PCET's Pimpri Chinchwad College of Engineering an Autonomous Institute

Department of Computer Engineering

Industrial Engineering FA - 2

B.Tech

PRN	NAME
121B1B207	SAKSHI RANE
121B1B254	TEJAS VAIJ
121B1B256	KRITI VERMA
121B1B257	VIKAS VERMA

Under The Guidance
Of
Prof. Hemant H. Kadam

PCET's Pimpri Chinchwad College of Engineering Department of ComputerEngineering

2024-25

Chapter 1: Introduction

Rohan Tools Center Overview:
Founded in 2007, Rohan Tools Center has established itself as a leading manufacturer and trader of high-quality cutting tools, including Band Saw Blades, Circular Saw Blades, and Metal Cutting Blades. The company is dedicated to consistently meeting or exceeding customer expectations through a focus on quality, timely delivery, and competitive pricing. With a robust distribution network, they serve a diverse clientele and maintain high product standards, particularly for precision tools used in various industries.

Vision Statement:
Rohan Tools Center aspires to be recognized globally as a premier manufacturer and wholesaler of high-quality cutting tools, such as BI-Metal Blades, Carbide Blades, and Circular Saw Blades. The company emphasizes delivering products that not only match but exceed customer quality standards. Their vision incorporates a commitment to reliability in product delivery, ensuring customer satisfaction through affordability and on-time service.

Mission Statement:
The mission of Rohan Tools Center is to deliver an assortment of cutting tools that consistently fulfill customer requirements in terms of quality, service, and value. The company aims to maintain high standards for each product manufactured, ensuring tools meet stringent quality specifications. This mission underlines their dedication to customer satisfaction and long-term client relationships.

Achievements:
Since its inception, Rohan Tools Center has achieved significant milestones, serving a total of 7,500 customers, with a customer repeat rate of 70%. Notably, the company has fulfilled orders as high as 150 units per transaction, reflecting customer confidence and satisfaction in their offerings. These accomplishments highlight the company's growth and the loyalty it has cultivated among clients through reliable, high-quality products.

Organizational Hierarchy:
The company operates under a structured hierarchy that defines roles and responsibilities. Vithhal Mane holds the position of Director, overseeing the overall operations. In the manufacturing unit, there are eight laborers responsible for production tasks. Rohan Mane heads the sales department, while Gaurav Mane manages accounting functions. This structured approach supports efficient operations and enables Rohan Tools Center to maintain smooth production and financial management.

Chapter 2: Plant Location Factors

- **Cost of land and utilities**: When this manufacturing unit was established then the cost of land in this area was comparatively low/cheap and hence they decided to settle in this area.
- **Competition in the area**: As they were the only one's in that area who were producing the products such as Band Saw Blades, Circular Saw , Blades, Metal Cutting Blades, so competition was not high at that time.
- **Labor Availability**: As this company is located in MIDC the availability of skilled labor meets the demand of the company.
- **Transportation and Logistics**: As this company is located in MIDC area transportation here was easily accessible.
- **Market access**: Initially, they were serving a specific region in Maharashtra which was near by and hence this location was selected so that the shipping cost and time is reduced but, now they ship their products all over India.
- **Regulatory and Environmental Compliance:** The location in which they are situated is clear from all the environmental compliance such as emission, waste, noise.

Chapter 3: Human Accidents and Safety

- **Personal protective equipment**

  Accident – As workers are working on heavy machine to produce saw blades and circular saw may cause accidents that can lead to physical damage. Welding is also one of the accidental factor.

  Safety – Workers safety is ensured by providing them cut resistant gloves for specially, when handling blades and sharp tools. They are also provided with safety goggles for eye protection and face mask for welding purposes.

- **Blade handling and disposal**

  Accident – The workers have suffered a small accident due to sharp blades and tools during their manufacturing and disposal.

  Safety – In order to reduce such accidents, the sharp blades when not in use are stored in the inventory area and the disposal of dull blades are done on monthly basis.

- **Regular audits and inspection**

  Accident – Once there was a major accident that was caused by one of the blade cutting machines that led to a huge damage not only to the workers but for production as well.

  Safety – After this incident occurred which led to huge damage regular inspections of the machines were carried out.

- **Training and education**

  Accident – Without the proper training and education if the workers try to run machine or handle any inventory then it leads to accidents.

  Safety – Machine operating training and inventory handling is provided to the workers along with how to safely handle the saw, blade etc.

Chapter 4: Human Relation in Industry

- **Employee Engagement:**
  - Regular communication and feedback loops.
  - Recognizing and rewarding good performance.
  - Involving employees in decision-making processes.
- **Workplace Safety:**
  - Prioritize safety training and proper use of equipment.
  - Ensure availability of safety gear and adherence to industry safety standards.
- **Skill Development and Training:**
  - Invest in skill-enhancement workshops.
  - On-the-job training for using specialized machinery.
- **Clear Job Roles and Expectations:**
  - Define roles and responsibilities clearly.
  - Offer support for employees to meet their job requirements.
- **Compliance with Labor Laws:**
  - Ensure adherence to minimum wage, overtime, and other labor laws.
  - Maintain transparent payroll practices.
  - Update policies according to local regulations.
- **Environmental Responsibility:**
  - Foster a culture of environmental responsibility.
  - Promote sustainable practices in production.
  - Educate employees on eco-friendly practices.

Chapter 5: Human Resource Management

1. Recruitment and Selection

- Hire skilled labor with experience in machinery operation and metalworking.
- Assess candidates on technical skills, safety knowledge, and adaptability.

2. Performance Management

- Set clear, measurable goals related to production quality and efficiency.
- Conduct performance evaluations and provide constructive feedback.
- Recognize high performers and incentivize improvements.

3. Compensation and Benefits

- Ensure competitive wages aligned with industry standards.
- Provide basic benefits such as overtime pay, and paid time off.
- Structure bonuses or incentives based on productivity and safety records.

4. Health and Safety Compliance

- Regularly update safety training sessions and enforce adherence to safety practices.
- Conduct routine inspections and provide personal protective equipment (PPE).
- Foster a safety-conscious culture with zero tolerance for unsafe practices.

5. Labor Relations and Compliance

- Stay updated on local labor laws (e.g., wage regulations, working hours).
- Maintain transparent payroll and timely payment processes.
- Address grievances promptly and establish conflict-resolution mechanisms.

Chapter 6: Break Even Analysis

Break-even analysis is a financial calculation that helps businesses determine the point at which their total revenues equal their total costs, meaning they're not making a profit or loss. This point, known as the **break-even point (BEP)**, is crucial for business planning because it tells a company the minimum number of units it needs to sell to cover all costs.

The main components of break-even analysis include:

1. **Fixed Costs (FC)**: Costs that stay the same regardless of production volume, like rent, salaries, and utilities.
2. **Variable Costs (VC)**: Costs that vary directly with production volume, like raw materials and packaging.
3. **Selling Price (SP)**: The price at which each unit is sold.
4. **Contribution Margin (CM)**: The amount each unit contributes towards covering fixed costs and generating profit. It's calculated as: Contribution Margin=Selling Price−Variable Cost per Unit

Let's conduct a detailed break-even analysis for Rohan Tools Center, let's proceed step-by-step.

Step 1: Identify Key Variables

1. Turnover (Revenue): ₹18 crore annually.
2. Average Contribution Margin per Unit: ₹3000 per blade.
    - This is effectively the amount earned per blade after covering variable costs, but it's important to distinguish this from profit per unit since fixed costs haven't been considered yet.
3. Number of Staff: 11 employees.
4. Estimated Selling Price: ₹5000 per blade.

Step 2: Determine Fixed and Variable Costs

1. Fixed Costs (FC): This includes costs that don't vary with production volume, such as salaries, rent, utilities, maintenance, etc.
2. Variable Costs per Unit (VC): Costs that vary with each blade produced, such as raw materials, cutting, polishing, and packaging.

Step 3: Estimate Fixed Costs

Fixed Costs (FC) Estimation

1. Salaries: Averaging staff members salaries which is around ₹30,000 per month.

    Annual Salary Expense:

=11 employees×₹30,000×12months

= ₹39,60,000.

2. Rent and Utilities: Workshop rent and utility bills (electricity, water, etc.) could total around ₹1,00,000 monthly.

   Annual Rent and Utilities:

   = ₹1,00,000×12

   = ₹12,00,000.

3. Maintenance and Equipment: The equipment and machine maintenance at around ₹5,00,000 annually.
4. Miscellaneous Overheads (insurance, licenses, etc.): Estimated at ₹1,00,000 annually.

Total Fixed Costs (FC) = ₹39,60,000 + ₹12,00,000 + ₹5,00,000 + ₹1,00,000 = ₹57,60,000

Step 4: Calculate Variable Costs per Unit

Since the contribution margin (₹3000) is provided, we can assume this is already the result of:

Selling Price per Unit−Variable Cost per Unit=Contribution Margin per Unit (₹3000)

Step 5: Calculate the Break-Even Point in Units

Now, we can calculate the Break-Even Point (BEP) in units, which tells us how many blades Rohan Tools Center must sell to cover all fixed costs.

The formula for the Break-Even Point in units is:

BEP (Units)=Fixed CostsContribution Margin per UnitBEP (Units)/Contribution Margin per Uni tFixed Costs

Plugging in the values:

BEP (Units) = ₹57,60,000/₹3000 = 19,20 units

Step 6: Interpret the Results

- Break-Even Point: Rohan Tools Centre must sell 19,20 blades annually to cover all its fixed and variable costs.
- Any sales beyond 19,20 units will contribute to profit.

Step 7: Calculate Break-Even Point in Revenue

BEP (Revenue)=BEP (Units)×Selling Price per Unit

If we knew the exact selling price, we'd plug it in here. But since the turnover (₹18 crore) is the result of total units sold at this unknown selling price, we can infer the approximate price per unit by dividing the turnover by an approximate number of units sold (total annual profit / ₹3000).

Summary:

- Fixed Costs (Annual): ₹57,60,000
- Contribution Margin per Unit: ₹3000
- Break-Even Point: 19,20 blades annually

This analysis allows Rohan Tools Center to understand that after selling 19,20 blades, all costs are covered, and they can start making a profit on additional sales.