

ERP Implementation in Bangladesh Garments Industry for Effective Chain Management

S M Farhana Iqbal; Md. Abdullahel Shafi ; Dr. Md. Humaun Kabir

Associate Professor, Yarn Engineering Department, Bangladesh University of Textiles, Dhaka

Lecturer, Department of Electrical and Electronic Engineering, City University, Dhaka, Bangladesh

Vice Chancellor, Prime University, Dhaka, Bangladesh

Abstract:- The use of technology and information is crucial for keeping up with emerging business trends as the Industrial Revolution 4.0 expands and heads towards 5.0. Particularly crucial is the use of enterprise resource planning (ERP) for enterprise management. ERP systems aid companies in managing projects and resource utilization while reducing time and effort expenditure. The procedures are carried out mechanically rather than by hand. Errors are prevented by the system's simultaneous proper and efficient operation. ERP data allows businesses to make important decisions. In the fashion sector, the business and product standards are very dissimilar. It is essential to have an ERP system that can manage purchases as well as handle inventory items, pricing, corporate structures, and campaign management. ERP features include a system with a huge number of data, the use of a top-down strategy that enables production chain management to be attentive, and the realization of complete ERP system management. The ERP system has improved control over the manufacturing chains in many businesses. This essay examines the use of ERP in the apparel sector and examines some of the possible advantages. The information used in this study was compiled from several academic sources as well as other sources like reports and other materials. At the conclusion of the paper, the conclusions and suggestions were discussed. Manufacturing organizations may profit from ERP systems in today's hyperconnected, data-driven economy if staff receive proper training and reliable data, as the value of ERP systems directly depends on data quality.

Keywords:- ERP, MRP, SME, Garment Industry, Bangladesh, Manufacturing, Management, Technology Implementation.

I. INTRODUCTION

ERP software gives the sales staff more leverage by providing essential customer data regardless of location, device, or time. Administration may build appropriate tactics, board the precise audience for particular activities, and consider specific follow-up actions by using purchase behaviour and considering the stage of the buyer client's journey. Due to the automated inventory and production processes, ERP provides management with the necessary tools to handle vendor and customer inquiries. Customer information teams can instantly access customer information

and address supply chain problems while on the move. This program will aid in preserving consistency in trade company buying behaviour, tracking online transactions, managing delivery schedules, and computing overall sales based on shifting margins. [1]

With their labour-intensive structure and employment-friendly character, small and medium-sized businesses (SME) in the clothing manufacturing industry have also made a substantial contribution to socioeconomic growth. Within the whole manufacturing business as well as across all economic sectors, the sector continues to be the one that creates the most jobs. In the apparel manufacturing sector, women make up around 75% of the workforce. Thus, the industry makes a significant contribution both socioeconomically and otherwise. [2]

In the Philippines, labour costs of garments industry are getting higher every year because the government legislates higher wages. On top of this, the Philippines has a reputation for having strident unions that in the past years paralysed garments factories that employed many thousands of workers. [3]

Additionally, there are a lot of problems in the clothing sector, particularly with production management. The process of making clothes is a planned operation that includes steps like laying, marking, cutting, sewing, checking, finishing, pressing, and packing. This procedure transforms basic ingredients into final goods. If the preproduction phase of material preparation is improperly carried out, production will not be up to standard, making it difficult to maintain the industry. This issue led to output or production estimates that were off. [4]

The tracking of income has been another issue for the clothing sector. The apparel industry faces a variety of challenges, including seasonal demand, multi-channel demand, and abrupt shifts in design, styles, and colours. In addition to this, economic complexity also affects customers' purchasing power, which in turn affects the garment sectors' profit margins. Therefore, to analyse the previous performance of the sector and project for the future, effective ERP system tools are required. According to a recent study report, using the right tools may raise sales by 2% to 5% and decrease inventory by 7% to 15%. A new product introduction might be profitable up to 20% of the time. Thus, putting the approach into practice improves revenue

management and deepens collaboration between executives and operational management. [5-7]

Examining how the Bangladeshi textile and apparel industries may employ cutting-edge ERP software to streamline manufacturing processes is the major goal of this study. Just-in-time production and total quality control are two operational objectives that have been merged during the past 20 years. Bangladeshi companies are realizing that higher quality may result in less inventory, which helps find hidden quality problems. Supplier and customer relationship management are two important areas where interfirm advantages may be observed. The following research questions form the basis of the study:

- How is ERP implemented in the garments industry of Bangladesh?
- What are the potential benefits of implementing ERP in small, medium and large-scale cloth manufacturing industry?

In this study, the qualitative method will be used, and primary and secondary sources of data will both be used to collect data. When compared to secondary data sources, which include papers, books, literature, and online surveys, primary data sources are those that acquire data directly from informants. The textile and apparel industry will provide data. The management team will be contacted in the second stage of this study by email, Facebook, LinkedIn, and other social media sites in order to ask them to participate in an online survey.

II. PRESENT STATE OF THE GARMENT INDUSTRY IN BANGLADESH

There is no denying that Bangladesh's biggest export industry, readymade garments (RMG), has been instrumental in the country's economic revival.

This sector accounts for 83% of all export earnings for the country. Bangladesh's garment industry has advanced to this point since the 1980s. The late Nurool Quader Khan created the ready-to-wear industry in Bangladesh. He could see how the country could be altered. In 1978, he sent 130 trainees to South Korea to study the production of ready-to-wear garments. He founded the first factory, called "Desh Garments," with the aid of those trainees to produce garments for export. The business has grown and matured throughout the years thanks to a variety of inspiration sources. In 1995, after becoming aware of child labour in 1994, we were able to completely eliminate it from our industry. Our industry was able to establish itself, develop through time, and evolve thanks to the MFA-quota. Many people projected that the phase-out would cause a big disruption in our export when the quota was due to expire in 2004. However, the post-MFA era is a different success story. We overcome the post-MFA issues and disproved every prognosis. The garment industry is presently Bangladesh's major source of foreign exchange earnings, with exports totalling more than \$27.9 billion in the 2019–20 fiscal year. [8]

A variety of issues, such as low rates of production and efficiency, protracted lead times, high prices associated with quality, and low rates of "Right First Time," are plaguing Bangladesh's ready-made garment (RMG) industry. Overseas clients are ultimately subjected to an excessive level of risks and uncertainties as a result of these problems at the RMG manufacturer's end. These problems could be resolved by implementing a variety of lean techniques. This study employed qualitative research methods to assess the adoption of lean practices in Bangladesh's RMG sector. A few of the important improvements include pull production, a stronger focus on just-in-time production, the establishment of cross-functional quality inspection teams, and enhanced information exchange via the enterprise resource planning system. Despite the substantial advancements, the senior management of Bangladesh's RMG producers still has to develop a thorough plan as well as a distinct vision, goal, and objectives before putting them into action. Data from imports into Europe and the US indicate that Vietnam will likely surpass Bangladesh in 2020, dethroning Bangladesh's RMG industry from its position as the second-largest garment exporter in the world after China. The World Trade Organization has not yet released comparable data for global exports in 2020. [9,10]

A. Demand Side

The garment product has a very broad variety, a rigid, short-lived supply chain, erratic, variable demand, and a short life cycle (summer items, winter products, etc.). In order to predict demand and, thus, be able to create the optimal product, the textile and clothing industry engages in demand side activities including studying customer expectations, social trends, upcoming events, seasonal changes, etc. The research and development divisions of corporations are responsible for these projects. The textile and clothing industry in Bangladesh have completely shifted its attention to exports. The government helps this industry by a variety of means, including the duty-free importation of raw materials, financial incentives, duty drawbacks, back-to-back financing, and bonded warehouses. Not all companies with an export-oriented strategy sell their finished products on the local market. Completed garment imports are used to satisfy local demand. [10-15]

B. Supply Side

When the manufacturing contract is signed, the supplier prepares for the production process. Here is where the supply side of the demand-supply chain begins. The supply side includes acquiring raw materials, producing clothing, delivering finished goods, and maintaining a good working relationship with buyer-distributors. The earliest phase of the supply side is the acquisition of raw materials, often known as the industry's backward linkage. The many types of raw materials are categorized as fiber, yarn, fabric, wet processing, and accessories. At the top of the value chain, fiber makers create materials out of natural or synthetic resources. According to the US Department of Agriculture, Bangladesh imports 99 percent of its raw cotton (USDA). [10, 15]

In the textile and garment sectors, foreign fiber and yarn predominate. Imports of raw cotton increased by 3.1 times, imports of staple fibers by 6.9 times, and imports of yarn by 3.2 times as compared to the fiscal year 2005-2006. In terms of exports of clothing, imports of staple fiber and yarn are rising, while imports of raw cotton remain mostly unchanged. Private fabric makers in Bangladesh may be able to provide the majority of the industry's demand for knit fabric. The woven fabric sector, however, still depends on imports. Fibers are used to make yarn. To make yarn, short, natural and synthetic fibers are spun, thrown, and smoother texture. Over the previous 10 years, imports of raw cotton fiber climbed on average by 17% while imports of staple fiber increased on average by 29%. Imports of staple fiber increased by 138% while imports of raw cotton fell by 22%. The growth rate of imported yarn decreased as domestic manufacturing of yarn began to replace imports. Thus, in the import chain for raw materials, staple fiber replaces raw cotton. The CAGR was 12.8% for raw materials and 12.4% for clothing, respectively. Imported raw materials accounted up 19% of the exported finished goods. [10,16]

III. STAGES OF ERP SYSTEM

Enterprise resource planning, or ERP, is a networked software framework designed to integrate the key functional parts of a company's business activities into a single integrated system. Business operations including those in human resources, finance, buying, supply, and other relevant divisions are regulated, streamlined, and assimilated by ERP software. [17] Manufacturing resource planning (MRP II) and material requirements planning (MRP) that expanded outside of manufacturing into other zones of the firm, mainly finance and human resources, were first described by Gartner in 1990. Material management, sales and distribution, production planning and management, quality control, costing, human resources and payroll, finance, and controlling are important ERP components.

ERP solutions are useful for manufacturing companies of all sizes. Modern industrial firms must use solutions and tools that may help them accelerate their growth and create data-driven values so they can make informed decisions. The power of analytics and big data is immeasurable in today's hyperconnected and data-driven economy. By integrating various internal operations, ERP systems not only enhance production and distribution but also provide a 360-degree perspective of the whole firm. One must consider a number of criteria, such as our budget, implementation targets, timeline, and necessary structures, in order to install the best manufacturing ERP system. For many firms, enterprise resource planning may be a highly successful undertaking. [18]

The design, manufacture, and distribution of yarn, cloth, and clothing are mostly handled by the textile industry's management. The industrial processes and procedures used to produce clothing on a large scale for commercial purposes. The textile and apparel business are a significant economic, social, health, and environmental sector for both Asia and Europe. The textile and apparel industries are one of the main

sources of growth in Asia's quickly developing economy. Heavy equipment activities used in the clothing industry necessitate efficient execution of intricate production processes. Therefore, ERP systems are often used for business operations by Bangladeshi enterprises. To understand their use, we shall talk about Ha-Meem Group and Squares styles in this section. [19]

A. Material Requirements Planning

According to demand and the bill of materials, a material requirement planning (MRP) system decides the raw materials, components, and subassemblies that are required as well as when to assemble the finished products. MRP II, or manufacturing resource planning, employs software programs to arrange evolving operations. Additionally, it covers processes for component purchasing, product assembly, inventory control, and product delivery.

B. Enterprise Resource Planning

Through carefully planned divisions like item scheduling, component procurement, stock control, product supply, completion, and order tracking, an ERP system commonly combines corporate operations. Application segments for supporting sales & marketing, human resources, finance, and accounting may be included in ERP software architectures. Large corporations used it at the time to their full advantage. However, the bulk of small and medium-sized businesses were left out owing to the higher starting costs.

In the 2000s, systems with ERP capabilities incorporated increasingly sophisticated features, such web-based internet functionality. The ERP II system's most crucial features were these characteristics. It can, for instance, be integrated with CRM systems. The development of technology makes it possible to retrieve information via mobile devices and web-based browsers. ERP II's introduction of Services Oriented Architecture (SOA) changed technological development.

Software as a Service is also used to supply commercial applications (SaaS). IT servers are set up on cloud platforms and accessed by Android, iOS, APIs, browsers, and programs created for delivering ERP applications in the SaaS framework. These commercial apps help both small and big enterprises utilize ERP systems effectively since cloud ERP solutions have a lower upfront cost than other types of ERP systems.

Online access is required to use cloud ERP, or enterprise resource planning, software. Cloud ERP software provides cutting-edge capabilities for all essential company operations and forms the basis of an organization's IT infrastructure. Cloud ERP is commonly made available "as a service" on the cloud computing infrastructure of a provider (software-as-a-service or SaaS ERP). Instead of purchasing the program completely, customers may lease it by paying an annual or monthly fee. Hardware start-up costs are not incurred; instead, the provider handles application maintenance, innovation, data storage, and security. [19-21]

IV. ERP IN BANGLADESH GARMENTS INDUSTRY

Right from the start, ERP covers a deep and comprehensive operation by combining all the data into a single data model. Bangladesh's garment industry is being modernized with the use of ERP software. It works best for the clothing sector. It consists of operations for manufacturing, supply chain management, human resources, and distribution.

A solid ERP system offers the answer to all of these problems. It is essential to organizing all of your activities and boosting productivity. The advantages of an ERP system for your clothing or apparel firm are as follows:

A. Inventory Tracking:

People try to make fewer errors at a clothing store because there are so many different kinds of goods there. This may be accomplished by putting ERP software into practice. This may monitor the inventory's availability, operational efficiency in moving inventory, and management of shortages and surpluses. Anyone can keep a careful check on your inventory depending on colour, size, styles, etc. thanks to the barcode scanning technology. Using the ERP software, companies can control their inventory and decide wisely when it counts.

B. Generating Customer Insights:

Data about clients and the features of their buying behaviour may be fed into the ERP system. This information is kept safe and secure in the database. This information can be further examined to produce insights. Companies can anticipate changes in consumer needs and purchase a new batch of goods in response. Additionally, organizations may base the marketing plans on consumer behaviour to improve the purchasing experience.

C. Managing All Business Operations:

The hub of a clothing store's operations is its ERP software. Every department, including sales, production, inventory, finance, warehousing, supply chain, human resources, etc., may be tracked and managed. On the dashboard, users may obtain a detailed view of any department whenever necessary. Additionally, coordination between various activities and departments is made possible by the integrated platform. Anyone with access to the system is able to enter data, amend it, update it, and submit it for processing. Teams are therefore not compelled to check in with one another for information or updates. For efficient corporate procedures, the ERP software improves cooperation and communication across various departments.

D. Managing All Business Operations:

The right ERP software centralizes the management of all a company's operations, saving time. By automating tasks like data input, clothing ordering, customer emailing, etc., companies may save time and lower the possibility of mistakes. The roles and duties as well as access rights for the ERP system may also be precisely defined. With ERP, organizations practice lean manufacturing, which reduces waste and, as a result, costs money. These processes all operate on schedule, resulting in cost savings and accuracy at the conclusion of each stage. Additionally, users can observe all of your processes in real-time and keep an eye on them from a distance to find any gaps. By correcting them, can improve process efficiency and accuracy, which boosts productivity.

Figure 1 exhibits the utilisation trend of ERP software amongst the Bangladeshi garments industry since the formation of BGMEA for a sample size of 600 companies. It clearly demonstrates that over the last decade the implementation and reliance on data driven decision making has gained undeniable momentum.

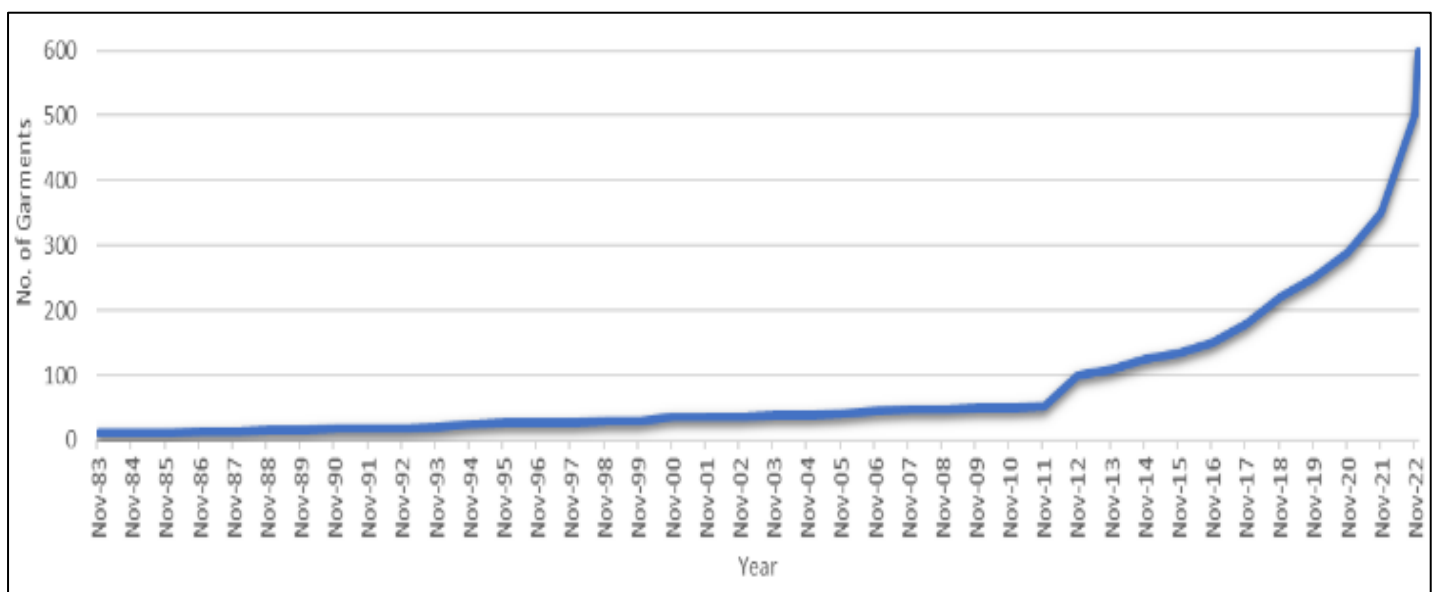


Fig. 1 Growth in ERP system usage by the Bangladeshi Garments companies.

V. METHODOLOGY

Multitude of data acquisition approach was adopted in this study with the responding sample size totalling 600 garments. Initially a list of garments factories was established along with their email, and other form of contact point as per the official website of Bangladesh Garment Manufacturers and Exporters Association [BGMEA] that has 3,665 members. [22]

A questionnaire was emailed to each email, and the reply from the cooperating companies were compared. For those who did not respond to the email questionnaire, they were called over phone and WhatsApp to ask the base questions, and/or for an appointment to visit their factory site. Those remaining handful were visited to take interview of the person in charge of the operation in different departments of the company.

The questionnaire comprised the following queries:

- ERP the company is using.
- The features of the ERP the company utilises.

- Integration of the ERP system with supply chain management.
- Demand, orders, and inventory keeping methods to input in the ERP system.

Questions were raised regarding the substance of the ERP adoption model, different components, application phases, and the importance of each component at each level. The order of activities in each phase of the implementation and other criteria that had previously been recognized by the study literature and the expert panel were also questions that were put to the interviewees. The second interview phase was semi-structured, allowing the subject to provide replies as they saw fit while the investigation was done in the order related to the model. In other instances, interview questions were condensed in a different way to meet the demands of interviewers with varying backgrounds, expertise, and traits.

The results of the survey have been presented in Figure 2 and Figure 3. Figure 2 displays the utilisation ratio of local ERP software used in the Bangladeshi garments industry. Figure 3 shows the percentage of Bangladeshi companies using international ERP software.

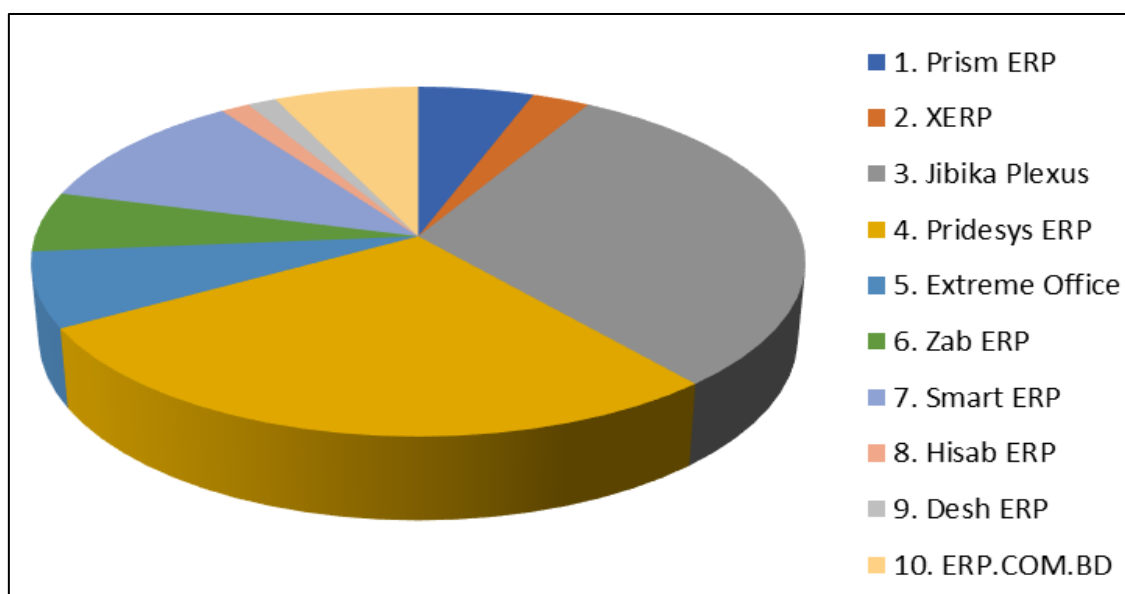


Fig. 2 Proportion of Usage of Different Bangladeshi ERP Software by the Garments Companies in the Country.

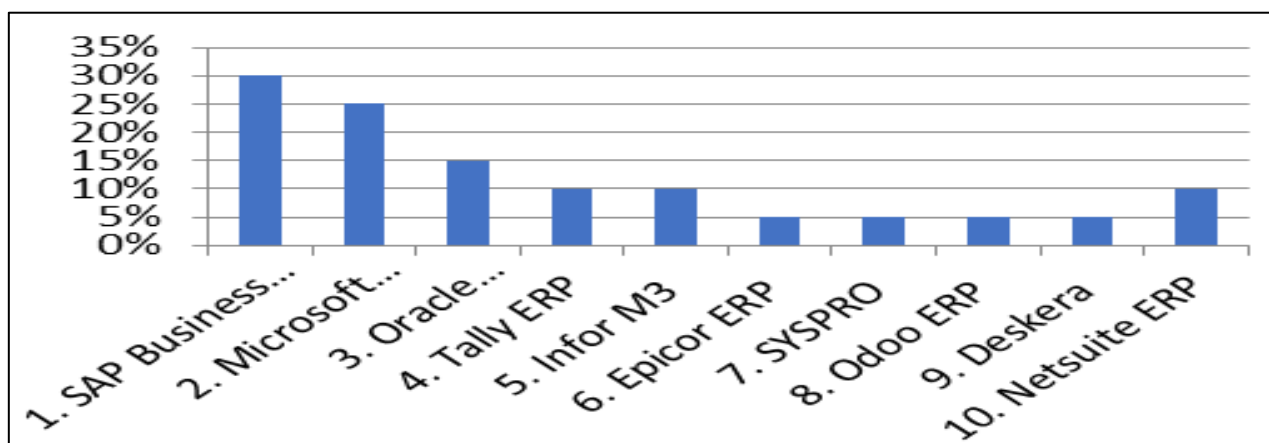


Fig. 3 Proportion of Bangladeshi Garments Companies using International ERP Software.

VI. DISCUSSION ON FINDINGS

Technology must be used to address issues including lack of flexibility, security, and interaction with existing systems. Since technology makes it simpler to automate daily chores, it essentially eliminates the possibility of human mistake and secures the man hours. It entails concluding the automated procedures offered by the manufacturing ERP, which cover a variety of operations including sales, purchase records, human resources, stock, and other areas. Automation frees up time, enables businesses to obtain timely data, and gives them greater control. Various components of supply chain and distribution management are outlined, including warehouses, packaging suppliers, vendors, logistics, and point of sale for various brands and retail chain organizations. For the business to expand, a proper supply chain and distribution management strategy is essential.

Respondents said that they encountered many and complex technical problems when using the ERP system. As a result, management frequently uses more raw materials than necessary and frequently encounters shortages as a result of this. Therefore, the organization needs enhance staff training to use manufacturing ERP software that offers real-time view of incoming work orders. The users may use this information to manage their inventory needs and make sure that the right resources are available at the right time to meet those needs. Such precise information can help reduce downtime and boost customer satisfaction. Since the employees are fully informed of the supplies to get, even if this necessitates relying on several suppliers to meet such needs, such projections will also reduce the overstock. The team will automate this logistical procedure and free up the workforce to address other supply chain concerns in a proactive manner by using the ERP system in production.

Related data and investigations were obtained based on the approach used by the researchers. Following that, the following are some, if not all, benefits of ERP for SMEs: (1) It is possible to decrease data entry mistakes, especially if the data does not need to be entered into the system. Additionally, if unnecessary procedures are skipped, excessive amounts of paper documents are eliminated, and manual labour for inventory is reduced, cost savings can be gained; (2) As the conventional paper papers are replaced with electronic copies, operational efficiency has grown. The capacity to compete and fight alongside larger businesses and organizations may be impacted by this. An ERP may assist in reducing IT and training expenses, as well as the time and effort required by staff to execute their everyday activities. When implemented correctly, an ERP solution may dramatically reduce or eliminate repetitive manual processes. Technically, this enables team members to concentrate on profitable pursuits; (3) A major advantage of ERP software is that it helps users gain better understanding. By implementing an ERP suite across divisions, all of the processes have a single, unified reporting structure. An ERP architecture provides a single source of authenticity, which makes it simple to create useful reports and analytics at any moment; (4) The framework may aid in the installation and use of best-practice procedures for the industry, ensuring that all operations are integrated across

the firm; (5) ERP software helps small and medium-sized enterprises to react rapidly to client requests and feedback. Therefore, using a CRM solution will help SMEs become more responsive.

The findings indicate that employees are worried about ERP's operational capabilities and vendor-related difficulties. As a result, I advise businesses to utilize ERP with regulation and compliance capabilities to aid in the administration of human resource regulation at each step and information security. A system of established standards known as quality control is used to ensure that manufactured goods fulfil the organization's quality objectives. The most crucial component for success is quality. A comprehensive inspection and testing of the product are required as part of quality assurance. With the use of alarm mechanisms and level-by-level evaluative processes, the ERP software aids in the monitoring and tracking of various quality management processes.

Comprehensive training is required since industrial companies use ERP software. We may also study and use cutting-edge technologies like cloud migration, artificial intelligence, two-tier systems, and the Internet of Things. ERP systems that are cloud-based eliminate the requirement to be present at your desk at work, which has implications for your team as well. The likelihood of a successful ERP installation is higher in a setting that values and rewards teamwork and open lines of communication. It's crucial to keep everyone informed with frequent updates and training sessions to guarantee a seamless ERP installation.

The software will also manage the dates when the checking up on maintenance are still needed to be checked plus send the reminders. All these will assist in utilizing the apparatuses optimally plus increase the life of the machines. Integration of ERP systems is a challenging procedure that needs careful planning and strategy. It takes between six months and two years to integrate client and server systems. Although modifications and changes are inevitable, it is crucial to design an ERP project before integration for a successful deployment.

Before choosing whether data has to be integrated into the new system, analyse the old data to eliminate any extraneous information. If the data is inaccurate or contains mistakes, the integration could not function. Management must develop a data integration strategy that collects data and divides it into logical tables.

Working with a solution provider early in your ERP deployment will boost your chances of success and help you avoid common blunders. Solution providers buy, set up, and initially implement ERP solutions. The best way to do it is to hire someone who has the necessary expertise and knowledge. Businesses look for competent personnel to handle ERP alignment with their operations as a result.

VII. CONCLUSION

In conclusion, the implementation of an ERP system in the Bangladesh garments industry can greatly enhance the effectiveness of supply chain management and an upward trend of this can be seen in the trend of utilisation over the years. By centralizing data and streamlining processes, an ERP system can improve communication and collaboration between different departments and stakeholders, resulting in increased efficiency and cost savings. Additionally, the use of real-time data and analytics can provide valuable insights for decision-making and forecasting. The findings of this study demonstrate that the advantages of installing ERP in the Bangladeshi clothing industry significantly outweigh the upfront costs of the process and the training necessary for it. Therefore, it is recommended that the industry consider implementing an ERP system to improve their supply chain management.

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