



## **Answer all three questions**

Operations Analysis (M6X01290)

BSc – Logistics and Supply Chain Management

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## **Question 1**

**Critically discuss using the benefits and limitations of lean operations providing an example (35 marks)**

Lean operation is a principle developed following the creation of the Toyota production system. Indeed, this principle is based on reducing waste in order to increase the speed of its operations. It also makes operations more reliable while producing better quality products and services at lower prices.

Since lean management originates from the Japanese Toyota system, certain terms have not been translated and are still used in their original version.

It is possible to identify several causes of loss divided into three groups.

Muda: Translated as waste, this group includes all activities that do not add value to the process or to customer satisfaction.

Mura: Translated by irregularity, this group corresponds to all the variations which lead to imbalances in the production chain. Irregularities can come from variations in demand and the integration of new services within the company.

Muri: Translated by excess, this group corresponds to activities involving constraints or unreasonable efforts. This occurs when the resources allocated are not sufficient for the proper functioning of the activity.

After identifying the causes, it is possible to identify the types of losses. These are the 7 losses that must be corrected by the lean operation.

Over production: Corresponds to producing more than necessary. Toyota identifies overproduction as the most significant loss.

Waiting time: Corresponds to the waiting times between each stage of the supply chain.

Transport: Corresponds to movements between different services without adding value to the product or service.

Process: The process can be a loss in itself even if it is not specifically adapted to the production or service requested. This also includes adding additional value to a product or service when it is not claimed by the customer.

Inventory: Inventory is a waste of time and money. It must be checked regularly and represents a financial asset. In addition, product storage encroaches on the available surface.

Motion: Corresponds to the loss of time resulting from the movement of machines and employees.

Defects: Corresponds to production errors to be resolved. It may correspond to faults on products ordered by customers.

Toyota is the pillar company and the creator of lean operation. It was when a study by the Massachusetts Institute of Technology was published in 1980 that this principle became known to the whole world and created a craze.

Toyota decided to create this system in order to be able to compete with American automobile companies following the end of the Second World War.

The idea of the company was to limit waste in order to limit the loss of money. The company therefore based its system on the use of few principles: Just-in-time production as well as self-activation of production.

Just-in-time production allows components to be received only when required. This principle had to be established within the company, but also with suppliers. The company has developed the Kanban technique for this, which uses a colour code to find out the supply needs. This made it possible to approach zero stock and thus reduce storage strikes while increasing the production area.

Autonomy corresponds to the use of industrial machines fitted with anomaly detectors. Indeed, many machines allow to produce great qualities without stopping when they are restocked with raw materials. However, if they are not willing to detect anomalies, the company can end up with a large number of defective products. This represents a huge waste of time and money if the anomaly is not quickly detected. However, with autonomy the machines are able to stop and alert operators in the event of a malfunction. This reduces the workforce and increases the amount produced for businesses.

The benefits for Toyota were therefore reduced losses while increasing their profit margins. This allowed them to have a competitive advantage over American companies.

However, companies such as Toyota operating in full accordance with the philosophy of lean operation may experience limitations.

The use of the strategy of limiting stocks, even going as far as having no stock, makes it possible to reduce costs and use the space previously allocated to storage for other services. However, the company becomes completely dependent on its suppliers. In the event of a problem, the company has no stock and the company stops if no immediate solution is found. This can lead to heavy costs for the company.

It is the same when a service or a machine in a production line stops. The whole chain must stop since it is impossible for downstream services to produce. Upstream services have to stop since there is no allocated storage space.

It is therefore necessary to ensure the quality of its suppliers and to have backup solutions. It is also important to carry out regular maintenance so that the machines do not break down.

When a company wants to innovate and adapt to a new organization, it is necessary to completely rework the organization of the company. This represents a significant cost for setting up the process but also for stopping the business. Indeed, it is possible that the company may have to close down during the works.

When a business changes the way it works it is important to include employees in the discussions to limit the potential rejection or fear they may feel at the prospect of a complete structural change. It is therefore necessary to train them while explaining to them the interests that they can bring out.

These limitations, although binding, can be kept under control using continuous improvement across the enterprise. This allows for regular changes in the business so as not to create sudden changes. It is also an opportunity to involve employees in decision-making by taking into account their vision of the field and by having them participate in tests.

## **Question 2**

**Critically discuss the project management role, techniques, tools and computer-based systems for successful project management (35 marks)**

Project management corresponds to all activities that allow you to reach set objectives and organize the smooth running of a project. This management is carried out by applying tools and methods specialized in each of the stages of a project.

Project management is important to allow a higher probability of project success, to increase the efficiency of the working group to meet the needs of stakeholders and finally to use resources wisely.

To guarantee the success of the management of a project it is necessary to bring together several elements:

- Define the purpose of the project
- Estimate the limits as well as the time and resources required
- Manage and motivate the team
- Evaluate the risks
- Manage the budget
- Communicate with the different interns
- Develop and implement a management plan

To have an effective project management it is necessary to organize well the tasks to be carried out.

Although similar to general management, it is necessary to include the fact that a project is unique and limited in time.

Project management is organized around four key principles.

Plan: This concerns all activities related to forecasts

Process: This is a global approach to all activities and project governance

People: This is about identifying the human factors that can have a positive or negative effect on the project. This helps identify threats and opportunities.

Power: A hierarchy must be organized and establish lines of authority.

## **Lean Six Sigma**

There are many methods to structure the management of a project.

The Lean Six Sigma technique is used to reduce the variability of a process and thus increase its quality as it approaches zero defects. This method is based on customer expectations as well as on measurable data. In fact, it identifies the causes of problems in project management and makes it possible to systematically improve performance.

This method makes projects more economical and efficient. It is also a way to involve employees in improving processes and thus involve them in the projects.

However, this means that it is necessary to make changes to the tasks and therefore that the various stakeholders must be ready to involve the time and resources necessary for the smooth running of the project.

## **Scheduling**

The use of the GANTT diagram is democratized and today essential in project management.

It is firstly interesting thanks to its visual impact. It allows you to identify at a glance the progress of a project and each task. In addition, the use of a colour code helps identify fault points and delays.

It is also a communication tool since the visibility of the progress of each task allows you to have a visual on the progress of the interdependent tasks and therefore prepare to carry it out when the previous task has been completed.

However, its advantages may be lacking when too much information is given on the schedule. Indeed, its clear and precise visual impact can be lost when too much information is present since it will no longer be possible to read it at first glance.

It must also be constantly updated so that each of the participants can find their bearings and identify the tasks to come and ensure that deadlines are met.

Finally, it does not present the costs associated with each task or the amount of work that each of them represents.

### **Computer based system**

Project management software facilitates the work of project management. Their main function is to take care of project planning. That is, they are able to schedule tasks using several methods.

The use of computer systems for project management is increasingly integrated with the use of connected devices and the use of decentralized systems. This allows the various parties to know the schedule and communicate with each without fixing a particular appointment. In addition, these technologies allow teams to work without being in the same premises. It is a technology that in the case of the Corona virus allows employees, with the possibility, to work remotely from their home.

However, despite all these positive aspects, it should not be forgotten that the use of these tools is linked to the use of electricity and the Internet. During a power outage, people who do not have access to a cellular connection or who work on fixed platforms will not be able to access their data.

When employees use decentralized systems, data becomes dependent on storage providers. In fact, in the event of a closure or a dispute with the service provider, a connection failure or a backup problem, the data will not be accessible.

However, these computerized tools meet the demand of companies and save time, reliability and money in the context of project management. In order to limit the problems linked to the storage of data on remote servers, it could be interesting to use blockchain technology in order to limit losses in the event of a problem.

### **Question 3**

#### **Comparatively discuss Total Quality Management (TQM) versus Six Sigma (30 marks)**

Companies are increasingly focusing on the quality of their products in order to limit their costs and offer a product or service that meets customer expectations. For this there are today two recognized philosophies for improving quality in organizations.

##### **Six Sigma**

The six sigma is defined as a tool to increase the quality of products by limiting losses. It is a tool aimed at supply chain perfection in order to increase profits. This method can be applied in two different ways

DMAIC: Define Measure Analyse Improve and Control

It is a method of improving processes that do not live up to expectations by making incremental improvements. That is to say a change which transforms nothing, but which improves the existing.

DMADV: Devine Measure Analyse Design Verify

Unlike the previous one, this method is used to design new processes that meet six sigma expectations.

##### **TQM**

TQM is a Philosophy geared towards customer satisfaction in a way that saves money. The customer is then at the center of concerns. This philosophy creates a climate in which the entire organization works daily to improve processes.

It is also an approach based on ISO 9004 which serves as an explanatory document to ISO 9001.

## **Differences**

### Focus

TQM is a philosophy created to improve customer satisfaction by working individually on the different positions with quality problems. Six Sigma is going to try to reduce losses by increasing the quality of the whole chain in a global way in order to increase its profits.

### Quality and Approach

The TQM Philosophy brings staff to work on stations with quality issues to enhance them according to company criteria. The Six Sigma when it seeks to increase the quality of the processes as much as possible so as to no longer have a loss and meet customer expectations.

### Skills

Due to its modification philosophy, the TQM allows anyone with a minimum of experience to supervise modifications. The Six Sigma philosophy allows certified professionals only to undertake major structural modifications according to Six Sigma standards. The company must therefore have, train or hire certified personnel. Given the training acquired or to be acquired, staff may request a higher salary.

The two philosophy although similar in the result of meeting customer expectations work in different ways and do not require the same pre-requisites and do not have the same objectives. TQM is a philosophy used to improve the quality of workstations that do not meet the objectives defined by companies. The modifications made are minimal and allow a manager to supervise them.

The six sigma is a philosophy used to increase the quality of its chain by reducing losses in order to maximize gains and meet customer demand. In the case of in-depth modifications or reorganization, it is preferable that the person responsible for the modifications be certified with a green or black belt. It is therefore necessary to have qualified personnel.

This second philosophy is certainly the one that will be the most used in the years to come. Businesses are undergoing continuous change and must constantly improve to stay competitive. It is therefore preferable that it hires specialized and certified people in order to carry out the expected changes in the best possible way.

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