Lean production, Toyota Production System and Kaizen philosophy

A conceptual analysis from the perspective of Zen Buddhism

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Abstract

Purpose – The purpose of this paper is to compare principles from the original Toyota Production System (TPS), the Toyota Way 2001 and Kaizen philosophy with principles derived from Japanese Zen Buddhism. The paper would also like to enlarge the debate concerning some lessons learnt from Japanese culture in order to avoid Lean implementation failures.
Design/methodology/approach – The original English version of Taiichi Ohno's book dedicated to the TPS, the Toyota Way 2001 and other relevant papers regarding Kaizen were reviewed and analyzed. The principles that emerged from the review of this literature were then compared with similar philosophical principles from Japanese Soto Zen Buddhism. The literature concerning Zen philosophy was methodically analyzed and categorized using the content analysis.
Findings – The results of this research show many theoretical parallelisms as well as lessons for practitioners, in particular referring to principles such as *Jidoka*, just-in-time, waste identification and elimination, challenge, Kaizen, *Genchi Genbutsu*, respect for people and teamwork.
Research limitations/implications – Analysis and results are mainly based on the literature that was found, reviewed and categorized, along with the knowledge of authors on Zen philosophy. Results could differ depending on the literature reviewed and categorized.
Practical implications – The results of this research bring food for thought to practitioners in terms of lessons learnt from Japanese culture, Toyota principles and management style in order to avoid Lean implementation failures.
Originality/value – This is one of the first papers which compares Lean-TPS and Kaizen principles with the Zen philosophy to try to learn lessons for succeeding in Lean implementation.

Keywords Lean production, Kaizen, Zen philosophy

Paper type Conceptual paper

Introduction and motivation for the research

Lean production stems from the Japanese Toyota Production System (TPS); the theory of TPS was introduced in Japan by Taiichi Ohno (Ohno, 1988; Holweg, 2007; Narayanamurthy *et al.*, 2016). The term Lean was first coined by the researcher Krafcik (1988) and the book *The Machine that Changed the World* by Womack *et al.* (1990) made the term Lean known worldwide.

Although there are some differences between Lean production and TPS, mainly linked to practitioners and scholars' adaptations, they basically introduce similar principles and objectives (Chiarini, 2011).

In the last decades, Lean-TPS has been implemented in western industry in different sectors and organizations and interesting results have been achieved in terms of performance, especially

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when we come to inventory reduction, customer satisfaction, lead time, and waste reduction in general (Dora *et al.*, 2013; Belekoukias *et al.*, 2014; Fullerton *et al.*, 2014; Ingelsson and Mårtensson, 2014; Prashar, 2014; Teehan and Tucker, 2014; Gupta *et al.*, 2016; Chahal *et al.*, 2017; Marodin *et al.*, 2017). Lean-TPS tends sometimes to be confused with Kaizen principles and philosophy (Chiarini, 2011), even if the term Kaizen was first introduced by Imai (1986) and more related to the total quality management (TQM) movement.

Nowadays, Lean-TPS is so widely implemented that its implications extend beyond the original boundaries of manufacturing and "seven wastes" reduction (Ohno, 1988). Lean implementation has expanded from Lean production to Lean healthcare (Costa and Godinho Filho, 2016) and Lean government (Suarez Barraza *et al.*, 2009), and Lean has even gone green and is used to improve environmental performance (Duarte and Cruz-Machado, 2013; Chiarini, 2014; Garza-Reyes, 2015).

However, total implementation of Lean-TPS is not easy and companies can face many difficulties and pitfalls during the journey. TPS offers many tools such as 5S, Kanban, value stream mapping and more complex techniques such as single-minute-exchange-of-die (SMED) and total productive maintenance (TPM) (Womack *et al.*, 1990; Holweg, 2007; Chiarini, 2011; Eroglu and Hofer, 2011; Monden, 2011). Sometimes techniques such as TPM are so articulated that they are considered more of a philosophy than a technique (Davis, 1995; Sharma *et al.*, 2016). Probably, in an initial period, Lean-TPS was considered a precise and mechanical management system based on such tools and techniques. However, from many attempts of Lean-TPS implementation the managerial and organizational culture dimension has emerged (Frahm, 2016). As a consequence, in western industries Lean-TPS quickly progressed from the implementation of isolated Lean tools and techniques to an integrated philosophy and culture (Bhasin and Burcher, 2006; Jørgensen *et al.*, 2007). However, Hall (2004) reported that the Lean production introduced in western culture differed from the original TPS in which the development of people's problem-solving skills, people's involvement, teamwork and respect of people are key elements. A number of western authors analyzed the western Lean journey and reported that it can often lead to complete failures or several attempts were required before some real benefits were gained (Rubrich, 2004; Ortiz, 2008; Scherrer-Rathje *et al.*, 2009; Rahbek Gjerdrum Pedersen and Huniche, 2011). Other authors (Garrahan and Stewart, 1992; Williams *et al.*, 1992) even proposed that Lean was used in western industry to exploit and dehumanize workers.

Therefore, it can be claimed that in the conversion from the original Japanese TPS to a western Lean system something has sometimes been missed: the interesting question is whether the specific tools and techniques or the cultural and philosophical approach of the original TPS.

In this light, this theoretical research investigates, through a literature review, the cultural and philosophical issues that directly stem from Japanese culture and society and how these issues can be related with TPS principles. Specifically, we compared the main TPS and Toyota Way 2001 principles (Toyota Global Site, 2017) and Kaizen philosophy with philosophical concepts derived from Zen philosophy and in particular Zen Buddhism. We tried to evaluate how these issues could be the key of TPS success and implementation rather than just a part of the Japanese culture. After a first analysis of TPS, the Toyota Way 2001 and Kaizen philosophy, in a separate dedicated section we analyzed Zen philosophy, trying to make a comparison from a theoretical point of view. In our Conclusions section we also try to enlarge the debate for practitioners and scholars regarding Lean-TPS, its implementation and the lessons learnt from this theoretical comparison.

Background to Lean-TPS

There is plenty of literature dedicated to TPS and Lean production and many subjects have been debated starting from Ohno's (1988) book *Toyota Production*

System: Beyond Large-Scale Production. To meet the objective of this paper, we referred to the original thoughts of Ohno and other Toyota documentation; therefore, only a few other authors who dealt with the Japanese cultural environment of TPS and Toyota Way were reviewed. Ohno's book first appeared in Japan in May 1978 and was translated in English ten years after its Japanese edition.

Ohno, in his book, described the history of TPS as dating back to the ideas and practice of Sakichi Toyoda, the Toyota founder. Sakichi Toyoda invented the Five Whys problem-solving technique used to find the cause-and-effect relationships for specific problems to reach the real root cause.

The practical model behind TPS is based on just a few principles and tools and Ohno's (1988) book is more a narration than a real model or pattern. We summarized the main principles in Table I. From this book it is well known that TPS is founded on two main pillars which are the *jidoka* or autonomation and the just-in-time (JIT). The first one goes back to 1902 when the entrepreneur Sakichi Toyoda invented a particular way of detecting a broken thread that immediately stopped the automatic loom. That invention allowed one operator to control the functions of up to 12 looms increasing the quality of the output. The autonomation brought something more important than the simple mechanism of automation. According to the Toyota Global Site (2017), this has led to the so-called automation with human touch and the principle of stop and respond to every abnormality. In this way TPS started introducing and fostering the principles of people involvement and contribution, empowerment and self-responsibilities (Liker, 2004). The machine can stop itself but the system needs people who are able to quickly respond to every problem in terms of root-cause analysis. As a consequence, according to Ohno (1988, p. 128), teamwork is everything and there is no reason to fear a line stop when a problem is detected. In this light, teamworking in TPS quickly became a cornerstone of the entire system with the intent of not making isolated islands, meaning that if workers are isolated here and there, they cannot help each other (Ohno, 1988, p. 123). In order to enforce autonomation and a quick response to each detected production problem, Ohno (1988, p. 129) also introduced the principle of visual control or management by sight. This principle has to be applied throughout from machines and lines as well as arrangements of products, tools and inventories and standard work procedures.

According to Table I, the second pillar of TPS is the JIT principle. Ohno (1988, p. 123) in his book attributed the principle to the Toyota's founder Toyoda Kiichiro who thought of the possibility of acquiring products at the time and in the quantity needed. Ohno enlarged this way of thinking by starting from customer demand and its rhythm. Everything is determined by the market demand and each process should pulse at the so-called takt-time given by the customers. This production system is known as a pull system compared to the

Model		Principle
Toyota Production System	Autonomation/*Jidoka*	Stopping the line
		Teamwork
		Five Whys
	Just-in-time	Takt-time and continuous flow
		Kanban
		Waste recognition and elimination
Toyota Way 2001	Continuous improvement	Challenge
		Kaizen
		Genchi Genbutsu
	Respect for people	Respect
		Teamwork

Table I.
Principles of TPS and the Toyota Way 2001

push system that originated from mass production principles. The push production system is typically based on previsions rule and advanced plans for production processes. In this way, Ohno started implementing a pull system from the machine shop of Toyota in 1953 inventing the so-called Kanban. The idea was, and still is, to create a continuous production flow from customers to suppliers, leveling the processes in accordance with the takt-time. To do this, Ohno used the idea of an American supermarket, viewing the earlier process in production as a kind of store (Ohno, 1988, p. 26).

However, in order to create a continuous production flow leveling the processes, according to Ohno there must be a total understanding of waste principle. All sources of waste have to be detected and crushed (Ohno, 1988, p. 59) and production waste can be divided into the famous seven wastes (Ohno, 1988, p. 129): overproduction, waiting, transporting, too much machining (over-processing), inventories, moving, and making defective parts and products. Overproduction is considered to be the root of all the other wastes and Ohno (1988, p. 129) stated: "It is not an exaggeration to say that in a low-growth period such waste is a crime against society more than a business loss."

During the 1980s and 1990s, TPS began to spread outside Japan and Toyota demonstrated how the model can be implemented in the European and American context regardless of the socio-cultural Japanese context (Holweg, 2007). At that time, Womack *et al.* (1990) crowned TPS as the best system for operations, forging the alternative western term Lean production.

Kaizen philosophy and Toyota Way 2001

Ohno in his book never used the term Kaizen which nowadays for many practitioners is synonymous with Lean production and TPS. As later discussed, this fundamental term represents in any case one of the most important principles of the so-called Toyota Way 2001. According to Suárez-Barraza *et al.* (2011), the term was first made known by Imai in his book *Kaizen – The Key to Japan's Competitive Success* (Imai, 1986); however, academics and practitioners still show a certain degree of ambiguity and inconsistency when referring to Kaizen (Suárez-Barraza *et al.*, 2011). Chiarini (2011) claimed that the term is more related to the total quality control-total quality management (TQC-TQM) movement and Shewart and Deming's studies concerning the continuous improvement principle. The Plan-Do-Check-Act (PDCA) is the most important TQM approach for introducing Kaizen. In fact, the Japanese word Kaizen can be translated as change (*kai*) and good (*zen*), meaning change for the better, but with no reference to something continuous. When Imai (1986) made known the term, interest in the TQM movement was at its peak and the influence of Deming and Juran's thoughts is apparent in Imai's book. According to Singh and Singh (2009, p. 52), Imai put under the theoretical Kaizen umbrella many techniques belonging to TQM or Lean-TPS such as customer satisfaction, Kanban, TPM, Six Sigma, automation, JIT, suggestion system and productivity improvement. In this way, Kaizen is seen as a philosophy which embraces both TQM and Lean-TPS. To the same results, came Suárez-Barraza *et al.* (2011). However, the authors, even if they claimed relationships with both TQM and Lean-TPS, indicated that Kaizen is displayed under three different umbrellas, which include a different series of principles, tools, and techniques.

Toyota moved forward introducing in 2001 its new Toyota Way (Toyota Global Site, 2017) which can be considered an evolution of TPS but not a substitution. According to the Toyota Global Site (2017), Toyota's principles before were implicit and now they represent values and conduct guidelines that all Toyota's employees should embrace all around the world. According to Table I, the two key principles of the Toyota Way 2001 are continuous improvement and respect for people, supported by other principles: challenge, Kaizen, *Genchi Genbutsu* and respect and teamwork. Challenge is strictly linked with a long-term vision rather than a short-term profit, while Kaizen is a way of improving business operations

continuously, always driving from innovation and education. However, the practical spirit of the Toyota Kaizen principle still remains in the Toyota Way 2001 and once again there is no definition and guide to it. Toyota's Chairman Fujio Cho declared that he was aware of different interpretations outside Toyota of the Kaizen principle (Suárez-Barraza *et al.*, 2011); however, he was just interested in spreading worldwide the Toyota Kaizen principle to Toyota people. According to the Toyota website (Toyota Global Site, 2017).

"Kaizen is the essence of continuous improvement. It is a way of thinking which encourages and empowers everyone to identify where and how even small changes can be made to benefit the business, their team or their individual performance." The precise reference to continuous improvement and not just an improvement implies that Toyota's Kaizen is now affected by some TQM principles such as the PDCA approach.

Another Toyota principle linked to continuous improvement is the *Genchi Genbutsu* which can be translated as actual place, actual thing and going to the source or go to see. It is considered similar to the *go to Genba* principles introduced by Ohno (Wakamatsu, 2007). There are some similarities with the TQM PDCA and Plan-Do-Study-Act approaches, where in the Do-phase people are supposed to go and see for themselves what is needed (Sokovic *et al.*, 2010). The *Genba* is the shop floor or the real place where things happen and where we can really understand how problems arise and what their causes are (Liker, 2004). People have to check the facts themselves, so they can be sure they have the right information for making the right decision.

Lastly, the Toyota Way 2001 emphasizes respect for people, which is divided into respect and teamwork. Whereas teamwork can be correlated with the original teamwork fostered by Ohno (1988), respect for people is new and related to a broader vision. According to Toyota (Toyota Global Site, 2017), respect is at the base of relationships with colleagues and with others. It is important that everyone is respected both for what they contribute and for who they are, which includes everyone's ideas and cultural and personal beliefs. According to Toyota (Toyota Global Site, 2017): "through respect we accept personal responsibility for what we do and build mutual trust and understanding with those around us."

Zen Buddhism in Japanese society

It can be said that Japanese society has been affected over the centuries by three important philosophical/religious movements: Shintoism, Confucianism and Zen Buddhism. The latter, according to Roosevelt Malloch (2014), contains the main principles that generate the foundation of Zen philosophy and the Japanese TPS as we know it. Zen Buddhism was introduced in Japan by two Buddhist monks named Eisai and Dogen (Morton, 2004) during the Kamakura period from 1185 to 1333.

The term Zen seems to be rooted in the Chinese and Indian languages and it refers to the meditation process (Morton, 2004). The Japanese Zen Buddhism is based on a rigorous self-control, *zazen* meditation (sitting meditation) and the personal reflection of this process in daily life, especially for the benefit of others and the context in which we live. In fact, the term Zen in Japanese is often interpreted and translated in English as good or better and does not exactly mean meditation.

Zen Buddhism spread across Japan until it directly influenced the imperial family. At the end of the eighteenth century, Zen Buddhism was the second religion in Japan; it was followed by all social classes and affected, in particular, workers, farmers and artisans (Mascherpa, 2014).

Since the beginning, diligence and practical spirit have been among the relevant characteristics of Japanese Zen Buddhism. A Zen monk would be devoted to meditation as well as running the monastery, but with the difference that this hard work was not required by the monastery community but considered a fundamental practice of the religious movement. The figure of Buddha as the hard worker represents the central

figure of the Japanese *Soto Zen* tradition (Dumoulin, 2005) as well as the Buddha's truth of seeing reality unfiltered as it actually exists and seeking the mindful discipline to improve oneself constantly and over time (Braguzzi, 2015). Undoubtedly other aspects of Japanese society also created a natural environment for the growth of TPS as well as TQC-TQM. For example, the fact that the Japanese tradition of craftsmanship pays attention to detail, as in the practices of bonsai miniaturization, Ikebana and the Chanoyu Tea Ceremony, could have made Japanese workers more receptive to Ohno's principles about reduction of waste and high-quality products. Likewise, because a large number of Japanese people lived in a relatively small area, they may have had a better cultural predisposition for teamworking than other countries, indicating that some changes in the Lean-TPS implementation might be needed. Lastly, there is a certain influence of Confucianism religion as well as the linked Bushido Samurai code (Baccarani *et al.*, 2013).

Methodology

The comparison of principles from the Lean-TPS, the Toyota Way 2001 and Kaizen with Japanese Zen Buddhism is mainly based on a content analysis methodology (Carley, 1992). There are different types of content analysis; we chose the relation analysis which is based on an exam of the relationships among concepts in a text. The text comes from the previous literature review along with other related papers on the subjects. For relational analysis, it is important to first decide the kinds of concepts to be explored in the analysis. For instance, we decided to analyze the principles contained in Table I. In this way, the second stage is simpler and more reliable for the content analysis where the researcher has to code concepts from the text. In fact, concepts already belong to the TPS and Toyota Way 2001 models and they can lead into coding the similarities with the other papers. According to Carley (1992), generalization of the conclusions is very dependent on how the researcher determines such concepts avoiding subjective interpretations.

Relationships between Lean-TPS, Kaizen and Zen philosophy

Ishikawa (1982) and Imai (1986) stated that Buddhism was one of the main factors that affected Kaizen principles in Japan. In this light, Zen Buddhism can be seen to be more like a practical religion or movement instead of a theoretical and abstract philosophy. According to Herrigel (1989), the only way to understand Zen is to practice and directly observe the phenomenon rather than following a path of explanation and reasoning.

In this very pragmatic introductive cultural scenario we can find a first parallel with a first important Lean-TPS principle, the *Genchi Genbutsu* (go to source). *Genba*, *Genbutsu and Genjitsu* mean actual place, actual thing and actual situation, and they represent the so-called 3G approach (Hartley, 1992). The *Genchi Genbutsu* approach has allowed people within Japanese factories to gain a much deeper understanding of everyday events and the root causes of problems. *Genba* is not only the shop floor, it is the place where things happen and people must go to the shop floor in order to observe and understand. *Genbutsu* refers to the facts and to the direct verification at the source, of numbers and things on the shop floor. Taiichi Ohno, the father of TPS, used to teach to Toyota's employees that "you have to see through numbers and only the shop floor can validate them" (Wakamatsu, 2007, p. 128). When data and information are gathered from managers, analyzed and then reformulated for the shop floor, managers can intentionally or unintentionally twist data and situations. According to Wakamatsu (2009, p. 129):

> […] if management staff did not fully comprehend the shop-floor or lack the interest in analyzing the real problems, it would be inevitable that a certain degree of their lies and biases would be fabricated into their reports.

In a similar way, one of the greatest fathers of the TQM-TQC movement, Deming, used to say that: "every theory is correct in its own world, but the problem is that the theory may not make contact with this world" (Deming, 1993). In Soto Zen, similar concepts can be found in the so-called *Hishiryo consciousness* or non-thinking (Deguchi *et al.*, 2013). This is the state of mind in which managers should go to *Genba* and start thinking; they should renounce whatever kind of scheme or logic category they have in mind. According to the Soto Zen master Dogen (2010):

> Do not think "good" or "bad." Do not judge true or false. Give up the operation of mind, intellect, and consciousness; stop measuring with thoughts, ideas, and views. Have no designs on becoming a Buddha. How could it be limited to sitting or lying down.

Similarly, from Dogen's writings emerges the principle of *Genjo Koan* or the complete manifestation of the established truth (Fujita, 2017). According to Dogen, the place where this happens is no other than everyday monastic activities.

According to Table I, another fundamental and well-known principle of TPS is JIT. JIT can be explained simply as producing only the necessary products, at the necessary time, in the necessary quantity (Shah and Ward, 2007). When a production system is based on data from the past and an uncertain future, the factory could produce large amounts of waste such as big lots size and a huge quantity of inventory. This was experienced by Toyota in the 1950s; it nearly went bankrupt because of a terrible mistake and an excess of inventory. This is reason why, according to Ohno (Wakamatsu, 2009), overproduction is a crime and do not plan with numbers from the past otherwise the same wastes will be inherited. In this way, JIT can be thought of not just as a way for organizing the production system but first of all as a way of thinking about time and how to act in the very moment when you receive a customer order. This continuous focus on the present moment instead of the past and the future is also inherited from Soto Zen Buddhism. According to Deshimaru (1982), the Japanese Soto Zen Buddhist master who spread Zen Buddhism over Europe, the present is the time where things happen and can be understood as well as can be changed while understood. And similarly, from the words of the Indian Zen guru Osho (2001, p. 168) who taught Zen also in Japan:

> Zen lives in the present. The Whole teaching is: how to be in the present; how to get out of the past which is no more and how not to get involved in the future which is not yet, and just to be rooted, centered, in that which is.

With this reasoning, inventories belong to the past because they are linked to previous decisions and at the same time they represent the future because they will affect management of the production system and the approach to market. On the other hand, JIT and pull system require alignment with the present, responding in real time to customers and managing the takt-time or rhythm of the orders. JIT renounces inventories as rooted in the past.

Connected with the JIT principle, according to Table I, in TPS there is the waste recognition and elimination principle. Three kinds of waste can misalign a company from JIT: *muda* (wastes), *mura* (unevenness) and *muri* (overburden). The Japanese way of considering waste is not merely from an economic point of view; in TPS, first of all, people have to be aware of the waste and give value to it. This is the reason why Taiichi Ohno, seeing some small and apparently worthless washer on the shop floor used to say to his workers (Wakamatsu, 2009, p. 8):

> […] what would you do if it was money? I am sure you would pick them up before anyone else. Imagine how much money you could gather up at the end.

The English philosopher Alan Wilson Watts, who deeply analyzed and studied Zen Buddhism, in his book *The Spirit of Zen* (Watts, 1936) reported a conversation between a master and a monk which leads to the same principle of being aware of waste:

> Do not spread any grain of rice, as they come from our good benefactors. No master I will not do it. However, the master saw a grain on the floor and picked it up saying: do not underestimate this only small grain because from it thousands can grow.

From both cases it can be learned that what is worth attention is not the value of the single item, but rather discovering the principle of value in general. In this light, we can explain the attention paid to each Zen art, such as martial arts, Ikebana Tea Ceremony and Japanese calligraphy, as well as the attention paid to zero wastes and zero defects principles in Lean-TPS. The principle of zero defects is also related with the TQM movement and TQC-TQM (Majstorovic and Sibalija, 2015).

Connected with being aware of waste and its consequences, in both Zen Buddhism and in Lean-TPS, is the principle of respect given to people and their contributions and their self-responsibility. In Buddhism, the future is open-ended and only we can affect and be responsible for it. Buddhism intensifies the sense of respect for people, the self-responsibility of a person for his or her own conduct (Teo, 1973) as well as discipline and perseverance in their daily life. Similarly, in TPS, the necessity of self-responsibility is brought about by *Jidoka* or autonomation.

An operator is responsible for a process and if a problem arises he or she is self-responsible for stopping the process without asking a long chain of command for approval (Liker, 2004). However, the stoppage of the process does not solve the problem; therefore, workers have to work together to try to find the root cause and remove it. As show in Table I, these principles belong to what has been named Toyota Way 2001, in particular, the respect for people principle. Taiichi Ohno believed in people's talent and respected their contributions and he used to say to his managers (Wakamatsu, 2009, p. 109):

> […] humans are extraordinary beings. There is no limit to humans' intelligence. Our responsibility is to inspire people to use their intelligence to generate new ideas. That is why I always put them on the spot.

In the same way, Imai (1986, p. 40) affirmed that Kaizen is a means of continuing improvement in personal and social life. Imai believed in people's inherent desire for quality and Kaizen and for Suárez-Barraza *et al.* (2013) this personal attitude should be referred to as a personal Kaizen approach. According to Imai (1986), in any case management has to understand that this attitude is going to be repaid in the long run. Furthermore, Imai considered that the respect for people principle is based on teamwork; similarly, Ohno (1988) affirmed, we do not have to create isolated islands, while Berger (1997) and Suárez-Barraza *et al.* (2011), considered teamwork as fundamental for creating a whatever Kaizen environment. Zen Buddhism has a specific practice called *zazenkai* or meditation in group where disciples are encouraged to come together in quick meetings, sometimes without the master, to improve their art of meditation (Fujita, 2017).

In view of this we can find another parallelism between managers and Zen masters. According to Ohno (1988), the good manager is able to bring to light this intelligence from people and foster it. If people in a factory do not produce any interesting ideas, it probably is not the people's fault but the manager's. Similarly, according to Watts (1936), the good Zen master has to lead the disciple to be aware of his or her "Buddha's nature," because the only difference between a Buddha and an ordinary person is that the latter does not know of being a Buddha yet.

Lastly, we can find several similarities between Kaizen and the real essence of Zen Buddhism. Kaizen, which has been often associated with the TQM continuous improvement principle (Chiarini, 2011), can be considered one of the cornerstones of both Lean-TPS and TQM and even other derived management systems like ISO 9001 certification

(Chiarini, 2017). In western organizations, Kaizen has been frequently considered a goal to achieve, in particular, in terms of continuous improvement of company performances, including economic and financial ones. Typically, all of a company's efforts are applied to improving the bottom-line at the end of a certain period and managers focus only on figures and indicators. However, Table I indicates that the Toyota principle of continuous improvement contains the challenge of the long term and Kaizen itself. The latter, according to Imai (1986), is not some measurable goal to achieve, but it is a way that is intimate with every day's work. Therefore, Kaizen can be considered to be a day-by-day effort with an end in itself and is not focused on reaching a precise goal. In Zen Buddhism we can find similar teachings in particular in the so-called *Mushotoku*, which is the attitude of non-profit, of not wanting to gain anything for ourselves (Deshimaru, 1991). This is also connected with *kyudo,* the ancient art of archery, where the master teaches disciples to ignore the target and master the process (Herrigel, 1989). In fact, the main principle of the art is to do the process correctly and ignore the target. In other words, the focus is entirely on the holding and drawing of the bow, step by step, continuously improving all of them, because it is only the correctness of the process and not the aim that allows the arrow to hit the target. This important principle can be found also in the Japanese martial arts or *Do*, that literally can be translated as the way. The way is a philosophy or system of thought applied to martial arts such as *Aikido*, *Judo*, *Karatedo or Karate*, and this system of thought is often misinterpreted in western society as a technique more than a philosophy; something only useful for reaching a target. In this light, Gapp *et al.* (2008) compared the implementation of the TPS 5S tool, both in Japan and in the USA, concluding that probably in western companies only a balanced understanding of 5S as a philosophy or way and a technique could help in its implementation. More generally, this can be easily compared with the approach of identification and removal of all the wastes within a process.

Similarly, Imai (1986, p. 165), in his book dedicated to Kaizen, concluded that "If you take care of the quality, the profits will look after themselves," while Deming (1993, p. 63), back from Japan, used to teach to American managers that: "we should work on our process, not the outcome of our processes." Deming also warned American managers not to be too focused on profits in the short term but rather on the long-term challenge of introducing continuous improvement. However, it has to be said that nowadays, in certain sectors were product and process innovation are at their maximum speed, it is difficult to reason in terms of fixed targets and long-term challenges. In these particular sectors the rapid innovation is pushing companies into considering the moving target as the real quality to be achieved.

Table II recaps the main Lean-TPS principles analyzed in the previous section compared with the main Zen principles and concepts that emerged from the literature review described in this section.

Lean-TPS principle	Zen philosophy principles
Autonomation/*Jidoka*	Innate sense of self-responsibility in the person and his or her conduct
Just-in-time	The present is the time when things happen. Zen lives in the present
Waste recognition and elimination	Focus on the perfection of the process rather than the outcome. The *Do* or way
Challenge	*Mushotoku*: attitude of not wanting to gain anything for ourselves
Kaizen	*Zen and zazen*: meditation and change for good or for the better
Genchi Genbutsu	*Hishiryo consciousness*: renouncing whatever kind of scheme and logic category we have in mind and go to the source
	Genjo Koan. The complete manifestation of the established truth
Respect for people	Innate sense of respect for people
Teamwork	*Zazenkai*: meditation in group

Table II.
Main similarities and relationships between Lean-TPS and Zen philosophy

Conclusions, lessons learnt and avenues for further research

In the first section, we reported that in western society there are many cases of Lean-TPS implementation failure that have been debated in the literature. Sometimes, the replication of Lean-TPS tools and principles do not work in the west as they do in Toyota or other Japanese companies. Why? What went wrong with the implementations in these western industries? Did they fail to apply the tools and techniques in the right way? Did they omit something or was their effort weak? And why are there also demonstrated cases of real success?

The results of this comparison between TPS and the Toyota Way 2001 and Zen philosophy, in particular derived from the Japanese Zen Buddhism, could even lead someone to believe that it is a matter of a different society, culture and religion. However, we do not have to become more Japanese or more Buddhist to succeed in Lean-TPS implementation. We have our own culture, society and religions and we cannot get rid of our heritage. To implement Lean-TPS we do not have to either copy a system of tools and techniques or a different culture as a whole. We just have to change our point of view or, better, what is called a frame of mind in managing company processes. We could call it Lean-TPS philosophy and try to adapt our daily work to it. Therefore, causes might be something entirely different from culture, more related to a certain management style. To give a simple example from a completely different subject, let us suppose for a moment we read an article about the high life expectancy in Japan and their typical food. We could conclude from the article that we have to dramatically change our diet and mainly eat *sushi* and *sashimi*. However, we might not like such dishes and completely reject such a diet. But letting alone the Japanese cultural aspects, we could focus on the frame of mind behind this; fish and rice are good for your health because they are not fatty. In this way, we could create our own fish and rice dishes without forcing ourselves to eat raw fish. Taking a broader view, we can see that changing our management style is much easier and possible than changing our culture. Other authors (Imai, 1986; Kobayashi *et al.*, 2008) came to similar conclusions analyzing the Lean-TPS and TQM as a whole and from the point of view of the single tools and techniques.

Moving on from this metaphor, practitioners can learn several lessons from the results of this literature review. First, management has to take on the challenge of long-term performance, in particular in terms of waste reduction, zero defects and customer satisfaction. During the 1980s and before the so-called Lehman Brothers' crisis many western managers were focused on quarter results, but we all know how it ended up. Managers and workers together have to follow the practical principle of going more often to the shop floor to try to find out the source of problems rather than looking at periodical reports. To succeed in this, the company as a whole needs an orientation to the present in terms of alignment with the takt-time and customer requirements, avoiding future forecasts based on past situations, especially when we come to inventory. The foundations of this new approach are respect for people and teamworking activities. The single worker and the team have to be encouraged to solve problems with no fear of potentially stopping the line or the machine. Borrowing some principles from Zen philosophy and the art of archery, managers and workers have to continually take care and improve all the processes rather than pursue mere targets; because, according to the Kaizen thinker Imai, if we take care of the process the profits will look after themselves.

The results of this research also open some important avenues for further research. In particular, scholars should try to find a way to implement such principles. Can we depict a complete and more structured theoretical model? What kind of management style does a Lean-TPS company need? Can we exactly identify all the management characteristics? And what about strategic management and deployment for Lean-TPS? We learnt that it has to be less focused on long-term objectives and more on the processes. How could we better combine strategies and a correct deployment? Moreover, how can we raise the awareness of

the staff of principles like teamworking and personal contribution. Lastly, it could be interesting to investigate whether, in some way, there is a sort of Western approach for implementing Lean-TPS based on the same tools and techniques but with different principles more pertinent to our culture.

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