

RELATIONS BETWEEN LEAN MANAGEMENT AND ORGANIZATIONAL STRUCTURES

Agnieszka Faron*

* Department of Management and Economics, University of Business, Wrocław, Poland,
Email: agnieszka.faron@handlowa.eu

Abstract Lean management is a method, the implementation of which brings many benefits and good results to companies. More and more firms decide to transform to become more lean – focusing on eliminating as much waste as it is possible, simultaneously bringing value to customers and motivation to workers. The article focus on examining, whether there is a relation between lean management and organizational structures in companies implementing that method. Additionally it is checked if there is any connection between the structures and company internationalization in those firms. At first, the article provides a brief description of lean management method, the history and main principles behind it. It is followed by a short presentation of some organizational types of structures, basing on the flexibility of these specific solutions. Next, on the ground of the literature, different views about the relations between organizational structures and lean are mentioned. Finally, the author presents some results of her own research conducted in the companies implementing lean management, assesses the types of structures and prospective changes depending on companies' internationalization and the time of lean implementation.

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1. INTRODUCTION

In this difficult world crisis, companies are looking for ways to produce more effective, diversified and better quality products, that will satisfy fast-changing customer needs. Lean management is one of the management methods that can help companies succeed and gain competitive edge. Unfortunately, implementing the method is a rather demanding process and many companies, either fail, or abandon it half way. One of the main reasons for these failures is incorrect approach to the implementation – companies choose some tools (e.g. 5S, SMED, kanban, TPM, standardization, etc.), managers implement them, inform people and expect enormous results. The results may come, but for a short period of time. A proper way of using lean management means changing the whole system and the organizational culture gradually. It also means adjusting the organizational structure to the changes. This article attempts to define whether implementation of lean management is interrelated with types of organizational structures.

2. LEAN MANAGEMENT – ORIGINS AND PRINCIPLES

The lean management method has its origin in Japan, specifically in the Toyota Production System. It took Toyota many years to develop the production system, which is now known all around the world and is a role model for many companies (not only in the automotive area), a system basing on elimination of waste and centered on people, the goals of which are: the highest quality, morale and safety, the lowest costs, the shortest throughput time (Liker 2005), (Ohno, 1988).

The system is based not only on the Japanese methods and visions, but also on the Ford's system to some extent, or other American and even European ideas (e.g. supermarket). As Fujimoto (1999) said, the TPS is neither totally original nor imitative, in fact it is a hybrid (Fujimoto 1999). Indeed, lean management based on the Toyota Production System is a metamodel, built on the basis of many methods, techniques, tools and practices, drawn from various other management methods. Nogalski and Walentynowicz (2007) enumerated lean implementation dimensions: 1) concentration on core activities, 2) TQC, 3) application of the concept of logistics management, 4) application of the concept of marketing management, 5) efficient use of personnel, 6) use of outsourcing, 7) kaizen and innovations, 8) permanent eliminations of waste, 9) human resource management, 10) organizational structures flexibility and flattening, 11) decentralized and efficient information system, 12) FMS (flexible manufacturing systems), 13) efficient use of time, 14) focusing all staff on total reduction of unnecessary costs, 15) high skills of managers (Nogalski & Walentynowicz, 2007).

Although the benefits from implementing lean management are unquestionable and Toyota willingly shares the knowledge about it, still the number of companies

achieving results close to that Japanese car producer is limited. There are a few reasons why companies still decide to produce in a mass way instead of turning into lean, or decide to quit the transformation in the middle of the process. Jackson and Jones (1996) mentioned some of the causes. For example the successful transformation requires time and assistance – only a long-term perspective thinking will encourage and convince to persevere until the new system is strongly in place. Next, the process of implementing lean requires many physical procedural changes, often accompanied by major upheavals in company structures and processes. (Jackson & Jones, 1996). It seems that a complex approach is the success factor while implementing lean management. Companies shouldn't treat the process only in terms of choosing some tools and techniques to be implemented (what Womack called a *tool age* that shouldn't be used any more (Womack, 2007), but rather as a long-lasting process, never-ending road of continuous improvement of all elements of the company. As a result all other elements of the organization should also be subjects to change, one of them is a proper organizational structure.

3. EXAMPLES OF TYPES OF ORGANIZATIONAL STRUCTURES

There are many types of organizational structures, some of them are more and some less popular in practice. All structures can be described in terms of their flexibility. Some of the types are described below.

In practice, many companies still use the functional structure, regardless of the fact that it is the least flexible type. This is a typical structure with many hierarchical levels and small span of control. The centralization and formalization levels are high. The tasks are repetitive and routine, the range is narrow, and this means high specialization. Divisional structure is also a less flexible type, but goes one step further than the functional one. Divisional structure is hierarchical, but more decentralized than the functional structure. It can be described as “centralization of control with decentralization of responsibilities“ (Nalepka & Kozina, 2007).

Matrix structure combines the advantages of the functional structure and subject division. The employees at medium and lower levels have greater power and the ability to make decisions – they work in teams. The matrix structure is more flexible than the previous one, the formalization, specialization and centralization levels are lower.

Team-based structure belongs definitely to the group of the flexible types; however, it doesn't resist the hierarchy. In practice employees are appointed to participate in a certain team, and after solving the task (making a project), they go back to their cells in the hierarchical structure. Each member has much bigger autonomy than in the previous types and the team manager (leader) is for support and coordination rather than control. The level of centralization and formalization are relatively low.

Hypertext structure is oriented towards creating knowledge and base on teams. Tasks are not routine, but complex, so the level of specialization is low. Centraliza-

tion will also be definitely lower than in the functional, divisional and matrix structures, also lower than in the team-based structure, because in hypertext the leader is chosen from among the members, his position doesn't stem from the place in a formal structure. Process structure is modern type and its source is the method of reengineering developed by M. Hammer and J. Champy (1996). It is a typical flat, decentralized solution, the middle levels of the organizational hierarchy are reduced. The members of the organization are working in teams. There is a changeover from hierarchy to equality and a reduction of managerial posts (Piotrowicz, 2003). The level of formalization and specialization are very low.

4. ORGANIZATIONAL STRUCTURES IN LEAN MANAGEMENT COMPANIES – LITERATURE REVIEW

The organizational structure plays an important role in implementing lean management. According to Lisiński and Ostrowski (2006), it describes, formalizes and strengthens the relationships between the various processes and units, pursuing them. At the same time the structure provides the coordination of activities among all contractors, which is necessary to create a smooth flow and value stream (Lisiński & Ostrowski, 2006, p. 228). This reflects the fact that structures in transformed companies should be perceived as one of the success factors of transformation. In other words, it also should be a subject of changes.

In majority of publications on lean management area, their authors almost unanimously claim that lean goes together with flexible organizational structures. There is no a consensus how to define a flexible organizational solutions, depending on the author's point of view there are different opinions. Particularly two approaches are visible. First focus on understanding flexible structure in the context of their adaptability to all changes in the environment (e.g. Kieżun, (1997), Goold and Campbell (2003). The second is concentrating on their changeability (e.g. Hopej (2004), Rutka (2001), Stabryła (1991)) – what can be seen in “changing the personnel and their tasks, according to the situation, without the necessity of making permanent changes in the frames of the organization” (Rutka, 2001, p. 122). Usually lean organizations' structures are connected with some specific characteristics, related to the flexibility.

Many authors mentioned flexibility, as a main structures characteristic in lean companies (e.g. Holbeche (1998)). Such a flat hierarchy allows managers to be closer to the shop floor and shortens feedback time, which results in improving information flow, clarity and speeds up decision making (Drew, McCallum & Roggenhofer, 2004, p. 52). Bogdanienko (2005) wrote that lean management is based on decentralization of responsibility and competence, in relation to the decentralization of information and self-control, organization of small organizational units, and the continuous improvement of the organization – this means that elaborated hierarchy, high formalization and centralization are replaced with a flat, flex-

ible organizational structure (Bogdanienko, 2005, p. 67). Foltyn (2007) stressed the importance of the organizational structure for the lean managements operations' and clearly stated that all activities must promote the right organizational structure – lean, decentralized, based on autonomous teams, enabling effective implementation of the processes (Foltyn, 2007, p. 191). Similarly Hopej (2004), while pointing to innovative structural solutions in lean management, indicated poorly developed hierarchy, team spirit and greater easiness of the members of an organization (Hopej, 2004, p. 36). Many authors stated that an obvious sign of structure flexibility are teams. Such cross-functional and cross-hierarchical teams have a bigger possibility to successfully investigate customers needs (Barlow, Parry & Faulkner, 2005). Liker and Hoseus, while describing a culture of Toyota, outlined that its structure, relatively flat, bases on teams, the members of which are empowered (Liker & Hoseus, 2008).

All mentioned characteristics of lean structures, which are a sign of their flexibility, are similar to organic structure characteristics. Organic structure (according to the Burns and Stalker paradigm) works in a fast changing, complex environment, mostly because of its low level of centralization and power structure changing together with tasks, horizontal interactions and communications, permissions and responsibilities adequate to the on-going tasks, advantage of directs and informal contacts over formal and bureaucratic rules, informing and advising rather than commanding, low level of specialization, etc. (Burns & Stalker (1961), Hopej (1994), Bielski (1997)). But, as noticed by Hopej (2004), organizational structures of the companies implementing lean, are not as innovative as the organic structure. The main differences are: 1) hierarchy of structural solutions in lean management includes more levels and managerial positions than the organic structure, 2) the degree of formalization and standardization is higher than in the organic structure, 3) there is no organizational slack in it, 4) internal boundaries are more stable then in organic structures (Hopej, 2004, p. 36). The differences are especially visible on the example of Toyota, which has flexible structure, adjusted to the lean system, but simultaneously, some of its characteristics remind more mechanistic organization then the organic one (like formalization; more in Liker (2005)). It means that organizational structures in the case of lean management should be flexible, but are not the same as organic, albeit on the continuum mechanistic – organic, close to organic.

5. LEAN MANAGEMENT AND ORGANIZATIONAL STRUCTURES – OVERVIEW OF RESEARCH RESULTS

5.1. The characteristic of the research sample

The research was conducted in 2008 among companies that declared having already been taking some actions towards lean management (the research was based

on a questionnaire). The research sample was represented by 73 organizations, differentiated due to the size, industry and internationalization.

In the research sample there were only companies employing more than 50 employees, declaring to be medium or large size (about 75% of them become to the group of large companies, employing more than 250 people). They were representing different industries (Fig.1).

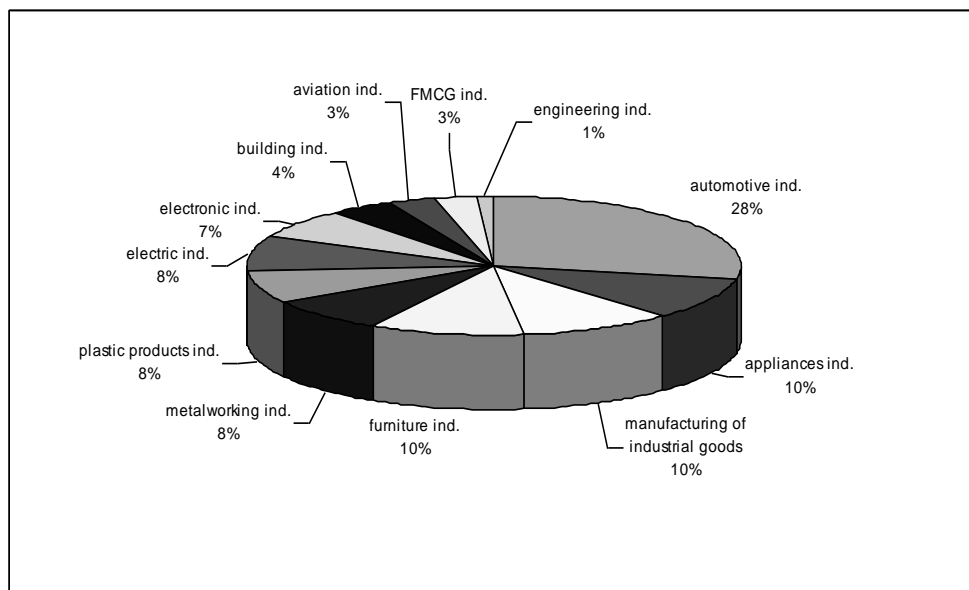


Fig. 1 Structure of surveyed companies by the industry (Faron, 2011, p. 170)

There are four leading groups according to the industry: the biggest are companies engaged in the automotive industry (28%), and then other (each has 10% share in the sample) are manufacturing of the industrial goods group, domestic appliances, and furniture industry. The other characteristic is an internationalization of companies. Here the major advantages have foreign enterprises (74%), whereas national constituted for 26%.

As the practice shows, often foreign organizations divisions or subsidiaries are bounded to implement lean management, because the method is a part of a corporation's strategy. But also in some national enterprises managers/owners stress a need of managing in accordance with the leading-edge methods (and lean management can be seen as one of them).

It seems obvious that one of important characteristics of companies using lean management, should be a period of implementing the method. Here the researched group was differentiated, without any greatly dominating group (Fig. 2).

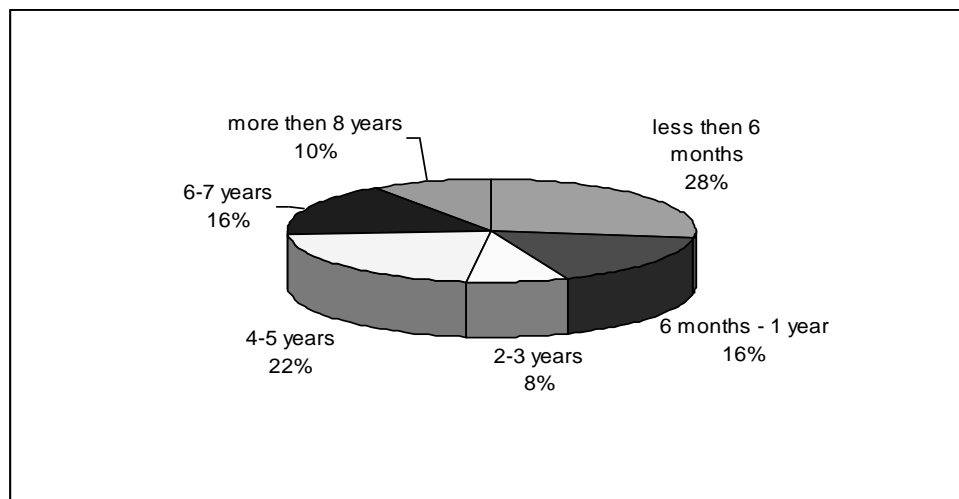


Fig. 2 Structure of surveyed companies by the period of implementing lean management (Faron, 2011, p. 171)

According to the received results, 28% of the questioned companies declared just starting their journey towards lean. Quite a big number are those organizations, which take actions from 4 to 5 years. The least group (8%) is implementing the method between 2 and 3 years.

5.2. Types of organizational structures in research companies

Companies included in the study had different characteristics and additionally varied in accordance to the types of organizational structures. However studying the results of a survey research, it can be noticed that there is one dominating type of organizational solutions – a functional structure – 40 organizations out of 73 declared it. Second popular type was a matrix structure (13 selected) and the next – process structure (10 companies). Other types – divisional, hypertext and team-based had marginal share (respectively 4, 4 and 2 respondents had chosen them).

Analysing the types of structures in accordance to the internationalization of the researched group, it turns out that most of the flexible types – matrix, hypertext and process structures appeared in the group of foreign enterprises.

Process and matrix structures occurred more often in the foreign enterprises group – 80% of process structures and 69% of matrix were indicated there, moreover hypertext structures were chosen in 100% in this group. It may indicate that in the researched group, flexible types of structure are more characteristic for foreign companies. But of course quite small research sample, rather big differences in size between those two groups and other confines considerably restrict the possibility of

putting the overall conclusions (appropriate for the general), limiting them to the research group of organizations.

The other criteria that could be interesting and important in finding differences in structure types, should be the period of being engaged in operations towards lean. Because the research group of companies richly varied according to the period of implementing lean management, it seems reasonable to systematize it. In the result research sample was divided into 2 groups – companies implementing the method for less than 4 years, and companies engaged in lean actions for 4 years and longer. The respondents, *inter alia*, were asked about the type of the organizational structure of their companies. As it turned out, in the first group – the companies implementing lean for less than 4 years – three types of structures were dominating – functional, matrix and divisional (Fig. 3).

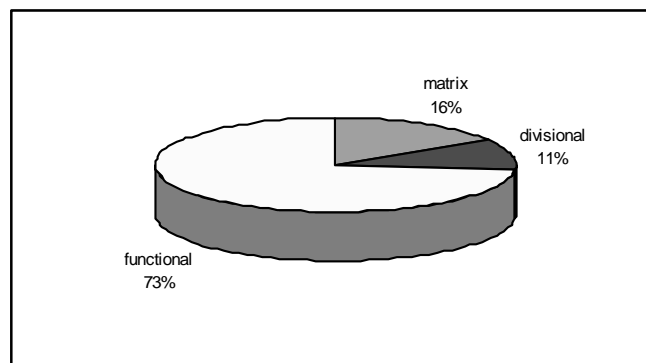


Fig. 3 Types of organizational structures in companies implementing lean for less than 4 years (Faron, 2011, p. 172)

In the second group – more advanced in lean actions – the results were more diversified. Here respondents declared, apart from functional (which is still the dominating form) and matrix, also process, hypertext and team-based structures (Fig. 4). These types, are, as it was already mentioned, definitely more flexible forms than the functional or divisional structures.

On the basis of these specific result it can be concluded, that in the researched group, more flexible types of structures were used in the case of foreign companies. Of course in that group there were also functional types chosen, but when to compare to the national group, there were more diversified types indicated. The second conclusion, very important from the point of view of this article – is that the longer a company has been engaged in implementing or using lean, the more flexible structure it had. Of course a period of 4 years – when talking about lean, which is a method relatively difficult to implement – is not a very long time. However, as the practice shows, when a company is continuously putting an effort toward disseminating lean management tools and principles, after 4 years some

clear results should be noticeable. One of them can be a changed organizational structure. It is not possible to put lean rules into effect (at least empowerment, customer orientation, cross-functional teams, etc.) without even the smallest structure regulatory changes. What's more, even when a company is using a "shortcut" and implements only some tools of lean first (not treating it as a holistic process of overall change of the company and its culture), in all likelihood, after 4-5 years there will involuntarily appear a need to make changes in the organizational structure.

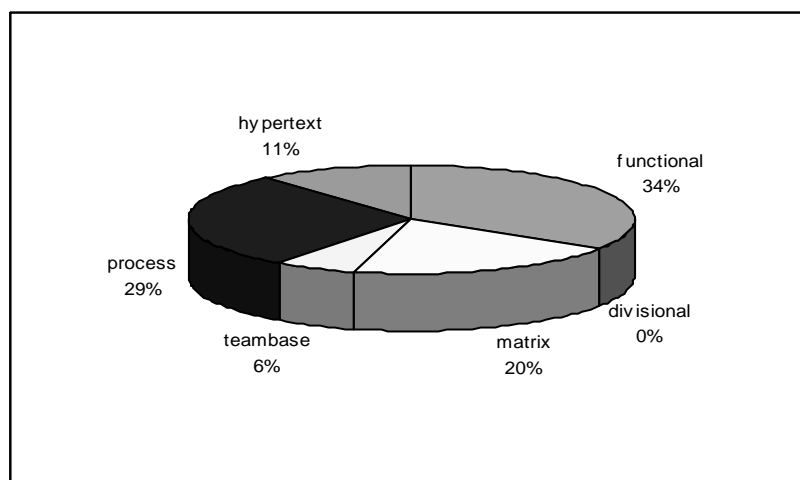


Fig. 4 Types of organizational structures in companies implementing lean for more than 4 years (Faron, 2011, p. 173)

In case of the surveyed companies that declared a longer period of striving for the leanness, divisional structures were not observed, but almost 30% of the respondents declared process structure. It can prove that advance development of lean philosophy should, sooner or later, lead to a change in understanding tasks and as a result – turning into processes. As it is known, process structure enables paying particular attention to the meaning of value, and is oriented on customers, and these terms are directly connected with lean.

Although some structure changes can be observed in the surveyed companies, depending on an implementing time, still the dominating type of structure in the whole sample is the functional one, and the matrix structure is placed on the second position. It is evident that for these groups of companies it is not obvious, that successful lean implementation must go together with organizational changes, especially those connected with structure. When looking at the example of Toyota, which is the benchmark for all companies striving for leanness, it is clearly visible

that success lies in the change of culture, not in tool implementation. And organizational culture goes hand in hand with the organizational structure.

6. CONCLUSION

Results of the research conducted by the author indicated, that in the surveyed group had appeared slight difference between the most popular types of structures in the companies, according to their internationality and whether they were just starting their “adventure” with lean management or were engaged in it for a longer period. The dissimilarity wasn’t prominent, but still it may mean that companies slowly change their way of thinking, converting the way they are organized. Of course the change should be gradual and stretched in time, it can’t be a revolution, rather an evolution. Czerska (2009) stated that this is particularly important, because it is consistent with the idea of lean – first prepare and make a thorough analysis, than slowly change.

Lean management can be a very effective management method, but, as the practice shows, it must be treated as a holistic approach directed to changing the whole company. Having the knowledge about the principles of the method, there is no doubt that when going deeper into lean, a traditional, highly hierarchical structures are not effective, and can be even an obstacle to further changes. It means that organizational structures should gradually change toward more flexible solutions. As the research conducted by the author showed, this can only bring positive effect and augurs well for the future.

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BIOGRAPHICAL NOTES

Agnieszka Faron is graduated from the Faculty of Law, Administration and Economics of University of Wrocław, and University of Business in Wrocław. She also participated in student exchange within Erasmus Socrates. She received a Ministry of Education and Educational Enterprise Foundation scholarships. In 2008 she graduated from the Ph.D. studies from the Faculty of Computer Science and Management of the Wrocław University of Technology. In 2010 she received her

Ph.D. in management science. Currently she is an Assistant Professor at the department of Management and Economics in the University of Business in Wrocław. Her research focuses on lean management and other modern managements methods.