

Lean Office Applied In the Training and Development Sector of An Electricity Distribution Company

Carla Ribeiro Moreira¹, Mário César Fialho de Oliveira², Patrícia Werneck Silva de Oliveira³, Jhosálim de Souza Ferraz⁴

¹ Student of Industrial Engineering, Faculdades Integradas de Cataguases-FIC/UNIS

² Expert in Business Logistics, Universidade Federal de Juiz de Fora-UFJF

³ Expert in Sociology, Universidade Federal de Juiz de Fora-UFJF

⁴ Industrial Engineering, Faculdades Integradas de Cataguases-FIC/UNIS

Abstract — *The present work aimed to use Lean Office tools in a training and development sector of an electric power distributor located in a city of Zona da Mata of Minas Gerais. Through the survey of problems made by brainstorming with the 4 people in the sector was defined as the study analysis problem the restructuring in the process of evaluation of managers in the company. Once defined, the Value Stream Mapping (MFV) tool was used to map the current state, as well as to project the future state. The process improvement began with the use of Google Forms to optimize the response capture process to replace the physical paper form. With the replacement of the current process by the proposed one, there was a reduction of one process, and a reduction from 5 business days to 2 business days and also increasing the adherence of responses by employees, from 76% of the current model to 100%. There was also an allowance for the use of papers throughout the process. After using the new process, the standardization tool was used, where a Standard Operating Procedure (SOP) document was prepared so that there were no deviations in the newly established procedure.*

Keywords: *Lean Office, Development, MFV, Standardization.*

I. INTRODUCTION

In today's competitive world, the pursuit of process improvement has led to the use of new work methodologies that allow process improvements, making them more agile, so that they can efficiently serve their customers. With this, we sought to use lean thinking or better known as Lean.

According to Cardoso and Alves (2013), lean thinking was initially applied in manufacturing environments and known as Lean Manufacturing. However, the dynamics of the market are constantly pushing for process improvements. Thus, soon the lean mentality began to be introduced in administrative environments.

In this line of thought, Balzer et al. (2016) says that Lean concepts have been disseminated and are

being applied in various areas such as construction, human resources, public service, and administrative areas. This aspect of Lean Manufacturing is known as Lean Office.

With this, Gronovic et al. (2013) and Cardoso and Alves (2013), say that the application of Lean Office concepts in administrative sectors allows the identification of sources of waste in the process and information flow that must be corrected to increase business competitiveness.

Through these statements, a study on Lean Office and its tools is justified to restructure the manager evaluation process in the Training and Development sector of a company in the field of electricity distribution.

The work presents two moments: the first, the theoretical foundation is structured and the second has a practical focus on the administrative system of the T&D sector. After reviewing the literature on Lean Manufacturing, Lean Office and People Management, qualitative exploratory research was conducted through semi-structured interviews, observation and field visits to compose the case study.

The general objective of this article is to study the possibilities of improvements in the manager evaluation process in the Training and Development sector of a company in the field of electricity distribution, applying Lean Office tools, seeking a solution to the current priority problem, It is the need for restructuring in the process of evaluating managers in the company.

The specific objective is to: improve the manager evaluation process through its optimization of the current model; Reduction of process steps; increased adherence of responses by direct reports; elimination of paper use.

II. LITERATURE REVISION

A. Origin of Lean Manufacturing

According to Yashuhiro (2015), the Toyota Production System (STP) was developed by Taiichi Ohno and was born out of necessity and market constraints, where it required the production of small quantities of many varieties of items under low demand conditions. Its implementation began shortly

after World War II, but attracted attention from Japanese industry after the oil crisis in late 1973. STP is part of Lean Manufacturing.

Lean Manufacturing was developed from the concepts and techniques of STP and the main objective is based on the elimination of waste and quality manufacturing.

According to Bartz et al. (2013), Lean Manufacturing is a philosophy, also known as lean production that seeks to combine new management techniques to make the company a reference.

B. Lean Office

Second Tapping; Shuker (2010), with the Lean Manufacturing philosophy and the need for companies to become leaner, eliminating the elements that tend not to add value in the processes, was born the Lean Office.

According to Tapping; Shuker (2010), Lean Office is based on the applicability of Lean Manufacturing principles and tools to the administrative activities of organizations. In the context of production systems, Lean Office adheres especially to information flows that do not follow material or manufacturing processes. Still maintain objectives of cost reduction, rework, minimization of communication problems, reduction or even elimination of activities that do not add value, increased productivity, the efficiency of administrative functions and finally, improvement of the desktop in administrative environments.

Roos and Paladini (2013) state that Lean Office is an adaptive evolution of Lean Manufacturing, with one particular difference: whereas in Lean Manufacturing, work scenarios are very visible, since they are processes with physical flows, in the case of Lean Office work scenarios are often difficult to see as these are processes involving non-physical flows.

According to Lean Institute Brazil (2019) the main Lean Office tools are: 5s, MFV, streaming, takt time, work standardization, Kaizen

**TABLE I
KEY LEAN OFFICE TOOLS**

5s	According to Falkowski (2013), the 5S program emerged from May 1950 in Japan, when the need for a method of combating waste was seen to optimize the scarce resources in a country that had recently gone through war. This new method was called the 5S and is made up of five actions or senses - selection, ordering, cleansing, well-being and self-discipline.
Value stream mapping	According to Lean Institute Brasil (2019), the value stream mapping takes place through a

	simple diagram of all the steps involved in the flow of materials and information, necessary from order to delivery of the product or service. Value stream mapping can be done at different times to seek and uncover opportunities for improvement.
Continuous flow	According to Drotz (2014), continuous flow aims to flow between products, materials, information, people, stopping only when it comes to any activity that adds value. In a scenario where continuous flow is optimal, there are no delays and the practical cycle time is the same as planned.
Takt weather	According to Holland (2014), Takt time is the speed with which customers order finished products, which is determined by dividing the total available production time per shift by customer demand.
Standardization	According to Chiavenato (2013), standardization consists of applying standards in an organization to achieve uniformity and cost reduction, leading to simplification as uniformity reduces variability and exceptions that complicate the production process.
Kaizen	According to Endeavor (2015), Kaizen comes from a Japanese word that means change for the better and in the business context reducing costs and increasing productivity and has as philosophy the continuous improvement in the development of its activities.

Source: Adapted by the author.

C. Training and Development

According to Chiavetano (2010), people management is a managerial function, aimed at the cooperation of people working in organizations to achieve organizational and individual goals. People management allows the collaboration of people, employees, human resources, employees, talents, etc., to achieve organizational and individual goals.

According to Stoner and Freeman (2010), people are a vital element in organizations and responsible for results, and to become continually able to enjoy their functions, it is necessary to raise awareness of the professional. In this context is inserted the training and development in the HR sector.

Also according to Stoner and Freeman (2010), training programs are designed to improve and maintain development at work, while development programs seek to develop. Training is the use of individuals to perform certain functions assigned to them in the company where they are inserted or where they will start, making them able to perform tasks in the best possible way, within the specific qualification.

Therefore, according to Chiavetano (2010), for training to be successful, the company needs to map staffing needs and design programs that meet each individual's diagnosed needs, then apply it and verify that goals have been met.

D. Similar Studies

It was found that several studies related to the use of Lean Office were performed in several sectors and organizations bringing applications of the approach proposed by Tapping and Shuker (2010).

Turati and Musetti (2007), in which proposed the study of the application of Lean Office concepts in a public administrative sector. Seraphim, Silva and Agostinho (2010), brought the application of Lean Office in military organizations in the health area. Ross, Sartori and Paladini (2011) deal with the Lean Office approach to reduce and eliminate waste in the flow of information and knowledge. Ferraz et al. (2018) bringing the possibility of improvement in a nursery-hotel located in Cataguases-MG using the tools of the Lean Office. Rocha and Walter (2015), identifying the possibility of improvements in the workflow of an information technology service company.

III. METHODOLOGY

To elaborate on the present work, bibliographical researches in books and articles published in magazines and periodicals were carried out, seeking the justifications and the objectives for the theoretical basis for the practice of the work.

The present scientific work was carried out in a training sector, in a power distribution company in a city of Zona da Mata of Minas Gerais. In order to define a primary problem, a brainstorming was performed with the only four (4) employees in the sector, who were asked to indicate a priority problem in which it was understood that there is a need for restructuring in the process of evaluating manager in the company, since the evaluation is performed manually through a printed form, with this, there are expenses with craft sheets, more time to compile the data and less adherence to the answers.

To restructure the new manager evaluation process in the company, the flow mapping tool was used to verify the current and future state of the process.

To collect the answers of the employees in the evaluation, an online form was elaborated and the link to their corporate emails was sent, enabling them to respond without identifying themselves. Thus, the

Google Forms tool was used which according to Google (2019), Google forms allow the user to collect and organize free and large information. Also, survey responses are stored in spreadsheets (Google Sheets) and can be viewed graphically or even raw in the spreadsheet. Thus, there are different question styles and input methods for answers, as well as section breaks, file upload, image or video display and other features. Heidemann et al. (2010, p. 32) states that opinion polls can be easily implemented in Google Forms.

The online form contains the same questions as the physical form because they were already standard questions. There are 19 questions, 14 multiple choices 3 binary and 2 open. The purpose of multiple-choice questions is to identify specific points for improvement. Binary questions are to identify if the manager seeks to understand employee activities. Finally, open companies seek to know what are the perspectives that employees have in relation to their manager and what they expect from management. To compare and verify the benefits of the online form, it was applied in a 25-person industry where employees had previously completed the physical forms.

In the process of analyzing the information obtained through the online form, Excel was used to create graphs of binary responses and multiple choices collected.

To standardize the new evaluation process, we used the Lean Office Standardization tool, where the main purpose was for the process to continue following the same structuring format.

A. Metrics Adopted

The online form allows you to import answers into Excel, so you can set values for multiple-choice and binary answers by quantitatively evaluating them. To calculate the average of the multiple-choice questions, the Likert scale was used, where the values were defined from 1 to 4. Being: 1 "Bad", 2 "Insufficient", 3 "Good" and 4 "Excellent". Still, in the calculation of the average in the binary questions, the values 1 and 4 were defined, being 1 "No" and 4 "Yes". Finally, open companies are qualitatively measured, from which we can derive from the point of view of employees what they expect from improvements in the manager evaluated. Thus, the average is based on questions, considering <2 "Bad / Insufficient", $> = 2$ "Average", $> = 3$ "Good / Excellent", and it is possible to identify which points the manager should act to improve.

IV. RESULTS AND DISCUSSION

A. Current State Flow Mapping

The current state of the process consists of editing and printing the forms according to the number of employees under management of the appraise, and then these forms are delivered to the employees, where they filled out the document. After this step,

the forms were collected and then digitized, consolidated and submitted to the manager (see figure 1).

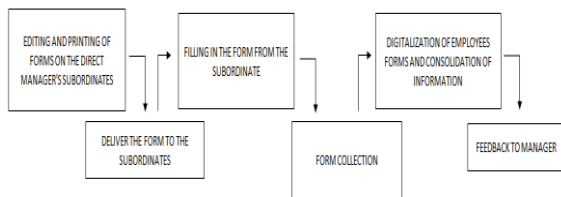


Fig. 1 -- Current State Flow Mapping

This molding process presents some problems, such as: non-compliance with the pre-established 5-day time limit; incorrect completion of information, containing erasure or even loss of document, causing rework; It takes time to consolidate information since it is done manually, where an employee evaluates the answers and was plotted in a spreadsheet for analysis.

B. Future State Flow Mapping

Subsequently, the process was defined as: Sending the Google Forms to form link to the collaborators under the management of the appraise following the completion of the form and after the 2 days deadline is closed to submit responses. After this step, the database is exported to Excel and the dashboard is elaborated and then the manager is given feedback (see figure 2).

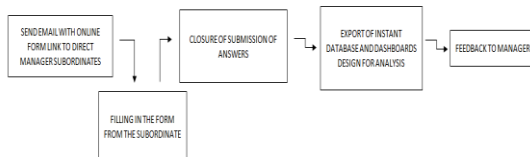


Fig. 2 -- Future State Flow Mapping

With a long working chain as it is used to generate paper forms, the process becomes tiresome, opening up gaps for human error caused by scattered attention. With the electronic form, there was the possibility of process automation. In addition, the electronic form can be used as many times as needed, and you can delete data and re-enter it as many times as needed. In the distribution phase of the online form, there were no paper expenses, as the online form can be answered electronically and anywhere on various devices, such as notebooks, computers, tablets or smartphones, thus contributing to the maintenance of the forms. natural resources such as reduced paper use and consequently reduced paper disposal.

Another point of improvement was regarding the distribution of forms where when the forms were paper required more laborious logistics for distribution to all respondents where with the new form it is possible to distribute a variety at the same time, optimizing time and getting faster answers. In

case of wrong selected answers, simply select the field and erase the information, then rewrite it.

Figure 3 corresponds to the comparison of the current state versus the proposed state.

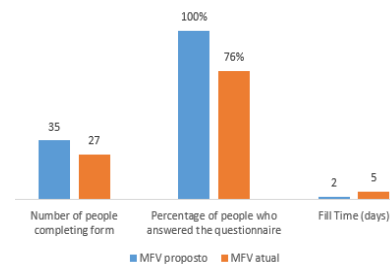


Fig. 3 -- Comparison current state vs. proposed state

As shown in Figure 3, it was also possible to notice that the employees responded faster and more assertively, in which the physical forms took 5 working days for 76% of the employees to respond, and 35 forms were printed, once the form was lost, they forgot of answering or erasing them. With the online form, there was 100% adherence of answers obtained within a timely 2 working days.

C. Standardization

After the change process was finalized, a PDCA meeting was held with the T&D team and Standardization, a Lean Office tool was applied. The standardization of the process was through the transfer of new evaluation procedures to the team. Besides, a Standard Operating Procedure (SOP) document has been prepared, which aims to guide employees on the processes related to manager evaluation.

V. CONCLUSIONS

The development of the work aimed to solve a current priority problem of a Training and Development sector of a company in the field of electricity distribution, using some Lean Office tools, which was defined through a semi-structured interview, observation, and visits. in the field, such as optimizing the process of evaluating managers in the company, reducing process time, consolidating results more efficiently and eliminating waste with materials. After defining the problem, the Lean Office: MFV tools were used where the current state of the process was mapped and also the future state was projected with the necessary changes to improve. For the optimization of the process, it was decided to replace the physical form with the electronic one. Thus, to collect the answers of the collaborators in the evaluation, an online form was elaborated through the Google Forms tool. To compare and verify the benefits of the online form, it was applied in a 25-person industry where employees had previously completed the physical forms. It was found that for the physical forms it took 5 working

days for 76% of employees to respond, and 35 forms were printed, since employees lost, forgot to answer or erased them. With the online form, 100% assertive responses adhered to within 2 business days, eliminating 100% of impressions. Still, with the replacement, it was noticed that there were optimization and gains in the processes and inputs, where the employee has more confidentiality in the answers because they can answer confidentially, and the form contributing to the environment and the environment is no longer printed. productivity in the T&D industry, as Google Forms already delivers data on a consolidated basis. Finally, it was realized that the process of collecting forms was eliminated. After the change process is complete, apply a Standardization Lean Office tool. It took place through the transfer of the new evaluation procedures to the team. It also prepared a Standard Operating Procedure (SOP) document, the same objective to guide employees on the processes related to manager evaluation.

The general objective of this article is to study the possibilities of improvements in the manager evaluation process in the Training and Development sector of a company in the field of electricity distribution, applying the Lean Office tools, where this objective was reached in the process of restructuring of manager evaluation in the company.

The specific objective was evaluated in: improvement of the manager evaluation process through its optimization; Decrease of process steps where it was verified the decrease of a process step; increased adherence of responses by direct reports where 100% adherence of employee responses after the new model; eliminating the use of paper where Google Forms was used to support it.

REFERENCES

- [1] BARTZ, A.P.B et al. Aplicação da Produção Enxuta em uma indústria de produtos agrícolas. *Ingeniare, Revista chilena de ingeniería*. Vol. 21 Nº 1, pp.147-158. 2013.
- [2] BRASIL, L. I. Mapeamento do fluxo de valor (VSM) – Estado Atual e Futuro. 2018. Disponível em: <[https://www.Lean.org.br/conceitos/72/mapeamento-do-fluxo-de-valor-\(vsm\)---estado-atual-e-futuro.aspx](https://www.Lean.org.br/conceitos/72/mapeamento-do-fluxo-de-valor-(vsm)---estado-atual-e-futuro.aspx)>. Acesso em: 10/04/19.
- [3] CHIAVENATO, I. Princípios da administração: O essencial em teoria geral da administração. 2 ed. Tamboré; Manole Ltda, 2013.
- [4] DROTZ,Erik;POKSINSKA, Bozena. Lean in healthcare from employee,perspectives. *Journal of health organization and management*, v. 28, n. 2, p. 177-195, 2014.
- [5] ENDEAVOR, B. Kaizen: a sabedoria milenar a serviço da sua melhor gestão. 2015. Disponível em: <<https://endeavor.org.br/kaizen/>>. Acesso em: 15/09/19.
- [6] FALKOWSKI, P., KITOWSKI, P.: The 5S methodology as a tool for improving organization of production. *PhD Interdisciplinary Journal*, 2013 n. 3, p. 127-133.
- [7] FERRAZ, Jhosálim de Souza; OLIVEIRA, Mário César Fialho; OLIVEIRA, Patrícia Werneck Silva; MOREIRA, Carla Ribeiro. Lean office: Case Study at a Daycare Center Located in Cataguases-MG. *International Journal of Engineering Trends and Technology*. Vol 65. 2018.
- [8] GOOGLE. Formulários. 2019. Disponível em: https://www.google.com/intl/pt_br/forms/about/. Acesso em: 15/06/19.
- [9] HEIDEMANN, Leonardo Albuquerque; OLIVEIRA, Ângelo Mozart Medeiros de; VEIT, Eliane Angela. Ferramentas online no ensino de ciências: uma proposta com o Google Docs. *Física na escola*. São Paulo. v. 11, n. 2, 2010, p. 30-33.
- [10] HOLLAND,M. Taking Control: A Simple Approach to World-Class Manufacturing. ISBN:978-1-4834-1549-9. Lulu Publishing Services. 2014. Cap 3.
- [11] LOWE, D. Redes de Computadores Para Leigos - 9ª Edição. Alta Books Editora, 2012.
- [12] MICROSOFT. O que é Power BI? 2019. Disponível em: <https://docs.microsoft.com/pt-br/power-bi/power-bi-overview>. Acesso em: 15/06/19.
- [13] ROCHA E WALTER. Lean Office: um estudo de caso em uma empresa alemã. In: XXXV ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO, anais... 2015
- [14] ROOS, Cristiano; PALADINI, Edson Pacheco. Implementação parcial do Lean Office em uma organização prestadora de serviços. In: CARVALHO, Marly Monteiro de et al (Org.). *Gestão de Serviços: Casos brasileiros*. São Paulo: Atlas, 2013. Cap. 10. p. 164-180.
- [15] ROOS, C., Sartori, S., PALADINI, E. P. (2011). Uma abordagem do Lean Office para reduzir e eliminar desperdícios no fluxo de valor de informações e conhecimentos. *Encontro Nacional de Engenharia de Produção*, 31.
- [16] SERAPHIM, E. C., SILVA, I. B. D., AGOSTINHO, O. L. (2010). Lean Office in health military organizations: case study in the health center of Campinas. *Gestão & Produção*, 17(2), 389- 405.
- [17] TAPPING, D., SHUKER, T. (2010). Lean Office: gerenciamento do fluxo de valor para áreas administrativas- 8 passos para planejar, mapear e sustentar melhorias Lean nas áreas administrativas. São Paulo: Editora Leopardo.
- [18] TURATI, R. C.; MUSETTI, M. A. (2007). Aplicação dos conceitos de Lean Office no setor administrativo público. In: *Encontro Nacional de Engenharia de Produção*, 26. Fortaleza. Anais... Fortaleza: ABEPRO.
- [19] YASHUHIRO, M. Sistema Toyota de produção: Uma abordagem integrada ao just-in-time. 4 ed. Porto Alegre; Bookman editora Ltda, 2015.