

COVER PAGE AND DECLARATION

	Master of Business Administration (M.B.A.)
Specialisation:	Strategy
Affiliated Center:	CEO Business School- Egypt
Module Code & Module Title:	MGT550: Managing Operations
Student's Full Name:	Mamdouh Youssef Khaled
Student ID:	EIU2020577
Word Count:	3647
Date of Submission:	15-12-2021

I confirm that this assignment is my own work, is not copied from any other person's work (published/unpublished), and has not been previously submitted for assessment elsewhere.

E-SIGNATURE:	Mamdouh Khaled
DATE:	15-12-2021

EIU Paris City Campus
Address: 59 Rue Lamarck, 75018 Paris, France | Tel: +33 144 857 317 | Mobile/WhatsApp: +33607591197 | Email: paris@eiu.ac

EIU Corporate Strategy & Operations Headquarter Address: 12th Fl. Amarin Tower, 496-502 Ploenchit Rd., Bangkok 10330, Thailand | Tel: +66(2)256923 & +66(2)2569908 | Mobile/WhatsApp: +33607591197 | Email: info@ciu.ac

Table of Contents

INTRODUCTION
1-COMPANY STRUCTURE AND RESPONSIBILITIES4
2-Vision and goals
3-Planning
3.1- Staffing and talents planning
3.2- Production planning and Industrial design6
3.3- supply chain and logistics planning8
4- Performance evaluation
4.1- Define KPIs for each department9
4.2- Monitoring and analysing10
4.3- Performance auditing12
5- Corrective actions and improvements
5.1- Corrective action steps13
5.2- Examples of Corrective Action Plan format14
6- Industrial standards on disposal of chemical waste
6.1- Staff training16
6.2- Packaging16
6.3- labelling17
6.4- Storage17
6.5- Liquid waste17
6.6- Solid waste18
7- The green alternatives to traditional manufacturing process
7.1- Using circular manufacturing to save energy and reduce waste
7.2- Implement safety measures by utilizing automation tools and artificial intelligence20
7.3- Digitize internal communication20
7.4- Choose Eco-friendly partners20
8- Conclusions
9- References

Introduction

Tractors industry has gone through a lot of developments, since the first model in 1868, that was steam powered, then the diesel tractor in the 1930s, until we reached the electric tractor that made in turkey in 2019.

The use of tractors is important part of farm mechanization, and it helped a lot in increasing productivity and reducing labour dependence.

And day by day, this industry is developing due to farmers tend to use the modern technologies in agriculture.

The global tractors market was estimated at 64.80 billion in 2020, and it is expected to reach 97.90 billion in 2030.

India is the world's biggest tractor market with over 899k units sold in FY 2020-2021.

The tractors industry is facing today a lot of challenges, which led to reduce demand on tractors around the world, like:

- 1- Covid 19 pandemic that led to reducing row material transfer among the countries and increase shipping fees.
- 2- Low prices of agricultural products making people reluctant to agriculture.
- 3- Increase diesel price that increases farm operation cost.

The Big Green Tractor have been impacted by these challenges as other companies and it sees decline in the growth, so we are putting this guide to get the company back to right track and make operations more efficient.

1- Company Structure and responsibilities:

Establish an organizational structure showing the company' departments, relation between them and the responsibilities for each is the main building block for success any organization.



Structure source: made by me

2- Vision and goals:

Based on the current situation of the company, we can summarize the company's vision and goals as follows:

2.1- Reduced errors, delays, missed deadlines, and double work.

2.2- Efficient use of company resources to reduce cost, improve production quality and increase domestic and external sales.

2.3- Switching to modern manufacturing by using the latest techniques in tractor industry.

2.4- Gain a bigger share of world tractor sales.

2.5- Switching to Eco friendly company by reaching to zero industrial waste, reducing the

pollution resulting from manufacturing processes and using the green alternatives for manufacturing.

2.6- Workflow hierarchy and ownership of tasks.

3- Planning

3.1- Staffing and talents planning:

Human resources department should be responsible for the following:

3.1.1- Attracting experienced and competent staff based on specific criteria such as:

- Experience years in the field.
- Academic knowledge in the field.
- Ability to thinking, innovating and solving the problems.
- Ability to cope and use the new techniques.

3.1.2- Establishing and share a whole and clear guide for the staff that includes their rights, responsibilities and the company's policies, in addition to labour laws applied by government.

3.1.3- Periodic evaluation of the employees to determine the strengths and weakness and their achievement during the period.

3.1.4- Conducting workshops and training programs for employees to enhance their capabilities and eliminate weakness.

3.1.5- Internal and external delegation for the departments heads and production engineers to keep abreast of developments in this industry.

3.1.6- Establishing a clear and fair system for the incentives and bonus to encourage the employees to do their best.

3.1.7- Establishing a clear and fair system for violations and penalties.

3.1.8- Set internal labour regulations that regulate the relationship between the departments and between employees and settle disputes between them.

3.1.9- Define a clear job description for each employee includes the duties, responsibilities, required skills and the tools used in the job.

3.1.10- using the modern ways to complete the daily work, archiving the documents and being the hiring interviews such as: using computers, Email, virtual meeting via internet applications, save documents on the cloud or local server.

3.2- Production planning and Industrial design:

3.2.1- Production forecast: based on market analysis, supply and demand and customer preferences

3.2.2- Determine production capacity and timelines: to know if the factory is able to meet the demand or its capability is over demand, or it is unable to meet demand.

3.2.3- Evaluate raw materials: it's the main building block for production where if the raw materials are available or not will impact on the production plan.

3.2.4- Set production KPIs:

- Production cost: it refers to efficiency of spending on the production, and includes cost of raw materials, overhead cost and energy.
- Production Capacity utilization rate: it refers to actual production versus full production capacity, production resources should be totally used to avoid any waste or money losses.
- Employee utilization (productivity): it refers to rate of worker useful time (spent on real work) versus total work hours or required mission.
- Takt time: it refers to spent time to produce the final product.

3.2.5- Designing and innovation:

- The latest technologies should be considered when designing the tractor such as: digital design software, 2D and 3D design.
- Using 3D printing to produce some parts to reduce waste and cost as possible.
- in parallel with traditional tractor launching a new line to produce electric tractor.

3.2.6- When planning production, the eight types of waste that may occur should be considered and avoided.

SN	waste type	waste description	Causes of Waste	Suggested Solution
1 2	Over - product ion Waiting	 it refers to excessive and unnecessary products that were produced the time it took for product to transfer from phase to next phase 	 Failing to determine the demand. Forecasting error Inflexibility of work. Overlapping of production phases. 	Study the market to determine the right demand Adjust production line for smooth movement.
3	Transp ortation	it refers to cost and time spent to transport the product from place to another.	-Poor planning. -Logistics issue.	Set a transportation schedule that includes a specific time for arrival, loading, unloading and departure.
4	Over- process ing	Refers to unnecessary and useless work that results in increased cost.	 Individual decisions. Unclear instructions. overlapping authorities. 	 Back to the decision maker or instructions list. Set a clear authority matrix. Segregate the powers
5	Invento ry	Refers to unnecessary inventory of final products and raw material.	Producing without plan or forecasting (push approach)	Market research to set correct expectations.
6	Motion	Refers to excessive motion of employees and equipment on a factory floor	Poor work regulation in the site.	Monitor the movement of workers and equipment to reduce unhelpful movements.
7	Defects	Refers to defects in the final product.	 defect in the equipment. Human mistakes.	 Periodic maintenance for machines and equipment. Employing of qualified and skilled workers

8	underut ilized skills	Refers to the employee's untapped knowledge and mental ability.	Putting employees in places that are not commensurate with their abilities and skills	Choose the right place for the right employee consistent with his capability.
---	-----------------------------	---	---	--

3.3- supply chain and logistics planning:

it's a basic and important part of the general operations plan, it impacts on the cost and quality of product, and we can divide supply chain operations into five elements.

3.3.1- plan: Start with comparing supply to demand, analysis inventory of required materials for production to avoid unnecessary and excessive stock, which might become a waste.

As well as avoid shortage of materials which leads to delay delivering the final products to customer.

Adoption a constant supply system for perishable materials such as tires, oil and electric parts.

3.3.2- Source: refers to supplier or vendor that provide company with production requirement such as raw materials, machines, tools and equipment.

when agreeing with supplier the following should be considered:

- Delivery time to avoid any obstruction to production.
- The quality of the materials must match the agreed standards.
- Supply the agreed quantity, no more, no less.
- Agreeing with lowest cost supplier, with the same required quality.
- At emergency (like COVID 19 pandemic), must be agreed with a local supplier to ensure of continuing supply in case of the external supplier is stopped.

3.3.3-Make: refers to operations that transform raw materials to finished product, here a few things must be considered:

- Flows of material and information.
- Production is made according to order.
- Consumer preferences.

3.3.4- Deliver: refers to logistics including materials transportation between warehouses and factory and final product transportation to customer. it's necessary to regulate the internal and external transportation and delivery process at time to avoid any extra cost or any delay.

3.3.5- Return: refers to returned products by customer for any reason, it's advantage and important service to build trust and ensure continuing of relationship with customer, as well as address defects.

From other side to manage the process of defective and surplus material return with supplier.

4- Performance evaluation

To ensure of achievement the company vision and objectives based on the plan.

4.1- Define KPIs for each department: To measure the performance of employees and the extent to which they are far from or close to goals.

4.1.1- Sales KPIs:

- New Qualified Opportunities
- Average Sales Cycle Time
- Sales Volume by Location
- Sales Target VS achievement
- Transfer Opportunity to Order
- 4.1.2- Managers KPIs
 - Working Capital
 - Gross Margin
 - Revenue per Customer
 - Debt to Equity Ratio
 - Customer Acquisition Cost

4.1.3- Marketing KPIs

- New Customers
- Conversion Rates
- Social Media Engagement
- Marketing Qualified Leads
- Lifetime Value of a Customer

4.1.4- Operations KPIs

- Labour Utilization
- Operating Margins
- Project Schedule Variance
- Punctual delivery rate.

- Processes and Procedures Developed
- 4.1.5- Customer Service KPIs
 - Number of Issues
 - Average Response Time
 - Customer Satisfaction Score
 - Positive Customer Reviews
 - Support Costs / Revenue Ratio

4.1.6- Human Resources KPIs

- Quality of hire
- Total benefits as percentage of labour costs
- Absenteeism rate
- Internal mobility
- Employee satisfaction rate.

4.2- Monitoring and analysing: It is one of the most important performance appraisal tools, it aims to record and document all activities, processes, and results for use in decision-making and correct the mistakes.

4.2.1- Monitoring tools:

- Charts and histogram: that show the frequencies for a specific event for example sales of electric tractor against regular tractor during 2021.



- Dashboards: it is an effective tool that enables managers at all levels in the company of monitoring the performance at all times.



Image source: https://www.idashboards.com/dashboard-examples/

Performance reports: it is an important tool to collect and analyse the data of company' departments. it might be daily, weekly, monthly and yearly for one or more geographic area and for one activity or more. Sales per customer Jan 21-June 21

	Jan	Feb	Mar	Apr	May	Jun	total
Cust 1	\$100,000	\$150,000	\$125,000	\$250,000	\$300,000	\$250,000	\$1,175,000
Cust2	\$80,000	\$100,000	\$125,000	\$100,000	\$200,000	\$150,000	\$755,000
Cust 3	\$50,000	\$75,000	\$85,000	\$100,000	\$150,000	\$200,000	\$660,000
Cust 4	\$40,000	\$45,000	\$40,000	\$55,000	\$60,000	\$125,000	\$365,000
Cust5	\$30,000	\$40,000	\$50,000	\$55,000	\$70,000	\$80,000	\$325,000
Cust 6	\$20,000	\$30,000	\$40,000	\$50,000	\$60,000	\$55,000	\$255,000
Total	\$320,000	\$440,000	\$465,000	\$610,000	\$840,000	\$860,000	\$3,535,000

Table source: made by me

4.3- Performance auditing: after collecting and analysing the data of all activities in the company we can now start reviewing the performance to evaluate the results, there are many findings that can be drawn in this regard:

- Compliance with company policies from employees.
- Compatibility with planned scope for each department.
- Meet the company vision and goals.
- Meet the sales target.
- Achievement versus target.
- Customer satisfaction rate.
- Profit achievement.
- Inputs and outputs.
- Lost opportunities.
- Threats and risks.
- Strengths and weakness.
- Productivity.

There are many templates that can be used to audit measurable and non-measurable results such as:

- achievement percentage:

	Target Per		
Department	Piece	Actual	Percentage
Sales	100	70	70%

- Check box:

Task	Done	Fail
Task 1	4	
Task 2	7	
Task 3		7

- Score model.
- Evaluation by text.

Tables source: made by me

5- Corrective actions and improvements

After reviewing the performance and analysing the results, the company needs to take corrective action against the unsatisfactory results or the errors.

5.1-Corrective action steps:

5.1.1-Define the problem: first, problem should be real, not expected and then it should describe the problem, place, time, causes and all details related.

5.1.2-Define the scope: it is necessary to understand the size of problem, frequency of problem, is it confined to a particular customer or particular area or particular part of product and is it occur at a specific time of year.

5.1.3-Containment Actions: it is an initial and temporary action to contain the problem while searching for its roots.

5.1.4- Identify the Root Cause: it is possible to be complex issue, needs long time, a lot of analysis and may be need external help from expert people.

5.1.5- Plan a Corrective Action: it shall include realistic solutions, measurable, achievable with clear deadlines and should consider removing the root cause, it may need to change a part of plan.

5.1.6- Implement the Corrective Action: after the completion of setting corrective plan, we can implement it on the ground, it may be replacing a machine, change supplier, replace a worker etc.

5.1.7- Following up the implementation: we have to monitor the process for some time to ensure that corrective action is working properly, and it is necessary to record and document the issue with all procedures and steps to be as reference for future.

5.2- Examples of Corrective Action Plan format: There are many formats for doing corrective action plan such as:

5.2.1- 5 why: it is Japanese technique; the rationale of this technique is asking for five times about the problem cause to reach the root.

5 WHYs ROOT	CAUSE ANALYSIS TEMPLATE	
DEFINE THE PROBLEM	Define problem here	
WHY IS THIS A PROBLEM?	PRIMARY CAUSE Why is it happening? 1 It is happening because 2 It is happening because 3 It is happening because 4 Why is that? 4 Why is that? 4 Why is that? 5 It is happening because Why is that? 5 It is happening because	ROOT CAUSE
	CORRECTIVE ACTION	PARTY RESPONSIBLE
CORRECTIV E ACTION TO TAKE	Describe action here	DATE ACTION TO BEGIN DATE TO COMPLETE
Image	Source: https://www.smartsheet.com/operational-audit-process	

5.2.2- Fishbone diagram: it mentions all possible causes for the problem as categories and branches to reach the root of problem.



Image Source: https://www.shutterstock.com/g/mindroom14

5.2.3- Root cause analysis report:

SIMPL	E ROO	Г CAUS	E ANAI	LYSIS R	EPOR	Г							
ISSUE DETAILS ISSUE TO REPORT			POSSIBLE ROOT CAUSE				SUGGESTED SOLUTIONS						
DATE ISSUE		DESCRIBE	EXPLAIN			CRITICAL			DESCRIPT	LIST ANY RISKS		DESCRIBE MEASUREMENT OF SUCCESS	
REPORTED	NAME	ISSUE	SOURCE	Rate how critical: Low, Medium, or Weah	Justification	CAUSE	Rate probability: Low, Medium,	List testing for clarification	SOLUTION	Rate likelihood of risks: Low, Medium, or Uiah	Modification	Describe testing	Describe results
Image Source: https://www.integrify.com/corrective-action-process/													

6- Industrial standards on disposal of chemical waste:

it is normal for any manufacturing process to result in a waste, either dry solid wastes, liquid or gaseous, so it will be necessary to have a waste management system as a part of the operations system for the organization to help in deposing of the waste safely.

chemical waste is the biggest concern for the organization because of the high risk on the human health and environment.

therefore, many international organizations have set standards for the safe management and disposal of chemical waste.

What is the chemical waste?

It is the waste originating from industrial process in large factories, hospitals and laboratories.

The Chemical waste comes in different forms: solid, liquid, gaseous and radioactive.

It's classified as dangerous if it's flammable, corrosivity, reactivity, and toxicity.

Management, storage, treatment, and disposal of chemical waste

6.1- Staff training: It is one of the most important components of the waste management system.

6.1.1- Employees should be trained to know the nature and risks of chemicals, how handle to save their self and the workplace.

6.1.2- How to proceed in case of an accident such as a fire, explosion, or leaks.

6.2-Packaging:

6.2.1- Provide special containers for each type of waste that commensurate with nature of material.

Example:

- steel container for the solid waste.
- steel barrel for the oil
- cement tanks or glass bottles for the contaminated water or acidic liquids.



6.2.2- The reactive materials should not be placed in one container to avoid fire, explosions, and generation of harmful gases.

6.2.3- The containers or barrels should not be filled to preserve a space for the generated vapour.6.2.4- Chemical solid waste should not be packaged in biohazard bags, because this incorrectly indicates a hazard that is not present.

6.3- labelling:

6.3.1- the containers or waste bags should be labelled to clearly identify their hazards.

6.3.2- Mention details of waste contents, as well waste source information: which department, room, and which product.

6.4 – Storage:

6.4.1- The containers of waste should be kept on good terms away from fire sources, sun and run- off.

6.4.2- Chemical waste must be stored in the building's central waste storage facility

6.4.3- The chemical waste containers should be away from spoilers, children, and incompetent people to handle with the chemical waste.

6.4.4- The chemical waste containers should be kept closed unless waste is added.

6.4.5- Containers should be checked periodically for leaks or damage.

6.4.6- Dispose of old or damaged containers immediately.

6.5- Liquid waste:

6.5.1- innocuous liquid waste: it possible to be poured down in the sink like:

- solutions of sodium chloride
- some concentrated, dilute acids and alkalis, harmless soluble inorganic salts.

- Alcohols containing salts, hypochlorite solutions, fine silica, and alumina.

6.5.2- Elemental mercury and spent acids waste can be collected in a separate container for recycling.

6.5.3- some liquid chemical waste should never be poured down in the drain. such as:

- compounds that contain poisonous organosilicon compounds, cyanides, transitional metals, biocides, mineral oils and hydrocarbons, metal phosphides, phosphorus element, and fluorides and nitrites.
- flammable liquids, acidic liquids capable of doing some damage to wastewater facilities.
- High viscosity substances capable of acting an obstruction in the sewage system.
- Radioactive waste and waste that have or generates a strong odour.
- wastewater capable of significantly raising the temperature of the system.
- Water from industrial processes can be separated into solids and treated water for reuse or release into sanitary sewers, as shown in the picture below.



Wastewater from an industrial process can be converted at a treatment plant to solids and treated water for reuse. Retrieved Dec 5, 2021, from https://en.wikipedia.org/wiki/Waste_management

6.6- Solid waste:

the solid waste that contains chemical elements can be treated by following ways:

6.6.1- Chemical treatment: by using some chemicals that interact with waste then reduce toxic and risks on the human and the environment.

6.6.2- Thermal treatment: burning at high temperatures using special burners.



Solid waste burner, Retrieved Dec 6, 2021, from https://www.alibaba.com/product-detail/SGS-certificated-hydrogen-incinerator-with-water_60633888988.html

6.6.3- Biological treatment: through mixing the waste with surface soil, then add microbes that help decompose the wastes.

6.6.4- the Safe landfills :by placing the waste into tightly closed containers then burying into secure landfills away from groundwater.

7-The green alternatives to traditional manufacturing process:

Intended to rationalize consumption of natural materials as can as possible, reduce the pollution, recycle the waste of manufacturing process, and rely on renewable sources of energy such as: wind, solar energy, landfill gas.

Protecting people and the environment and observing the government instructions is not the only motive for the transformation to green manufacturing, there is financial motive such as increase productivity and reduce the cost.

7.1- Using circular manufacturing to save energy and reduce waste.

Aiming to reduce wastage through:

- recycling the materials coming from production process and reuse such as: the iron and plastic cut parts, oil, and water.
- Periodic maintenance for machines, equipment, and vehicles to benefit of them as long as possible.

- Switching to renewable energy sources instead of fuel and electricity to reduce cost and air pollution, there are many sources for renewable energy like wind, solar, bioenergy and hydrogen.

7.2- Implement safety measures by utilizing automation tools and artificial intelligence:

- Work automation and artificial intelligence help reduce work injuries caused by direct contact with machines.
- Workplace will be more safety and machinery failure will be reduced.
- A lot of time and effort will be saved, and productivity will increase.

7.3- Digitize internal communication:

- saving money, tons of paper and space used for saving the paper documents.
- operations will be more efficient due to speed up communication and coordination between employees.
- saving time and effort of employees.

7.4- Choose Eco-friendly partners:

Purchasing the raw material and services from eco-friendly companies will enhance transformation to green manufacturing on a large scale as well as its fiscal impact, where the raw material and services will be low cost comparing to those provided by traditional company.

8- Conclusions

- The Big Green Tractor has seen a decline in the growth, because of Inefficient operations and reliance on traditional methods in the work.
- An industrial guide has been established based on the international standards for operations quality like (ISO 9002, ISO 14001, 6 Sigma).
- The organizational structure of the company has been established, it includes departments and responsibilities.
- The company's vision and goals have been defined, taking into consideration transfer the company into green company and using latest techniques to reduce waste and increase efficiency.
- An action plan has been developed for all departments.
- A plan has been developed for the disposal of chemical waste based on international standards.
- A plan has been developed for transfer to green alternatives instead of traditional industrial methods.

	Allied Market Research, November 01, 2021, Global Tractor Market, Retrieved					
1	December 2, 2021, from https://www.globenewswire.com/en/news-					
1	release/2021/11/01/2324160/0/en/Global-Tractor-Market-Is-Expected-to-					
	Reach-97-90-Billion-by-2030-Says-AMR.html					
	Global Tractor Market 2021-2026. (n.d.). Retrieved December 2, 2021, from					
2	https://mobilityforesights.com/product/tractor-market/					
	Environmental Health & Safety. (n.d.). Retrieved December 4, 2021, from					
3	https://ehs.utoronto.ca/laboratory-hazardous-waste-management-and-disposal-					
	manual/general-requirements/					
	Jerry A. Nathanson , Jan 22, 2010, hazardous-waste management, Retrieved					
4	December 6, 2021, from https://www.britannica.com/technology/hazardous-					
	waste-management/Transport-of-hazardous-waste					
	A. Slotosch, May 23, 2021, 4 Novel Ways to Transform Your Factory into a					
5	Green Manufacturing Plant, Retrieved December 7, 2021, from					
5	https://www.beekeeper.io/blog/4-ways-manufacturing-companies-can-go-					
	green/					
	K. Eby, Sep 19, 2018 (Last modified on Jul 26, 2021), Smartsheet Contributor,					
6	Retrieved December 11, 2021, from https://www.smartsheet.com/streamlining-					
	processes					
	M. Bhardwaj, Aug 31, 2020, the five basic components of a supply chain					
7	management system, Retrieved December 13, 2021, from					
,	https://www.iimu.ac.in/blog/what-are-the-five-basic-components-of-a-supply-					
	chain-management-system/					
6						
8	KPI Examples and Templates. (n.d.) Retrieved December 14, 2021, from					
8	KPI Examples and Templates. (n.d.) Retrieved December 14, 2021, from https://www.qlik.com/us/kpi/kpi-examples					
8	KPI Examples and Templates. (n.d.) Retrieved December 14, 2021, from https://www.qlik.com/us/kpi/kpi-examplesThe Quality Toolbox, Second Edition. (n.d.) Retrieved December 14, 2021,					
8	KPI Examples and Templates. (n.d.) Retrieved December 14, 2021, from https://www.qlik.com/us/kpi/kpi-examples The Quality Toolbox, Second Edition. (n.d.) Retrieved December 14, 2021, from https://asq.org/quality-resources/fishbone					
8 9 10	KPI Examples and Templates. (n.d.) Retrieved December 14, 2021, from https://www.qlik.com/us/kpi/kpi-examplesThe Quality Toolbox, Second Edition. (n.d.) Retrieved December 14, 2021, from https://asq.org/quality-resources/fishboneCorrective Action and Preventive Action (CAPA) Process. (n.d.) Retrieved					

9- References