COVER PAGE AND DECLARATION

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Introduction

Operations management has to do with how businesses come up with and offer different goods and services. Agricultural equipment makes farming more productive and less boring. In any case, the equipment used to make things should be efficient for the makers and useful for the customers. Because of this, a lot of the systems engineering that is thought to help our food production systems is focused on making home machines more productive and efficient.

This matrix shows a plan for product development that takes into account the effects of creative work, production, distribution, operation, and financing. It connects coming up with ideas for product design with progress meetings. This matrix also has these points of view: this is such a matrix. Sharp ideas about how the process works have a big effect on how quickly a manufacturer can make new things. Products that meet customer needs are what come out of the process.

As a result, good subsystems (like engine and carrying parts) and the firms' production capabilities for product families like tractor series can be used for other things. Close relationships with suppliers have allowed express items to be added that don't see a producer from a competitor (for example, hydraulic products). These systems show that agricultural machinery has changed over time to become very well organized. When project developers use these technologies, they can see that the design, production, and availability of goods are all on schedule.

Early use of tools cuts costs, speeds up the process, and reduces bets on future improvements in electrical content. At this meeting, people will talk about express manufacturing techniques and how to use framework engineering techniques to lower the costs of making tractors and other project management equipment. It is the best example of modern agricultural growth because of how it is made and how it is made.

Company Overview

The Big Green Company is an Indonesian production company that works in the Palembang area. It is a place for making things. Based on the organization's recent slowing progress, which can be seen in its low and average levels of productivity, In order to make the market more competitive, the company needs to change how it runs.

1. Operational Industrial Streamline Procedural Guide

a. The Recommendations

Recommendations for Cost-Efficient Manufacturing Processes

To save money, many manufacturers quickly look for structures that cost less. This could mean anything from giving employees time off to removing emerging drives. These mechanisms can slow down the creative mind when needed. This keeps the creative mind under control and lets enemies move forward. Plan for making something Each company needs a solid manufacturing plan to increase output. Effective planning, on the other hand, is a dynamic process that involves a wide range of tasks, such as putting people, resources, and tools where and when they are needed. Production planning is like a map in that it shows people where to go and how far they need to go to get there. Managers and authorities need to know exactly what the boss wants and how he or she wants it done in order to make good plans. These kinds of models are shown by the following:

Standardised Steps and Time:

The best way to evaluate your production phases is to sketch out the steps that need to be done and then add a standard amount of time for each step. Know that you don't have to finish all the steps at once and that some can happen in the middle. After making a process map, it's easy to figure out how long the whole process is likely to take. When work is copied or done quickly, everyone should put in the same amount of work and time.

Document and use practically questionable practices as a framework to show expected routes and times of likely use. By doing this, the process of getting ready will go much faster. When making the process map, waste was seen. Ideas from lean manufacturing and operational efficiency can be used to cut down on waste, streamline processes, and cut costs and development time (Kaur et al., 2020). Standardization makes it possible for things to work together, get smaller, and use and reuse materials in the best way possible. Industry is putting in a lot of work to make mechanical systems more standardized.

Also, technologies for electronic networking are starting to change. Standardizing the devices and controls, like networks and transportation, helps the agricultural industry move forward in the same way

that standardizing hitches, tires, belts, and power discharges does. Still, this industry needs the fast exchange and impact of electronic capabilities more than anything else. There are fewer and fewer qualified people in the company.

Design Issues for Manufacturing:

By making certain design choices, the costs of making agricultural equipment can be cut. In this situation, the cost of production will go down because of great engineering and management. Costs of making things can be affected by a number of things. It has been shown that standardization and reusing parts are important in a certain way. Long-term costs are still a problem for the company.

Modularity is one way to deal with the rising costs (Permana et al., 2022). Modularity cuts costs by letting you mix and match different parts to meet a product's outline. Some changes in electronic equipment and the creation of workstations for mechatronic systems could have an effect on the costs of execution and manufacturing. If not planned for, other things, like problems with management, could have a big effect on production costs.By automating tasks, you can work smarter:

By automating or combining manual tasks, manufacturers might be able to improve product quality, empower the end result even more, and save money. Since the 1960s, when they were first used on factory floors, robots and automation have come a long way. The robots of today are smarter, more flexible, and faster, and they are always getting better at understanding and copying information.

With working robots that work together (called "cobots"), jobs can be done by machines that can do common, dangerous, and ergonomically correct tasks safely. This solves the problem of time and makes it possible for the workforce to grow. Few things and medium-sized companies that weren't ready for the cost of robotics and automation are getting better returns on their investments as the cost of automation goes down and it gets easier to use.

Just in Time Approach:

In order to increase production and cut down on waste, the Corporation must take a timely approach to its manufacturing process. This is usually done by buying stock based on what is going on in the production process. Last but not least, this would lead to lower stock costs, which is important. The JIT method gets rid of waste from overproduction, stores extra inventory, and waits for materials. This will allow manufacturers to lower their overall overhead costs and, as a result, ask for parts to make their products.

Embrace Lean Manufacturing:

Lean Manufacturing gets rid of or cuts back on jobs that don't matter, from the front desk to development. So, manufacturing costs go down and the process moves faster. This lets the creators figure out what their most obvious goal is. Lean development should be important for a company's culture of collaboration and

teamwork, but Lean's addition of "reliable improvement" really helps a company reach its goal. By using a few of the real suggestions for saving money, manufacturers will be able to get more done. Before you start cutting costs, you should know one thing: even though it's great to save money and cut costs, you can't let the quality of your business or product suffer. The needs of end users should be reliable.

Minimise Defects throughout the Manufacturing Process

Each manufacturing company has its own rules that it must follow in order to make its own products. Things are made from raw materials, parts, and machines. They are already around. There is also a range of quality among different products. Among things that work fine, there may sometimes be a lot of broken ones for different reasons. If too many broken items are sold to customers, the business's legitimacy and reputation could be hurt.

In exchange, possible sales could go down (Lim et al., 2021). So, it is in the best interest of the manufacturer to make as few mistakes as possible. There are many ways to cut down on mistakes. These strategies can be put into two groups: early-stage and late-stage. Before the development process even starts, early phase strategies focus on getting rid of flaws. When scientific methods are used to reduce manufacturing mistakes during the development process, usually later stage procedures are needed.

Defect Reduction Early Stage Strategies

Product Design:

Bad product design can sometimes lead to flaws in the product. Manufacturing engineers should be involved as soon as possible and as closely as possible, since they may be able to spot trouble spots before they happen. The development team will learn a lot from this manufacturing experience. These engineers' background may also help the business save a lot of time and money. One way to plan for manufacturing flaws is to use a team of engineers from different fields during the product development process.

Flexibility in Production:

One way to cut down on mistakes could be to give the production process more freedom. With a strategy for growth based on steps, the business may be encouraging and energizing (Paul et al., 2014). For example, to sort the results into those that came from outside and those that came from within. A big chunk of the time needed to make sure products are the same and have fewer flaws is taken up by a second process.

Use of Technology (Smart Manufacturing):

Large companies that make plants use computer modeling, simulations, and other IT services to find and fix problems with their products as early as possible in the development process. This kind of technology can help find problems early on by testing assured scenarios that are still being made.

b. A Through Plan to Minimise Defects throughout the Manufacturing Process

Inspection:

Enterprises should continually reject production processes in order to determine the root cause of defects. Today, it is quick and simple to acquire technologies like ultrasonic, particle, vibration, and resistor observation that can be used to eliminate defects in the manufacturing process.

Take Preventive Action:

This could be a wise decision to replace outdated gear and equipment that is constantly in need of maintenance. It is also a good obstruction technique to ensure that all machinery is in good working order.

Maintain Stringent Quality Control:

Creative product design is rendered useless if the manufacturing line is not periodically checked. It is possible to develop a quality management team to ensure that each stage of manufacturing adheres to tight rules. Six Sigma may be utilized by a quality management team to eliminate product defects and increase product quality.

Flow of Communication:

Effective communication is crucial to the success of any business. It is vital and expedites the discovery and resolution of an issue when manufacturing personnel contacts often with other design professionals and engineers. With this teamwork, it will improve tremendously and become more successful.

Six Sigma Approach:

In 1986, Motorola created the Six Sigma rule as a set of tools and techniques to improve their production processes (Lippold, 2019). This statement was coined by Jack Welch in 1995 and serves as the foundation of General Electric's corporate strategy, which is currently being copied by a number of industries. Six Sigma identifies and eliminates defect-causing elements and limits the flexibility of the market and production processes to change in order to improve production execution efficiency.

In accordance with this strategy, a company has identified a mechanism for processing the project's target value in a predetermined number of ways. Using Six Sigma in manufacturing may assist a corporation in

reducing emissions, shortening one or more process time cycles, and lowering production costs to increase customer productivity and satisfaction.

Total Quality Management (TQM):

By implementing TQM, inefficiencies in production are eliminated, supply chain management is optimized, customer service is improved, and staff members receive ongoing education and development. The ultimate goal of total quality control is to ensure that the standard of the final product or service is representative of all stakeholders. William Deming, a management specialist, developed TQM and had a profound effect on Japan's economic development. With regards to the Six Sigma approach, TQM and Six Sigma are fundamentally the same, however they are not identical. Instead of focusing on external factors, like Six Sigma does, TQM looks inward to make sure that internal guidelines and standards for procedures minimize the likelihood of errors occurring.

Kaizen Approach:

Thanks to technology, the producer can always get to a bigger level. It is a type of movement strategy that gives creative ideas for processes that are already going on. The main goal of the strategy is to make sure that procedures and programs are always the same, get rid of waste, and improve the efficiency of industrial processes as a result. This method has six steps: finding places to improve, evaluating current methods, coming up with new ideas, making plans for putting those ideas into action, putting a plan into action, and testing new methods. Kaizen is a good way to get rid of flaws because it increases competitiveness, product development, high consumer expectations, and supply chain productivity.

c. The Use of 21st Century Tools to Make a Greener Process

Lean technologies could change the average amount of waste in many ways. The EPA's lean tool-based research in businesses from many different industries has given us a deep understanding of 5S, TPM, cellular manufacturing, JIT, Kanban, Jidoka, and their standard effects and waste-reduction benefits. This section is a list of the lean tools that can be used to make a process greener.

Jidoka (Automation)

A jidoka is another Japanese-made tool for lean manufacturing. Sharp automation, or "automation with a human touch," is a method of maintaining quality control in a partially automated setting. Jidoka is the design of machinery that partially automates the production process so that machines can detect flaws and stop the line to fix them as they occur.

This Lean tool is intended to prevent overproduction and the delivery of faulty items. It reduces labor costs by eliminating the need for direct human management of each production line station.

Workers can follow many stations and focus on critical thinking rather than just quality control with the help of a partially automated system.

Gemba

Gemba is a Japanese term that means "the certifiable area," or the shop floor of a manufacturing facility where work is done. It refers to the Lean location. Going to the Gemba is a way for leaders to demonstrate their presence at the blending of what is decided on a choice for them to leave their offices and spend time on the plants to comprehend the reality of their working environment significantly and precisely (Karuppiah et al., 2020).

A startling number of decisions about esteem sources are made without the input of those most knowledgeable about how to improve systems and overcome obstacles. In the event that problems arise, it is critical to investigate the situation and make sound decisions that accurately represent the presence of the problem. The Gemba, one of the three key Lean tools, may assist leaders in approaching their positions with more obvious modesty, which can help them improve their analytical skills.

SMED (Single Minute Exchange of Die)

The Single Minute Exchange of Die, or SMED, is a valuable tool for reducing the time required for modifications or setups. According to a widely held belief, you must ensure that you can change your procedures in less than 10 minutes. SMED ensures that once-daily tasks are completed in minutes, allowing you to use your equipment while also reducing cluster sizes for continuous flow.

2. Socially Responsible Operational Guide

a. Industrial Standards on Disposal of Chemical Waste

The National Insurance Organization's Resource Conservation and Recovery Act (RCRA) applies to chemical waste (EPA). It cannot usually be disposed of in the waste system. The EHS Hazardous Waste Program would be used to dispose of the heavy chemical wastes. Residents of the producing lab will be responsible for managing any chemical waste before they are kicked out of the massive green tractor firm, and RMS will be in charge once they are kicked out. With the help of a collaborative team effort, UA can achieve and maintain the highest level of environmental similarity.

The disposal of chemical waste is divided into four stages:

Stage 1: Preparation of containers

Trash management requires the proper compartment selection. A misdirected compartment cannot contaminate the environment or the massive green tractor company. As a holder, 3.5 litres of HDPE plastic are placed (Leong et al., 2019). For a long time, the large green tractor manufacturer has been told

to provide buckets. The large green tractor company then has garbage packages delivered to them, and RMS removes all company containers.

Stage 2: Waste Identification Tag

The proper waste identification is as important as the proper compartment. Once the trash compartment's quality is established, everyone benefits. The contents of a holder must be documented according to federal and state regulations as soon as the first waste drop is placed in the compartment. The tag's purpose is to track any waste products found with the large, green tractor. Tape the tag to the holder handle until the compartment is ready for use.

Stage 3: Waste Accumulation

The complete name of the chemical should be visible on the tag as trash is placed in the container. It is necessary to separate liquids from solids. Trashcan solids obstruct the consolidation process and can damage waste disposal facilities' syphoning systems. Regardless, while waste is being added, containers must be kept sealed.

b. Green Alternatives to Traditional Manufacturing Process

Green production entails reducing negative environmental impacts and properly disposing of trash. This can be accomplished at any time by simply implementing practices that have an impact on product strategy, working standards, and process design. For an environmentally friendly and green manufacturing process, every company should prioritize initiatives such as discharge reduction, energy consumption reduction, waste age reduction, and water reduction. Some new, environmentally friendly production adjustments are listed below.

Green Alternatives

One definition of green manufacturing is "a system that integrates product and process design issues with production planning and control issues in order to characterize, measure, dissect, and oversee normal waste flows in order to reduce traditional impact and finally to improve resource efficiency" (Seow & Hamid, 2017). During this time, the Commission ensured that green manufacturing procedures used low-cost, everyday raw materials and collaborated with manufacturing procedures to increase efficiency, reduce waste, and depreciation.

Green manufacturing is also defined as methods of production that reduce waste and resource degradation, as well as traditional wrongdoing in any aspect of the manufacturing process. Despite numerous interpretations defined by scholars, there is still a logical classification of green manufacturing in the era of rapid mechanical progress and understanding of green philosophy.

EPP or Green Purchasing

Green purchasing, also known as environmentally preferred purchasing (EPP), is the practice of selecting products with a stronger or larger positive impact on human prosperity and the environment than competing products that provide the same function. The EPP must consider the purchase, assembly, manufacture, packaging, sale, reuse, servicing, and disposal of raw materials during the procurement process. This involves purchasing items that are energy- or resource-efficient, recyclable, or created from recycled materials. EPP is utilized with respect when displaying an environmentally friendly or sustainable practice.

Design for Sustainable Product Design

Green product design may involve the selection of materials, utilization of resources, production, and disposal requirements (reuse, reuse, or disposal). Aside from being a stand-alone strategy, it has a beginning and an end, but it must be integrated into an organization's continuous approaches to product design to change conventional models to traditional product attributes such as efficiency, competitiveness, and usefulness. Green products may be improved, disassembled, recycled, and used with greater ease than their conventional counterparts, as they consume fewer resources and breakdown into independent, interchangeable bits.

Green Product Design

Green product design, also known as would-be typical design (DFE) or eco-feasibility design, is a strategic business technique that focuses on typical problems at an early stage of product production in order to reduce negative typical effects throughout the product's life cycle.

Conclusion

Based on the above organizational guide of rules and the poison strategy, sustainability is the most significant rule in a company's development process. We need to settle on specialized designs and process standardization as the bedrock concepts of leaner, more efficient manufacturing. The assumption is also made that process evolution facilitates the transfer of designs between product lines.

The use of the just-in-time technique can help the organization save money by minimizing the need to keep expensive items in inventory. Having products that are appealing or relevant is sufficient. In addition, the Big Green Tractor Corporation will automate as much of the manufacturing process as possible, greatly increasing the role of machines over humans. Even more so, it was thought that methods like kaizen and six sigma might be used to cut down on manufacturing process flaws.

Gemba, Jidoka, SMED, TPM, JIT, and the 5S Method are just few of the 21st-century tools used to run operations in an eco-friendly manner, as seen in the plan of action. The implication is that different chemical wastes from different stages of production are held to different industrial standards. Last but not least, it is widely believed that the use of fast computerized processing, laser-assisted production, ecologically friendly product acquisition, sustainable energy, and biofuels represents an upgrade over traditional production methods.

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