Lean Office application in management flow of a billing department

João Vitor Almeida Costa[#1], Mário César Fialho de Oliveira[*2], Patricia Werneck Silva de Oliveira[#3]

¹Student of Industrial Engineering, Faculdades Integradas de Cataguases-FIC/UNIS
²Expert in Business Logistics, Universidade Federal de Juiz de Fora-UFJF
³Expert in Sociology, Universidade Federal de Juiz de Fora-UFJF
Cataguases/MG, Brazil

Abstract — *This paper aims to present how the use of Lean Office tools combined with automation tools were used in a big company of electric sector, located in the Zona da Mata Mineira. Where after mapping the processes related to print flow it was possible to identify points for improvement. Among the Lean Office tools used are the: Value stream mapping (VSM), process map, standardization, and Kaizen. After mapping the processes, defining the standardization and using the Kaizen tool to make employees aware of continuous improvement. An automation tool for mapped processes was developed using Visual Basic for Apllications. And after developing the automation and control tool, Power BI software was used to develop a dashboard to enable managers to obtain real-time information regarding printing processes. Using the developed tool it was possible to reduce unnecessary movements, reduction of 60% in printed sheets, reduced physical archiving requirement, reduction 90% in sheet accumulation on the table and a saving of R $ 7,312.65 in envelope and sheets expenses and it was possible to standardize the process.*

Keywords — *Lean Office; MFV; Kaizen; VBA.*

I. INTRODUCTION

In a highly competitive market, companies are driven to automate the processes focusing on sustainability and quality, wanting to achieve their goals to remain competitive in the market.

Thus, the study of more effective management methodologies stimulates interest in the lean office concept, which can provide improvements in administrative processes.

Lean Office is a technique used in office management, that applies lean mindset principles to managing materials, people and information flow based on cultural, visual, operational and managerial patterns [1].

This study becomes fundamental as it will make it possible to apply the lean methodology integrated with the automation, go to Gemba and map processes with high print and waste, besides being performed manually. And after this analysis identifies the processes that can be improved, to reduce impression volume, waste, queue at printers,

time spent on unnecessary movements, the high cost with paper and toner, besides reducing environmental impacts.

The overall objective of this study is to map the processes related to document printing and reports used by employees to hold conferences and analyzes and which are performed manually and contains a high volume of impressions and how the use and applicability of Lean office and automation can improve print flow control management and consequently reduce costs. The specific objectives are to execute a brainstorm with the department team, to identify bottlenecks in print production, using Value Stream Mapping (VSM) to map the points of improvement within the process and seek standardization. And drafting a dashboard providing process managers with managerial control and identify future enhancements.

II. LITERATURE REVIEW

The following will be presented the literature review for a better understanding of this scientific article, as the definition of Lean Office and its fundamental tools, such as value stream mapping, continuous flow, takt time, job standardization, Kaizen and 5s.

A. Lean Office

According to [2], Lean Office is an adaptive development of Lean Manufacturing, with one difference: while in Lean Office work scenarios are often hard to see because these are methodologies involving non-physical flows in Lean Manufacturing the work scenarios are very visible because these are methodologies with physical flows.

[3] affirm Lean Office is a tool of Production Engineering, that was adapting to scenarios with opportunities for improvement inserting changes when needed to avoid closing in predefined batches with already directed movements because first, it is necessary to certify the functionalities proposed by the Lean Office methodology in the environment. The following are the main Lean Office tools.

B. Kaizen

According to [4], Kaizen proposes transformation in the perception of all employees of an organization,

who must often find waste at work, to be able with the support of their superiors to eliminate them.

C. Value Stream Mapping

According to [5], the value stream product is a graph comprising the enterprise-wide flow, being able to identify the period of inventory accumulation, full production time and the percentage of the value-added time.

D. Continuous Flow

According to [6], continuous flow aims to flow between products, materials, information, people, stopping only when it comes to any activity that adds value. In the scenario where continuous flow is ideal, no delays and practical cycle time is equal to planned.

E. 5S Program

According to [7], the 5S program started in May 1950 in Japan, when we saw the need to create a method to combat waste, to optimize the few existing resources in a country that recently had a war.

F. Takt Time

According to [8] takt time is related to the rate at which parts or elements must be processed to respond to specific customer demand.

G. Standardization

Standardization consists of the use of standards in an organization for uniformity and cost savings, becoming vital for improving efficiency, as uniformity reduces variability, and the exceptions that complicate the production process according to [9].

III. METHODOLOGY

For the elaboration of this article, bibliographic searches were conducted between February and April 2019, through Google Scholar and books, tracking appropriate justifications and objectives for a theoretical basis for the composition of the work practice.

The research to be conducted according to [10], is classified as exploratory descriptive since it will be defined through methods and analysis of facts and processes.

The company studied it is a big company, operates in the power sector, established in the Zona da Mata Mineira and with several units spread in the regions of Brazil. It has approximately 16,000 employees.

The processes of document and report printing used for simple conferencing and analysis among employees were mapped during the month of May 2019 based on print volume. In general, processes using printing were inspected and data collected among employees aiming to find what were the pain points, among them: a high volume of papers on the table, queue at printers, time spent moving between stands, and the printers, unnecessary impressions to hold conference, high cost with paper and toner.

To propose a solution to the research question problem were used as Lean Office tools: Value Stream Mapping (VSM), process map, standardization and Kaizen.

Through the mapping of processes using printouts, the flow of the current process model was simulated to identify opportunities for improvement and identify inefficiencies in the process performed manually. From the study of the current model, a new proposal has been prepared to automate the process and create a new feature for print control and management. The billing verification process was found to be the main offender.

For the realization of process automation, which will generate qualitative and quantitative data, Visual Basic for Applications was used, which allows the user to apply programming features to Microsoft Office documents. After process automation and control, Power BI software a business analytics tool was used aiming to provide insights to enable quick and informed decisions, in addition to sharing information on any device. It was then defined, Power BI software due to its practicality since it allows for scheduled and real-time updates.

For process standardization, training was carried out with the employees involved in the process of billing conference, which he set out to present the automated process using logic in VBA and the tool developed through the PBI for management and decision making of managers.

It was defined that at the end of each month, the responsible for creating print management PBI, was responsible for updating the impression volume worksheet and then update the PBI generating the link for analysis of the managers of the area responsible for the process.

The Kaizen Tool was used, to convey to employees about the relevance of continuous improvement, to avoid waste and non-value-added activities, it also highlights the importance of this methodology within organizations.

For results production and discussions, the application developed through the VBA was used for 12 (twelve) weeks from May to September 2019 and after this time the future state of the process was mapped, and from the measurement of results, a presentation was built through the PowerPoint software where all tangible and intangible gains were measured.

IV. RESULTS AND DISCUSSIONS

Next, we will present the results achieved by applying the Lean Office methodology described above. Previously the billing checking process was done as shown in Figure 1, where she presents the

billing checking process. The process is performed in this manner and manually implied: Lack of control over the flow of impressions, lack of control over the cost of impressions and no management analysis and controls.

Figure 1 - Billing Industry Conference Process.
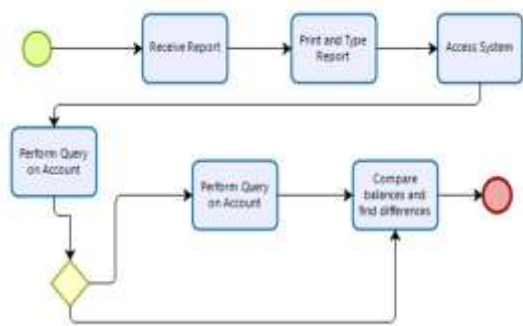
With the help of Lean Office tools, it was realized that the billing industry needed to create print volume management. This need became clear after mapping the processes with the highest volume of impressions.

Through the MFV it was possible to reduce the print volume because it can be optimized through logic in VBA and once the logic is created billing checking process gains in reliability and agility. It is no longer necessary to perform the analysis manually.

Later the process was defined according to Figure 2. This new process is being explained to industry employees along with the importance of the Kaizen philosophy of continuous improvement. Aiming that employees are more attentive to the processes in which they operate not only satisfied with a simple change and small positive results.
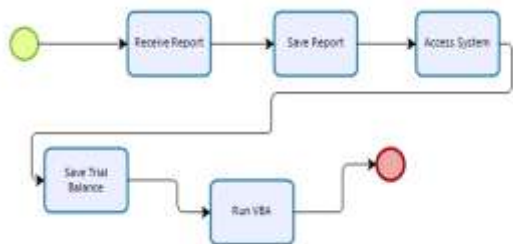

Figure 2 - New billing verification process.

Following the process illustrated in Figure 2, where the department uses the developed VBA application, allowed flow control within this process what previously did not happen. Therefore, it was not possible to perform management analyzes of this process.

The process for performing print management was defined as Figure 3. Where the responsible employee requests the impression report from the responsible sector and updates the data into the management dashboard.

Thus, managers and responsible employees can have indicators and perform analyzes both for future improvements and for better monitor and control of the process.

The Management Dashboard that makes it possible for managers to manage print volume management can be viewed as Figure 4. Where is possible view and track total pages printed by day, year, and month. Which collaborators and department made the most impressions and where did those impressions flow most.
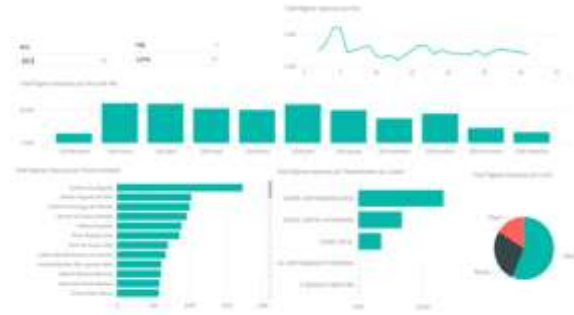

Figure 4 - Billing Sector Impression Volumetric Management Chart.

A. Measurement of Earnings

After completing the twelve weeks of implementation of the developed application it was possible to measure the gains for the organization among them: Reduction of unnecessary movements and 60% reduction of printed sheets. Which consequently generated physical archiving reduction, a 90% reduction in the accumulation of sheets on the table and a saving of R $ 7,312.65 in spending on envelopes and sheets.

V. CONCLUSIONS

This present work aimed to perform a mapping of the processes that are performed manually and contains a high volume of impressions, in a big company of the electricity sector located in Zona da Mata Mineira, Brazil. And how to use Lean office methodology and tools coupled with automation tools to identify points for improvement and consequently generate better management, control of print flow and cost reduction.

Lean Office tools used include: Value Stream Mapping (MFV), Process Mapping, Standardization, and Kaizen.

After mapping the processes it was possible to identify the opportunities for improvement and identify the inefficiencies. Using the mapped model was elaborated a new model has been developed aiming to automate the process and also create a new feature for print control and management.

To perform mapped process automation Visual Basic for Applications was used and after developing the automation and control tool Power BI software was used to develop a dashboard that

allows managers to obtain real-time information of mapped processes.

Running the application developed for 12 weeks measured the following gains for the organization: Reduction of unnecessary movement, reduction of printed sheets, reduced physical archiving, reduced sheet accumulation on the table and savings on envelope and sheet costs. In addition to obtaining a standardized process.

REFERENCES

[1]   GREEF, A. C.; FREITAS, M. C. D.; ROMANEL, F. B. Lean Office: Operação, Gerenciamento e Tecnologias. São Paulo. Editora Atlas. 2012.

[2]   ROOS, C.; PALADINI, E. P. Implementação parcial do lean office em um organização prestadora de serviços, In:

[3]   MAGALHAES, I. R. V.; NOGUEIRA, R. J. da C. C. Lean Office: Mapeamento do fluxo de valor no gabinete da secretaria municipal de saúde de manaus – semsa. São Paulo: XXIII SIMPEP, 2016.

[4]   IMAI, M. Kaizen Institute. 2010. Available in: <http://br.kaizen.com/artigos-e-livros/artigos/kaizen-baixando-os-custos-e-melhorando-a-qualidade.html>. Access in: 05/04/2019.

[5]   ROHAC, T.; JANUSKA, M. Value Stream Mapping Demonstration on Real Case Study. Original Research Article Procedia Engineering, Vol. 100, pp. 520-529, 2015.

[6]   DROTZ, E.; POKSINSKA, B. Lean in healthcare from employees' perspectives. Journal of health organization and management, v. 28, n. 2, p. 177-195, 2014.

[7]   FALKOWSKI, P., KITOWSKI, P.: The 5S methodology as a tool for improving organization of production. PhD Interdisciplinary Journal, 2013 n. 3, p. 127-133.

[8]   SUNDAR, R.; BALAJI, A.; KUMMAR, S. A Review on Lean Manufacturing Implementation Techniques. Original Research Article Procedia Engineering, Vol. 97, pp. 1875-1885, 2014.

[9]   CHIAVENATO, I. Princípios da administração: O essencial em teoria geral da administração. 2 ed. Tamboré; Manole Ltda, 2013.

[10] Volpato, G. L. O método lógico para redação científica. RECIIS 2015, jan-mar. São Paulo. 2015.