

Implementing Lean Office: A Successful Case in Public Sector

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Applying lean approaches in office areas can lead to performance improvements and other benefits as achieved in traditional manufacturing environments. The intangibility of office operations may appear as a major difficulty for lean implementations but in fact the benefits achievable are as important as the ones achieved in manufacturing environments. This paper reports a successful case of lean office implementation in a public sector organization giving emphasis to its major performance improvements. Lead times were greatly reduced to the most important office processes as well as achieving good improvements in productivity. Starting the lean office implementation with process mapping was very effective in creating rapid results and as a consequence more motivation and involvement of everyone. On the other hand, a good side effect achieved from this lean office case was the generation of a common culture among all teams and also a much easier integration between all different teams.

Keywords: Lean Office; Public Sector; Office Process Mapping; Lean Teams; Visual Management.

1. INTRODUCTION

Several are the benefits reported in the literature when lean and kaizen approaches are introduced in industries across different sectors and countries [1]. Technological advances and globalization have been changing the way operations managers deal with the production of goods and services; including the way factories, suppliers and customers have interacted to perform their business [2] [3]. This worldwide context changed the way companies operate, so organizations that were once local, have become national and global with all its benefits and challenges. The business competitiveness has leveraged organizations in overcoming the competition, and therefore the need for continuous improvement of the production process; productivity; and the quality of its products and services, so that has sought to innovate by adding value to them [4][5][6].

The implementation of lean concepts, principles and tools in office areas became natural also since companies observed clear performance improvements from lean implementation in their own manufacturing areas.

A successful case of lean office implementation in the public sector is presented in this article expressing its main achievements in terms of performance and in terms of the team integration. A discussion about the identification of key factor for success is also included. This article reports the case of a public organization (an association of municipalities) dedicated to solid waste treatment in Oporto region.

This organization started a lean office journey in

2010 triggered by a restructuring initiative in all the supporting departments. The objective was to concentrate in a single department the five existing ones (Management Control Department; Financial Department; Supply Department; Human Resources Department; and Administrative Department). The head of the new larger department requested help from an external consultant to assist with the implementation of lean office concepts and solutions to reduce lead times and improve overall performance.

The main phases of the project, named as “DAFCG Kaizen Project”, proposed by the external consultant were: (1) Lean Event and Project Presentation, (2) Priorities Identification, (3) Pilot Team Identification, and (4) Methodology application. The last phase included the following steps: (i) Team Organization, (ii) Visible Best Practices, (iii) Process Improvement, and (iv) Autonomous Teamwork.

2. BACKGROUND

Lean manufacturing, lean production or simply “lean” [7] is an approach to organization and management derived from the Toyota Production System (TPS) having its basis in the absolute elimination of waste (non-value added activities) [8]. The two pillars needed to support the TPS are referred by the same author as being the Just-In-Time and the Autonomation (Jidoka). Another not less important concept assigned to TPS, although less clear and less recognized by many lean implementations, is the respect for people. This concept of treating workers with respect and considerations was already assumed by the original Toyota Production System [9].

Regarding the waste elimination side of lean, the concept of shop-floor waste (“muda” in Japanese) is defined as any activity that does not add-up to the products’ value; and for that reason, it is very unlikely

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that the customer has to pay for it [8] [10] [11]. Waste is not exclusive of manufacturing environments, it is also present in administrative environment [12] [13]. Evidences of the benefits of lean are largely reported in the literature [14] but the application of lean approach in office areas is still in the beginning.

Although lean principles (Specify Value, Map the Value Stream, Establish Flow, Implement Pull flow, Pursue Perfection) [11] are in theory valid to any type of production (goods or services) most of the work and experience generated in the last decades was focused on industry and a new approach may need to be developed to address office work requirements [15].

It is recognized that lean tools employed in the administrative proceedings, have more difficulties in operation mainly due to [16]: i) variations that occur in processes that are larger than those that occur in manufacturing processes; ii) the existence of less information from the people involved; and iii) lack of reference in the literature.

Some existing lean tools are quite easily applied in offices while some others require considerable effort and adaptations to result in gains to the organization. 5S technique is easily applied in office areas but although changes are rapidly implemented and visible to anyone the gains are not easily quantified. Because the quantification of real gains is difficult, starting with this technique may not be the best option. Moreover lean sceptics may gain some strong arguments and the lean office implementation may be compromised.

Value stream or process mapping has been probably the most successful lean tool implemented in office areas [15]. The main reason may be based on the fact that good results are rapidly achieved from its implementation and therefore it is a good way to attract people to lean office adoption. Process mapping is probably the most effective tool in lean office. The methodology starts by gathering in a room all relevant actors in the selected process mapping all steps of the process (adding value or not) and flow of information. The team then identifies the process tasks that are pure waste and eliminating them in order to reduce the number of process steps, reduce lead time and improving flow and efficiency. Moreover the team also finds ways of improving the efficiency of the needed steps by including low cost automation solutions and “poka-yoke” devices to reduce errors.

Other important effective tools with great impact in lean office implementation are the standardization of procedures such as One-Point-Lessons, performance indicators monitoring and visual management.

Unfortunately at this moment only a very small number of quality lean office studies are published in recognized international journals and even books on the subject are very few. Much of the work are still to be done in order to develop a robust body of knowledge in lean office.

3. DESCRIPTION OF THE INITIAL STATE

LIPOR was founded in 1982 as a Municipalities Association for eight municipalities (Espinho, Gondomar, Maia, Matosinhos, Porto, Póvoa de Varzim,

Valongo and Vila do Conde) and it has implemented an integrated waste management, recovered, developed and built infrastructures and organised awareness campaigns for the population, estimated in almost 1 million inhabitants.

In 2010 the Board of Directors approved a new organizational structure concentrating on a single department all support activities to the business there were distributed in 5 separate departments. This was already a challenge to this new larger department team. The person assigned to lead this new larger department took this opportunity to implement cultural changes at getting better team overall performance. This new leader decided to implement a lean office approach as a tool to achieve better performance and a more effective management environment.

At that time, the existing departments were: the Management Control Department; the Financial Department; the Supply Department; the Human Resources Department; and the Administrative Department. The number of people assigned to each department is presented in Table 1.

Table 1. Existing departments

Department	# of People
Management Control Department	4
Financial Department	4
Supply Department	10
Human Resources Department	4
Administrative Department	4

The Management Control Office was composed by a team of 4 senior technician and its main tasks were related to the planning and budgeting process. The team prepare monthly the “Tableau de Bord”, and key variables business analysis for the Board of Directors. This is the main tool used in the company decision-making process.

The Financials activities were carried out in the financial department by 4 workers, with the responsibility of suppliers and salary payments, banking monitoring, and ensuring adequate financial resources to the normal activity of the association.

The Supply Department centralize and standardize the procurement of goods and services and carrying out procedures relating to contracts necessary for the development of the association's activities. According to the law, and according to the predicted value for the acquisition, they define appropriate buying procedure. This unit also have the responsibility of manage warehouses and tooling, registering inputs and outputs in computer application, in order to control stocks and updating stocks records. The team was constituted by 10 elements, and the main way of buying was the direct treats (expenses until 5 thousand euros).

The Human Resources Department aims to provide the necessary conditions for skills development of all workers, through management training, or through specific development programs. Their responsibilities include salary processing, management of internal training, medicine at work, recruitment and selection, and performance assessment system.

The main responsibilities of the Administrative Department includes performing all accounting records required by law, prepare diverse tax and accounting information and answer to the main entities and also the management of the organization's insurance portfolio. The monthly closing accounting process is the most critical process in back office activities, since only after completing this task is possible to issue analysis reports of the organization's activity in management control office.

4. PROCESS OF LEAN IMPLEMENTATION

One of the strategic drivers for LIPOR since the implementation of Balanced Scorecard, in 2006, is operational excellence in order to achieve higher productivity levels. The main concern of the new leadership in 2010 was an in-depth process knowledge of all working areas in the Department. Lean Office was the chosen tool for this propose and a Project was design - **DAFCG Kaizen Project** - with impact in annual individual performance evaluation for all workers.

The phases of the DAFCG Kaizen Project were:

- A. Lean Event and Project Presentation
- B. Priorities Identification
- C. Pilot Team Identification
- D. Methodology application

The first phase of DAFCG Kaizen Project - Lean Event and Project Presentation - occurred in March 2010, several employees were selected from all teams and with an external consultant the basic Lean principles were transmitted and the team learned about kaizen methodology approach. In this first event the team did not know what was expected from them regarding this new project and this new way of working.

In the second phase - Priorities Identification - the most important process in each work team was chosen for process mapping. The selected process from each work team is depicted in Table 2.

Table 2. Process Lead Time

Work Team	Selected Process	Lead Time
Management Control Team	Management reporting	3 days
Accounting Team	Monthly accounts closure	8 days
Human Resources Team	Payroll processing	10 days
Finance and Treasury Team	Payment to suppliers	9 days
Supply Team	Direct treats	5 days

A 25% of efficiency improvement target was assigned to each process upon with a process map was created.

In the Pilot Team Identification phase (third phase), the accounting team was selected as the pilot team, in way to define and apply the kaizen methodology approach, and spread the best practices through others teams, helping them to overcome the difficulties in the project.

In the final phase – Methodology Application – (see Table 3) the Kaizen approach consists of four distinct levels: (1) Team Organization; (2) Visible Best Practices; (3) Process Improvement; and (4) Autonomous Teamwork.

Table 3. Kaizen Approach Levels

Level	Objective
1. Team Organization	Waste Awareness and Setting Objectives 5s Practice Team Board and Suggestion System
2. Visible Best Practices	Quality Visual Standards Time Visual Standards Other Visual Standards
3. Process Improvement	Process Mapping Structured Problem Solving
4. Autonomous Teamwork	Daily “Gemba” Management Strategy Deployment

The sequence of steps associated with the kaizen approach was not followed in DAFCG Kaizen Project. The reason was based on the belief that the team members would be more motivated if results could be achieved rapidly. The project implementation started with “Process Improvement” in order to show the potential efficiency gains in team’s daily work.

4.1 Process Improvement

The first Step in this level (Level 3 – Process Improvement) is Process Mapping. A process map was generate, for the chosen process in order to understand the current flow of information, with the identification of all players, tasks, inputs and outputs in process. In this activity the external consultant was present to help the team in the critical reflexion about task pertinence. It was calculated time spent on each task in order to determine the total process lead time.

The Accounting Team (pilot team) began by drawing the process map for the monthly closing accounting process, identifying its sub-processes. The analysis was carried out starting from a macro perspective to gradually a more detailed level. In this common team work held initially by hand, using post-its and a big sheet of paper, were identified: (1) all tasks in each sub-process; (2) The time spent on each task; (3) Inputs for the task; (4) outputs from the task; (5) the relevance of the task; (6) Sub-process Lead time.

One of the most important sub-processes in Monthly closing accounting is Billing Municipalities Costumers. This sub-process is used here as an example to illustrate the methodology. The Billing Municipalities Costumers sub-process was detailed by the sequence of tasks as shown in Table 4. The team then identified problems and improvement opportunities, leading to an action plan aimed to address each problem and improvement opportunity that have been found. In the document named “Action Plan” included the following data: (1) the action to be undertaken; (2) the person responsible for its development; (3) the deadline for its implementation and (4) the action state (Planned, In

development; or Executed). To each action state is assigned a colour allowing a better visual control.

The Billing Municipalities Sub-process took in 2010 about 642 minutes. The main causes of this lead time were the duplication of work, the time spent waiting for information from other areas and the fact that most tasks were performed manually (even when information was available in the system).

Table 4. Current State – Billing Municipalities Sub-process

Actor	Task	Time Spent
Assistant 1	Waiting information from Business Unit	480 min
Assistant 1	Check weighing	10 min
Assistant 1	Enter amounts in the excel file	20 min
Assistant 1	Print excel file	02 min
Assistant 1	Asking for validation for specific items to be billed	30 m
Assistant 1	Prepare invoice	60 min
Assistant 1	Take copies of specific items in the invoice and attach it	10 min
Assistant 1	Send email to costumers with excel file	10 min
Assistant 2	Check the invoice	15 min
Assistant 1	Send invoice by post mail	05 min
Lead Time		642 min

After the evaluation of the billing sub-process the new proposal for the process resulted in a reduction of lead time to 60 minutes (see Table 5). This reduction of about 582 minutes was mainly because all the tasks that did not add any value have been eliminate. Other significant improvements were achieved by automating some tasks that were performed manually. Automated routines were included in the IT system with direct impact on the lead time of the sub-process.

Table 5. Future State – Billing Municipalities Sub-process

Actor	Task	Time Spent
Assistant 1	Print from Weighing data base pdf file	10 min
Assistant 1	Asking for validation for specific items to be billed	30 min
Assistant 1	Specific items validation in accounting data base	8 min
Assistant 1	Printing pdf invoice from accounting database	8 min
Assistant 1	Send electronic invoice by email	10 min
Lead Time		60 min

4.2 Team Organization

With the good results achieved from process improvement the team was then motivated to make more progresses. The organization of the work areas using 5S technique was assumed as the second challenge of this lean office approach implementation.

As expected, all back office areas started implementing this methodology which aimed to maintain the workplace well and effective organized. To achieve the best performance the working areas and stations need to have everything in a defined place, neat and clean at all times. It must be stressed that more important than starting applying 5S is to have the discipline and willpower to keep the settings and organization achieved.

The filing system was disorganized with a lot of duplicated, outdated and unnecessary documents. The stationery was messy and was hard to figure out which articles were missing.



Figure 1. Before 5S

The files organization was performed by all the teams and was perceived by everyone as value added activities despite the amount of work necessary to organize and clean the filing system and existing data.

All stationary storerooms that existed in each building were centralized in a single stationary storeroom in each building. The new centralized stationary storerooms were cleaned and organized in order to reach better effectiveness and less time spent in looking or waiting for the supplies needed.



Figure 2. After 5S

The main output of the application of this tool was an increase in the available storage and filing room. At the same time, it was noticeable the increase in efficiency when searching for documents, data or tools whenever needed. The appearance of the office areas before the implantation of 5S are presented in Figure 1 while the appearance of the office areas after the implementation of 5S are presented in Figure 2.

Another very important results from the 5S implementation was the positive effect in the motivation of the personnel. After verifying the first results of their efforts to clean their stations, not only they were more efficient but started to motivate others and share the benefits of applying the 5 S' tool.

4.3 Visual Management and Suggestion System

The team board allows better daily work management (task assignment and management priorities) of team members. It also allows monitoring the progress of the main team performance indicators. Moreover it enables the track of all the ideas for improvements gathered across a team and then helps to analyse the status of ongoing improvement initiatives.

Every kind of improvement idea is written down on structured cards and fixed on the board. Depending on the progress of implementation the cards are transferred to the appropriate section of the PDCA circle.

The board structure is created by each team, because it is important that each team decide what is more relevant for their organization, monitoring and management. By participating in the design process team members were more engaged in the process.



Figure 3. Example of a Team Board.

Every day each team takes some minutes around the board (see one example in Figure 3) to discuss the plan for the day as well as performance indicators. Time to time it is necessary to introduce changes in the board, and start the standardization process again.

Changing needs are identified by the team during the daily meetings reflecting the dynamics of continuous improvement. In this process it is important for managers to ensure that the boards are used and maintained. With this purpose it was conducted regular audits by other teams.

4.4 Standardization

As it was pointed out before, all the time spent organizing the areas will be a waste if we cannot keep everything in place and the work flow. An obvious way of achieving this is by standardizing the supporting processes like filing, cleaning and storing, and of course keeping everything lean.

The main goal of standardization is to avoid wasting time when looking for a document, data or supplies needed in a process, increasing the efficiency and consequently improving the Lead Time of these processes.

With the standardization of the supporting processes LIPOR was able to reduce the clutter in the archives keeping all the important documents organized and accessible. Besides, these standards allowed that whoever performs the filing knows exactly where and how to keep the documents. This led to a better organization of the filing cabinet, less time looking for documents and less misplaced or lost documents, allowing us to find all the needed documents on a timely manner. In fact this is one of the main objectives of Kaizen, to have everything in place, increasing efficiency of processes and supporting tasks. It can also be said that as more tasks and processes are standardized greater overall performance is achieved. In the end this new department gets more and more organized, more and more efficient, and continuously improving its ultimate goal - Short Lead Times.

Another standardization effort was made on the storerooms of different articles such as office equipment, stationary, and other materials. The number of different articles stored was 660 and an objective of put to reduce that number in 40%. During this project the team was able to reduce the number down to 486 articles, a 27% reduction.

4.5 Daily Kaizen

Daily Kaizen is a methodology that aims to develop teams and to increase teamwork on natural teams (teams that naturally work together in the same work area). Since each area has its own natural teams, the idea is to have a daily meeting, by area, with these teams where they can monitor standards and goals, solve problems that arise on the work floor and give new ideas. These meetings also allow the natural teams to become more autonomous and at the same time turn these practices into a routine. Daily Kaizen is therefore vital to maintain the levels of efficiency and to, steadily, improving the performance indicators.

The implementation of Daily Kaizen was a challenge especially because habits and routines are difficult to change in people.

As a start, it was asked to each work team to prepare a set of performance indicators that could clearly reflect the performance of their daily activities. The next step was to decide which of these were more suitable to be discussed at the Daily Kaizen Meetings, and which would give a better picture of the working day. This was done by the team leaders together with their natural

teams. Finally everything was compiled on a board where tasks and indicators can be easily checked in a daily basis, allowing an increased level of control and efficiency.

After the team boards were assembled, the concept of daily meetings were introduced to easily monitor the daily progress of work in different areas and of different team members.

This tool has proven to be much more useful than initially thought and allowed to manage both the implementation of improvement projects, as well as the daily problem solving requirements.

5. RESULTS AND CONCLUSIONS

The lean office implementation at LIPOR was clearly a great success. The benefits of this implementation is perceived in many ways. The space is now more effectively used, the areas look better, the performance was improved, people act more relaxed, team work was improved, people feel more in control and happier.

A very important performance indicator that is perceived by costumers in this case is lead time. Different lead times associated with different processes were improved substantially. Some relevant processes are presented in Table 6 along with its reduction in their lead times.

Table 6. Achieved improvements in lead times

Process	Before lean office (Jun.2010)	After lean office (Dec.2010)	Now (2015)
Management reporting	3 days	2 days	2 days
Monthly accounts closure	8 days	6 days	4,5 days
Payroll processing	10 days	5 days	5 days
Payment to suppliers	9 days	3,5 days	1,5 days
Direct treats	5 days	3 days	0,5 days

These results are achieved is clearly linked to the second classic principle of lean thinking: "Mapping the Value Stream". As perceived in the literature it is the most commonly referred tool in leading lean office implementations to performance improvements. In the case reported in this article it was a key tool to motivate most of the people and to reach good performance improvements.

A 25% of efficiency improvement target was assigned at the beginning of project but as can be seen in Table 6 the improvements are a lot better. The monthly closing accounting process, performed by the Accounting Team (pilot team), reached a reduction of 44% in its lead time from 8 days down to 4,5 days. A similar reduction (50%) was also obtained in the payroll processing going from 10 days to 5 days.

The payment to suppliers lead time, performed by the Finance and Treasure Team, was reduced from an average of 10 days to an average of 1,5 days. This is a

very welcome result to suppliers and contributes to a better relationship with LIPOR.

Another important improvement was achieved by the Supply Team, reducing 90% of the direct treats lead time.

Nowadays the Kaizen Daily meetings are fully instituted and the Team Boards are in place, and we have been noticing that the mindset of the workers is changing and they are embracing these changes. We hear less and less the "this will not work" expression and everyone is starting to believe that change is possible.

The improvements of performance did not stop when the project of lean office implementation ended. The interesting fact is that the continuous improvement momentum stayed in the system. Since the end of the project up to now the performance kept improving. In some cases bigger improvements were achieved after the end of the project, which is the case of the direct treats lead time improving from 3 days to half a day at the moment (see Table 6). In some processes the lead time was not improved since 2010. That is the case of "Management reporting" as well as "Payroll processing" the reduction of lead time in this processes could lead to the final output quality problems and so it has not been a priority in the department.

Although improvements in productivity were not the target of this project they actually occurred as a side effect. The reductions obtained in lead times, the reduction on process tasks, a better organization of spaces, the standardization of work and other improvements led to reduction on the number of people required. Table 7 depicts the reduction obtained in the number of people in each work team (previous departments).

Table 7. Improvements in productivity

Work Team	# of People	
	Before lean office (Jun.2010)	Now (2015)
Management Control Team	4	4
Accounting Team	4	3
Human Resources Team	4	4
Finance and Treasury Team	4	2
Supply Team	10	7

Now, the work is performed faster but with less number of people. Back in 2010 there was 26 people distributed in 5 departments while now there are 20 people distributed in 5 work teams.

Some of the learnings from this case may not be applied to every lean office initiative because different realities may require different approaches. Nevertheless the authors are sharing the most relevant aspects of the experience reported in this article in addition to the performance improvements reported earlier. Starting the lean office implementation from process mapping resulted very effectively in getting rapid improvements,

getting people involved in the project and motivate them. People rapidly believed in the lean office implementation and that is an enormous advantage. An unexpected side effect was that each team was working separately behind their “walls” with its particular culture and routines, but the implementation of lean office resulted in creating a common culture of all teams and facilitated its integration. The frequent kaizen meetings as well as the “team of the month” nomination, are keeping teams connected and integrated.

Both positive and negative statements were collected from the personnel. Most commonly positive statements were: “We are performing better and with better quality”; “The information/data (physic and electronic) is better organized”; “The areas look better”; “More effective task planning and monitoring”; “Higher team cohesion and involvement”; “Systematization and integrated view of the daily work”; “Now there are rules and procedures helping the daily work”; “Processes were detailed studied”; “Higher autonomy”; “More free time”; “Processes are now simplified”; “Work is easily visualized”; “Think and do simple”; “Creativity and proactivity were enhanced”;

On the other hand the most commonly referred negative statements were: “At the begging there is an overload of work”; “The waiting for informatics changes”; “Difficulty in finding time to perform planned actions”; “Impersonal work stations”; “It costs money”; “More work”;

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ПРИМЕНА LEAN СИСТЕМА У АДМИНИСТРАЦИЈИ: ЈЕДАН УСПЕШАН СЛУЧАЈ У ЈАВНОМ СЕКТОРУ

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Примена lean приступа у простору служби администрација може да доведе до побољшања перформанси и повећања користи какве се остварују у традиционалном производном окружењу. Пошто административни послови нису опипљиви, то може представљати главну потешкоћу за примену lean система, али користи које се могу остварити су подједнако важне као и оне које се остварују у производном окружењу. У овом раду се приказује случај успешне примене lean система у администрацији у једној организацији јавног сектора, при чему се ставља нагласак на побољшање перформанси. Извршно време је у великој мери редуковано код најважнијих административних процеса, а остварено је и значајно побољшање продуктивности. Примена lean система је отпочела

мапирањем процеса што је врло брзо дало позитивне резултате, повећало мотивацију и активност свих запослених. С друге стране,

позитиван споредни ефекат је био стварање заједничке културе свих тимова и лакше интегрисање различитих тимова.