

**Report On**  
**“Application of Single Minute Exchange of Die (SMED) in Walton  
Manufacturing Unit: A Lean Manufacturing Concept”**

By

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An internship report submitted to the BRAC Business School in partial fulfillment of the  
requirements for the degree of  
Master of Business Administration

BRAC Business School  
BRAC University  
September, 2024

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## **Declaration**

It is hereby declared that

1. The internship report submitted is my own original work while completing Master of Business Administration (MBA) at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help

**Student's Full Name & Signature:**

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Md. Israkh Ahmmed  
21364063

**Supervisor's Full Name & Signature:**

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Md. Shamimul Islam, PhD  
Assistant Professor, BRAC Business School  
BRAC University

## Letter of Transmittal

Md. Shamimul Islam, PhD  
Assistant Professor,  
BRAC Business School  
BRAC University  
66 Mohakhali, Dhaka-1212

Subject: Submission of Internship report on Application of Single Minute Exchange of Die (SMED) in Walton Manufacturing Unit: A Lean Manufacturing Concept.

Dear Sir,

It is my great pleasure to present the internship report on a renowned Bangladeshi Company, with all due respect. At the head office of Walton Hi-Tech Industries PLC, I completed my internship. During my internship, I gained valuable experience and information, which I appreciated because it will benefit me in my professional career. Despite the fact that we are still learning, this report has provided me with an overview of my organization.

I have attempted my best to finish the report with the essential data and recommended proposition in a significant compact and comprehensive manner as possible.

I trust that the report will meet the desires

Sincerely Yours

---

Md. Israkh Ahmmed

21364063

BRAC Business School

BRAC University

Date: September 30, 2024

## **Non-Disclosure Agreement**

This agreement is made and entered into by and between Walton Hi-Tech Industries PLC and the undersigned student at BRAC University.....

## Acknowledgment

First, I would like to express my profound gratitude to the Most Merciful and Benevolent Almighty for enabling me to complete the report on time.

Without certain people's assistance, this story would not have been possible. Receiving almost honest direction, counsel, and collaboration from diverse individuals is a great blessing. Without reliable data, it was impossible to adequately evaluate and present the report in a detailed manner.

A profound gratitude and wholehearted respect to the honorable Faculty and academic Supervisor Md. Shamimul Islam, Assistant Professor, BRAC Business School and Co-Supervisor Dr. Abdul Hoque, Professor, BRAC Business School for his illuminative guidelines, valued suggestions, formative criticism, and unwavering help throughout the study work and in formulation of this report.

I want to thank Md. Khayruzzaman (DOD, Oracle EBS), for their prompt responses, guidance, encouragement, and support throughout my internship. They also gave me valuable information about the systems and procedures that the Oracle EBS (SCM) department at the company employs. On various occasions, they have also given me valuable advice on a variety of work-related issues, which has helped me comprehend the company's standard operating procedures.

## Executive Summary

Everyone of days prefers more comfort in their surroundings. As we make unrelenting progress in this direction, it has become clear that now is the moment to devote more attention to the topic of human entertainment and comfort. Because of this, there is a big increase in the demand for fashionable goods worldwide, and many businesses are focusing on this. One of the sister firms of R.B. Group of firms Ltd., Walton Technologies Corporation is currently one of the top businesses in Bangladesh. It still aspires to be the top company in Bangladesh in terms of volume and turnover. It motivated it to pursue market expansion within its own organization in order to promote itself as a high achiever. In this regard, Walton is performing admirably in the fiercely competitive electronics sector. Additionally, dealers play a crucial part in promoting the products to customers by using persuasive sales techniques. They are crucial to every business since they contribute greatly to the marketing and promotion of electrical items. Therefore, the more effective and efficient the sales teams are, the more money they may bring in for both themselves and the business. This research project is specifically designed to gauge the market position or value despite its best intentions. outstanding credibility and image.

The industry's fierce competitiveness is putting pressure on the company. Walton understood there was no other option but to increase his marketing aggressivity in light of the market's escalating rivalry and enormous sales targets. Although pleased with the current marketing strategy, Walton management wants to keep a look out for hidden competitors and improve their current strategy to adapt to the changing business environment. As a result, Walton management has been tasked with creating a survey on the country's market situation in the Dhaka Zone. Walton. now markets its goods through its own sales teams and dealers across the nation. This essay on "The Market Position of Walton" aims to investigate the field forces that affect sales performance, product quality, dealer satisfaction, advertising effectiveness, customer service, transportation, and communication, among other factors. The survey found issues with general marketing. 40 dealers participated in this poll. Since the sample size is adequate, we can accurately determine the market position in the Dhaka Zone. I'm hoping that this work will aid Walton management in its future planning and assist it accomplish its objectives. One of the issues with finding is the timely delivery of the product to the distributors. Only 20% of respondents indicated that goods deliveries are always on time, while 37.5% said that this is occasionally the case. is delivery lag arises for a

number of reasons, including the products' unavailability. It is astonishing that sales of Walton products range from 31% to 40% per week. When compared to other competing companies, this product or sales record for Walton is strong. However, the rate for the Refrigerator is only 0%–10%, and it needs to be raised immediately. In my study, 45% of participants stated Walton's customer service is good, and 27.5% said it is satisfactory. Only 17.5% of those surveyed claimed Walton's customer service is great, and no one else said it is very good. has poor. Only 30% of respondents felt that Walton products' prices are close to their ability to be purchased by customers, despite 70% of respondents saying that this is the case. In my study of 40 dealers, 20 said they were content with the company's motivation, 14 said they weren't, and none said they were extremely satisfied. Only 27.5% of respondents to the survey believed that Walton's advertising was sufficient to keep up with the competition, while 72.5% disagreed.

Walton is ranked fourth in the opinion of 32.5% of respondents, whereas 30% of respondents believe it is third. After doing a survey or research, I discovered several factors that contributed to Walton's poor sales performance, including a high rate of product and a low rate of service. All of these factors are covered in chapter four of this report. A succinct suggestion based on the results of my survey has also been made for Walton management's further consideration. I sincerely hope that the Walton management would value my effort and take into account the issues I've raised in this report.

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# CHAPTER ONE

## OVERVIEW OF THE INTERNSHIP

### 1.1 Summary of my Internship

I had the great pleasure of working as a team member with Walton Hi-Tech Industries PLC from the start of my internship in May 2023 until the conclusion of September 2023. I was inspired by my everyday trips from Walton, where I work directly out of the Walton Corporate Office, Plot-1088, R-80ft.2, Block-I, Bashundhara Residential Area, Dhaka-1229, ON. Walton offers an amazing work atmosphere. The staff members were incredibly cordial, helpful, focused on providing excellent customer service, kind, and honest. Walton provided me with more than just an internship throughout my four-month stay; it was a chance for me to establish my credibility as a trustworthy worker, a dependable teammate, and a driven student. It was also a chance for me to get the essential office experience that my previous employment had not given me. Among the most useful abilities I acquired was adaptability. Working across departments is typical in smaller businesses, and that's exactly what I did. I worked in the marketing, IT, supply chain, and commercial departments throughout my internship. I also got the amazing chance to work as a controller via the supply chain conversion. I got to know all of my coworkers, attended quarterly and annual meetings, and shared projects with colleagues in other areas. I was greeted and oriented in the supply chain department as a staff supply chain and IT analyst. As I completed more work, I was given more responsibility, and I always looked forward to getting new assignments. For the three days that my direct manager was not in the office, I felt confident enough to handle my task because to the assistance and honest comments I received. However, my work was not limited to supply chain projects. I actively wanted to continue contributing after finishing the work I was given, so I found a new home in the IT department almost away. When I wasn't working on my supply chain, I was frequently distracted by using the ERP program to retrieve particular reports. In the IT department, I had the chance to collaborate closely with both my third and second managers. These supervisors' extensive expertise as corporate officials made them role models for me and had a direct influence on my personal development.

### 1.2 Learning Experience

- After I joined Walton Hi-Tech Industries PLC, I learned many types of supply chain related work and Operate Oracle software and try to implemented them.
- I studied supply chain related topics while studying in MBA, all of which were theoretical. When I came to work at Walton, I applied those theoretical topics to practical work life.
- My academic experience has been very helpful for me in my work life.

### **1.3 Job Scope/ Responsibilities**

- Supply Chain Management Support.
- Analysing Import purchase order file.
- Analysing Local purchase requisition report and forward.
- Collaborate with supply chain team and handle critical situations.
- Support the in charge with risk assessment and mitigation activities.
- Analysing price complain and getting approval from management after receiving accurate information.
- Operate the Enterprise Resource Planning (ERP)
- Analysing production report
- Point of sales approval
- Analysing the quantity
- Check validation
- Check safety stock, pipe line, inventory
- Analysing the L/C, PI
- Analysing CS

### **1.4 Contribution to the company**

In Walton Hi-Tech PLC, my position as an Oracle, ERP intern is crucial. I was able to get real-world experience through my internship in a variety of import-related fields, including Local Purchase, import purchase, document management, and supplier relationship management. I will take part in strategic decision-making, collaborate with cross-functional teams to ensure the smooth flow of imported goods, and learn crucial information about international trade regulations.

- Local Purchase Price Approval- (Analyze previous Purchase Order (PO) price and Present Purchase Order (PO) price and also analyze Purchase Requisition report, Identify why current PO prices are high and Ask the purchase why the price is higher, then Getting approval from Management after receiving accurate information)
- Import PO Management Approval- (Analyze Purchase Order (PO) report, LC Quantity, Previous LC Price, Present LC Price, Price variation and Value variation and then Getting approval from Management after receiving accurate information)
- Cross-Functional Collaboration: Work closely with the finance, procurement, sales, and other departments to ensure effective communication and coordination of import activities. Attend team meetings, offer advice, and aid in achieving departmental goals.
- Data management and reporting: Maintain complete records of all import transactions and related documentation. assistance with report and analysis generation for management review.
- Management of customer relationships Speak with vendors, suppliers, and overseas partners to ensure that goods are delivered on time and accurately. Maintain a constructive

relationship with all international stakeholders and help to resolve any issues or irregularities relating to imports.

- **Compliance and Regulations:** Acquaint yourself with import regulations, customs procedures, and trade compliance standards. help ensure that the organization's import activities adhere to legal and regulatory requirements.

### **1.5 Benefits of Learning**

Benefits for a Oracle ERP Intern may vary depending on the company and its policies. As an intern in this role, you could benefit from the following things:

- **Exposure in the Real World:** Gain knowledge of the import sector, international trade standards, and company practices.
- **Learning Opportunities:** I have access to training sessions, seminars, and workshops that can help me gain a better understanding of local purchase, import purchase market research, and other relevant skills.
- **Networking:** Establish relationships with professionals in the import and international trade industries to create crucial contacts for conceivable future employment opportunities.
- **Mentorship:** Seek out seasoned folks who can mentor me and offer guidance on the development of my career.
- **Company Culture:** Gain an understanding of the values, working environment, and culture of the company to see if they align with your professional goals.
- **Problem-Solving Skills:** I may strengthen my critical thinking and problem-solving abilities by confronting challenges with logistical planning, legal compliance, and customer relations.
- **Assessment and remarks:** Get honest feedback on how I did so that I can identify where I need to improve.
- **Workplace Flexibility:** Depending on the company, I may be able to work from home or on my own schedule.

### **1.6 Personal Development**

I learned how to function under pressure during my internship, which was one of the most significant skills I have learned. I have observed that when interacting with Walton team members. I believe that this knowledge will be helpful to me when I eventually organize my professional activities under time constraints. Demand Planning and Packaging teams are managing multiple projects at once while adhering to the deadline maintaining lead time and creating Indent. On the other side, Procurement team continuously purchases from local and foreign sources as per Indent and raises Purchase Orders (PO). I've learned how to successfully prioritize my tasks while maintaining my composure. Additionally, the modernization and speed of business activity piques my interest in my internship

## **1.7 Problems/Difficulties**

As an intern with the program, I have observed a number of constraints.

- It is logical that managers are hesitant to provide important company secrets to interns in order to maintain secrecy. As a result, obtaining an exact image is never simple.
- Another issue I've found is poor time management between the internship program and report writing.
- Sometimes we face communication problem
- ERP system is new for me that's why I can't use properly this software.

## **1.8 Recommendations**

- An organization should increase the duration from three months to six months. That will impact more accurately and also gives advantage in future career growth.
- Walton should dedicate a week of orientation or training to helping new hires and interns grasp DSS.
- Ensure proper learning environment
- Organization culture, environment, structure is so good for official work. If you work with dedication, you can improve very easily.

## **1.9 Student Information**

Name: Md. Israkh Ahmmed

ID: 21364063

Program: MBA

Major: Operations Management

## **1.10 Internship Information**

### **1.10.1 Organizational Information**

Company Name: Walton Hi-Tech Industries PLC

Period: 23th May 2023 to 23th September 2023 (4 months)

Department: Oracle EBS, ERP

Division: EBS (SCM)

Address: Walton Corporate Office, Plot-1088, R-80ft.2, Block-I, Bashundhara Residential Area, Dhaka-1229

**1.10.2 On-Site Supervisor's Information**

Internship Company Supervisor's Information:

Name: Md. Khayruzzaman

Position: Oracle EBS

Mobile: 01678860336

E-mail: khayruzzman17423@waltonplc.com



## CHAPTER TWO

### ORGANIZATION PART

#### 2.1 Company Profile

With one of the largest and best-equipped R&I facilities in the world, Walton is a new international brand that produces appliances, electronics, cars, and other electrical goods through a number of subsidiaries that operate under the Walton group headquarters in Bangladesh. Walton currently employs more than 30000 people across 22 production bases spread across 700+ acres of plant space. Based on market need, there can be 10 million units produced annually. Walton is the largest professional producer in the business and has built a solid reputation for creating Electrical and Electronics products in the most competitive manner possible in terms of quality, price, design, and innovation.



#### 2.1.1 Vision, Mission and Core values of Walton

##### Vision

Walton has gained domestic and international acclaim for its expertise and successful track record in a range of electronics disciplines along the road. With a dominant market share and a focus on multi-stored refrigerators, freezers, air conditioners, LED/LCD televisions, motorcycles, smart phones, and home appliances, Walton is a pioneer in the development of cutting-edge designs and contemporary technologies. In order to dominate Go Global and the top five Electronics Brands of the World by 2030, Walton is trying to expand its red and green market footprint from the current 40 nations to more than 200 countries.



### 2.1.2 History of Walton

Business began in 1977, and in early 2008, WHIPLC began producing refrigerators, freezers, air conditioners, and compressors. Now, the company is growing into the manufacturing of televisions, home appliances, and electrical appliances. Walton & Marcel has grown to be the most reputable and trusted brand in Bangladesh's E&E sector thanks to its robust manufacturing base, high-caliber products, affordable prices, wide market reach, and last but not least, its quick after-sales support. As a result, both Brands have quickly gained a sizeable portion of the market and established themselves as Bangladesh's top performers in the E&E industry. Refrigerator (Frost & Non-Frost), Freezer, Air Conditioner, Compressor, and Television are among WHIPLC's product offerings.



### 2.1.3 Product lines or services

#### Walton Hi-Tech Industries PLC:



**Washing Machine**



**Television**



**Air Conditioner**



**Refrigerator & Freezer**



**Home Appliances**



**Kitchen Appliances**



**Electrical Appliances**



**Elevator**

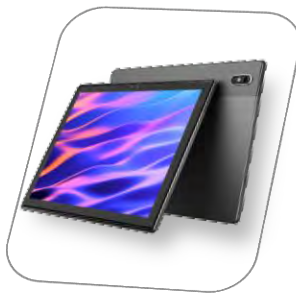


**Compressor**

**Walton Digi-Tech Industries PLC:**



**Laptop**



**Tablet**



**Mobile**



**Computer**



**Display**



**Component**



**Lifestyle**



**Accessories**



**Music**



**Security**



**Network**



**Printer**



**Kids Product**



**Power**



**Electric Bike**



**PCB**

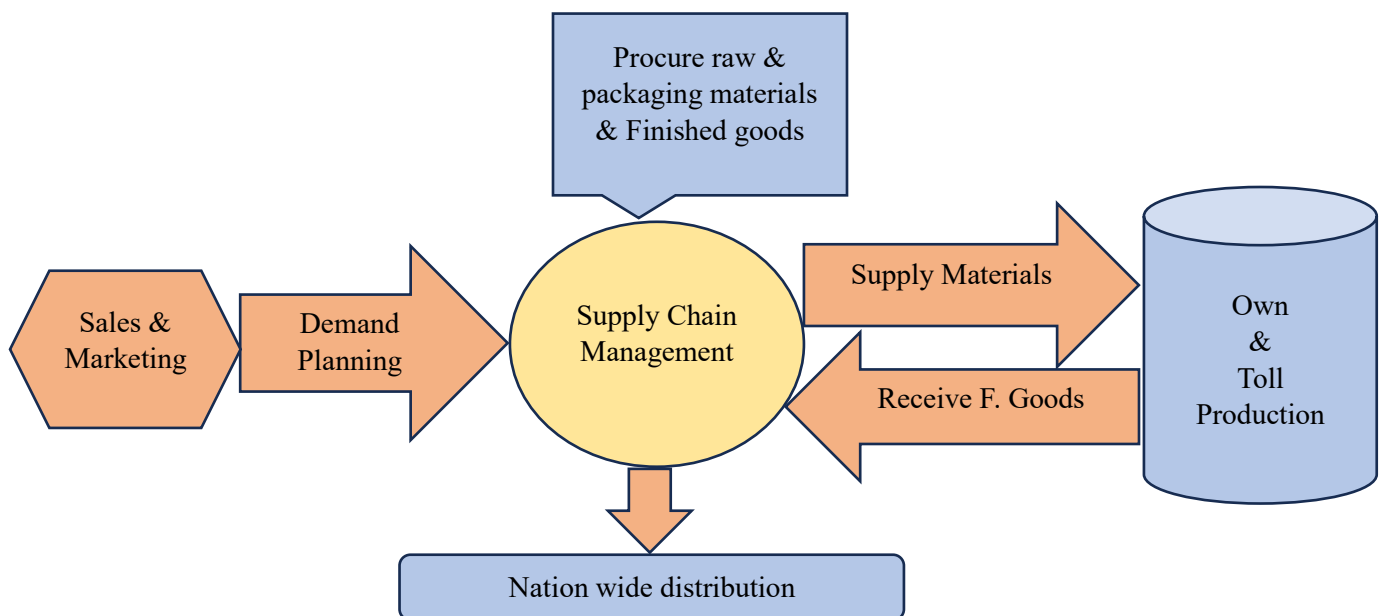
### 2.1.4 Corporate Division/department

- Finance & Accounts
- Sales Department
- Marketing Department
- Human Resources Department
- Quality Control Department
- Production Department
- Distribution Department
- Commercial Department

## 2.2 Functional Departments

### 2.2.1 Supply Chain Management

Supply chain management at Walton includes all actions required to ensure prompt shipment and widespread product availability all the way up to retail stores. It involves sourcing finished products and raw materials from domestic and international vendors, followed by warehousing, shipping, and delivery to the 12 Walton Area Sales offices, and finally distribution to retail and wholesale pharmacies, supermarkets, and other enterprises. Managing the supply chain Supply chain management at Walton includes all actions required to ensure prompt shipment and widespread product availability all the way up to retail stores. The Walton Hi-Tech Industries PLC team collaborates to guarantee on-time supply in response to marketing and sales demand as well as widespread product availability up to the [SCM] team at Walton Hi-Tech Industries PLC obtains finished goods and raw materials for one's own produced goods from domestic and foreign suppliers, followed by warehousing, logistics, and delivery to the 200 plaza Area Sales offices, and then distribution to retail and walton plaza. There are currently five teams working under the Supply Chain Management (SCM) division: Demand Planning and Inventory Management, Procurement, Commercial, and Logistics & Distribution.



**Figure 2.1:** Supply Chain Management

### 2.2.2 Finance & Accounts

This department's primary duties include managing all cash and check-related activities, creating payment notes, keeping track of receivables and payables, setting annual goals, managing bank accounts, creating vouchers and journal entries, and creating financial statements, among other duties.

### 2.2.3 Sales

According to Walton executives, the publicly traded company's sales increased by 70% to close to Tk 7,000 crore, while cost reduction helped its net profit increase by 124% over the previous fiscal year. Due to the disturbed business environment caused by the lengthy nationwide closure, followed by a few sluggish quarters in the same fiscal year, Walton had to endure some sales losses in the prior fiscal year. Sales decreased to less than Tk4,200 crore in fiscal 2019–2020 from more than Tk5,180 crore the previous year, which also caused the net profit to practically halve to Tk730 crore. Abul Bashar Howlader, Walton's Additional Managing Director, said, "In fiscal 2020–2021, we have our sales points open during the two major national festivals—the Eids." "While in the previous fiscal year, the Eid-UI-Fitr sales were lost due to the nationwide shutdown. "In order to facilitate their homestay during the pandemic, many families purchased their necessary gadgets and household items on a priority basis once the 2020 lockdown ended, he added, which contributed to the sales surge. According to Abul Bashar Howlader, the business continued to innovate and release new goods and models to draw in new clients and loyal ones.

"The matter of our bigger pride, over the latest fiscal year Walton's export grew by more than eight times to Tk120 crore as it received more and more orders from a set of export markets that include both the developing and developed markets," he stated. According to Howlader, Walton, whose refrigeration and cooling products account for more than two-thirds of its revenue, experienced nearly proportional growth across all of its product categories. The biggest electronics manufacturer in the nation, Walton, entered the public market in 2020 with an eye toward the international market. For the fiscal year that ends on June 30, its board of directors recommended a 250% cash dividend for ordinary shareholders and a 170% cash dividend for sponsor and director shareholders.

In order to construct an iconic tower for its corporate office, the business had made the decision to pay roughly Tk172 crore for a 236 decimal plot in the capital. To be in compliance with the revised Companies Act, the board of directors decided to modify the business name suffix. This company will change its name to Walton High-Tech Industries PLC. Walton's yearly earnings per share increased to Tk54.21 from Tk24.21 on Wednesday, although the company's stock price only declined 3.9%, to Tk1,417. Without adding the surplus, which was Tk208 on the same day, the company's net asset value per share increased to almost Tk311 at the end of June this year.

## 2.2.4 Human Resource Department (HRD)

The two main focuses of HRD's attention in Walton are planning and staff action monitoring. Career development is one of HR's primary responsibilities; it is carried out through the dissemination of circulars and applicant interviews, although the Managing Director of Walton has the final say. When a new employee joins, HR also takes the initiative to introduce them to everyone.



Figure 2.2: Organogram of Walton

The aforementioned diagram demonstrates Walton's centralized organizational structure. This structure is extremely formal and unexpected. Power is transferred from the top down. Walton's leaders have complete ownership and management of the company. One-way correspondence systems exist, such as the hierarchical approach. The Walton directors must approve every action. Additionally, Walton's directors are the only ones who make decisions. As a result, Walton has a single point of control and authority.

## 2.2.5 Marketing Department

The marketing department is largely in charge of planning all promotional campaigns, setting budgets, coming up with market-friendly concepts, planning events for distributors and clients, providing presents, and other promotional activities. This division is in charge of managing PR



and offering client assistance as needed. The marketing division also creates packaging and pack designs.

The marketing department has four activities:

- **Product development:** Although not solely the domain of the marketing division, product development does necessitate cooperation from other divisions. Marketing is generally in charge of the product's research component. They gather information on the state of the market before deciding what kind of product could be produced to best suit the market. After that, different departments help create the new product design. The division in charge of product development is also concerned in packaging.
- **Promotion** is one of the marketing department's most frequent and significant tasks. Promotion is one of the four Ps in the marketing mix. Since there is no other means to get any kind of message to final consumers, this is a crucial task for the marketing team to complete. All methods of consumer contact are included in promotion. One of the key strategies for branding is promotion, which is why the marketing division is responsible for it. working in tandem with other divisions. Product packaging falls within the purview of the product development division.
- **Brand equity** is a term used to describe how valuable a brand is in the eyes of its consumers. To create a positive brand image that will eventually transfer to the newly created product and make it easier to sell, it is essential to build significant brand equity. Thus, building strong brand equity is one of the main operations. To achieve the final goal of high brand equity, several small actions are taken. engagement with other departments; hence, falls under the scope of the marketing department. Product packaging falls within the purview of the product development division.
- **Market research** is the process of gathering information from customers and the market about how they feel about a product being offered by a company. As a consequence of the market research equity, many decisions regarding the current product line and the planning of new items are made. engagement with other departments; hence, falls under the scope of the marketing department. Product packaging falls within the purview of the product development division.

### **2.2.6 Production Department**

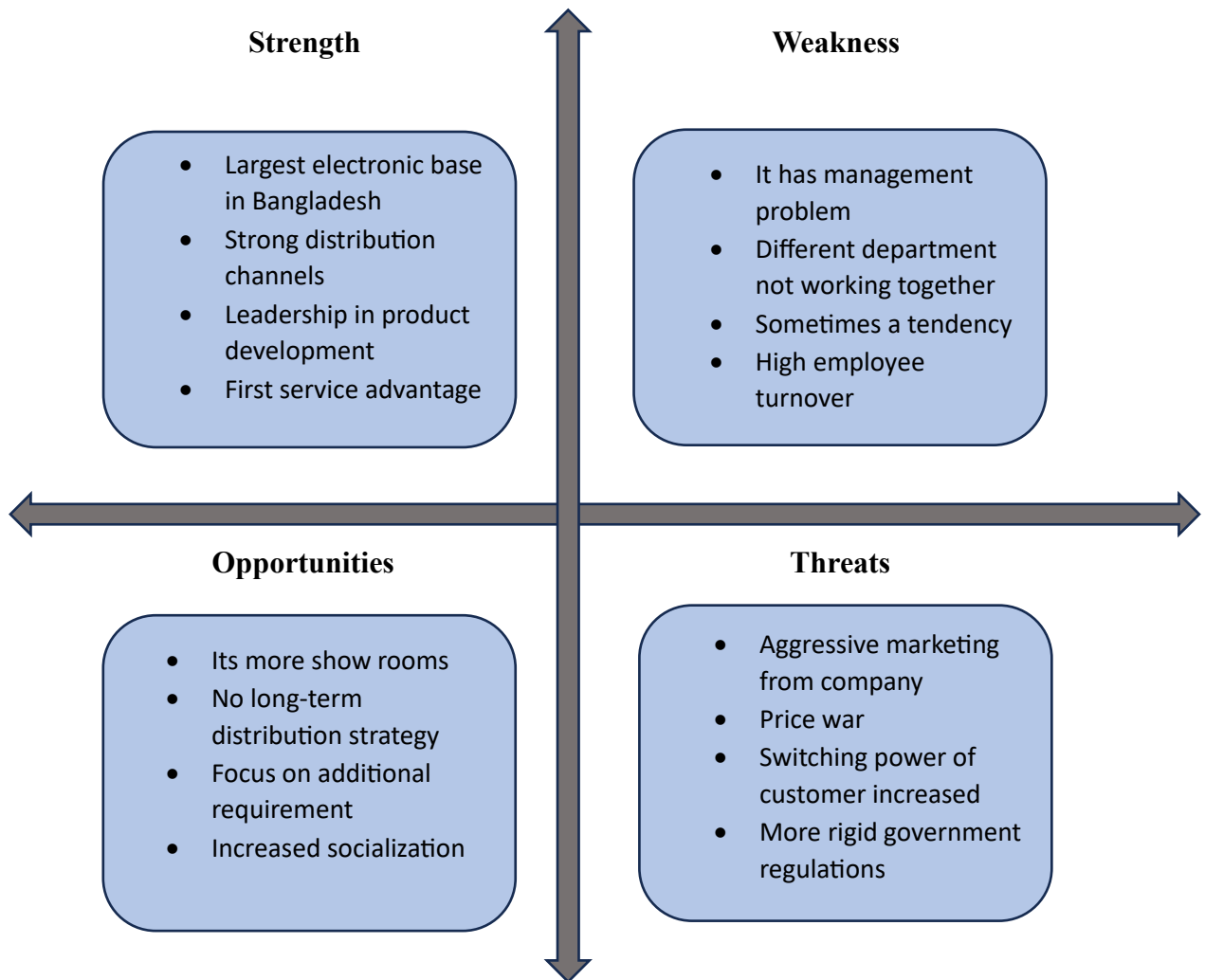
The manufacturing section mostly imports and produces goods from within and beyond the nation in response to orders. The PD department's policies are adhered to when creating goods. After production, local products are delivered to the Distribution division, while imported goods are moved to the warehouse at the Chittagong port and stored there until they are ready for shipping.

### **2.2.7 Quality Control Department (QC)**

This division's primary goal is to inspect the goods for quality prior to packing. All commodities go through quality control (QC) testing to make sure they are all edible and remain at the highest

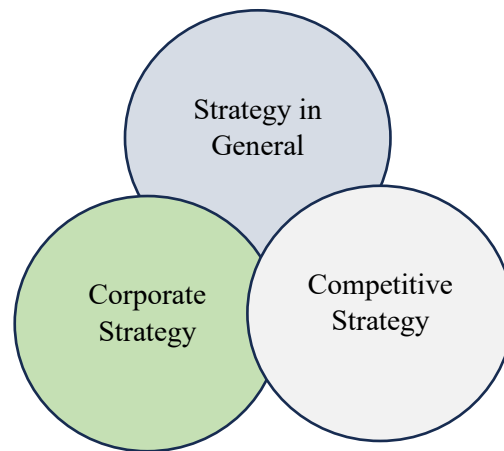
standard. Additionally, QC thoroughly examines exported products and guarantees that each one meets international requirements and is prepared for export.

### 2.3 SWOT Analysis



**Figure 2.3:** SWOT Analysis of Walton

### 2.3.1 Strategy



**Figure 2.4:** Strategy of Walton

- Walton always try to make the best possible services.
- Moreover, it does not promise any specific quality standards in service.
- Walton now try to give service all side in our country.
- Any reason subject to official notification of such offers prior to giving effect to such changes.

### 2.4 Limitations

This research work is concentrated only the electronic of the selected electronic industry, so further study can be done in other product of the selected industry such as FMCG.

## **CHAPTER THREE**

### **SINGLE-MINUTE EXCHANGE OF DIE (SMED)**

#### **3.1 Abstract**

In our investigation, we used the SMED approach in the Walton manufacturing unit in Bangladesh. We have chosen the manufacturing sector to apply these techniques. One of the crucial lean techniques for reducing waste and enhancing flexibility in manufacturing operations is the Single Minute Exchange of Die (SMED). SMED decreases non-productive time by standardizing and streamlining exchange tool operations utilizing straightforward methods and user-friendly software. We have determined the transition time by conducting a review of the literature, consulting experts, and gathering data. We have determined that these strategies help to shorten changeover times after calculating data using them. These findings are very important for the growth of a manufacturing unit. The implementation makes it possible to speed up transition.

#### **3.2 Introduction**

The manner that organizations do business has changed as a result of industrialization and globalization. When customers' expectations are not met by a specific product, they are dissatisfied with it for an extended period of time. Because of this, consumers will buy other products that are on the market that are less expensive and have more features, even when there are other makers of the same product. It indicates that there is a wide range of goods and machinery on the market. These machines are employed in the production of various product kinds or variations within a single product family. Every time a series of products (A) is produced, during the moment of manufacture (**Goubergen, 2009**). SMED is a theory and technique set that allows equipment setup and changeover activities to be completed in less than 10 minutes. With modest investments, SMED enhances the setup procedure and offers a 90% setup time reduction. The setup operation is the pre-processing or post-processing modification that is carried out once for each lot. The setup process is split into two sections by Shingo: internal setup and external setup. Attaching or detaching dies is an example of an internal setup procedure that can only be performed while the machine is shut down. The setup process that can be carried out while the computer is operating is known as external setup. It is possible to carry out these tasks both before and after the machine shuts down. (**Ulutas, 2019**)

The terms "Internal Setup" and "External Setup" are often used in manufacturing and industrial contexts to describe different types of tasks and operations related to machinery and equipment. Here's a brief explanation of each: (**Inamdar Y. R., 2012**)

#### **Internal Setup:**

Internal setup refers to tasks and operations that are performed when the machine is shut down or turned off. These activities typically involve maintenance, adjustment, or replacement of

components within the machine itself. **Examples of internal setup tasks include:** Removal or exchange of a die or drill bit: This involves taking out a worn-out or damaged tool (die or drill bit) from the machine and replacing it with a new one. Calibration and alignment: Ensuring that various machine components are properly calibrated and aligned for precise operation. Lubrication and maintenance: Applying lubricants, inspecting, and performing routine maintenance on internal parts of the machine to keep it in good working condition.

#### **External Setup:**

External setup refers to tasks and operations that can be carried out while the machine is in operation or running. These activities are typically related to preparing materials, tools, or other resources for the machine to continue its work smoothly. **Examples of external setup tasks include:** Transportation of a new die or bit to the machine: Bringing replacement tools or components to the machine without interrupting its operation. Loading materials into the machine: Adding raw materials or workpieces to the machine's input system while it is running. Tool change or tool replenishment: Swapping out tools, such as cutting tools or grinding wheels, while the machine is in operation to minimize downtime. In summary, internal setup involves tasks performed when the machine is not running, typically to maintain or adjust its internal components, while external setup encompasses tasks performed while the machine is in operation to ensure a continuous and efficient workflow. Both types of setup are crucial in manufacturing and industrial processes to optimize productivity and minimize downtime.

### **3.3 Literature Review**

One of the various thin production techniques to shorten the time it takes for a manufacturing process to change is Single Minute Exchange of Die (SMED). It offers a quick and effective method for switching any production process from the shipment of the current product to the shipment of the next product. The secret to lowering production volume and enhancing flow is this quick shift. While all changes and beginnings should not take more than ten minutes (often known as "single digit minutes"), the term "single minute" does not imply that they must. A single minute swap of die or setup time that may be computed in single digits of minutes is referred to as SMED.

"Rapid change" and SMED are frequently used interchangeably. The process of cutting down on the amount of time needed to switch a line or machine from one product to another is known as SMED or Quick Changeover. Now more than ever, SMED and quick-change initiatives are required due to the growing demand for product variability, shorter product lifecycles, and drastically lower inventory levels. (Sohani, 2012)

#### **3.3.1 Historical background of SMED**

The SMED was created by Taichi Ohno for the Toyota 5. Ohno wants to create a mechanism that can swap out dies faster. Ohno was able to cut the time it took to change dies from a day to three minutes in the late 1950s. SMED's main goal is to shorten a machine's setup time. Setups come in two flavors: internal and external. While external setup tasks can be completed while the system

is operating, internal setup tasks can only be completed after it is turned off. The fundamental concept is to complete as many tasks as you can, ranging from internal to external, and to get the conclusion that setup reduction is a generally useful tool. Numerous studies have been conducted on the SMED method in the textile processing industry. A number of fundamental requirements, such as teamwork, visual factory control, performance measurement, kaizen, and the production environment's role in implementing SMED, are necessary for the method to be implemented effectively. The cost of each part will rise when the batch size falls and the change time becomes less dispersed, according to research on the relationship between change and production leveling. Higher changeover times result in increased production costs. The examination of specific modifications is also covered, with the conclusion being that every machine degree of freedom needs to be defined when making a part. SMED is a tool for increasing flexibility, and the capacity to produce parts in small batches is the main advantage of reduction during change. SMED is appropriate for both equipment creation and production enhancement, as shown by the relationship that exists between SMED and equipment design. The SMED tool has been effectively implemented in a pine plant. The experimental outcome demonstrated the value of lean in the deployment of information technology products, reducing setup time from 45 minutes to 15 minutes. Lean implementation is broken down into "waves" in the newly suggested development framework, with the SMED equipment falling into the second of a total of four waves. According to Shingo, "SMEDs can be applied to any machine at any factory". Apply design modifications and establish minimal change-up to balance the production process. **(Sohani, 2012)**

### **3.4 Methodology**

The methodology used to develop this study consisted of five main stages. In the first stage, the work to be developed, which was based on scientific papers, was supported by a brief assessment of the literature and a historical background of SMED. In the second stage, I have discussed the objectives of our study. In the third stage, the equipment on which the study is based is presented, as well as the identification of the problems. In the fourth stage, the SMED tool was used to identify waste. Using the SMED tool, I discussed the implementation of SMED, showed all activities before SMED and all activities after SMED, and then compared activities before and after SMED. Finally, in the fifth stage, there is a description of the results as well as the conclusions of this article.

#### **3.4.1 Primary Sources**

The following methods can also be used to collect primary data:

- Conversation and discussion with employee and production manager.
- Data has been collected by talking to worker.

#### **3.4.2 Secondary Sources**

The report was put together using the secondary data sources listed below:

- Books and journals helped me to know SMED related all the concepts and all the activities.
- Annual Report and website of Walton.

### 3.5 Objective of our Study

In order to disseminate this information among the entrepreneurs in the electronics sector, the study aims to conduct a literature review in order to ascertain the advantages of the SMED methodology, the primary factors influencing production time in the electronics sector industries, the countries that have carried out more studies on the subject, the primary contributions discovered by the authors, the characteristics of SMED implementation, and how to apply it in industrial companies in the electronics sector.

### 3.6 Six Big Losses in Production

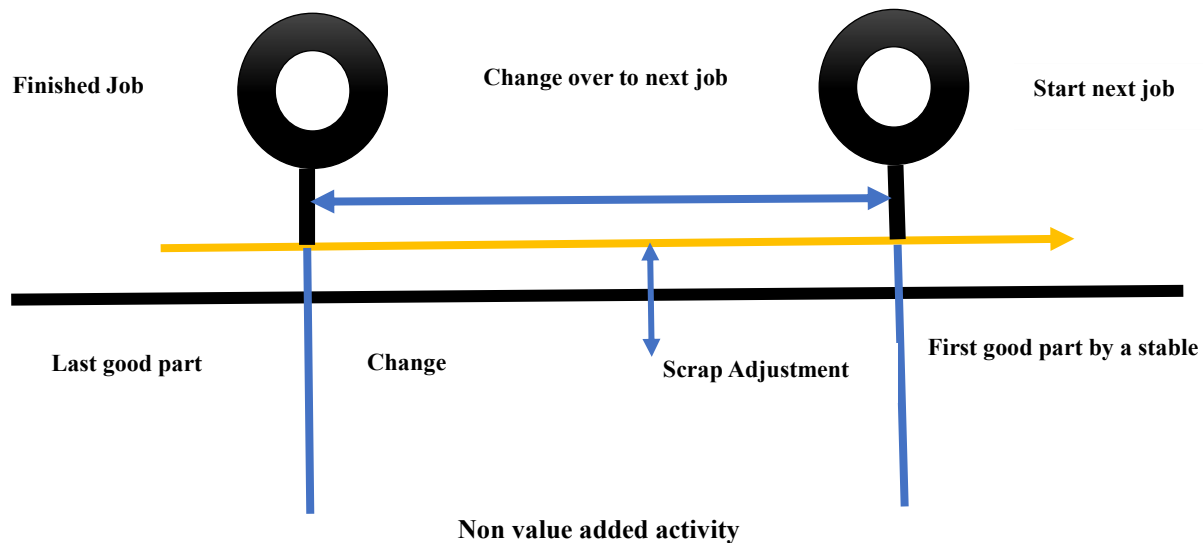
According to Hedman (**Richard Hedman, 2016**), these three factors are influenced by the six big losses in production

Downtime Losses	Time losses	When productivity is reduced
	Quantity losses	Caused by defective products
	Setup and adjustment time losses	Occur when a changeover operation is performed
Speed Losses	Wasting and minor stop losses	Temporary malfunction or when a machine is wasting
	Reduced speed losses	Difference between design speed and actual operating speed
Quality Losses	Reduced yield losses	Occurs during the early stages of production from machine startup until stabilization
	Quality defects and rework	Caused by malfunctioning production equipment

### 3.7 Lean Manufacturing

Lean manufacturing is a production methodology that views resource consumption for any purpose other than producing value for the final consumer as wasteful and should be eliminated. Lean manufacturing is often perceived as a collection of "tools" that support the continuous identification and removal of waste (muda). A manufacturing program's primary tools are Six Sigma, 5S, TPM, SMED, and value stream mapping. Additionally, there are less common tools or subsets of the more common tools, like Jidoka, mistake proofing, Hoshin Planning, Kaizen improvement cultures, standardized work, and just-in-time inventory. These tools concentrate on particular facets and regions of the manufacturing process in order to minimize production time and cost while improving quality and removing waste. According to the waste reduction concept, changing over time is not a value-added activity. Figure 3.6 depiction of change over time is

described as a technique for evaluating and cutting down on the amount of time required to switch a process from generating one good component to the next good part.



**Figure 3.7: Representation of change over time**

(Ulutas, 2019) give a brief overview of the history of lean manufacturing before talking about the many elements or resources that make up a successful lean program and culture.

### 3.8 Work Steps in Implementing SMED

Working steps in implementing SMED will be as follows:

- Changeover Elements Classification
- Step One- Identify Pilot Area
- Step Two- Identify Elements
- Step Three- Separate External Elements
- Step Four- Convert Internal Elements to External
- Step Five- Streamline Remaining Elements

### 3.9 Changeover Elements Classification

In SMED, the elements of change are classified into two categories:

- An exterior operation entails tasks that can be finished while the machine is running and prior to the start of the changeover procedure.
- When the equipment stops operating, the internal components are those. In the meantime, there may be inefficient functioning.

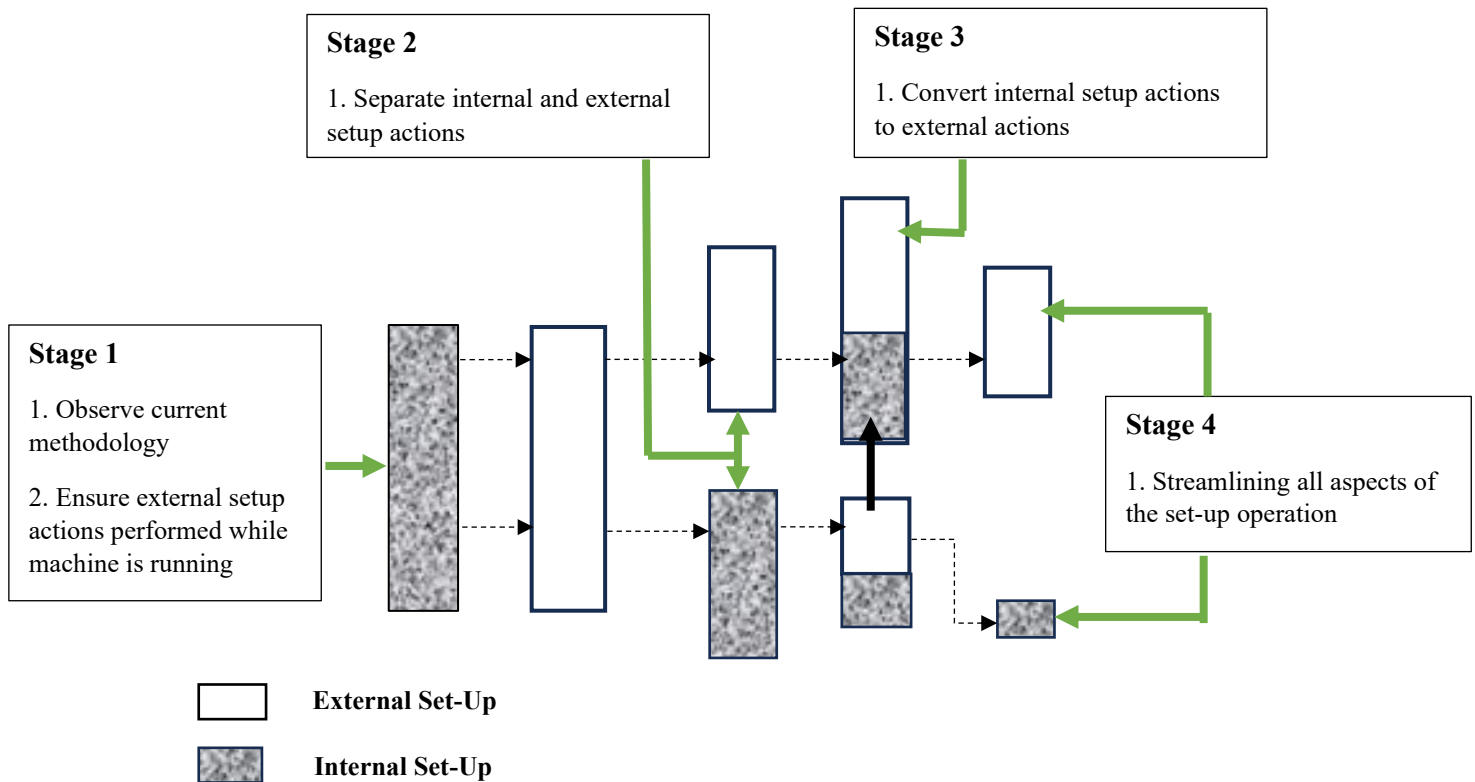


### 3.10 SMED Implementation

This section offers a detailed road map for putting into practice a straightforward and useful SMED. (Rawani, 2006-2017)

SMED initiatives have three conceptual phases:

- **Separate**- Internal & External elements.
- **Convert**- Modify elements so they can be external, or remove them completely and
- **Streamline**- Complete elements within standard time.



**Figure 3.10:** Conceptual stages of SMED Improvement

#### 3.10.1 Before Starting

SMED can be useful to almost all manufacturing companies that carry out the improvements. This does not, however, imply that SMED should be given the highest level of priority. Companies should be handled where they will yield the best return given the restricted resources they have in the actual world. For the majority of businesses, it should be a top priority to ensure that they have a clear understanding of where they are losing productive time and that decisions about improvement projects are made in light of verifiable facts. That entails setting up a system for gathering and analyzing data on manufacturing performance. Once a system for monitoring production performance has been established, data should be captured for at least two weeks to provide a clear picture of where productive time is lost.

### 3.10.2 Step One – Identify Pilot Area

The target area for the pilot SMED program is chosen in this step. The following characteristic will be present in ideal tools.

**3.10.3 Step Two – Identify Elements** The team collaborates to identify each piece of change in this step. The most effective way to do this is to tape the entire change to the video and then work to create an ordered list of elements from the video tape, each of which includes:

- **Description-** What work is performed in entire process.
- **Cost in Time** - How long the element takes to complete

The effect of documenting 30 to 50 items is a straightforward switch. Making a series of post-it notes that stick to the wall and function during the change is a quick way to capture elements. Make sure to record both "human" and "equipment" aspects (i.e., the components that the operator is doing on the device). Human factors are typically the simplest to optimize, as will be covered later.

### 3.10.4 Step Three – Separate External Elements

The "external" change (i.e., executed before or after the change) is identified in this step, and the components of the change or processing in the equipment can be carried out with little to no modification. It is not uncommon to reduce the change times in half with only these methods.

- Recover parts, equipment, materials and / or instructions.
- Inspection of parts, equipment and / or materials.
- The tasks that can be performed during the process can be performed.
- Testing the quality for the last production run.

A revised list of transitional components, classified into three groups as external components (before changeover), internal components (before changeover), and external components (after changeover), should be given from this phase.

### 3.10.5 Step Four – Convert Internal Elements to External

This step aims to convert as many external aspects as feasible to external ones by closely examining the present transformation process. Prioritizing this list will ensure that the most promising applicants are pursued first. It basically boils down to doing a cost-benefit analysis for each exam question:

- Cost calculated as the sum of the materials and labor needed to make the required adjustments
- Benefits that are based on time will no longer be affected by the change.

The list can start making the necessary changes after it has been prioritized. Examples of techniques for transforming internal elements into external ones:

- Prepare part (e.g. preheat dies before replacement)
- Use duplicate jigs (e.g. alignment and other adjustments before changeover)
- Modification tools (e.g. add guarding for safe cleaning during the process)

An updated list of variable elements, including internal components and new external elements (done before or after the change), should be the output of this phase.

### 3.10.6 Step Five – Streamline Remaining Elements

The remaining components are examined in this step with an emphasis on simplifying and simplification to enable quicker completion. To meet the primary objective of reducing change times, internal components should be given top priority. Prioritizing the action of the elements from the previous stage should be done using a straightforward cost/benefit analysis.

Examples of methods for streamlining elements include:

- Eliminate bolts (e.g. use quick release mechanisms or other types of functional clamps)
- Create parallel operations (e.g. note that with multiple operators working on the same equipment close attention must be paid to potential safety issues)
- Eliminate adjustments (e.g. use standardized numerical settings; convert adjustments to multiple fixed settings; use visible centerlines; use shims to standardize die size).

To modify the product from this phase (i.e., produce standardized work) and greatly speed up changeover times, there should be a set of updated job instructions.

**Table: 3.1: All Activities Before SMED**

<b>Process/ Activities</b>	<b>Work Duration(min)</b>
1. Remove Clamp	5
2. Open Nut and Bolt to Remove Die from Machine	30
3. Bring Die to Die Maintenance	8
4. Waiting for Next Product Die Preparation	10
5. Bring Die to Production line	10
6. Install Die	30
7. Connection	30
8. Die Takes Time to heat up	150
9. Install Clamp and Mandrel	30
10. Install Clamp	30
11. Cleaning Nozzle	5
12. Searching Maintenance Equipment	6
	<b>Total Time= 344</b>

**Table 3.2: Separate Internal and External Activities**

<b>Internal Activities</b>	<b>External Activities</b>
1. Remove Clamp	1. Bring Die to Die Maintenance
2. Open Nut and Bolt to Remove Die from Machine	2. Waiting for next product Die Preparation
3. Install Die	3. Bring Die to Production Line
4. Connection	4. Searching Maintenance Equipment
5. Die Takes Time to Heat Up	
6. Install Clamp and Mandrel	
7. Install Clamp	
8. Cleaning Nozzle	

**Table 3.3: Improvement Ideas of all Activities**

<b>Process/Activities</b>	<b>Improvement Idea</b>
1. Remove Clamp	Simplification
2. Open Nut and Bolt to Remove Die from Machine	Simplification
3. Bring Die to Die Maintenance	Implement 5'S, Remove the Activities
4. Waiting for Next Product Die Preparation	Implement 5'S, Remove the Activities
5. Bring Die to Production Line	Implement 5'S, Remove the Activities
6. Install Die	Simplification
7. Connection	Simplification
8. Die Takes Time to Hear Up	Simplification
9. Install Clamp and Mandrel	When Die is Hot, We can Install Clamp and Mandrel
10. Cleaning Nozzle	When Die is Hot, We can Clean the Nozzle
11. Install Clamp	Simplification
12. Searching Maintenance Equipment	Implement 5'S, Remove the Activities

**Table 3.4: All Activities after SMED**

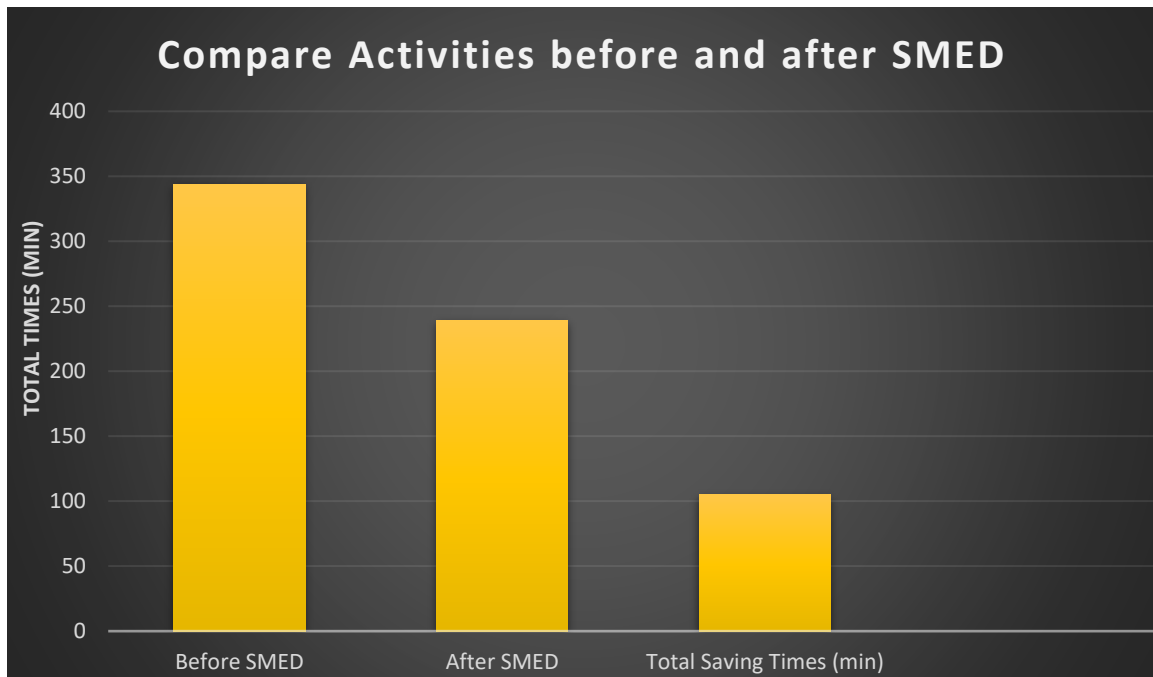
<b>Process/Activities</b>	<b>Work Duration(min)</b>
1. Remove Clamp	4
2. Open Nut and Bolt to Remove Die from Machine	28
3. Install Die	28
4. Connection	25
5. Turn on Die Heater	150
6. Install Clamp and Mandrel	-
7. Install Clamp	4
8. Cleaning Nozzle	-
<b>Total Time(min)= 239</b>	

**Table 3.5: Compare Activities before and after SMED**

Total Activities Before SMED Implementation	12
Total Activities After SMED Implementation	8
Total Saving time After SMED Implementation(min)	105

**Table 3.5.1: Compare Between before and after SMED**

	Total Time(min)
Before SMED	344
After SMED	239
Total Saving Times	105

**Figure 3.5:** Compare activities before and after SMED

### 3.11 Responsibilities of production team

The steering committee's job is to keep an eye on the project's development, ensure that it is moving forward, and to help the champion and the initial implementation team overcome any challenges. The president of the staff council and two labor representatives from the steering committee, which consists of all the major departments, should be chosen as champions. The general manager is in charge of the steering committee.

#### 3.11.1 Roles of Steering Committee Members

- Making strategic choices regarding the execution of a project.
- Participate in decision making.
- Create a support system to help you handle your product effectively.
- Work together and communicate with the personnel and support departments.
- The relevant departments guarantee their dedication and help.
- Help with dispute resolution, prevention, and obstructions.

- Give technical advice and help for the application of the product.
- Determine the training requirements, and offer training assistance and knowledge transfer.
- Create and follow project plans, offer direction, and help with implementation.
- Recognize deviations from the plan and make any necessary corrections.
- Inform the appropriate authorities of the project's accomplishments and problems and take corrective measures.

### **3.11.2 Champion**

Who has the power and duty to provide resources to the organization. A general manager, a factory manager, or a production manager might fill this role in a small business. The chief engineer or industrial engineer may be in charge in large organizations.

### **3.11.3 Core Implementation Team**

There aren't enough circumstances in place to support plant improvement efforts. It is necessary to set up a structure for employee counseling. Therefore, factories need to provide additional team incentives. The actions a team member must do to comprehend how team activities serve their individual goals for self-actualization and personal growth. To manage and achieve improvements, it's crucial to form a core implementation team in addition to being a champion. The initial implementation team carried out the champions' requests. The team will make plans, communicate with everyone in the organization, see to it that staff members are trained, and put the standard flow method into action. Working as a team is essential since quality stream mapping calls for close cooperation in all areas, particularly when designing a concept.

### **3.11.4 External Activities Improvement**

- Improvement is possible through the application of all external activities (mentioned above) to 5S.
- Using checklists to prevent unwanted events in resource preparation (5s).
- Workplace organization that reduces maintenance equipment search time (5s).
- “At hand” tool organization (5S).
- Use OEE & TPM in every process.
- Develop standard time for all tasks.

### **3.12 Conclusions**

The main target of our research was to identify waste and how to reduce it effectively. I was able to show that changeover time can be reduced by using the SMED method. In the electronics sector, many types of waste are generated during production. This waste causes it to increase the changeover time. If the changeover time is increased, then production will be delayed, and many errors can occur. Before applying SMED, the question was whether SMED could actually reduce changeover time. I have been able to demonstrate that changeover time can be reduced by using the SMED method. If all electronic companies use the SMED method, then companies can reduce changeover time, production time, and many errors. Firstly, I visited the factory for a few days. I observe the production line very closely. I used to always try to observe what type of product was being manufactured in the production line and the quality of the product. Then I observe some time wastage on the production line and create many types of errors. Then I will try to reduce the time waste by using the SMED Method. I follow some research papers and some books to apply SMED method properly. One of the limitations is that this method only works with manual matching. This method will not work for automatic matching. And another limitation is that it really depends on all stages of the procedure. I am mainly focused on the electronics and plastics sectors. In the future, I want to work in the in the FMCG and RMG sectors.



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