Guilherme Bergmann Borges Vieira et al.(2011) - This study focused on improvements in **material handling management** in the automotive industry. Here company was motivated to innovate or improve the internal material handling system which increases the efficiency of services to manufacturing. The improvement in material flow caused by the new material handling system increased the accuracy of material delivery time inside the company.

Ivica Veza et al. (2011)-This study is about the results of **lean manufacturing implementation problems in beverage production systems**. The implementation of lean concept was made through line output improvement. The results of the case studies were there is drastic increase in production, reduction in waste, reduction in unnecessary action.

Elsadig Musa Ahmed(2012), This study is about the **Malaysia’s food manufacturing Industries productivity Determinants**. Here made an attempt to study the gap in the existing research on drivers of the total factor productivity growth in the food industries by adopting statistical method. The result found that there is growth of food manufacturing industries following the implementation of Government policies.

K. Hemanand et al. (2012) - In this study research work has been carried out as a case study in automotive industry with the objective of waste reduction for **improving productivity of manufacturing division using lean concept and development of material gravity feeder**. Efforts are made to reduce the motion waste in the shop floor. The problem in the current layout are indentified and analyzed through simulation. The layout was modified, simulated and the results are compared with the current layout. The results revealed an improvement of 11.5% in productivity. A new material handling system has been designed and developed to reduce the motion waste and unwanted transportation.
Liu & Li (2012)- In this study analyzed China’s productivity growth in manufacturing industries. It was concluded that chain’s Industrial strength is based on input growth and improvement in technical progress.

T.K. Jack (2012)- This paper is about case study on material handling and supply management in Fertilizer production. Here author pointed that in the Fertilizer company in the bagging line operation for bagging and conveying to final delivery to the truck is major problem due to frequent breakdown of the conveyors. The source of major problem identified was fertilizer granules being trapped at the packaging and bagging conveyors and due to which corrosion taking place and eventually failure of conveyor roller.

Taiwo Olufemi Asaolu et al. (2012)- This study examined the effect of material management on the profitability in the Nigerian food and beverage manufacturing industry. Data was collected through an interview, structured questionnaire, publications with key individuals in the organization. It was observed that major constraints to the material management in the organization included public power supply and poor transportation work. It has been concluded that by efficient material management the organization can improve the productivity and profitability.

Gautam B. Ghegadmah et al. (2013)- This report investigated the information on productivity improvement in automated material handling system for Liquor manufacturing plant. This involves PLC (Programmable Logic Controller), SCADA(Supervisory Control and Data Acquisition system) to visualize and control the system. Required modifications are carried out in this automated material handling systems used in liquor manufacturing plant, one at conveyor system and other one at crushing section. These modifications have resulted in a great productivity improvement.

Jain et al. (2013)- This study is about a review on manufacturing flexibility. Here authors state that to achieve the competitive edge in the market manufacturing flexibility is
critical component. This paper presents the review of various issues related to manufacturing flexibility and implementation aspect in the company.

Mayank Devsingh et al. (2013)-The purpose of the Research is to study overall productivity improvement in casting & fastening Industry. This Research focused on the company which produces various mechanical components by casting process. This research used change in plant layout, flow of material movement for better utilization of plant area for improve productivity. Objective towards this study is to identify problems in casting and fastening process and improved it in terms of reduction in production time, number of manual process and back flow of materials by proposing an efficient plant layout and design of components used for loading of material used in fastening process. The improvement in productivity was executed by eliminating back flow of work process, which reduces production time, number of process and effectively utilization of plant area. Reduce in time of loading time of loading fasteners in rotary retort furnace by suggestion implementation of hopper with mechanism with it proper design. Overall productivity improvement by solve problems of ergonomics, manual process, material handling, ineffective utilization of plant area, back flow of materials, etc.

Md. Ahasan Habib et al. (2013)-In this study it was observed that productivity of Apparel manufacturing system is improved by using value stream mapping and production control tools. Some important benefits of this implementation are decrease in sample rejection level by 70%, working condition and space utilization are improved. New layout has been implemented to increase the productivity.

Naveen Kumar & Dalgobind Mahto (2013)- This paper presents the productivity improvement through process analysis for optimizing assembly line in packaging industries. There is a necessity for balancing the operations at various strategic workstations in order to apply group technology and minimize the total production cost and the number of work stations. In this study from the analysis of data gathered from the industry on assembly line balancing it is found that assembly lines are flow line production system, where a series of work stations, on which interchangeable parts are added to product. The product is moved
from one work station to other through the line, and is complete when it leaves the last work station. Ultimately there is such station where the time study shows the lines are not properly balanced. So the priority of all line balancing should start with these work stations in order to bring more improvement in productivity.

Prasad Karande and Shankar Chakraborty (2013)-This paper applies weighted utility additive theory for selecting the right type of material handling equipment. It has been observed that this method is the viable tool for solving the material handling equipment selection problems. This method has a strong and sound mathematical foundation is capable of deriving more accurate ranking of the considered alternatives. This method can also be applied for decision making problem.

S.S. Deshmukh, A.P. Bahale (2013)-The paper deals with a case study of ginning machine manufacturing company where he discovered inefficiencies in material handling and alternative for their improvement. During the study it was observed that the company is not using appropriate equipments and layout and there is a scope for improvements. Some changes in the internal material handling system has been suggested which leads to increase in material flow efficiency.

Summaiya R Shaikh, Sathish R Dulange (2013)-In this study factors affecting the productivity of power loom industries is highlighted. Data collected using questionnaire by interview technique and analysed using ANOVA type statistical technique. Human factor and technological factor are the most important factor affecting productivity. Labour productivity can be increased by workers motivation schemes where as technological factor plays vital role in increasing the productivity. Due to the higher initial investment cost entrepreneurs do not switch to new up gradation. Through the various programs, seminar entrepreneurs are trained benefit of adopting newer technologies to increase the production, reduced overhead cost and material handling time. If these two factors are controlled there is assured growth of productivity of power loom industries.
Vivek A. Bandebuche & D. J. Tidke (2013)- This paper focuses on various issues typically faced by SMEs in parts handling system for machine shops during different stages of processing in a machine shop that houses variety of machine tools. Low cost material handling techniques become necessary to reduce the manufacturing cost, manufacturing cycle times, smooth material flow and remains competitive. It is seen that umpteen opportunities exist in SMEs to upgrade and improve existing facilities by making use of low cost automation strategies. It is observed that with relatively low cost investments, Low cost automation systems certainly enable the managements to lower the workers involvement in material handling. This automatically lowers the parts rejection, improve safety and contribute significantly to product quality and organizational productivity.

A. P.Bahale, Dr.S.S. Deshmukh (2014)-This paper deals with a case study of improving material handling efficiency ginning machine manufacturing company. The main objective was to find out wasteful activities of material handling. It has been discovered that a problem areas are the lack of space and lock of appropriate material handling equipments.

Anant V. Khandekar, Shankar Chakraborty(2014)- In this article describes material handling equipment selection using Fuzzy Axiomatic Design principles. The author has mentioned that material movement from one place to other accounts for about 30 to 40 % of the cost of final product. In this article it has explained that right type of material handling selection is solved using multi criteria decision making method based on fuzzy automatic design principle applied. By this fuzzy automatic design principle material handling selection problem solved more accurately.

Bordoloi M.P., Nath T. (2014)-This study highlights the modification of an existing Layout of a production line based on distance function. This paper presents a technique of layout improvement based on a distance function. Case study of the production line of a soft drink refilling company is taken and reduced the length of the conveyors between the facilities. With the modified layout there is considerable reduction in length of the conveyor
and material handling cost. Other benefits like reduction in energy cost and increase in productivity.

Kavishwar Roy Gaurh, et al. (2014)-In this study it was highlighted the MCDM techniques for the selection of material handling equipment in the Automobile industry. Various Material handling equipments such as Conveyors, Industrial trucks, cranes and Hoists are used in Automobile industries. Multi Criteria Making Methods are the best option method for selecting right material handling. In Automobile industry more accurate type of handling equipment required for reducing the cost of manufacturing in order to increase the productivity and improve the working condition.

Mohammed Al. Kahtani, et al. (2014). This paper presents a case study of Cost- Benefit analysis of flexible manufacturing systems to investigate the effect of different input factors including layouts, Material Handling System configuration on Flexible Manufacturing systems performance which is measured by total production cost, total flow time and throughput. Cost benefit analysis is conducted to determine production volumes breakeven point for layout and Material Handling System Selection. It is concluded that layout effects cost flow time and throughput, whereas Material Handling System units and their speed effect throughput.

Somuyiwa et al. (2014)-The study evaluated the effect of reversal logistics objectives on economic performance in selected food and beverages companies in Nigeria. Analysis was done using inferential statistical analysis for the data collected from primary and secondary sources of data on food and beverage manufacturing companies. The surveyed companies results indicated that the companies have been effective in using the reverse logistics to reduce logistic cost, improve customer satisfaction, achieving compliance with environmental regulations and finally cost reduction with improved profitability.
A.A. Gulghane, Prof P.V. Khandve (2015)-This study highlights management construction materials and control of construction waste in construction industry. Construction waste is one of the major problem in construction industry. Poor handling of construction material affects the overall productivity performance.

Abhilasha Dongree & N. Y. Mohite (2015)-In this paper an attempt is made to review the significance of selection of material handling system design in industry with the considerations for material flow design problems like material handling equipment selection, flow path design, facility layout design, routing etc for related product design in the industry. It is observed that material handling expenses should be reduced as much as possible with respect to time, distance, frequency and overall cost. From the study it is observed that the material handling is important activity in manufacturing industry. The selection of the most appropriate material handling equipment for any particular application can influence the profit of any manufacturing company. It is concluded that Material Handling system plays a major role in Productivity.

Ajay RV- Deepan K. G.(2015)- In this paper a case study of Rackpiston manufacturing for productivity improvement based on lean production was carried out. It has been established that multi tasking job allocations could bring major improvement in the productivity. The cycle time and manpower reduction ensured improvement in the efficiency.

Dushyant Kumar (2015), This study is about the Economic reforms and productivity of Indian manufacturing: A study of food product sector. Here author tried to estimate to find out the total factor productivity for food product and beverage industry at two digit level. Solow method is used to measure total productivity factor. During post reform higher productivity factor is found and also found the export growth is higher during post reform in comparison with the pre-reform period.
Praveen Kumar Sharma et al. (2015)-In his research paper focus is in the area of Selection of material handling equipment by using analytical hierarchy process, in pump industry to reduce the cost of manufacturing. Multi criteria decision making method is the best method used for selection of material handling equipment due to its ability to converting a complex problem to a paired comparison.

Rishabh Mishra (2015)-This study is about the productivity improvement in automobile industry by using method study. Here initially identified areas in the production department where the process is done which is taking extra time, extra efforts. Due to which cost of the product increases and workers affected some unwanted fatigue. Method study is adopted to analyzing the problem and adopting different material handling system like trolley instead of pallet to improve the productivity. After implementing the suggested necessary improvements the company is able to increase the productivity.

S.M. Kollapure (2015)- here authors has made an attempt to study the Food processing industry in India: Growth, Problems and remedies. Objective of study was to review the development of food industry India, Identify the problem and suggestion for improving the performance. During the study author has found majority of the food industries in India are facing raw material, finance and adoption of new technology for improving the production.

Zagade D.D & Dulange S.R. (2015)-This study is focused on the productivity improvement techniques for casting producing company. Identified the areas in the casting industry where the production time can reduced, manual process can be curtailed by using the material handling system and better plant layout along with the automation. By doing the same it was concluded that material handling taken place with less trouble or worker fatigue. Reduction in manpower, time reduction for material movement from casting machine to furnace.