

# THE RELATIONSHIP OF LEAN MANUFACTURING CONCEPTS AS JAPANESE PHILOSOPHY WITH RELIGION'S TEACHINGS

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## ABSTRACT

*This article presents the relationship of Lean manufacturing concepts as Japanese philosophy to the Islamic religion's teachings. The research will demonstrate that the modern concepts of lean manufacturing were mentioned in the Islamic Holy Book "Quran" around 1400 years ago. The article discussed 33 verses in the Quran and 4 Hadith (saying of prophet Mohammed) then relating them to the theories, concepts, and culture of Lean manufacturing. Analyzing The Holy book of Quran and Lean Manufacturing concepts side by side to compare and to find similarities to prove our article purpose. Major pillars of lean manufacturing will be discussed in the introduction and match them to the Islamic teachings.*

**Keywords:** Lean Manufacturing, Tact Time, Islamic Teachings

## INTRODUCTION

Lean manufacturing is a Japanese philosophy aims to eliminate none-added value to the system under consideration (Coronado et al., 2002). Its major pillars are: 5s (Sort , Set in order, Sweep, Standardize, and Sustain), 3M( Muda, Muri, Mura), JIT, Kaizen, Continuous improvement, Poka-Yoke, Improving productivity, Customer Satisfaction, Customer Value, Lean Culture (Respecting people), Heijunka, Increasing efficiency, Standardized work , Reducing waste, Maintenance, Cellular Manufacturing, Leadership, Qualified People, Pull-System, Overproduction.

Lean is a continuous improvement approach, with the aim of eliminating waste and any non-value-added activities by targeting the steps that do not add value to the customer/ patient such as avoidable interruptions, delays and mistakes to improve the process flow. Lean manufacturing is; therefore, a quality improvement tool which can significantly enhance service quality and efficiency. Lean manufacturing implies a unified, comprehensive set of philosophies, rules, guidelines, tools and techniques for improving and optimizing a production system. While lean was issued in a large volume, the repetitive manufacturing setting within the automotive industry sector, its principles, can almost be applied to all processes (e.g., health care, service industries, high technology enterprises, sales and marketing and fast-food providers) (Womack et al., 1990). How Toyota and their suppliers applied the lean manufacturing concept was studied and popularized within the book *The Machine that Changed the World* (Womack et al., 1996). The authors concluded that the basic idea of lean is attractively simple in that the organization should be obsessively focused on the most effective means of producing value for their customers. An organization which has lean approaches this challenge by applying five basic lean principles, with a focus on understanding waste within its systems. It recognizes the value of its work, the importance of staff training and their role within improvement teams to bring about change (Das, 2005). The five lean principles to be applied are

as follows: (1) Specify what customers value most – Value is what the customer wants and expects. This requires a precise understanding of the specific needs of the customer; (2) Understand the value stream – The value stream is the activity that when done correctly and in the right order, produces the results (a product or level of service) that the customer values; (3) Improve the flow – A lean organization work should flow steadily and without interruption from one value-adding activity or its supporting activity to the next activity; (4) Pull – The system should be able to readily respond to customer demand, in other words, the customers pull the work through the system; (5) Perfection – Having implemented the first four principles, the organization will understand the system ever better and from this be able to generate ideas for further improvement. A lean system becomes leaner and faster and its waste becomes easier to identify and eliminate. A perfect process delivers the exact amount of value to the customer. Each step within the process is value adding, capable (producing a good result every time), available (producing the desired output and the desired quality every time), adequate (free of delays), highly flexible and is continuous in its operation. If one of these factors fails, some waste is produced. This research attempt to use lean manufacturing to minimize the spread of corona virus epidemic by using some of lean manufacturing concepts (Liker, 2004).

Lean manufacturing and Islam can be defined as similar ways of thinking and practices as well as that lean manufacturing is a philosophy that was conducted in the year of 1990s but on the other hand Islam religion was found before 1441 years ago. Islam teaches us how to manage and deal with everything in our lives like in dealing with our day-to-day life and on the long run as well. While talking about Lean they say that it's that it's not only dedicated to manufacturing, but it can be used as a way of living, while people are finding it as helpful and can bring vital changes to their lives. While people were looking into Lean, they didn't know that Islam is teaching us how to live like this in concepts that was established long time ago. Lean and Islam has many similarities especially in the way of thinking and the methodology that is used to establish their efficient processes. When we come to describe how they are similar, there are more than one perspectives due to how the Holy Quran and Hadith have different approaches due to the wisdom of Allah almighty and for everyone to understand (Gent et al., 2019; Alkouatli, 2018). By breaking down the Lean Manufacturing concepts as well as the Islam approaches where we will be able to distinguish and observe how they are similar[8,9]. We have researched some verses and we have added notations on them on which Lean concept it is targeting.

### **Quran, and Sunnah Similarities with Lean Manufacturing Concepts**

O you who have believed, persevere and endure and remain stationed and fear Allah that you may be successful. Quran; Chapter 3 (Ali Imran):200

When applying lean, always the outcome depends on the long run as mentioned in the 5s, the last S is sustained, which means you always keep up the work that you have done. This will eventually show the results in the near future. Not only for the first day applying those 5S. As shown in the Quran Allah all mighty have mentioned that patience will eventually lead to success related to the sustain in lead. And give the relative his right, and [also] the poor and the traveler, and do not spend wastefully (26). Indeed, the wasteful are brothers of the devils, and ever has Satan been to his Lord ungrateful.(27)

Quran; Chapter 17 (Al-Isra): 26-27

Lean manufacturing and islamic culture both agreed that the concept of excess is unacceptable. For instance, in lean manufacturing, they created the Just in Time (JIT) principle to reduce overproduction that would reduce cost because they wouldn't have too many products in inventory (cash on racks) due to the JIT principle. And in islamic culture, Allah almighty said do not waste and Allah almighty Said the wasteful are brothers of the devils.

O mankind, indeed We have created you from male and female and made you peoples and tribes that you may know one another. Indeed, the most noble of you in the sight of Allah is the most righteous of you. Indeed, Allah is Knowing and Acquainted.

Quran; Chapter 49 (Al-Hujurat): 13

Lean is not something you do, it is something you become, and there is no standard definition of culture in lean, however they all agreed on one thing, which is respect for people. While in Islam as shown above there is no difference between a man or women nor their community and their tribe only by their Tuqya. All mighty Allah is promoting here that respect must be attained here because relatively there is no difference! So people should get off their high horse, and respect each other.

For each one are successive [angels] before and behind him who protect him by the decree of Allah . Indeed, Allah will not change the condition of a people until they change what is in themselves. And when Allah intends for a people ill, there is no repelling it. And there is not for them besides Him any patron.

Quran; Chapter 13 (Al-Ra'd): 11

As we want to identify the Lean concept of continuous improvement, we can define it here where if someone wants to change something he/she has to be determinative about it to reach their goals and to go over the cycle of improving always.

And do not approach the orphan's property except in a way that is best until he reaches maturity. And give full measure and weight in justice. We do not charge any soul except [with that within] its capacity. And when you testify, be just, even if [it concerns] a near relative. And the covenant of Allah fulfills. This has He instructed you that you may remember.

Quran; Chapter 6 (Al-An'am): 152

Woe to those who give less [than due], Who, when they take a measure from people, take in full. But if they give by measure or by weight to them, they cause loss.

Chapter 83 (Al-Mutaffifin): 1-3

In Islam people have to treat each other respectively in any kinds of relations such as business, friendship, and co-workers where as we know in Lean manufacturing everyone should be respected from the bottom of the organization to the top. As well as if we are talking about customer satisfaction which is number one priority in Lean Manufacturing concepts , Allah Almighty told us that it's prohibited to not give people as much as they are giving us.

And do not pursue that of which you have no knowledge. Indeed, the hearing, the sight and the heart - about all those [one] will be questioned. Quran; Chapter 17 (Al-Isra'): 36

O you who have believed, if there comes to you a disobedient one with information to investigate, lest you harm a people out of ignorance and become, over what you have done, regretful.

Chapter 49 (Al-Hujurat): 6

In lean manufacturing when performing the value, you stream map, always the contributors should “walk the process” and interview the workforce, this is done to ensure that the acquired information is accurate. Relatively to islam that when any information is given you should check the source by yourself for accuracy.

And do not pursue that of which you have no knowledge. Indeed, the hearing, the sight and the heart - about all those [one] will be questioned

(Quran; Chapter 17 (Al-Isra'): 36

Allah gave us blessings such as hearing and sight. We should make use of them in a way that we gain some benefits and not to make Allah upset. We can relate this to the concepts of lean where we should use and utilize all of the resources that we have.

Say, " Allah is most knowing of how long they remained. He has [knowledge of] the unseen [aspects] of the heavens and the earth. How Seeing is He and how Hearing! They have not besides Him any protector, and He shares not His legislation with anyone.

(Quran; Chapter 18 (Al-Kahf): 26

In this verse Allah reminds us that whatever level of knowledge we reach in this life we still know nothing compared to Allah. Lean manufacturing teaches us to always strive to gain knowledge and improve our work in order to reach perfection.

One of the women said, "O my father, hire him. Indeed, the best one you can hire is the strong and the trustworthy

(Quran; Chapter 28 (Al-Qasas): 26

Lean is about providing the maximum value to customers, and to succeed in the most effective way is to hire qualified people for it.

In Quran this verse is related to Prophet Moses, is that when he ran away due to the tribe wanted to revenge and killed him, he found a tree and stayed there and two girls came by needed help with heavy duty and they asked the prophet for help due to his attributes and the prophet is the qualified for this job.

[Solomon] said, "O assembly [of jinn], which of you will bring me her throne before they come to me in submission"

(Chapter 27 (Al-Naml): 38

A powerful one from among the jinn said, "I will bring it to you before you rise from your place, and indeed, I am for this [task] strong and trustworthy."

(Chapter 27 (Al-Naml): 39

Said one who had knowledge from the Scripture, "I will bring it to you before your glance returns to you." And when [Solomon] saw it placed before him, he said, "This is from the favor of my Lord to test me whether I will be grateful or ungrateful. And whoever is grateful - his gratitude is only for [the benefit of] himself. And whoever is ungrateful - then indeed, my Lord is Free of need and Generous

(Chapter 27 (Al-Naml): 40."

He said, "Disguise for her throne; we will see whether she will be guided [to truth] or will be of those who are not guided

(Chapter 27 (Al-Naml): 41

In the Quran, this story is related to the prophet Suliman, and how he could manage different divisities, in which he managed Gin, people, and animals, etc.. On the other hand lean experts have agreed on how lean that it could never succeed unless performing participative management. Management who succeed in applying lean manufacturing uses a method that emphasizes trust through the employees are allowed to access information to perform their job effectively.

The believers are but brothers, so make settlement between your brothers. And fear Allah that you may receive mercy

Chapter 49 (Al-Hujurat): 10

O mankind, indeed We have created you from male and female and made you peoples and tribes that you may know one another. Indeed, the most noble of you in the sight of Allah is the most righteous of you. Indeed, Allah is Knowing and Acquainted

Chapter 49 (Al-Hujurat): 13

In Quran and sunnah we always find that it's important to respect each other and there is no difference between us, so we should take everyone as a brother and not treat anyone with egoness. In lean there is no concrete definition that states what is the culture of lean, however all lean leaders agreed that it is the respect among people.

And the heaven He raised and imposed the balance (Alkouatli, 2018).

That you not transgress within the balance (Zanoni, 2010).

And establish weight in justice and do not make deficient the balance (Mokhtar, 2018).

Quran; Chapter 55 (Al-Rahman): 7-9

In Lean manufacturing the three kinds of wastes are the 3M's , Mura is all about unevenness; inequality. So Lean tells us that we need to prevent those kinds of wastes, by using Heijunka to avoid injustice. In the other Quran have promoted that always you should balance. The opposite of mura. So they both aim to the same goal of eliminating injustice.

Mothers may breastfeed their children two complete years for whoever wishes to complete the nursing [period]. Upon the father is the mothers' provision and their clothing according to what is acceptable. No person is charged with more than his capacity. No mother should be harmed through her child, and no father through his child. And upon the [father's] heir is [a duty] like that [of the father]. And if they both desire weaning through mutual consent from both of them and consultation, there is no blame upon either of them. And if you wish to have your children nursed by a substitute, there is no blame upon you as long as you give payment according to what is acceptable. And fear Allah and know that Allah is Seeing what you do.(233).

Chapter 2 (Al-Baqarah): 233

In Lean the concept Muri is all about overloading the operator or a machine, so to maintain improvement you must identify those kinds of waste to eliminate it, by using the concept Heijunka to avoid injustice. While in quran the Chapter 2 (Al-Baqarah): 233 has stated that No person is charged with more than his capacity.

They ask you about wine and gambling. Say, "In them is great sin and [yet, some] benefit for people. But their sin is greater than their benefit." And they ask you what they should spend. Say, "The excess [beyond needs]." Thus Allah makes clear to you the verses [of revelation] that you might give thought.(219) Quran; Chapter 2 (Al-Baqarah): 219

In organizations, there are two kinds of systems, which are push and pull. They are both beneficial concerning the overall profit. Lean manufacturing suggests using the Pull system because it is more beneficial. On the other hand, the Quran has mentioned that Gambling and drinking wine both have benefits, but it is more beneficial to avoid them.

And say, "My Lord, cause me to enter a sound entrance and to exit a sound exit and grant me from Yourself a supporting authority." (80). Quran; Chapter 17 (Al-Isra'): 80

Islamic religion sees truth and honesty as one of its important practices where if a human being would only do what is honest so when he/she will make something as in our case (manufacturer) it should be at its highest quality levels or will at least be honest about the quality they are providing. Relating to lean manufacturing concepts quality should be checked frequently where they will try to provide the best quality or the agreed quality levels to their work and be honest about them.

(He made you prosperous on the earth. You are settled in it and you treasure it.)

Quran : (Hud) 61

In this verse Allah said that humans are on earth to take advantage of its resources and to benefit from them. Where if we want to analyze we will find the taking advantage of resources is an essential but while keeping in mind not to take over than what we need. On the other hand one of the benefits in Lean manufacturing concepts is to increase efficiency and productivity by benefiting from resources and here where we can see how lean and Islam studies comes to meet. (Don't be extravagant; surely, He does not love the Extravagant.)Quran :

(Al-Araf) 31

In this case Allah Almighty said to us that not to take from beyond our needs when we come to relate this as well, we can find one critical type of waste which is overproduction. Whereas a Muslim we only do want need nothing exceeding our needs.

And prepare against them what force you can and horses tied at the frontier, to frighten thereby the enemy of Allah and your enemy and others besides them, whom you do not know (but) Allah knows them; and whatever thing you will spend in Allah's way, it will be paid back to you fully and you shall not be dealt with unjustly. Quran: (Al-Anfa) 60

When we want to talk about strategies, learning is a concept with building up strategies such as how to eliminate waste. "Kaizen" Islamic studies teaches us how to make strategies even in wars and to always be prepared for a ready strategy as well.

Help ye one another in righteousness and piety, but help ye not one another in sin and rancor: fear Allah: for Allah is strict in punishment.

O ye that believe! betray not the trust of Allah and the Messenger, nor misappropriate knowingly things entrusted to you.

As we know that the implementation of lean need cooperation in all of the organization people should work together as a family so that the work will be done effectively, in Islam cooperation between people is a must. Honesty is very important in lean where people should be honest with each other's if there is no honesty among them the implementation of lean will never succeed as well as in Islam honesty is very important and its repeated in quran several times.

### **Tafseer Sahih International**

Say "Each works according to his manner but your Lord is most knowing of who is best guided in way"

To relate this to our study so that everything needs to be done on its time so there are no delays in anything, for example if we want to purchase materials at a specific time we have to

meet this time exactly. The person who is responsible for any activity that relates to JIT he/she should do it according to his/her best way.

Children of Adam, take your adornment at every place of prayer. Eat and drink, and do not waste. He does not love the wasteful.

In sort step we have to remove all unwanted items. Overstock of items that are unneeded is considered waste where the waste in lean is unacceptable. In Quran and Islam says that dont use things that you don't need because Allah does not like those who use things much than their need.

You should never stand in that building: the Mosque which has been founded on piety from the very first day, is the proper place for you to stand (for prayer). For there are such people in it as would like to keep themselves pure; and Allah likes those people who like to keep themselves pure. \*102

Cleaning and maintenance is very important so that the equipment and machines should be always clear to avoid any problems. This concept in lean is called preventive maintenance. To relate this to Islam, Islam always talk about cleaning in everything before you do something and after you finish.

In Islam, when you commit a Sin, you always can correct your actions by asking Allah Almighty to forgive you by Tuwba, While in Lean when you don't perform maintenance eventually the machine will fail, so you need to preform corrective maintenance the repentance accepted by Allah is only for those who do wrong in ignorance [or carelessness] and then repent soon after. It is those to whom Allah will turn in forgiveness, and Allah is ever knowing and Wise. Quran: An-nisa(17)

In Islam, when you commit a Sin, you always can correct your actions by asking Allah Almighty to forgive you by Tuwba, While in Lean when you don't perform maintenance eventually the machine will fail, so you need to preform corrective maintenance.

The prophet Mohammad said peace upon him : On every Muslim there is enjoined (a compulsory) Sadaqa (alms)." They (the people) said, "If one has nothing?" He said, "He should work with his hands so that he may benefit himself and give in charity." They said, "If he cannot work or does not work?" He said, "Then he should help the oppressed unhappy person (by word or action or both)." They said, "If he does not do it?" He said, "Then he should enjoin what is good (or said what is reasonable)." They said, "If he does not do that" He said, "Then he should refrain from doing evil, for that will be considered for Him as a Sadaqa

.Sahih al-Bukhari

In Islam working can be stated as one of the most important things where a human should continuously improve and benefit himself afterwards of benefiting himself, he would donate to charity as if an individual couldn't work, he would donate with emotional support. Due to the high importance in Islam to improve yourself as a human being we can see a lot of methods and concepts in lean that would state that lean manufacturing concepts is all about continuous improvement as well as trying to find and adopt new ideas to increase efficiency and productivity.

"Allah will be pleased with those who try to do their work in a perfect way "

Sustain is to make sure all the 5s works very well and obtained good, to relate this to our study in Quran there is ayah in Quran that means if someone did something he needs to do it very well. And this shows how Allah Almighty emphasizes on The quality of the work.

All of you are guardians and are responsible for your wards. The ruler is a guardian and responsible for his subjects; the man is a guardian and responsible for his family; the woman is a guardian and is responsible for her husband's house and his offspring; and so all of you are guardians and are responsible for your wards."

Where if we want to relate it to lean manufacturing concepts we can see the relation with Poka-yoke where everyone is responsible for what he or she is making or working on to send to the next workstation.

Verily Allah has prescribed ihsan (proficiency, perfection) in all things.

Relating to lean concepts the workers should get used to what they are doing until they become professionals or get enough training as we can say standardize.

## CONCLUSION

Lean manufacturing methods are claimed by Toyota. However, Ford came and they claimed that they invented it. Therefore, we are claiming that Islamic guidance referred to it in The Holy Book of Quran and Hadith where it is not a new concept but it is the lifestyle practiced by Muslims.

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