COVER PAGE AND DECLARATION

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Introduction:

Operations management controls the processes concerned with planning, organising, and supervising production. Similarly, it can be described as allocating and converting inputs into outputs through designing, inventory, production, quality control and delivering goods and services to the consumers. It's also defined as the techniques used at all sectors in every step to achieve the most efficient use of resources, which leads to higher profitability. Consequently, many components must be addressed to successfully produce and deliver them to customers on time.

Operation managers are responsible for developing and implementing business strategies, practical plans, and practices to ensure long-term growth and sustainability. Organizations in the 21st century, as a part of their social responsibility, have given more attention to the environmental impact of their business and focus on environment-friendly activities. Accordingly, our report will discuss the operational streamlining and social responsibility procedural guides.

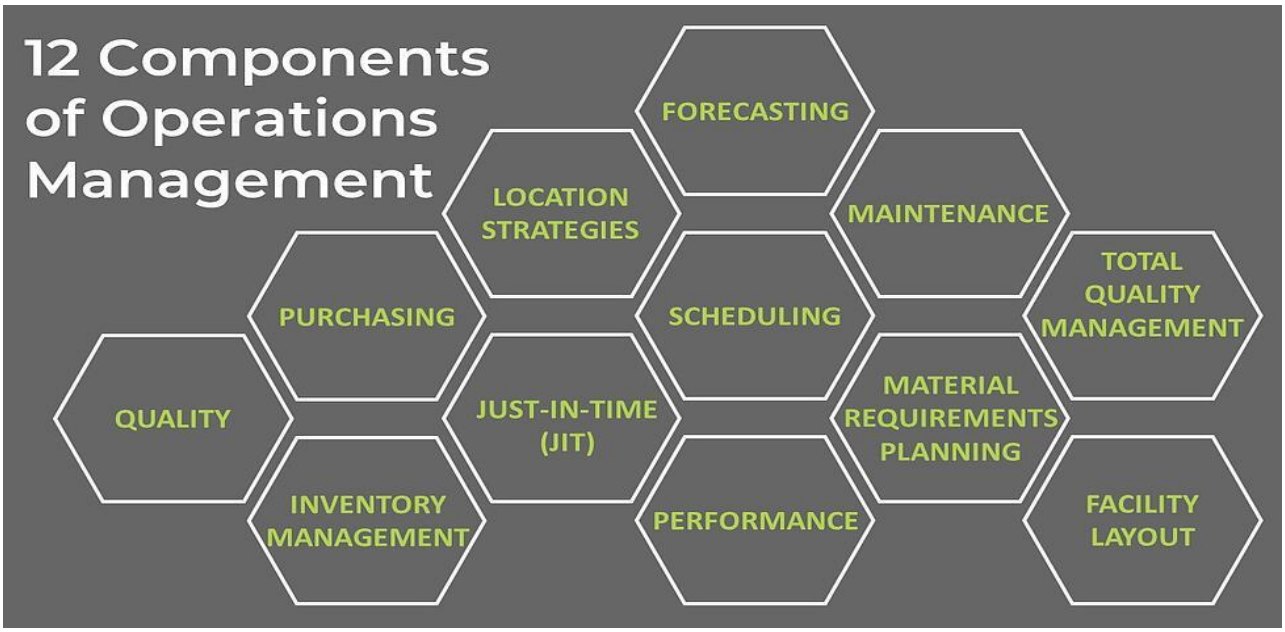

FIGURE 1: COMPONENTS OF OPERATIONS MANAGEMENT

Company Overview:

Our case scenario concerns “the big green tractor”, a specialized industrial company manufacturing tractor. They are based in Palembang, Indonesia. In recent years, the company could not maintain its growth rate. The main challenge to the company is to have a cost saving-effective strategy through the most efficient use of resources to achieve profitability, sustainability, and operational excellence. Therefore, the company must restructure its operations to streamline the procedural guide and practices to become more efficient and profitable and develop its social responsibility towards green manufacturing alternatives, which can be shortlisted below:

1. Improve the product design to be more attractive and competitive to customers.
2. Reduce the cost of materials used in production.
3. Reduce workforce costs.
4. Improve the required time to complete the production and delivery of the final product.
5. Reduce the costs associated with shipping the materials to the destination” freight costs”.(Rowse, 2020)

-to achieve operational excellence, the company has identified the areas of challenges:

1. Inexperienced designers with a lack of information can’t produce a design that can be competitive and cost-controlled.

2. The research and development team can’t provide the appropriate technologies to compete with other suppliers in the same industry.

3. Production tracking system could be more efficient.

4. Sales and marketing teams must provide accurate forecasts for customer orders where production and demand differ, leading to losing orders and increasing the freight costs of urgent delivery orders.

-the main areas of improvement are:

- Designing
- Planning
- Production

- Firstly, to improve material planning, it's required to review workflow and quality procedures to ensure material availability on time and reduce production waste. As well as enhancing fresh engineers' and technician skills through conducting training workshops.
- Secondly, reducing material costs, eliminating waste, and improving quality will help the company to achieve productivity improvement.
- To improve productivity, the company should focus on four main areas:

  - Automation through using robots and engineering software instead of labour in intensive processes.

  - Redesign work processes: improving operational processes will lead to high productivity.

  - Upgrading production equipment will lead to higher productivity and reduce the waste of breakdown lost time.

  - Develop workforce knowledge and capabilities to take on higher value-added activities.

1.Operational industrial procedural guide:

Operation procedures are a set of procedures, agreements and protocols in written instructions that define the actions and steps to be taken in each activity and the person responsible for it. The efficiency of the operational process is the key to the organization's success and sustainability. That's why it's required to continue improvement.

-different types of the operational process can be divided into:

1. Control processes: starting from the policy and associated activities, ex, planning, control, evaluation, and adjustment.
2. Primary processes: main activities, ex, services providers and product manufacturing.
3. Support processes: activities required to ensure the success of primary functions, ex: factory security.

-some steps to improve and streamline the operational process are as follows:

1. Eliminate waste: finding and eliminating unnecessary operations is the first step toward achieving efficiency.
2. Optimising the production process:
    - Regularly improve the workflow.
    - Enhance the use of technology.
    - Plan regular maintenance.
    - Train your staff.
3. Set deadlines and stick to them.
4. Find suitable replacement alternatives for the key employees, suppliers, and machines whenever required.
5. Improve your recruiting process: to ensure hiring the best candidates.

-operation activities such as:

- Forecasting
- Capacity planning
- Scheduling
- Managing inventories
- Assuring quality

- Motivating employees
- Deciding where to locate facilities

-decision-making in operations management depends on below factors:

- What resources are needed?
- When will resources be needed? And when should work be scheduled?
- Where will the work be done?
- How will the product be designed?
- Who will execute the work?

-responsibilities and hierarchy structure:

The company's primary functions are to define and convert raw materials into the final product. To achieve these goals, the company must state each job's responsibilities and tasks in a predesigned hierarchy to ensure that decisions have been taken within the granted authority.

1. Board of directors: responsible for setting vision, strategy, goals, and overall planning for the company. They are also responsible for evaluating different levels of management.
2. Chief executive officer: responsible for overall activities, ensuring the achievement of the overall goals of the company.
3. General manager operations: responsible and liable for managing the requirements of raw materials, equipment, and other tools required for production.
4. Marketing manager: responsible for developing the marketing strategy based on market needs and analysis of other competitors' products.
5. Finance manager: produce financial reports, create long-term financial goals, responsible for cost control of expenses and procurement within the budget, and calculate the risks involved in the financial activities of the organisation
6. Human resource manager: responsible for recruiting, managing, and evaluating the performance of the employees.
7. production manager: creates the production policy and designs, monitoring the cost, quantity, and quality of the production.
8. Supervisor: responsible for motivating the workers and providing guidance for improving performance to achieve the production plan.
9. Workmen: assemble and produce the product.

-to ensure the safety of your stakeholders, a safety policy should be created and communicated to everyone entering your work premises.

Health, safety, and well-being guide:

Health and safety work environment should be given the same awareness as other business functions. It is everyone's obligation, and organisations are committed to designing and applying the policy and procedures that serve this purpose. Employees should not fear their life is at risk of injury or illness; the company must ensure a safe and secure environment to improve their job satisfaction, which is considered a key indicator of organisational excellence. Work-related injuries or illness and hazard identification should constantly be under risk assessment, risk control procedures, and improvement through a health and safety management system.

Line managers are primarily responsible for maintaining and implementing health and safety procedures in coordination with the human resources team by providing expertise to assist in formulating preventive strategies to avoid, reduce and control safety risk-related causes. These strategies should be developed into procedures to be communicated to all the employees, vendors, customers or whoever will be impacted to risk.

Risk awareness and preventive procedures can be communicated to the stakeholders by providing them with a written guide manual, notices, roleplay, and posters. However, providing them with the required training and supervision enables them to understand and comply with the policy and the procedures.

Some accident preventive measures are as below:

-doing things right: all employees should understand and be updated on the safe way of doing things, "safe working practices", and the consequences of failing to comply with safety procedures. Always focus on newcomer employees.

-creating safety consciousness: Employees should be aware of safety techniques such as:

- Posters and notices: visual reminders placed around the work facility.
- Films or videos: showing guidelines on how to do things safely.
- Use fear techniques: show your employee photographs of accidents and how the people suffered severe injuries.

-discussions and roleplay technique: have open conversations with your employee about improving the safety procedures. "Employees are your safety partners".

-implementation of procedures: preventive procedures to be applied for everyone in the organization without exceptions.

- Examining premises layout: Ensure exit doors and emergency passways are free of barriers.

-regular maintenance: fixtures and equipment should be adequately maintained to avoid any faults or accidents.

-set discipline actions: use clear and strict rules for those violating safety working practices.

-safety committees: employees responsible for reviewing the safety procedures measures and required improvement.

-machine safety rules:

- Worker must not operate the machine unless safeguards are in place and should wear the safety kits.
- Changing machine safeguards only can be done if the machine is tagged out.
- Only authorised parts can be used.
- Worker shouldn't leave the machine until it's completely stopped.
- Any loose items should be kept away from the machine.
- Lubricate machine parts whenever it's possible.

1.A Recommendations for more cost-efficient manufacturing processes:

Reducing manufacturing costs is the key to increasing profit and positively affecting the whole process. That's why most companies focus on finding new, better ways to get things done, streamline systems, and reduce costs by understanding the current operating expenses. Starting from labour costs, material and supply chain and other overheads. In short, "it's all about removing inefficiencies and unnecessary expenses from your operations while quality and delivery of the products should be maintained".

Below are some practical strategies that can be used to reduce manufacturing costs:

1. Perform a complete assessment: start with specifying and analysing your operating expenses (material costs, labour costs, insurance costs, maintenance, rent, etc.)
2. Design-to-cost: it's essential to consider the costs associated with designing at an earlier stage to avoid future expenses due to later design modifications. It can be regarded as a design for the complete product cycle by knowing all the expected costs associated with the production, such as direct product material, technology, non-recurring, acquisition, and maintenance costs.
3. Implement lean manufacturing: achieving more production with less effort and material wastage through increasing labour output, cutting production breakdown time, reducing inventory, and having minor errors and scrap.
4. Produce to order: to reduce over costs, it's advised to produce when you have an approved order on hand, by this way carrying costs can be eliminated.
5. Use standardised parts: this will help mass production by reducing the number of part types and leading to lowering costs of procurement, floor space, setup time, supply chain, as well as overhead expenses.
6. Reduce weight and size: during the design stage, make sure to consider the weight and the size of the products to reduce logistics costs.
7. Focus on profitable products: make more accessible operations activities and set free the available resources resulting in improved productivity and profits.
8. Reduce the cost of purchased material: effectively negotiating the price of required materials with the vendor can be done through well planning of mass production, coupled with getting the best prices by having a rate agreement with your vendor.
9. Choose a simple supply chain: establishing solid and close relationships with vendors and getting them involved in product design will ensure that you get recommendations for low-cost components to be used in production and the availability of required materials. By

other means, you are improving the manufacturing process.(*15 Ways To Reduce Costs In Manufacturing*, n.d.)

10. Consider the cost/benefit of the quality: make sure you have enough time to plan the product, simplify the design and consider the past products' quality problems to prevent errors, defects, and rework costs.
11. Use total cost management: identify and quantify significant cost drivers and other associated costs, focus on reducing them, and encourage total cost savings.
12. Seek continuous improvement: gratify your employees for their efforts and ideas to reduce costs, which will motivate them and keep them willing to find additional ways of cutting costs.
13. Use the appropriate manufacturing system: the critical tool to measure, manage and analyse the data of each process that leads to total cost reduction.
14. Use automated manufacturing process: using machines and robots for certain activities can reduce labour costs and associated errors. On the other hand, it is increasing quality and productivity.
15. Set a reducing energy consumption plan: reduce lighting during break hours and set air conditioners and heaters to a certain degree.
16. Sell your manufacturing scrap: most vendors are willing to buy manufacturing scrap for recycling purposes.(Longfellow, 2019)

1.B Plan to minimise defects throughout the manufacturing process:

Every manufacturing process has a provision for waste, scrap & defects. The role of operations managers is to set procedures that maximise profits and eliminate defects to save costs and time. Finding and fixing the defects at earlier stages will prevent the company from losing its brand reputation, especially if defective products have already reached the customers. Below are some recommendations that will help the company to minimise defects:

1. Product design: the first step in production is the design the customer would accept. Every industry has its type and needs of customer preferences. That's why it's advisable to involve production engineers and experts from the beginning stages to get the proper guidance on the product's best design.
2. Manufacturing flexibility: considering new technology, diversifying material sourcing, and adjusting the production process will improve your products and reduce defects—especially when using computer modelling that simulates real-life tests and detects production defects at each stage.
3. Inspection: production processes must be reviewed regularly to find the cause of defects and ensure that final products are ready to be delivered to the customers.
4. Preventative measures: machines and equipment are directly involved in the production process. So, ensuring they are working in good condition and regularly maintained influences the defect rate of products. That's why making a particular decision like replacing machines requires abnormal repair or maintenance is essential.
5. Quality control: quality management should regularly check the production process, confirming that it is executed based on each stage's instructions and guidelines, leading to better quality output.
6. Communication: developing the communication channel between design engineers and the production team to identify the defects and find the best solution is an essential cycle for reducing production defects. Teamwork brainstorming will lead to better production efficiency.
7. Training: human resources are an essential chain in the production process, so labourers must follow the workshop manual. Training sessions for the labourers will enhance and refine their skills and reduce product defects.

8. Use six sigma methods: a series set of techniques to increase production efficiency by identifying and eliminating defect causes.

1.C The use of 21st-century tools to create a greener process.

The green process, also called clean technology, is a solution that improves productivity, efficiency, and profitability while reducing the harmful effect on the environment. Governments would like the manufacturing sector to play a more substantial role in the country's economy through greener processes and innovation that ensures environmental resources sustainability.

Below are some green industrial revolutions:

1. Water treatment and purification: used water can be recycled to make it clean enough for drinking and planting.
2. Recycle and waste management: reducing landfill impact through recycling and waste-containing procedures.
3. Generate energy from waste: energy for electricity can be generated from burning landfills.
4. Green transportation: shifting to transportation ways that depend on electricity other than petrol or coal (hybrid and electric vehicles, trains, scooters, etc.).
5. Advanced thermostats: (programming can adjust the temperature automatically to save energy).
6. Solar panels: devices that collect sunlight and convert it into electric current
7. Low carbon construction: buildings with designs of enhanced renewable energy. Ex, high heating isolation will save energy consumption and reduce operating costs.
8. Advanced lighting system: the new technology of light pulps that works more efficiently than incandescent light pulps.
9. Vertical farming: a process of growing crops in vertical layers. Optimise plant growth by using new farming techniques such as aquaponics and aeroponics. It can be described as controlled environment agriculture.
10. composting: converting organic materials into nutrient fertilizer for the soil.

2. Social responsibility operational guidelines:

It can be defined as the strategies that focus on society's benefit other than maximizing profitability, such as voluntary actions taken by organizations over the minimum legal requirements for the interests of the workers, the community, and the environment. "The big green tractor" has taken the initiative to perform its operations with consideration of social responsibility (Slack & Brandon-Jones, 2019).

1. Social responsibility towards the environment:
    - Using the technology that focuses on reducing the energy consumed in production "using machines with better performance and less energy consumption".
    - Use recycled materials.
    - Host environmental initiatives.
    - Produce the best products that have long life working hours to reduce unnecessary waste of damaged products.
    - Work with suppliers that follow ethical and environmental measures.
    - Implement footprint for production processes starting from the design stage till shipping the final products to the warehouse to trace social and environmental impact.
2. Social responsibility towards the workers:
    - Ensuring the availability of all safety tools and equipment to make the workplace safe.
    - Conducting the necessary training for actions and evacuation plans in emergencies.
    - Provide health care and life insurance for each member of the organisations.
    - Implement flexible working hours
    - Paid time for voluntary activities.
3. Social responsibility towards the society."
    - Charitable donations (money, blood, and food banks).
    - Develop emotional intelligence to improve human relations skills.

Benefits for the favour of "the big green tractor" through social responsibility activities are as follows:

1. Brand recognition: customers nowadays are more aware of the company's impact on their community and act positively towards the companies that benefit their customers.

2. Investor relations: positively affect investors’ decisions about the company's worth and sustainability.
3. Employee engagement: employees generally will stick to companies which treat their staff fairly. Consequently, reduce hiring and new hiring training costs.
4. Risk mitigation: companies implementing social responsibility activities more than minimum legal requirements will mostly avoid lawsuits or legal proceedings.

2.A Industrial standards on disposal of chemical waste:

During the production process, some chemical waste should be disposed of according to the health and safety regulations for humans and the environment. The environmental protection agency has defined the rules for disposing of chemical waste. Every worker who uses chemicals should be aware of the hazards of the chemical waste and use precautions in dealing with it by using protective equipment “gloves, safety goggles, etc.”

Governments are stating strict regulations for chemical waste management to guide the companies in best practices for disposing of chemical waste and apply cost penalties for non-compliance. Chemical waste is mainly generated from the laboratory, lubricants, and many other materials. It’s everyone’s responsibility to understand the importance of the safe disposal of chemical waste.(x, 2019)

Waste management responsibilities:

1. Identify the chemical waste generated from the production activities and the correct ways to dispose of it appropriately.
2. Train the concerned employees on how to deal with chemicals and waste disposal procedures.
3. Maintain disposal records as per governmental regulations.

-the chemical that will not be used anymore can be:

1. Expired materials: considered as waste if the expiration date is passed and the chemical can’t be used.
2. Extraneous materials: excess chemicals left over after product completion will no longer be used.

- chemical waste disposal guide:

1. use the appropriate containers for storing chemical waste.

2. Waste containers must be labelled with the chemical name, date of the waste and container numbers.

3. send full details of waste containers to the environmental health and safety department.

2.B Green alternatives to the traditional manufacturing process:

Green manufacturing means implementing practices that eliminate environmental pollution, such as reducing production waste, improving product design, and reducing energy use.(Wright, 2016)

Some green alternatives are described below:

1. Green manufacturing is used when manufacturing processes depend on using less raw material and less energy used and controlling the waste by enhancing the efficiency of the production.
2. Green daily work activities: using new technologies like email or other communication applications and reducing paper printing.
3. Green purchase: choosing the material less harmful to the environment.
4. Green design: developing the plans at the first stages to ensure eliminating future modifications considering the type and volume of the raw material will be used that o complete the design and the final product.
5. Green energy sources: depending on solar empowered, electricity generated from wind turbines instead of oil and gas will positively impact the environment by reducing emissions.
6. Use the new technology: using new machine generations which has efficient engines and require less energy to operate.

Below are other examples of green manufacturing:

Serial.no	Area	Objectives of green technologies
1	Agriculture	avoiding agricultural processes that lead to environmental ruin.
2	Food processing	Ensure to eliminate toxic manure that poisons the food and reduce carbon emission if food packing processes.
3	Potable water	Water desalination through filtering sea and other dam water.
4	Sustainable energy	Such as wind and solar energy creates zero carbon emissions that can harm the atmosphere and contribute to global warming.
5	Consumer products	Using paper cups, plates, and bags instead of plastics takes longer to degrade.
6	Automobiles industry	Produce efficient engines that save energy with lesser emissions—electric and hybrid cars.
7	Construction	Eco-friendly construction involves using materials and processes that are resource-efficient and environmentally responsible throughout the life cycle of a building.

8	Industrial automation	Using green energy, which can be generated from recyclable waste and depending on robot programs, leads to efficient use of resources.
9	Computer and information communication	Utilize and recycle computer components.

(Boye & Arcand, 2012)

Conclusion:

“The big green tractor” has used operations management analysis to determine the areas which need improvement and identify the operational guide to streamline its operations through cost-efficient manufacturing processes and reducing the production defects to improve the growth rate with the consideration of implementing green alternatives to the manufacturing process to ensure sustainability and social responsibility towards workers, society, and the environment.

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