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Implementation of Lean Management Practices in Azerbaijan: On the Example of a Private Company

Dr. Yelena Alaskarova

Ph.D. Student, School of Management and Business Administration
Hungarian University of Agriculture and Life sciences, Hungary

Alina Alaskarova

B.Sc. Student, Department of Economics,
Azerbaijan Economic University, Azerbaijan

Miklos Daroczi

Professor, Department of Economics and Social Sciences,
Hungarian University of Agriculture and Life Sciences, Hungary

Abstract:

Organizations are facing crucial modifications as global market and conditions change day after day. To keep up with fast changing realities, it's important to apply innovation decisions to the current stage of organizations. Lean management consolidates tools and techniques to revert from traditional way of operating to the new human oriented one. In the carried-out research its outlined, human resources management plays a big role in spreading and supporting lean initiatives. It was suggested that, Lean and Human resources management are compatible and should work together to obtain sustainable success by implementation of an innovation approach such as Lean. Both lean management and human resource management focus on the same goals with different methods in terms of control of businesses. All positivist approaches and practices are included in these approaches and practices, which are developed with a focus on the interests of the community, in order for the process to be concluded positively. The employee-centred management approach of human resources management is crucial to lead and maintain good environment in the teams. For this reason, in the lean management philosophy, it is aware that the corporate structure has responsibilities in terms of training the employees, eliminating their problems and supporting them in struggling with the responsibilities they undertake. This paper is quantitative, online survey has been conducted with employees of a private company in Azerbaijan and results were analysed in statistical analysis software SPSS and relevant suggestions and recommendation were given for reorganization to enable lean friendly environment on a sample of the given company.

Keywords: *Continuous improvement, Human resources management, Industry 4.0, Lean Management, Lean philosophy*

1. Introduction

Lean management practices, which have been recognized in the literature for many years and have positive effects on large masses as a management practice, can be considered as a supporter of the understanding a certain management savings in terms of businesses. Lean management is an approach that plans to save on both the financial and workforce structure of the enterprises by simplifying the management understanding of the enterprises as much as possible. According to Helmold, the foundation of Lean philosophy is identification and elimination of waste that that does not add any value to the customer (Helmold, 2020). The first and most important step in the name of the lean management philosophy is to quickly complete the processes in a positive and trouble-free manner as possible for the perception of management within the organization, including human resources and production. According to some researchers, there is no clear evidence that lean could have some impact on personnel (Conti et al., 2006; de Treville and Antonakis, 2006), or HR in terms of their roles in implementation of Lean related policies and practices (Liker and Hoseus, 2010; Bonavia and Marín-García, 2011). Both lean management and human resource management focus on the same goals with different methods in terms of control of businesses. All positivist approaches and practices are included in these approaches and practices, which are developed with a focus on the interests of the community, in order for the process to be concluded positively. It's widely recognized that collaboration of lean and human resources practices can bring positive cumulative effect of business in general (Ciano et al. 2019). In this respect, while human resources management allows the management understanding of enterprises to be handled from a wider perspective within the organization, it is noticed that management practices are gathered around a more result-oriented and more integrative identity together with lean management.

2. Research Methodology

In order to achieve the goal of the researchers, a thorough literature review and statistical analysis was carried out. We will introduce the importance of Lean Management overall and particularly in companies from Human resources perspective. Therefore, an online survey was performed to collect data on understanding the scale that employees are aware of lean and measures taken place to spread lean thorough organization as well distribution of lean philosophy. In the first part of the survey, questions regarding demographics were addressed, following by Likert scale questions to understand Lean Management practices in the second part. In this paper, Factor, Reliability, Correlation and regression analysis were conducted to find out possible cause and effects on lean management implementation.

With regard to the structure of this paper, three main parts can be distinguished: First part will cover theoretical background of Lean philosophy and Lean in organization. Second part includes results of statistical analysis and their interpretation, and final third part is about discussion on the findings of the research.

2.1. Lean in Organizations

The development of the business and the achievement of commercial as well as operational success depend on the development of employees. For this reason, in the lean management philosophy, it is aware that the corporate structure has responsibilities in terms of training the employees, eliminating their problems and supporting them in struggling with the responsibilities they undertake. In terms of main KPI for lean adoption in organization, human resources management plays one of the most important roles as stated by Sangwa and Sangwan (2018). Special training of employees is seen as essential for sustainable success in terms of businesses that maintain the understanding of human resources management in an institutional framework, professionally. With the development of Industry 4.0 AI and Agile management Lean is facing new challenges in terms of collaboration and adoption to the new realities. As due to some researchers, lean is considered as a precondition in shifting towards Industry 4.0 (Tortorella and Fettermann 2017). In turn, technically, it creates challenges for employees to combine their knowledge to solve complex issues arising from new environment (Longo et al. 2017). Therefore, an online survey was performed to collect data on understanding the scale that employees are aware of lean and measures taken place to spread lean thorough organization as well distribution of lean philosophy. In the first part of the survey, questions regarding demographics were addressed, following by Likert scale questions to understand Lean Management practices in the second part. In this paper, Factor, Reliability, Correlation and regression analysis were conducted to find out possible cause and effects on lean management implementation.

2.2. Validity and Reliability Analysis

In this section, there are findings related to the demographic characteristics of the participants. In total 253 responded has participated in online survey, distributed to one bit private company in Azerbaijan. Due to confidentiality Issues Company wished not to mention the name. Table 1 shows the distribution of the participants by gender. Accordingly, 161 (63.6%) of the participants were female and 92 (36.4%) were male.

Gender	Frequency	Percentage
Male	92	36.4
Female	161	63.6

Table 1: Distribution of the Participants by Marital Status

Table 2 shows the distribution of the participants according to their marital status. Accordingly, 109 (43.1%) of the participants were single and 144 (56.9%) were married.

Marital Status	Frequency	Percentage
Single	109	43.1
Married	144	56.9

Table 2: Distribution of the Participants by Marital Status

Table 3 shows the distribution of the participants by age groups. According to this, 26 of the participants (10.3%) were between the ages of 18-25, 127 (50.2%) were in the 26-34 age range, 82 (32.4%) were in the 35-44 age range and 18 of them (7.1%) were in the age group of 45 and over.

Age Group	Frequency	Percentage
18-25	26	10.3
26-34	127	50.2
35-44	82	32.4
45 and above	18	7.1

Table 3: Distribution of the Participants by Age

Table 4 shows the distribution of the participants according to their educational status. Accordingly, 29 (11.5%) of the participants are high school graduates, 31 (12.3%) are associate degree graduates, 126 (49.8%) are bachelor graduates and 67 (26.5%) are master or PhD graduates.

Educational Status	Frequency	Percentage
High school graduates	29	11.5
Associate degree graduates	31	12.3
Bachelor graduates	126	49.8
Master od PhD graduates	67	26.5

Table 4: Distribution of the Participants by Educational Status

Table 5 shows the distribution of the participants by occupational position. Accordingly, 87 (34.4%) of the participants are in the position of specialist/assistant specialist, 40 (15.8%) of the participants are in the position of manager/team leader, 36 (14.2%) of the participants are in the director/senior management position and 90 (35.6%) of the participants work in other positions.

Occupational Position	Frequency	Percentage
Specialist/assistant specialist	87	34.4
Manager/team leader	40	15.8
Director/senior management	36	14.2
Other positions	90	35.6

Table 5: Distribution of the Participants by Educational Status

Table 6 presents the findings for the validity and reliability analyzes of the Lean Management Scale. During the factor analysis on the scale, three statements were excluded from the analysis in order to reach the most appropriate factors. These expressions are as follows:

- Team spirit is dominant in your business.
- Healthy communication is at the top level in your business.
- Equal pay for equal work principle is applied in your business.

As can be seen in Table 6, the KMO value of 0.960 indicates that the sample size is sufficient for performing factor analysis, while Chi-Square (4296,173) and sigma (0.000) values are appropriate for performing factor analysis above the scale. As can be seen in Table 6, two factors were determined as a result of the factor analysis performed. These factors are named as Benefits and Opportunities (FO) and Initiative and Participation (INK), respectively, in line with the statements in it. According to Table 5.10, the total explained variance of the scale is 63,861%. Benefits and possibilities explain 35.76% of the variance, while initiative and participation explain 28.10% of the variance. In addition, as reflected in Table 6, the reliability of the scale was 0.963, the reliability of the benefits and possibilities factor was 0.941, the reliability of the initiative and participation factor was 0.931, at a very high level.

Expression	Benefits and Opportunities	Initiative and Participation	Reliability	Scale
Your business offers you training opportunities related to your business.	,780		0,941	0,963
Your business implements new and necessary regulations to make it easier for employees.	,739			
There is ongoing research and improvement in your business to remove unnecessary work from work schedules.	,727			
Your business provides you with social opportunities (trips, sports, etc.).	,726			
The working environment in your business reduces time and labor losses.	,722			
Your business attaches importance to being fair and balanced while distributing your workload.	,682			
Your business cares about the occupational health of its employees.	,657			
Your company gives you job security (assurance for long-term employment).	,656			
In your business, your materials, documents and all kinds of other transactions are met in accordance with your demands and on time.	,654			
Your business values you.				
,653				
The working environment in your business is simple, plain and clean.	,618			
You are informed about the objectives of your business.	585			

Expression	Benefits and Opportunities	Initiative and Participation	Reliability	Scale
When you make an additional contribution to your business, such as voluntarily working overtime, your managers reward you for this sacrifice you make.	,566			
Your business encourages you to make suggestions.		,787	0,931	
Your business encourages you to solve your own business problems yourself.		,774		
Your business gives you the initiative to participate in decisions about your business.		,719		
In your business, managers are careful to act as a 'director' rather than just 'commanding'.		,719		
In your business, the managerial steps you need to pass in order to reach the highest-level manager when necessary are less than you.		,709		
Your business offers you an environment such as a family environment where sincerity prevails.		,675		
Your business can provide equity and fairness in giving you authority and responsibility.	,582	,654		
Meetings are held in your company where the superior-subordinate relations are put aside, and the problems are discussed mutually.	,516	,624		
Explained Variance	35,76%	28,10%	Total: 64,92%	
KMO: 0,950; Ki-Kare: 4358,289; SD: 250; Sig.: 0,000				

Table 6: Lean Management Scale Factor Analysis and Reliability Analysis Results

2.2.1. Hypothesis

After the factor and reliability analyzes, the following hypotheses were developed:

- H1: Lean management factors have a significant effect on the performance system.
- H1a: The benefits and opportunities factor have a significant effect on the performance system.
- H1b: Initiative and participation factors have a significant effect on the performance system.
- H2: Lean management factors have a significant impact on recruitment.
- H2a: Benefits and opportunities factor have a significant impact on recruitment.
- H2b: The factor of initiative and participation has a significant effect on recruitment.
- H3: Lean management factors have a significant effect on participation in decisions.
- H3a: Benefits and opportunities factor have a significant effect on participation in decisions.
- H3b: The factor of initiative and participation has a significant effect on participation in decisions.

3. Correlation and Regression Analysis

3.1. Correlation Analysis

In this section, the results of the correlation analysis carried out to determine the relationships between the variables covered in the research are included. As can be seen in Table 8, there are significant relationships between all variables. All correlations are positive. The highest level of correlation was between initiative and participation and benefits and possibilities factors ($r=0.832$; $p=0.000$). The lowest level of correlation was between initiative and participation and recruitment factors ($r=0.674$; $p=0.000$). When an evaluation of the correlation analysis is made, it can be said that there are high degree (between 0.70 and 1.00) and medium degree (between 0.30 and 0.70) relations between the variables.

		Performance System	Recruitment	Participation in Decisions	Benefits and Opportunities	Initiative and Participation
Performance System	Pearson Correlation	1				
	Sig. (2-tailed)					
Recruitment	Pearson Correlation	,728**	1			
	Sig. (2-tailed)	,000				
Participation in Decisions	Pearson Correlation	,683**	,726**	1		
	Sig. (2-tailed)	,000	,000			

		Performance System	Recruitment	Participation in Decisions	Benefits and Opportunities	Initiative and Participation
Benefits and Opportunities	Pearson Correlation					
	Sig. (2-tailed)	,000	,000	,000		
Initiative and Participation	Pearson Correlation	,713**	,674**	,802**	,832**	1
	Sig. (2-tailed)	,000	,000	,000	,000	

Table 7: Correlation Analysis

** The Correlation Is Significant at the 0.01 Level (2-Way)

3.1.1. Regression Analysis

Table 8 shows 'H1: Lean management factors have a significant effect on the performance system factor.' The findings of the multiple linear regression analysis performed to test the hypothesis are included. As can be seen in the table, the fact that the F value (208,289) is high and the sigma value (0.000) is found to be significant indicates that the model is significant. The explanatory power of the model is quite high with 61.40%. Accordingly, the Benefits and Opportunities factor explains 61.40% of the Performance System factor. The Benefits and Opportunities factor has a positive and significant effect (0.685) on the performance system. According to these findings, 'H1a: Benefits and opportunities factor has a significant effect on the performance system.' While the hypothesis was accepted, 'H1b: The factor of initiative and participation has a significant effect on the performance system.' hypothesis was rejected. In this context, 'H1: Lean management factors have a significant effect on the performance system.' was also partially accepted.

Dependent Variable: Performance System	Beta	t value	Sig.	R2	f	Sig.
Constant			0,000	61,40%	212,334	0,000
Benefits and Opportunities	0,685	9,518	0,000			
Initiative and Participation	0,125	1,602	0,108			

Table 8: Regression Analysis Findings for the Performance System Factor

Given table below shows effects on hypothesis: 'H2: Lean management factors have a significant effect on hiring.' The findings of the multiple linear regression analysis performed to test the hypothesis are included. As can be seen in the table, the fact that the F value (238,672) is high, and the sigma value (0.000) is found to be significant indicates that the model is significant. The explanatory power of the model is quite high with 65.20%. Accordingly, the Benefits and Opportunities factor explains 65.20% of the Recruitment factor. The Benefits and Amenities factor has a positive and significant effect (0.838) on recruitment. According to these findings, 'H2a: Benefits and possibilities factor has a significant effect on recruitment.' hypothesis was accepted, 'H2b: The factor of initiative and participation has a significant effect on recruitment.' has been rejected. In this context, 'H2: Lean management factors have a significant impact on hiring.' The hypothesis was partially accepted.

Dependent Variable: Recruitment	Beta	t value	Sig.	R2	f	Sig.
Constant			0,013	65,20%	238,672	0,000
Benefits and Opportunities	0,838	11,354	0,00			
Initiative and Participation	-0,028	-0,358	0,654			

Table 9: Regression Analysis Findings for the Recruiting Factor

Table 10 shows the findings for 'H3: Lean management factors have a significant effect on participation in decisions.' As can be seen in the table, the fact that the F value (256,845) is high and the sigma value (0.000) is found to be significant indicates that the model is significant. The explanatory power of the model is quite high at 62%. Accordingly, the Benefits and Opportunities factor and the Initiative and Participation factor explain 62% of the Participation in Decisions factor. Benefits and Opportunities factor has a positive and significant effect (0.326) on participation in decisions, Initiative and Participation factor has a positive and significant effect (0.528) on participation in decisions. According to these findings, 'H3a: Benefits and possibilities factor has a significant effect on participation in decisions.' and 'H3b: The factor of initiative and participation has a significant effect on participation in decisions.' hypotheses were accepted. In this context, 'H3: Lean management factors have a significant effect on participation in decisions.' hypothesis was also accepted.

Dependent Variable: Participation in Decision	Beta	t value	Sig.	R2	f	Sig.
Constant			0,254	62,00%	264,752	0,000
Benefits and Opportunities	0,326	4,483	0,000			
Initiative and Participation	0,528	7,942	0,000			

Table 10: Regression Analysis Findings for the Factor of Participation in Decisions

4. Results and Discussion Regarding the Research Findings from the Private Companies

The perspective of human resources management, which moves human resources away from being a department and acts innovatively, enables human resources to act in harmony with many different structures. At the same time, this situation provides an opportunity for human resources management to take more qualified steps by incorporating innovative practices. The paths of the lean management approach and the human resources management approach intersect within the organizations that want to carry out quality activities in the institutional sense. The employee-centered management approach of human resources management, which emphasizes the existence and functionality of employees and places more value on them, is in parallel with the lean management approach. Accordingly, in lean management, creating a working environment that will appeal to both their physical and mental health is an important management move for businesses so that they can perform more qualified activities. In the literature review, the link between lean and teamwork is stated as one of the most important pillars of building lean environment (De Vries and Van der Poll 2018). It's also mentioned by Taiichi Ohno, as well, that team-work is essential in human cooperation and lean will only contribute from it (Ohno 1988). Last but not least, the steps taken by the human resources management to improve the operational performance and psychological state of the employees has huge impact on TQM (Dahlgard and Park 2006).

On the other hand, as discovered in our research as well, lean management approach is closely concerned with the development of all elements within the corporate structure, especially employees. The development of the business and the achievement of commercial as well as operational success depend on the development of employees. For this reason, in the lean management philosophy, it is aware that the corporate structure has responsibilities in terms of training the employees, eliminating their problems and supporting them in struggling with the responsibilities they undertake. A similar situation is also in question in terms of human resources management, and special training of employees is seen as essential for sustainable success in terms of businesses that maintain the understanding of human resources management in an institutional framework, professionally.

Another point that draws attention based on our research is: the harmony between lean management and human resources management in terms of employee productivity is the benefits of acting in integrity. Lean management philosophy adopts the idea that the high-quality business volume that will emerge by acting together is critical in terms of focusing on common goals. In terms of human resources management, employees are not described as being different or distant from each other in any way. On the contrary, even if the employees work in different departments, they are able to increase each other's working energy, with the awareness that they will provide each other with a sense of motivation and common interest. So, on the example of the investigated company, we can summarize a conclusion for an overall situation in Azerbaijani companies as well. At this point, it is possible to think that lean management and human resources management are two institutional elements that are compatible with each other due to the combination of process and activity perceptions in the target of common interests. And it's advised to invest more time and resources in a that Lean Management calls.

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