CARGO CULT LEAN

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Abstract

Competition grows very fast and companies need to adopt new extraneous concepts, tools and techniques, which are usually required by top management of company or members of a supply chain. Despite all efforts to adopt lean or Toyota production system the results are often only minimal or negative. The author of this paper tries to find parallels between cargo cult (anthropological phenomenon) and practices of unsuccessful adoption of lean in companies. Cargo cult term is used to describe various South Pacific social movements or religious practice. It is a result of interaction between pre-industrial tribal societies with technologically advanced cultures. Cargo cult members build primitive airfields, fake airplanes, landing trips, storage facilities, radio equipment, watch or control towers and many others associated paraphernalia with hope that airplanes full of the cargo will arrive soon. They only imitate the external manifestation of deeper principles which are hidden in background. Cargo cult is a good metaphor for inability to recognize the cause and effect in companies.

This situation can be observed in many companies which claim that they have implemented lean or Toyota production system. But it is usually only some purely formal matter with lot of paper work but without any practical effect. Employees realized several "rituals" without understanding the purpose. The managers' eyes "search the sky, but they are destined to be disappointed, because no planes will land". The author claims that the only way how to avoid cultivating cargo cult in company is to understand the importance and role of organizational learning in decision making and problem solving. Knowledge of employees should be the most important resource of company.

Key words: cargo cult, lean, organization learning, knowledge creation.

Classification JEL: M12 Personnel Management, M11 Production Management

1   Introduction

We are witness of the world economic transformation. Customers' needs are raised. They demand quality products at low prices, personal approach, customization etc. Products are increasingly more complex and sophisticated. It causes en enormous increase the complexity. Global markets are becoming more opened and it reflects in competition growth. European and American companies must handle with low prices and continuously quality improvement of Asian competitors. According to Hult *(Hult, 2007),* a character of competition is changing because of strategic importance of supply chain for each its element. So rivalry is becoming less about "company vs. company" and more about "supply chain vs. supply chain".

If company wants survive it needs to adopt extraneous concepts, tools and techniques. Many authors agree with opinion that this situation requires change in the way of thinking; it needs to aim at learning, knowledge creation and a holistic view of company.

Motivation for writing this paper was to find and describes parallels between anthropological phenomenon cargo cult and experiences of companies from West, which try to adopt lean or Toyota production system. The effect of adoption, that requires radical organizational changes, is usually only minimal or often negative. It is common that company after several years of bad experience with "lean practice" decides to come back to previous practices. It implies several questions. The most important is about the main causes. I think that cargo cult can be a suitable metaphor to explain one of the main reasons - the problems with organizational learning. I think that studying the cargo cult phenomenon can be a good "laboratory" or metaphor for several phenomena in companies. Studying cargo cult can help us better understand the ability of humans to understand the reality and recognize the *cause and effect.*

2   Cargo cult

They believe that planes come from paradise - their ancestors sent them. But the white man, a crafty pirate, manages to get his hands on them by attracting them into a big trap of an airport. You build your plane too, and wait with faith. Sooner of later, your ancestors will discover the white man's trap and will guide the planes on your landing strip. Then you will be rich and happy.

\- Narration from the film Mondo Cane, 1962

Cargo cult as an anthropological concept is known since 1945 and it is used to describe various South Pacific social movements or religious practices. Some authors say that this phenomenon can be observed also in other parts of world, where it has appeared in many traditional pre-industrial tribal societies as a result of interaction with technologically advanced culture. The cults focus on obtaining the material wealth (the cargo) of the advanced culture and it is realized through realizing various magic or religious ritual and practices. These rituals and practices was sometimes traditional and sometimes innovative, bud the purpose was the same – obtain cargo.

The term of cargo (or "kago" in Melanesian Pidgin English) is rich in meaning and it can be divided into following categories:
a) physical cargo (money, vehicles, food, guns, tools etc.),
b) metaphorical cargo – new moral order to withdrawal of colonial rulers.

Regardless the type of cargo the cult members expected miraculous transformation in their lives. They believe that it was intended for them by their deities and ancestors.

Cargo cult activity in Melanesia increased significantly in 1940's and 1950's because of World War II, when several small islands became strategically important for Japanese or American army. The indigenous population (with very primitive technology; like in Stone Age) was confronted with technologically advanced culture. These army forces have been bringing large amounts of materials by plains or ships. But when the war ended these temporary military bases were closed and soldiers leaved the islands. The local shamans with their followers engaged in ritualistic practices to attract further deliveries of goods. These practices were to be encouraged varied between different cults in different islands but the ritual usually involved the preparation and construction of variety of structures and facilities. We can find several examples: primitive airfields, fake airplanes, landing trips, storage facilities, radio equipment, watch or control towers and many others associated paraphernalia. The cargo cult members often wear cloths very similar to army uniforms with primitive insignia and behave as the military personnel. We can find photos in the internet of cargo cult members which do drill team marching with bamboo rifles with flags that are similar to US flag. The cult members are expecting during these ceremonies that the airplane full of the cargo will arrive soon. Their eyes search the sky, but they are destined to be disappointed, because no planes will land. According to anthropologist Kirk Huffman *(Raffaele, 2006),* who spent 17 years in Vanuatu, they do not know from where the cargo come and therefore they believe the cargo were summoned by magic. The cargo is from their point of view sent from the spirit world. They prayed to this spirit for shipping the cargo.

Cargo cult members reasoned that *if they could build exact replicas of the white man's artifacts, they would receive the same benefits.* McConnell *(2000)* states that "performing of imitative rituals *without an understanding of the underlying cause and effect* is what gives the cargo cult its metaphorical power".

Figure 1: Cargo cult members are waiting for cargo on primitive airfield near fake airplane (New Guinea)
Source: Adapted from Walker, 2011

The concept of cargo cult has been a source of fascination for many years and has often been used as a metaphor *(Holmquist, 2005).* The most well-known example is by physicist Richard Feynman *(Feynman, 1997)* who introduced the concept of *Cargo cult science*[1] in Caltech commencement address in 1974. Another famous term is Cargo cult programming which describes the using elements of code because of successful utilization elsewhere unnecessary for the task at hand. In context of this article it is used as a metaphor for organization learning problem during lean implementation.

3   Lean

Lean can be defined as an approach to operations management that emphasizes the continual elimination of waste of all types. According to Taiicho Ohno (former Toyota executive), who is considered to be the father of the Toyota Production System, defines 7 types of waste (japan: muda[2]) and a few additional types:

1. *Defective good*s.
2. *Overproduction* of things not demanded by actual customers.
3. *Inventories* awaiting further processing or consumption.
4. Unecessary *over-processing* (for example relying on inspections rather than designing the process to eliminate problems).
5. Unnecessary *motion* of employees.
6. Unnecessary motion – *transport* and *handling* of goods.
7. *Waiting* for an upstream process to deliver (machine to finish processing, supporting function to be completed, for an interrupted worker to get back to work etc.).
8. *Confusion* – missing or misinformation (confusing goals and metrics).
9. *Unsafe* or no-ergonomic work conditions.
10. *Underutilized human potential* (skills, knowledge, talents, and creativity).

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[1] Feynman used the term to describe a certain type of scientific dishonesty – fooling other scientists or the general public by presenting research results as "fact" even though they are not proven correctly. A typical example is "pseudo-science" (e.g. mind reading), but could also be a scientific experiment where the researcher fails to include previous work that invalidates the outcome. He advised scientists to follow two principles: (i.) do not fool yourself; (ii.) and do not fool the layman (Holmquist, 2005). In another words cargo cult science describes science that is similar to real science but lacked a basis in honest experimentation and reasoning.

[2] Muda is a waste; Mura represents unevenness, overburden and strain; Muri is term for demand that exceeds process and equipment capacities.

It must be mentioned that these types of waste are not the direct target for continuous improvement, but the symptoms. So it is necessary to identify and eliminate the root causes.

Lean is often used interchangeably with just-in-time. There are several opinions about relation between these two terms. For purpose of this paper Lean is considered as an overall philosophy whereas just-in-time is used to indicate an approach to planning and control that adopts lean principles. The goal of lean is to develop an operation that is faster, more dependable, produces higher quality products and services and, above all, operates at low cost *(Slack, Chambers, Johnston 2004).* To achieve these mentioned goals in concrete company it *requires deeper understanding the basic principles*, which are sometimes counterintuitive.

Leading practitioner of the lean approach is the Toyota Motor Company. This company has progressively brought its manufacturing processes closer to its customers and its suppliers. The development of Toyota and its Toyota Production System was encouraged by the national cultural[3] and economic circumstances. The Japanese effort to eliminate waste is an effect of character of country – naturally resource-less; it is a famous Japanese proverb: "make every gain of rice count". Lean can be considered as a 'total' system what means that its aims to provide guidelines which try to embrace everyone and every process in the organization. Organizational culture play key role in these initiatives, because it provides support for these objectives through an emphasis on involving all of the company's staff. It is often called as respect-to-humans system[4], because it encourages (and often requires) team-based problem-solving, job-enrichment, job rotation and multi-skilling *(Slack, Chambers, Johnston, 2004, pp. 256).* These activities require high degree of personal responsibility, engagement and 'ownership' of the job.

Lean approach can be viewed as a philosophy with a collection of several just-in-time tools and techniques, which are utilized to eliminate waste. Basic working practice is difficult to achieve all of them in a same time. We must deal with several trade-offs. Basic working practices are *(Slack, Chambers, Johnston 2004, pp. 527):*

1. *Discipline* – work standards must be followed by everyone all the time.
2. *Fexibility* – it should be possible to expand responsibilities to the extend people's capabilities, and barriers to flexibility should be removed.
3. *Equality* – unfair and divisive personnel policies should be discarded.
4. *Atonomy* – delegating responsibilities and competence to people (examples: ability to stop process in the event of problem, scheduling work and material arrivals, problem solving, data analysis etc.).
5. *Development of personnel*.
6. *Quality of working life* (examples: involving decision making, security of employment, enjoyment).
7. *Creativity* – it is one pillar of motivation, opportunity to improve the processes.

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[3] It is determined by different historical development. Despite western point of view of reality which is based on categorization (based on similar attributes of entity), the eastern point of view is aimed at recognition of relations between entities and its environment. In other words it is more context oriented way. Because of purpose this article, it can be itemized these significant elements which influenced eastern way of thinking: Taoism, Zen Buddhism, Confucianism and Shintoism. This influence can be easy recognizing during reading of the literature from eastern authors (Ikujiro Nonaka, Shigeo Shingo, etc.). Even they have often built their models directly on Eastern classical philosophy. Good examples can be: SECI model and concept Ba which are similar to some Taoist "models", some elements of Toyota Production System (kaizen, hansei, horenso etc.). It is better understand these concepts, because they are only external manifestation of deeper principles.

[4] It must be mentioned also some critical commentary, because not all commentators see these people-management practices as entirely positive. Kamata and Dore (Kamata, Dore, 1983) write about 'the inhumanity and the unquestioning adherence' of working under such system. Similar criticisms has been voiced by some trades union representatives.

8. *Total people involvement* – effort to use more people's abilities to the benefit of the company as a whole.

As was mentioned before, Toyota Production System is a paradigm for Lean. The system consists from several partial systems, concepts, tools and techniques. But for purposes of briefly introduction it will be sufficient to describe "Toyota production system 'house'" shortly. The base is *stability*. Stability supports *heijunka*[5], *standardized work*[6] and *kaizen*[7]. These elements provide a basis for two pillars: (i.) *just-in-time* (continuous flow, takt time[8], pull system) and (ii.) *jidoka*[9]. These pillars support the 'roof', what is the goal: "Highest quality, lowest cost, shortest lead time".

4   Lean implementation problems

The most important parts of lean implementation are preparation, because it is usually one of the most frustrating and misunderstood issues. It deals with objective assessment, *learning of employees* and development of the business and technical cases for lean.

Adoption of lean principles requires principal changes in company which must be realized smoothly. Without these changes and especially understanding the principles behind the tools and techniques it is impossible to be successful. According to many lean advocates and professionals *(Kallage, 2005)* current lean implementation failures rates-well over 50% in North American companies. Managers and employees of company are usually without basic knowledge about lean and its philosophy and principles. So they become very easily "confused, and prone to fizzle at the first signs of difficulty," *(Kallage, 2006)*. Kallage adds that lean implementation becomes "Let's give it a try" instead of "We will do it, and here's why".

He claims that the failures usually fall into following categories: (i) did not meet expectations, (ii) too long to do, (iii) too expensive, (iv) risks or costs started to exceed benefits, (v) or too resource-intensive. The author seeks for the root causes of these failures and defines two necessary conditions for successful implementation: (i) *knowledge about lean*, (ii) stable processes and weak discipline[10]. He presents twelve common failures models which can be sorted into three following categories: (i) *top management leadership*, (ii) *people issues* and (iii) *development methods*. Top management leadership failures:

- Poor development of the business case for lean.
- *Missing* or *insufficient understanding* of lean six sigma and its elements.
- Insufficient top management focus and involvement.
- Communications: too little, too complex, too simple.
- Poor organizational and leadership development.
- Lack of proper metrics to determine performance and isolate challenges.

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[5]   *Heijunka* can be characterized as the overall leveling, in the production schedule, of the volume and variety of items produced in given time periods. Heijunka is a pre-requisite for Just-in-time delivery.

[6]   The Toyota Production System organizes all jobs around human motion and creates an efficient production sequence without any "Muda". Work organized in such a way is called standardized work. It consists of three elements: Takt-Time, Working Sequence, and Standard In-Process Stock. (web: Toyota Production System Terms).

[7]   Kaizen (en: change for the better) is a system of continuous improvement in which instances waste are eliminated one-by-one at minimal cost. For kaizen it is typical that it performed by all employees rather than by specialists.

[8]   Tact time is the time which should be taken to produce a component on one vehicle. It helps to keep production on schedule and permits flexible response to change in sales.

[9]   It refers to the ability to stop production lines, by man or machine, in the event of problems such as equipment malfunction, quality issues, or late work. Jidoka helps prevent the passing of defects, helps identify and correct problem areas using localization and isolation, and makes it possible to "build" quality at the production process (web: Toyota Production System Terms).

[10] Basic disciplines involving quality control, material handling, setups, and so forth, are in place.

People issues:
- Lack of middle-management buy/-in[11].
- Management or employee capabilities are lacking.
- Not everyone is a leader.

Deployment methods:
- Weak deployment strategy.
- Insufficient or inappropriate training.
- Failure to learn proper continuous improvement methodology-reliance on kaizen blitzes.
- Reliance on a single in-house champion or expert.

As we can see from the presented failures most of them occur before the deployment and a lot of them deal with learning. We can state that preparation is crucial phase – especially an objective assessment and development of the business and technical cases for lean. It also shows that lean implementation is not simple or easy in context of Western culture.

Situation is very similar also in our geographical region. Authors focused on lean or kaizen implementation in Slovak or Czech companies show that the results are usually only minimal *(Kosturiak et al., 2010, 2006).*

Fraunhofer IPA Slovakia[12] realized research about progress in utilization and adoption of Kaizen in Europe *(Kosturiak et al., 2010, pp. 4-7).* It was realized in 2000-2008 and use following methods:
- Process audit (realized directly in a particular company; duration of 2 days).
- Interviews with key employees (managers, specialists and other stuff members).
- Anonymous questionnaires.
- Benchmarking of continuous improvements systems in Japanese and European companies.

The sample consists from 58 small and medium enterprise companies (SMEs) and 65 large international companies. The results were:
- 68% of SMEs and 32% large companies do not have any system for problem management. All problems are usually categorized as "projects". The number of these projects usually grows rapidly and causes the stress and nonsystematic problem solving without identification the root cause.
- Workshops and projects for continuous improvement usually do not have appropriate support from management of company and have very spontaneously character. Only 23% of large companies and 3% of SMEs have integrated system of individual improvements, workshops and projects.
- Improvement systems are usually only some purely formal matter. These companies do not have the most important element – *the culture of an identification of problems causes, open communication*, confidence in problem solving. The managers of companies do not focus on improvement of *knowledge* and *skills* of their employees but focus only defend their managerial position.
- Continuous improvement is usually focused only on operations. The waste elimination in another function of organization is only secondary issue.

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[11] It is not only buy-in, but also pushback. Middle managers and professionals have usually a lot of collective responsibility, but not an equal amount of control and authority.

[12] Fraunhofer IPA Slovakia is an association of legal entities and individuals which was established in 2000 as a result of a long-year cooperation of Slovak consultants, designers and researchers from the Fraunhofer IPA Stuttgart (IPA Slovakia).

- Companies do not have any systematic approach for selecting the important problems. Employees are work overload, discouraged and have a lack of motivation.
- Continuous improvement systems in companies require a lot of additional paper works.

Following Table 1 shows differences between improvement in Japan and Europe.

Table 1. Improvement in Japan and Europe

Characteristics	Japanese top companies	European top companies
Number of improvements per employee (1 year)	46	1.2
Average saving per 1 improvement	7700 Euro	1000 Euro

Source: Adapted from Kosturiak, J. et al.: Kaizen – osvědčená praxe českých a slovenských podniků. Brno. Computer Press. 2010, p. 5

The mentioned research was focused also on performance of improvement system utilized by companies. The results are shown in following Table 2.

Table 2 Performance of improvement system (companies with more than 1000 employees)

Level of organization	Number of improvements per employee (1 year)	Number of employees involved in improvement (percent)	Total financial benefit per 1 year (thousand Eur)
Poor companies	0.1	5 - 10	50 - 150
Good companies	0.2 - 0.5	10 - 25	150 - 500
European class	0.5 - 1.5	25 - 40	500 - 1000
World class	1,5 -	35 -	1000 -

Source: Adapted from Kosturiak, J. et al.: Kaizen – osvědčená praxe českých a slovenských podniků. Brno. Computer Press. 2010, p. 5

"Cargo cult employees" build primitive "lean production", adopt shallow 5S, provide several ritual kaizen initiatives and organize fake meetings or *gemba*s "rituals" with vague idea about the correct purpose. They provide shallow debate using many "correct" foreign words or acronyms without understanding their correct meaning. Everything looks like perfect. "Cargo cult managers" play the drums and their eyes "search the sky, but they are destined to be disappointed, because no planes will land".

5   Organizational learning in response to cargo cult lean

Since the phrase "organizational learning" was first used 25 years ago in a book by Chris Argyris and Donald Schön, the thinking behind it has evolved. Companies have started to understand the importance of organizational learning and utilization of learning tools and techniques as a catalyst for building the competitive advantage. Peter Senge in his book The ifth discipline: The art and practice of the learning organization *(Senge, 1994)* presents following elements of the Learning organization:

1. System thinking – integrates the other 4 elements and helps them to realize its potential.
2. *Personal mastery* – fosters the personal motivation to continually learn how our actions affect our world.

3. *Mental models* – focus on the openness needed to unearth shortcomings in our present ways of seeing the world.
4. *Building shared vision* – fosters a commitment to the long term.
5. *Team learning* – develops the skills of groups of people to look for the larger picture beyond individual perspectives.

Systems thinking help to understand a complex system by contemplating the whole, not any individual part of pattern. Everything can be viewed as a system. Senge shows *(1994)* the importance of this holistic approach in decision making and problem solving. Without ability to see the whole pattern of change we tend to focus on snapshots of isolated parts of the system and wonder why our deepest problems never seem to get solved. System thinking is a conceptual framework which underlines worldview that is extremely intuitive. Senge supports these ideas with results of experiments with young children which show that they learn systems thinking very quickly.

The goal of *personal mastery* is to achieve a special level of proficiency. "People with a high level of personal mastery are able to consistently realize the results that matter most deeply to them – in effect, they approach their life as an artist would approach a work of art," *(Senge, 1994)*. It is possible because they become committed to their own lifelong learning. Personal mastery is based on continual clarification and deepening a personal vision, developing patience and an effort to see reality objectively. These ideas must be a part of company's culture.

Mental models can be defined as "deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action" (Senge, 1994). Many decisions in companies fail to get put into practice because they conflict with powerful, tacit mental models. First step in discipline of working with mental models is to start with turning the mirror inward; learning to unearth our internal pictures of the world. It is important to bring them to the surface and hold them rigorously to scrutiny. It requires the ability to carry on "learningsful" conversations, the will to make that thing open to the influence of others and the finding of balance between inquiry and advocacy.

Building *shared vision* involves the skills of unearthing shared "pictures of the future". It must foster genuine commitment and enrollment rather than compliance (Senge, 1994). It is not about dictating a vision, but about translating individual vision into shared vision. It is not a "cookbook", but a set of principles and guiding practices. It is an action.

Team learning enables not only producing extraordinary results but it is strong catalyst for growing of individual members. It is about ability to "think together"; it is about the Greeks *dia- logos* as a free-flowing of meaning through a group. It allows the group to discover insights not attainable individually (like patterns etc.).

All these mentioned disciplines can are a body of theory and techniques of learning organization and must be studied and mastered to be put into practice. To practice these disciplines it so be a lifelong learner and can be classified as "personal" disciplines.

Putting new ideas into practice is hard because it is necessary to integrate these new tools and not only simply apply them separately. They must be seen as a system. According to Aristotle, the whole is more than the sum of its parts. For example, shared vision without systems thinking ends with description of the ideal future but it is without understanding of forces which must be managed to achieve this vision. Another example: system thinking without building shared vision, mental models, team building and personal mastery does not bring expected results.

Senge *(1994)* presents several examples of successful implementation of learning organization concept to companies: Hanover Insurance, Herman Miller, Analog Devices, Apple, Ford, Pilaroid, Royal Dutch/Shell, and Trammell Crow.

6   Conclusion

Purpose of this article is to point out the still existing problems with a lean adoption in companies. Contribution of the article consists in using the cargo cult phenomenon as a metaphor for organizational learning issues. Companies are usually full of "cargo cult facilities", provide several "cargo cult rituals" but everything is without an effect. An enormous energy is wasted for useless "mystical" activities. This situation can be considered as a call for improve organizational learning, asking the question *"why",* it provides meaningful discussions and understand the importance of common sense. We have also learning organization concept disposal for these purposes.

Companies must understand the importance of employees' knowledge as a valuable source of innovations; build own integrated management system and a culture, because it creates competitive advantage.

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