

Level of Lean Culture and Its Relation to Organizational Life Cycle

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Abstract

Lean Production is widely recognized and accepted in the automotive industry. It concerns the strict integration of humans in the manufacturing process, involvement of all employees in continuous improvement and in waste elimination. The literature emphasizes the importance of the underlying organizational culture as a critical factor for supporting and sustaining lean management implementation. Organizational life cycle plays role in achieved level of lean too. The article seeks to verify whether there is a link between the attributes of lean culture and the stages of life cycle. Therefore, this paper initiates a discussion towards a framework that combines life cycle assessment and appropriate lean culture characteristics to provide the best condition for continuous business improvement. To address this issue, automotive industry was chosen as it is the world's leading advanced manufacturing technology industry producing complex products and is the most advanced industry in using lean.

Keywords: lean culture, lean strategy, organizational life cycle stages, automotive industry

JEL Classification: M 11, M 14, M 15, M 21

1. Introduction

In these pandemic times, it is increasingly important for (not only) private companies to make the right strategic decisions. Individual strategic management activities undoubtedly contribute to the overall prosperity of an organization. In any case, it is advisable to ascertain one's own position within the competition. Since the 1960s, it has been possible to follow the strategic recommendations resulting from the position of a company in its life cycle stage, as each phase has its own specificities and requires different management approaches. At the same time, there is constant pressure on costs reduction, which is greatly facilitated by continuous improvement methods and techniques. According to Zemanová and Slavík (2017), organization can adapt their production according to changing market needs because of implementing lean management. We consider a culture of continuous improvement to be essential in our ability to face competition and to continue to offer our customers quality products at appropriate prices. Concepts such as lean and kaizen are widespread in the manufacturing industries, particularly in the automotive industry, to which these concepts are historically linked. Liker (2004) emphasizes that, lean requires a long-term commitment. A medium-sized company would need about three to five years to start pursuing the lean philosophy. One of the reasons is cultural aspects that plays great role in fulfilling the full potential of lean. If these cultural aspects are missing, companies could not obtain the full benefits of lean manufacturing implementation, and in fact, they are having difficulties sustaining the achieved success. There have been several studies focused on importance of

lean culture for lean management. Dorval et al. (2019) identified 678 academic papers with key word “lean” and “culture”, but at the same time he mentions that in 86 percent of them, lean culture was only discussed superficially. This article is more specific. The aim of this paper is to open a discussion on the possibility of linking the phases of the enterprise life cycle and lean culture in the automotive industry as the main driver for continuous improvement within manufacturing industries. In the following section, the individual areas are examined in order to discuss the individual points of questionnaire surveys. As a result, within chapter 3, the questionnaire formulation is defined to ensure the stated aim of the paper.

2. Problem Formulation and Methodology

This chapter focuses on the literature review and discussion in the areas of interest of the paper, i.e., organizational life cycle, lean culture, and automotive industry in the Czech Republic. Furthermore, the interconnection of these areas in the scientific literature is discussed.

2.1 Organizational Life Cycle (OLC)

As mentioned in the introduction, the theory of the business life cycle has been in the scientific literature for more than 60 years. Over such a long period of time, a number of models and approaches have been developed with different numbers of phases ranging from three to ten. It is the ten phases that are proposed in the well-known model by Adizes (1979), however, in recent years, authors have been leaning towards a smaller number of phases - three to five (e.g., Dickinson, 2011; Souza et al., 2015; Primc & Čater, 2016; Tam & Grey, 2016).

In general, a company passes through its life from the inception phase, through the growth phase, a maturity phase, to the decline phase, and finally extinction. In the course of the life of an organization, one can also encounter the revival phase, which is very similar in its specifics to the growth phase. In our article, we focus on scientific papers that determine the life stage of a company based on a set of questions.

Souza et al. (2015) propose to use a modified supply chain process management model for their research, which takes into account the maturity of the company. For this purpose, they use a form with 20 questions presented by Lester et al. (2003). The phases are identified as existence, survival, success, renewal, and decline.

Tam and Grey (2016) suggest a set of nine questions where SME managers are self-declaring their firm's life cycle stage. A point system (1, 2, 3) is allocated to answers to relate inception (birth), high growth, or maturity. A total score then identifies a firm to its stage.

Primc and Čater (2016) propose a very brief characterization of each phase in an online cross-sectional survey of Australian listed companies in order to investigate the relationship between firm life cycle phases and environmental proactivity. In doing so, they draw primarily on the characteristics of the phases posited in Miller and Friesen (1983). These stages of OLC are birth, growth, revival, maturity, and decline. The questions are formulated primarily for listed companies, which means that most of them are organizations with strong capital and a solid market position. Concerning the automotive sector, it is quite obvious that these large companies are certainly leaders in their field in terms of continuous improvement methods.

2.2 Lean Culture

Lean set up organizational processes for waste minimization and productivity improvement based upon the use of specialized tools and techniques linked with initiating a culture of continuous improvement. Crucial factor that impacts the success of lean implementation is the adoption of soft practices. (Ulewicz & Kuceba, 2016). This is in line with claim of Liker and Rother (2011) who explain that soft practices are concerned with people and relationship, hard

practices relate to the lean techniques and tools and special soft practices are critical for achieving maximum efficiency through lean and maintaining productivity in the long run. The organization develops its culture in response to the working environment established by its leadership and management team. The establishment can be guided or not and it can have positive or negative effect on performance. Thanks to an appropriate corporate culture, a company can achieve excellent economic results, while an inappropriate corporate culture can cause barriers to efficient operations (Taherimashhadi & Ribas, 2018).

Organizational culture and the role of leadership are one of the main factors that can impact lean implementation as lean is based on the motivating and supportive approach of management to employees. The role of the leader needs to be highlighted in order to achieve expected results. According to Al-Najem et al. (2012) company cannot operate in lean without a healthy culture, skilled personnel, the buy-in from the top management and a strong leadership.

Al-Najem (2012) propose lean culture assessment model that contains lean critical factors focused on: top management, leadership, empowerment, customer relation, supplier relation, training, departmental relation, teamwork. Companies with successful lean implementation are strong in these areas. Dahlgaard and Dahlgaard-Park (2006) states that the main objective of lean system is to develop pro-active corporate culture, where continuous improvement and people's involvement is essential. Though, empowerment is the precondition for creating the desired culture. Angelis et al. (2011) also states that managers need to take action to enable greater worker commitment.

Ulevitz and Kuceba (2016) mention problems that may limit the potential of lean application. These are lack of commitment of the managers, employees not respecting norm of organization, general lack of knowledge about lean and most importantly limited resources. Sherres-Rathje et al. (2009) add what is the impact of lack of leadership: limited access to resources, communication problems including long-time decision-making process.

Elkhairi et al., (2019) identified 175 research papers that discussed lean implementation. Based on these articles they identified success factors that were divided in 5 groups related to leadership, cultural change, competence and expertise, commitment from top management, education and training, communication. They also identified following barriers to implementing lean management: lack of planning, lack of expertise, lack of commitment from top management, lack of strategic performance, misunderstanding of LM, limited resources, resistance to change.

Adequate lean culture is often described on companies operating in the automotive industry. Companies operating in the automotive industry are known for high level of efficiency and quality and focus on the lowest possible cost as lean is the main philosophy for most of those companies. There is great number of studies focused on lean in automotive industry (Nordin et al., 2010; Nallusamy, S., & Ahamed, A., 2017; Marodin et al., 2016).

2.3 Automotive industry in the Czech Republic

The automotive industry is a logical proxy for lean culture research, given its rich history in continuous improvement development. At the same time, the automotive industry of the Czech Republic represents an important contribution to overall economic development and has a significant impact on the national trade balance; we can expect that selected enterprises will have ample expansion opportunities. Foreign capital plays a decisive role in the Czech automotive industry, most of the members of the Association of the Czech Automotive Industry are held by foreign investors. Domestic suppliers are mostly 3rd tier suppliers, i.e. in

a vulnerable position. The Czech automotive sector is currently facing several concurrent challenges.

First of all, “Industry 4.0”. The fourth Industrial Revolution is a strategy for being competitive in the 21st century utilizing high-tech technologies, smart automation of traditional manufacturing, and interconnectivity. In this case, the biggest challenge for the automotive industry is the aforementioned automation, smart technologies, and also continuous improvement. As discussed by Mrugalska and Wyrwicka (2017), there is a link between lean Production and Industry 4.0.

Second, there is the “European Green Deal”, approved 2020. It is a collection of European Commission policy steps with the goal of achieving the European Union (EU) climate neutral by 2050. These steps need to be taken so that the transition to a more sustainable, greener economy, could be performed. The Green Deal should lead to a reduction in the disparity between the high costs of pollution and the price paid by polluters and users. However, the energy market situation is not ready at the moment to face the risks that may accompany its implementation. At the turn of 2021/2022, energy prices have risen significantly, which has also increased the price of emission allowances. Furthermore, the economy is only just waking up from the turbulence associated with the global pandemic COVID-19. At the same time, coal and nuclear power plants are being curtailed or phased out. And last but not least, Europe is currently facing the impact of the war conflict between Russia and Ukraine from 02/2022, which invalidates all previous forecasts. At the moment, we can only guess how far the economies will be affected by the sanctions imposed on Russia, and how the issue of energy and gas supply restrictions will be resolved.

3. Problem Solution

What stage of the life cycle the Czech automotive companies are situated in? The answer is not straightforward, as it depends on whether the analyzed enterprise is identified as large (more than 250 employees) or small and medium sized (SME). Large companies, for example Hyundai Motor Manufacturing Czech, Ltd., Tatra Trucks, Inc., Iveco Czech Republic, Inc., Toyota Motor Manufacturing Czech Republic, Ltd., and ŠKODA AUTO, Inc., are well established companies with strong capital and solid backgrounds. Based on the quantitative indicators according to Slavičková and Myšková (2017), we can evaluate these firms as being on the borderline between the growth and maturity phases, as the growth of indicators is not very high, but still shows constant growth. However, this was true for the period prior to the COVID-19 pandemic; from 2020 onwards, financial indicators need to be seen in the broader context of the global crisis with its consequences in the form of supply chain disruptions, and reduced sales, etc.

At the same time, we can state about these large organizations that elements of continuous improvement and lean are part of their corporate culture. Pedersen-Rise and Haddud (2016) confirms that majority of articles about lean focus on large companies with great both financial and personal resources. Except the resources, also the expertise is the reason why large companies apply more lean than small companies (Doolen & Hacker, 2005).

There is only limited number of small and medium-sized companies that adopted lean approach (Achanga et al., 2006). They also state that SMEs have differential characteristics compared to large companies and the touchstones for their success are different. Ulevitz and Kuceba (2016) state that SMEs companies and their management significantly differ from practices used during the stabilized production in large companies. Their research confirms that small and medium-sized businesses have significant challenges in applying the lean approach e.g. that in it is problematic to plan a production and stick with its production

schedule, lack of standardization, short-term financial goals, barrier in management and employee relations. Yet, their research showed that there is a great demand for lean philosophy among the SME.

Hence, the question is how the small and medium-sized companies do (in terms of the number of employees) in the automotive industry stand in this area. Here we can expect their capital strength to be less high, their organization to be less hierarchical and less burdened with administration compared to large companies. We anticipate that the issue of continuous improvement will not be a regular part of the corporate culture. Similarly, their life cycle phases are likely to fluctuate between growth, maturity, and decline phases. It is this area that is of interest to the authors for further in-depth investigation.

We offer for discussion the question of whether a relationship can be observed between the phases of the organizational life cycle and the lean corporate culture approach in these SMEs. In order to explore this area, we propose to conduct a questionnaire survey in a group of companies defined as follows:

- number of employees 10-249;
- turnover 2-10 million EUR;
- automotive industry “CZ NACE C29” – manufacturing of motor vehicles, trailers, and semi-trailers;
- financial data history of at least 5 years, i.e. 2017-2021.

For the purpose of a questionnaire survey, we propose a simple questionnaire with 2 main parts to verify the relationships: 1) Identification of the life cycle phase of the company, and 2) Identification of the relationship with the culture of continuous improvement. The statements are based on a systematic literature review about the life cycle phase and typical lean culture characteristics.

The first part contains the following statements, from which the respondent chooses only one that most closely matches the current description of their company (adapted from Primc and Čater, 2016):

- Our company is less than ten years old, has a loose structure, and is run by an owner-manager. Our decision-making is centralized and intuitive, and we occasionally take commercial risks. *This section refers to the birth phase.*
- Our revenues have increased by more than 15% as a result of our cost-cutting programs and inventive strategies. We've developed unique capabilities that set us apart from the competition. Our company is organized functionally, with decentralized decision-making and codified procedures. *This section refers to the growth phase.*
- In our company, formalization, and control are the norms. We focus on cost efficiency, while we lack innovation activity. The rate of sales growth is less than 15%, and the level of sales remains stable. Our management focuses on strategy and planning. Risk-averse decision-making is the domain of top management. *This section refers to the revival phase.*
- We're growing our product line and broadening our markets. Our creativity and invention are aided by the employment of a divisional or matrix structure, with formalized procedures and a decentralized decision-making process. Sales have increased by more than 15%. *This section refers to the maturity phase.*
- Our decision-making and control are centralized and risk-averse. Due to external challenges and a lack of innovation, our profitability has decreased. Our company has a formal and bureaucratic structure. *This section refers to the decline phase.*

In the second part, a 5-point Likert scale is used to express the respondent's level of agreement with each statement:

- There is two-way communication between employees and management, including feedback.
- Employees are presented with information about the company's strategy and improvements both verbally and visually.
- Teamwork is required and is a priority when designing and implementing changes.
- Team goals take precedence over individual goals.
- Change is seen as an opportunity, mistakes are tolerated.
- Employees are motivated and involved in the process of designing and implementing change.
- Company values emphasize innovation and creativity.
- Managerial tools and methods are used to manage change.
- All employees participate in continuous improvement and problem-solving.
- Employees proactively face challenges and do not hide from problems.

Prior to conducting the actual survey among the companies in the next phase of the research, the questionnaire should also be discussed among the managers of the selected sector themselves to ensure that the concepts were relevant and that the phrasing and meaning of the concepts were both comprehended.

The output of this part, where 10 managers from the automotive industry were interviewed, was primarily a comment on the impossibility of determining the life cycle phase for very small companies (up to 9 employees), as these companies have no chance to choose only one suitable category with the current simple organization. For this reason, the authors will exclude from the survey the group of small enterprises with less than 10 employees.

4. Conclusion

Priority of every company applying lean is concentrating on customers needs to achieve customer satisfaction.

The authors' questionnaire will be used primarily to examine the relationship between the phase of the life cycle which has the company achieved and the level of culture of continuous improvement. Based on the literature research, the authors assume that it will be companies that have been on the market for at least 3 years that achieve positive results regarding the attributes of lean culture corresponding to the successful implementation of the lean philosophy. In case we confirm high level of lean culture in certain company, we can state that one of the main components of a successful lean implementation has been achieved. We expect that many solutions applied in stable production (typical for large companies) will not be applicable to SMEs and that alternatives will have to be offered to achieve the desired results.

In future research, it is important to find ways for the organization to strengthen lean culture for all employees in every organization even for companies in the early stages of the life cycle.

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References

- [1] Achanga, P., Shehab, E., Roy, R. and Nelder, G. (2006). "Critical success factors for lean implementation within SMEs", *Journal of Manufacturing Technology Management*, Vol. 17 No. 4, pp. 460-471. <https://doi.org/10.1108/17410380610662889>
- [2] Adizes, I. 1979. Organizational passages: diagnosing and treating life cycle problems in organizations. *Organizational Dynamics*, Vol. 8, No. 1, pp. 3-24.
- [3] Al-Najem, M., Dhakal, H., and Bennett, N. (2012). The role of culture and leadership in lean transformation: a review and assessment model. *International Journal of Lean Thinking*, 3(1), 119-138.
- [4] Angelis, J., Conti, R., Cooper, C., and Gill, C. (2011). Building a high-commitment lean culture. *Journal of Manufacturing Technology Management*.
- [5] Dahlgaard, J.J. and Mi Dahlgaard-Park, S. (2006), "Lean production, six sigma quality, TQM and company culture", *The TQM Magazine*, Vol. 18 No. 3, pp. 263-281. <https://doi.org/10.1108/09544780610659998>
- [6] Dickinson, V. (2011). Cash Flow Patterns as a Proxy for Firm Life Cycle. *The Accounting Review*, Vol. 86, Iss. 6, pp. 1969–1994. <https://doi.org/10.2308/accr-10130>.
- [7] Doolen, T. L., and Hacker, M. E. (2005). A review of lean assessment in organizations: an exploratory study of lean practices by electronics manufacturers. *Journal of Manufacturing systems*, 24(1), 55-67. [https://doi.org/10.1016/S0278-6125\(05\)80007-X](https://doi.org/10.1016/S0278-6125(05)80007-X)
- [8] Dorval, M., Jobin, M.-H. and Benomar, N. (2019). "Lean culture: a comprehensive systematic literature review", *International Journal of Productivity and Performance Management*, Vol. 68 No. 5, pp. 920-937. <https://doi.org/10.1108/IJPPM-03-2018-0087>
- [9] Elkhairi, A., Fedouaki, F., and El Alami, S. (2019). Barriers and critical success factors for implementing lean manufacturing in SMEs. *IFAC-PapersOnLine*, 52(13), 565-570. <https://doi.org/10.1016/j.ifacol.2019.11.303>
- [10] Lester, D., Parnell, J. A., and Carraher, S. (2003). Organizational life cycle: A five-stage empirical scale. *International Journal of Organizational Analysis*, Vol. 11, No. 4, pp. 339-354. <https://doi.org/10.1108/eb028979>.
- [11] Liker, J. (2004). *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. New York, NY: McGraw-Hill.
- [12] Marodin, G. A., Frank, A. G., Tortorella, G. L., and Saurin, T. A. (2016). Contextual factors and lean production implementation in the Brazilian automotive supply chain. *Supply Chain Management: An International Journal*. <https://doi.org/10.1108/SCM-05-2015-0170>
- [13] Miller, D., and Friesen, P. H. (1984). A longitudinal study of the corporate life cycle. *Management science*, Vol. 30, No. 10, pp. 1161-1183. <http://dx.doi.org/10.1287/mnsc.30.10.1161>.

- [14] Mrugalska, B., and Wyrwicka, M. K. (2017). Towards Lean Production in Industry 4.0. *Procedia Engineering*, Vol. 182, p. 466-473. ISSN 1877-7058. <https://doi.org/10.1016/j.proeng.2017.03.135>.
- [15] Nallusamy, S., and Ahamed, A. (2017). Implementation of lean tools in an automotive industry for productivity enhancement-A case study. *International journal of engineering research in Africa* (Vol. 29, pp. 175-185). Trans Tech Publications Ltd. <https://doi.org/10.4028/www.scientific.net/JERA.29.175>
- [16] Nordin, N., Md Deros, B., and Abd Wahab, D. (2010). A survey on lean manufacturing implementation in Malaysian automotive industry. *International Journal of Innovation, Management and Technology*, 1(4), 374-380.
- [17] Pedersen-Rise, O., and Haddud, A. (2016). Exploring lean culture challenges in a small family-owned manufacturing company: a case study from Norway. *International Journal of Lean Enterprise Research*, 2(1), 1-25. <https://doi.org/10.1504/IJLER.2016.078247>
- [18] Primc, K., and Čater, T. (2016). The Influence of Organizational Life Cycle on Environmental Proactivity and Competitive Advantage: A Dynamic Capabilities View. *Organization & Environment*, Vol. 29, Iss. 2, pp. 212-230. <https://doi.org/10.1177/1086026615584684>.
- [19] Scherrer-Rathje, M., Boyle, T.A., and Deflorin, P. (2009). Lean, take two! Reflections from the second attempt at lean implementation. *Business horizons*, 52(1), 79-88. <https://doi.org/10.1016/j.bushor.2008.08.004>
- [20] Slavíčková, J., and Myšková, R. (2017). Corporate life cycle determination in manufacturing companies. *Manažment Podnikov*, 7(2), 48-55. ISSN: 1338-4104. <https://hdl.handle.net/10195/70361>
- [21] Souza, R.P., Guerreiro, R. and Oliveira, M.P.V. (2015). Relationship between the maturity of supply chain process management and the organisational life cycle. *Business Process Management Journal*, Vol. 21, No. 3, pp. 466-481. <https://doi.org/10.1108/BPMJ-03-2014-0023>.
- [22] Taherimashhadi, M., and Ribas, I. (2018). A Model to align the organizational culture to Lean. *Journal of Industrial Engineering and Management*, 11(2), 207-221. <https://doi.org/10.3926/jiem.2511>
- [23] Tam, S. and Gray, D. E. (2016). Organisational learning and the organisational life cycle: The differential aspects of an integrated relationship in SMEs. *European Journal of Training and Development*, Vol. 40, No. 1, p. 2-20. <https://doi.org/10.1108/EJTD-07-2015-0052>.
- [24] Ulewicz, R., and Kuceba, R. (2016). Identification of problems of implementation of Lean concept in the SME sector. *Ekonomia i Zarządzanie: Wiedza. Raporty. Diagnozy. Analizy. Przykłady*, 8(1). <https://doi.org/10.1515/emj-2016-0002>
- [25] Zemanová, B., and Slavík, P. (2016). Implementation of Lean Tools Used in Logistics: A Case Study Approach. In *Proceedings of the 28th International Business Information Management Association Conference*. International Business Information Management Association-IBIMA.