A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

THE IMPACT CREATED BY LEAN 2.0 INITIATIVE IN APTIV

CLARA CONCEIÇÃO DINIS VARGAS

Work project carried out under the supervision of:

Filipa Breia da Fonseca

18/12/2023

Abstract

Lean 2.0 initiative was implemented on Aptiv with the goal to increase productivity, profitability and customer satisfaction. Nevertheless, the theorical base of the initiative did not allow for a direct impact evaluation. Instead, the Commercial Competence Team, a sales administrative team, that resulted from Lean 2.0, was used as a correlated measure. The results of the Commercial Competence Center were overall optimistic, as they had a positive operational, financial and organizational performance, as demonstrated by the 55% decrease in backlog quotation and the 23% improve in financial margin. Therefore, the Lean 2.0 was determined as successful for enterprise value creation.

Keywords

Lean Management, Central Team, Automation, Standardization, Kaizen

1. Introduction

The opening of global markets and the disruptive environment in which we live this days, led to the common agreement, among the management community, about the importance of company practices and processes that can guarantee sustainable growth and quick adaptation to new opportunities and trends. Accordingly, the popularization of lean grew substantially over the last decades, and by 2010, 69.7% of manufactures in North America were using lean management, as reported in the 2010 Compensation Data Manufacturing survey (Renner 2020). Considering this, companies are adopting initiatives that promote continuous improvement and lean development of their production, as is the case of Aptiv, with the Lean 2.0 implementation (Aptiv 2021).

The main objective is the full integration of the lean methodology into the company culture and DNA (Aptiv 2021). Therefore, Lean 2.0 is perceived as the next step in the continuation and incorporation of excellence and efficiency, in a natural format, in the enterprise procedures.

Nonetheless, Lean 2.0 relies on abstract and overarching concepts and quantifying the precise financial impact of lean and kaizen initiatives can indeed be a formidable task. Nonetheless, we can illustrate the effects of Lean 2.0 through real-world improvements that have arisen as a result of the base principles. The assumption is that if a project founded on Lean 2.0 values generates positive impact to the company, Lean 2.0 created value. The project to be study is the Commercial Competence Center creation.

2. Literature Review

2.1. Lean Management

Lean management can be described as processes that allow production with less use of resources compared to a traditional organization (Womack, Jones e Roos 1990) or as a process to increase customer-delivered value (Lizarellia e Alliprandini 2020), by making use of standardization and automation. Decades of academic research and operational tests have proven the overall efficacy of lean in improving operational, processual, and financial performance (Dieste, Panizzolo e Garza-Reyes 2021).

The initial popularization of concept was connected with automotive manufacturing and started in the late 80s/ early '90s (Saabye, Powell e Coughlan 2023), with the publication of *kaizen – The Key to Japan's Competitive Success* (Imai 1986) and *The Machine That Changed the World* (Womack, Jones e Roos 1990). Still, ever since that, the method have expand beyond manufacturing, and have been vastly adopted for production and non-production tasks (Rodrigo de Castro Freitas 2020).

The base lean principles are described by Likers with the TPS house diagram. The first principle is stability, consistency and standardization of process and production. The second pillars is *Jidoka*, that stands for build-in quality to avoid defect waste and the third is *Just-in-Time* to reduce overproduction and inventory (J. Liker 2004). In the Lean principles, it is also referred Kaizen and continuous improvement, so that enterprises can adapt to the constant changing needs of the market. The objective of the principles is the elimination of the seven types of waste, found on traditional management enterprises: defects, overproduction, waiting, non-value-added behavior, transportation, inventory, motion and excess processing (Resetarits 2021).

2.2. Lean Management in Administrative Tasks

As referred, lean management expanded beyond the original lean manufacturing to also include administrative tasks, aiming at eliminating waste associated with processes and information flow (Rodrigo de Castro Freitas 2020).

The main benefits identified of lean in administrative tasks are the improved productivity and customer satisfaction, and the reduction of cost and lead time (Rodrigo de Castro Freitas 2020). There are different perspectives on the implementation methodology of this philosophy, still, all of them rely on the cooperation between the teams, focus on customer, application of kaizen and emphasis on the visualization of processes and data (Danielsson 2013).

2.3. Lean Tools

The implementation of Lean management in the enterprises typically makes uses of common tools, that have been proven to add value to the business. For administrative tasks, the most common techniques employed are Visual Management, 5S's and Value Stream Mapping.

2.3.1. Visual Management

Visual Management is a strategy used to enhance process efficiency and effectiveness by leveraging visual cues that prompt specific actions. This approach helps maintain process alignment or promptly identify deviations. Visual Management reduces the reliance on written and verbal communication, as visuals convey information intuitively (Abbadi 2022).

2.3.2. 5S Methodology

The 5S methodology is a framework for organizing the workplace to foster safety, cleanliness, organization, and efficiency. By eliminating waste associated within or between processes, it becomes easier to ensure safety and quality standards (Patange 2019).

The 5S consists of five key steps: Sort, Shine, Simplify, Standardize, and Sustain.

2.3.3. Value Stream Mapping

Value Stream Mapping (VSM) is a visual method to depict the value creation process and pinpoints all the required materials and information for a process (Chena, Lib e Shadyc 2010). This method employs visual aids to illustrate various aspects of the flow.

The most effective workflow is characterized by smooth transitions from one step to the next, minimizing time and effort wastage. If any part of the system hinders this smoothness or does not contribute value to customers, it warrants examination for potential removal (Aptiv 2022).

The topics examined in the literature collectively played a role in shaping both the case and the methodology. However, the most influential factors in fostering an understanding of Lean 2.0 at Aptiv and in establishing the Commercial Competence Center were Lean Management in Administration, Value Stream Mapping, and the application of the 5S tool, primarily in administrative management.

3. Methodology

The methodology employed to examine the creation process of the Commercial Competence Center incorporated various complementary practices. Three distinct methodologies were chosen to shed light on the three key stages of the process: design, implementation, and control.

Qualitative analysis aimed in understanding the rationale behind the CCC's process development and the implementation phase. The observational research provided information in the implementation and results, and quantitative study provided information on control measures and the actual impact.

3.1. Qualitative Analysis

It was decided to use qualitative research because this methodology allows for a better understanding of complex data and phenomena. Additionally, it may reveal important factors that were not originally taken into consideration or that are not reflexed in quantitative data (Nikolaos Basias 2018).

Qualitative interviews were conducted with key members of the CCC who were responsible for both the design and implementation of the project *(Appendix I & II)*. The primary goal of these interviews was understanding the challenges faced during the implementation, and what were the influential factors for the outcome of the project.

The first interviewee was the CCC team leader, who was involved since the beginning in developing the implementation strategy, as well as in supporting the implementation. The interview was conducted face-to-face and lasted 15 minutes.

The second and third interviewees are lower management and were the primary sales assistants to join the team. Both were active participants in the development and design of processes with different characteristics. The second interview lasted around 20 minutes, and the third lasted 17 minutes.

3.2. Observational Research

It was observed the daily implementation activities by working directly alongside the team and the team management during a period of 6 months. The objective is to provide valuable insights into the methodology employed for the process implementation, maintenance, and the underlying rationale.

Additionally, it was conducted a retrospective evaluation of the team results around one year and half after the creation. The assessment was done by analyzing the team performance in achieving the KPI's defined by the company for the CCC. This allowed to evaluate the team success on contributing to company goals in operational and financial parameters.

3.3. Quantitative Analysis

A survey was also conducted to understand the entire sales team's perception of CCC and its impact. The reasoning behind is the CCC central role in interacting with and influencing other teams' work.

For this matter, a survey was designed to assess the perception of the CCC's impact on sales. At the beginning, participants received context regarding the subject of the study and a brief description of the CCC team's responsibilities, and after they received six questions (*Appendix III).*

The survey was distributed online to the entire sales team, comprising 66 employees. We received 39 responses, representing a 60% response rate. Of these, 6 were excluded due to

incomplete answers to the initial questions, which were considered grounds for exclusion. Thus, the analysis reflects the opinions of half of the EMEA sales team.

4. Case Study

4.1. Aptiv Introduction

Aptiv is an American company operating in two areas of the automotive industry: Signal and Power Solutions (SPS), which focuses on the production and design of automotive electrical systems, and Advanced Safety and User Experience business, centered on safety and autonomous driving development. In addition, Aptiv currently has a presence in forty-eight countries in diversified world regions, including APAC, LATAM, and EMEA.

This research will focus on the implementation of Lean 2.0 in the SPS - EMEA business. Therefore, for simplicity, every time Aptiv is referred to in the document, it indicates this division.

Aptiv's core business relies on manufacturing and allows little differentiation from competitors. Therefore, the necessity for cost-cutting and efficiency improvement processes led to the early establishment of a culture that places significant emphasis on integrating lean principles, continuous improvement, and the kaizen philosophy.

4.2. Lean 2.0 Implementation

Lean 2.0 aims at capturing three essential benefits for Aptiv: an increase in customer satisfaction, the systematization of processes, and an improvement in overall enterprise performance (Aptiv 2022). Therefore, the initiative´s will be fully achieved through the application of three key components (Aptiv 2022):

- Prioritizing the process and action to maximize impact.
- Engaging leaders in lean and kaizen to support bold leadership.
- Building staff capabilities through teamwork and cooperation.

The implementation of Lean 2.0 at a multi-functional level in Aptiv is done in a phased way, where each department and operational area adopts it, at their rhythm, through a 5 Phase Model.

Phase 1: Organizational Readiness

The first phase of Lean 2.0 implementation focuses primarily on cultivating leadership awareness. It involves establishing a robust top-level framework to foster the development of a lean organizational ethos throughout hierarchical levels and initiating the development of a base plan for change.

Leadership is expected to reflect on the operating environment and their supervisory style, through assessment of organizational readiness, which entails identifying improvement possibilities and creating processes to address them.

Additionally, a maturity test is completed to guide management in the right direction for transformation. The test aims to analyze the state of lean and kaizen on the site or department, examining categories such as Leadership Philosophy, Demand Management, Education & Training, and Resource Management.

Valuable to note, that the management undergo theoretical and practical training on lean and kaizen concepts, to ensure they have the necessary capabilities to lead their teams through the transformation.

Phase 2: Building the Foundation

Phase 2 initiates the dissemination of kaizen and lean concepts to bottom-level employees by sharing knowledge and reviewing Aptiv's organizational capabilities.

Knowledge sharing occurs primarily through workshops and interactive sessions that gradually integrate lean principles into core functions. Each department or site is required to participate in several activities, such as sessions covering topics like Business Process Improvement, Lean Basics, Safety Culture, and Problem-Solving. Manufacturing sites also must attend 6-sigma training and achieve 5S certification site-wide.

The organizational capabilities review involves studying the managerial structure and internal value stream design. The goal is to inform on specific work area allocation intending to enhance the planning, define responsibilities, and foster personnel development.

Ultimately, the Kaizen Suggestions System becomes available to departments, enabling employees to suggest improvements and offer solutions through structured proposals.

Phase 3: Transforming

The primary objective of Phase 3 is to commence the practical integration of key Lean 2.0 concepts into day-to-day operational activities and problem-solving processes at Aptiv, via idea testing and employees' periods adaptation to tools. However, it's essential to emphasize that this phase is structured to support and guide the execution of these concepts rather than pursuing unguided arbitrage. This approach aims to ensure positive outcomes and sustained motivation among participants.

At the end of Phase 3, all leaders need to retake the Maturity Test to rate progress and identify areas still left for improvement.

Phase 4: Excellence

The Excellence phase aims to solidify the implementation of lean methods/tools, as it ensures that the tools are fully implemented and working according to expectations. Therefore, the objective is to ensure that the sites understand the concepts and the tools' function, working to achieve the lean and kaizen objectives of productivity, efficiency, and adaptability.

Besides, sites undergo a maturity test once more, and management starts to develop a Continuous Improvement Plan, which will be better discussed and implemented in Phase 5.

Phase 5: Enterprise-Wide

The Enterprise-Wide phase marks the final step, aiming to solidify the culture of Continuous Improvement and bolster the connection between different functions and tools.

The goal of this phase is to solidify the conditions that help sites and teams maintain the results generated in Phase 4 in the long term, while also developing the ability to adapt the tools to possible changes in the organization or client needs.

Besides, to align with the One Aptiv policy of the company, employees undergo training sessions to understand other functions' processes and responsibilities. This ensures that teams and sites understand their contribution to the organization while recognizing other teams' responsibilities and pain points.

4.3. Commercial Competence Center

In this study, we will handle the Commercial Competence Center Project as an exemplar of Lean 2.0 impact.

This specialized team emerged following a comprehensive analysis of the sales approach through the initiative lents, that highlighted concerns about consistency and information sharing within the team.

The need to design and implement an improvement program emerged, with the primary goal of integrating kaizen and lean principles into the company's commercial processes, through standardization and automation.

Aptiv customizes its products entirely to meet the specific engineering requirements of each client after a project is awarded to the company. Consequently, the pricing structure is variable and needs to be adjusted based on the final components and labor involved in the product. Given this, the sales team bears the responsibility of reviewing and controlling price changes from the original offer. These responsibilities encompass calculating price adjustments, maintaining product margins, negotiating with clients, and initiating sales orders.

However, since both the enterprise and clients are international, the EMEA sales team was dispersed in smaller squads across several regions. Each sub-team had different procedures and work methods, which created disparities between clients and projects.

The Lean 2.0 initiative revealed the following critical issues within the sales processes:

1. Account managers devoted a significant amount of time to administrative tasks.

2. Processes, including sales order creation and price calculation, lacked standardization.
3. Substantial delays were observed in routine tasks.
4. Repetitive daily activities remained manual without automation.
5. Control over price margins with clients was insufficient.

These issues highlighted the urgent need for streamlining and improving the sales processes to enhance efficiency and profitability, and it was decided by the management team the centralization of the administrative tasks in a new sales operations team.

The overreaching goal was to improve efficiency, by dividing sales responsibilities between sales analysts and sales/account managers. This way sales/account managers would have more availability for customer communication and negotiation, and the administrative tasks would generate better results regarding lead time, financial impact and data accuracy. The goal achievement depends on three fundamental factors: a specialized workforce, quality reporting, and adequate systems.

A short-term implementation plan was elaborated by the management team, and it focused on three key areas: increasing efficiency in routine tasks, by reducing average quotation and invoicing times, improving the financial control over the sales processes, and enhancing data management and analysis. Therefore, the action plan prepared for the new team to became responsible, in one year, for documenting and calculating engineering change prices, creating purchase orders in the SAP platform, updating customer data in the internal CRM, and informing sales reports.

Aptiv decided to develop this squad in Lisbon, Portugal, under the already existing team of Business Planning due to the present capabilities of systems management and reporting. As a complement, three sales operations specialists were hired in June 2022 to start the development of the internal procedures and to relocate the control over the administrative tasks of two of the major clients.

5. Data Analysis

5.1. Qualitative Results

5.1.1. Challenges and Obstacles

The first question of the interviews focused on the key challenges and obstacles encountered during creation of the CCC. The three interviewees consistently highlighted the difficulty of transferring tasks from other teams as the main obstacle, citing common explanations across all interviews.

The first cause emerged during the design stage, with the definition of the working scope - “There was lack of preparation regarding area of action of this team**.”** (M, 26). While it existed a general understanding of the team's objectives, clarity on which tasks should be under CCC's responsibility was lacking. This complexity led to challenges in drawing of the task transfer and in the integration of new members. Overcoming this challenge required multiple discussions to define a clear scope for the general team, and the creation of sub-divisions inside it facilitated the definition of individual responsibilities. Subsequently, a comprehensive onboarding plan was developed to ensure the seamless integration of members - “We needed an onboarding plan, to guarantee that people became productive quicker.” (M, 26).

The second challenge was the limitations of online training and the lack of availability for it. Originally, upper management plan was to automate the process in the previous teams before introducing it to the CCC through online training. However, due to a lack of available time of those responsible for adapting the process, the transfer plan was adjusted to include physical training of the old processes before being transformed in the CCC - “We saw the importance of understanding the way of doing things, before start we started changing them.” (F, 49).

The third challenge was resistance to change, and it was a recurrent theme. According to interviewees, teams responsible for the quotation and invoicing process opposed transferring activities to CCC due to fears of a decrease in quality and loss of control. They noted that this resistance was more pronounced in some account managers than others, but the strategy to overcome it was the same for all: invest in formal training for all the team members to create undeniable team's expertise, that can quantify the value added and break down resistance - “You need to show the value added so that they trust the team.” (F, 49). Leadership support was also highlighted as crucial in resolving this issue - “The support of our manager was really important to force the transfer of tasks.” (F, 49).

In summary, the main challenge encountered, during both the design and implementation stage, was the resistance from the adjacent team. The main causes for this were the lack of availability to change, the lack of scope clarity and the lack of time to transform the processes in the initial teams.

5.1.2. Organizational and Cultural Factors

The second question centered on the organizational or cultural factors that influenced the team. The common theme between all interviews was the diversity of CCC team members, encompassing

age, culture, and professional background – “I think that your team, and its diversity, is the main success factor.” (F, 36). This topic successfully contributed to the design of holistic processes that comprehend multiple viewpoints.

In addition, three other topics were raised in the different interviews. Language barriers were noted as an adverse issue because English, the common language, is not the primary language for any team member. The complex company structure was identified as a hindering factor in defining and converting tasks. Company and management values were acknowledged as positive characteristics supporting automation and digitalization.

In conclusion, the fundamental organizational factor that influenced the CCC creation were the team member characteristics. Still, the company also played a role in the project because of the favorable value but complex structure.

5.1.3. Lessons Learned

In the last question, participants were asked to identify best practices and lessons learned from the implementation experience that could be replicable in other projects.

First, multiple references were made to the importance of selecting team members to ensure not only individual quality but also positive cooperation between them - “I think that the importance of team dynamics is probably the most important lesson.” (F, 49). The interviewees highlighted that it was achieved by having a clear alignment between the management picture and the human resources team.

Second, supporting the professional development of team members was also deemed crucial for value adding to and from the team, and to foster higher levels of motivation.

Lastly, two interviewees also emphasized the importance of understanding the old process before developing the new one through brainstorming sessions. This is linked with the responses to the first question, emphasizing the importance of transferring old processes rather than already transformed ones.

To conclude, the interviewees believe that the main success factor that is not culture or organization specific, is the team composition and dynamic created between it. The selection of the personal and leadership support are the main factors, but the fostering of the motivation and cooperation dynamic is also primary.

5.2. Observational Results

After the first year following the relocation of sales operations to Lisbon, the team expanded by 150%. Specifically, the team responsible for business planning and systems activities grew from three members in June 2022 to seven in October 2024, and eight additional individuals were hired for sales operations.

Over the last twelve months, following the action plan, the transfer of the sales operations activities from nine clients was complete, and the team became responsible for product change quotations and management of sales orders in SAP. Furthermore, during this period it was identified the need for some team members to assume responsibilities related to overdue invoice control.

The team is organized into sub-teams by area of work, and, inside the sales operations sub-team, there is also a division based on client *(Appendix IV)*. Considering this, the responsibilities and daily activities differ between the team members and there is no overlap.

Each member is independent on the organization and prioritization of their tasks, inside the general indication by the management. Still, to secure communication and oversight, each sub-team has a weekly call in the beginning of the week to communicate their planning for the following days. At the end of the week, the complete CCC meets for a round table for workers to provide a summary of their week. At the end of each month, the CCC team physically comes together for a longer summit to share on obstacles, lessons learn, and to redirect on the goals for the next weeks.

This structure allows to respond to all the distinguish needs of the clients or other teams, while still maintaining a coherent strategic direction between all. Moreover, it guarantees that all individuals are prepared to short-term reallocation inside the team, in necessity, which an environment of team work and cooperation.

Over the last year, the team exhibited good performance in achieving its short-term objectives, although not all objectives were fully met. Performance was assessed using several Key Performance Indicators (KPIs) aligned with the three primary team goals. It's important to note that the company's policy compares results once per year. Therefore, the values presented below represent the progress from January 2023 to October 2023.

The first goal, focused on efficiency in routine tasks, was evaluated using two main metrics: the product quotation backlog and the annual average quotation lead-time.

The team successfully reduced the product quotation backlog. Over nine months, the average backlog for clients assigned to the team decreased by nearly 55%. This achievement resulted from the implementation of classification processes and automation, allowing the team to prioritize requests and reduce the time needed to address each of them.

The goal to reduce the average annual quotation lead time to 10 days, while showing positive progress, fell short of the target. To fully meet the proposed goal, an 85% reduction was required, but the team achieved only a 36% decrease. It's essential to consider that this metric is influenced by several external factors, including the lead-time value before the process was transferred to the CCC, the performance of other teams impacting the quotation process, and a negative correlation with backlog reduction, as closing older requests results in higher lead times.

Financial performance and control were assessed through an analysis of the team's quotation margins, claim recovery value, and the percentage of overdue invoices.

Firstly, the absolute financial margins of the quotations generated by the team increased by 23% since May 2023, meeting the finance team's objective within two months, in absolute terms.

Secondly, claims to clients represent one-time invoices for extra costs to be borne by customers. The recovery of these claims is a complex, time-consuming process dependent on data evidence. Since the CCC team began supporting this process, the number of claim recoveries increased by 42%, with the absolute value already reaching 89% of the 12-month objective. However, it's important to note that the positive outcome of this metric involves multiple teams.

Thirdly, the issue of overdue invoices was not initially identified when the CCC team was created. However, once recognized as a critical concern for the entire commercial team, CCC took on responsibilities to address it. Unfortunately, due to a potential lack of timely planning and an increase in issued invoices (linked to backlog reduction), there was little to no progress on this KPI.

In terms of the objective to enhance reporting: before June 2022, financial, performance, and operational reports related to sales were primarily created manually using Excel or PowerPoint, with data extracted from the CRM or quotation platform. In the past ten months, the business planning team introduced a reporting platform that efficiently aggregates data from multiple sources and presents it in a visually appealing format. This platform offers instant access to information for relevant stakeholders in a centralized location, reducing the risk of errors associated with manual work and significantly lowering resource expenditure on platform maintenance. It's worth noting that there is still room for improvement in this area in the coming months, particularly in automating more complex reports. Nevertheless, the short-term objective for this year was successfully achieved.

5.3. Quantitative Results

The distribution of participants working in the CCC and those in other roles is roughly equal, providing insight into both internal and external perceptions of the team.

The survey results revealed a positive perception of the CCC's impact on the sales processes. 81% of participants believe the team had a positive impact in the sales process, with 53% expressing high certainty. The remaining 19% lacked sufficient evidence to conclude whether

the team had improved or had a detrimental effect, and thus, they chose the "Might or Might Not" option in response to the first question.

Both CCC team members and non-members predominantly believed that the team had a positive influence, but the proportion of positive responses was higher among team members, indicating a more favorable internal perception.

Regarding the specific impact, the CCC had the greatest influence on client-oriented aspects, such as quality, price accuracy, and error reduction. The response to this topic ranged from, 0 to 10 (the available range to participants was from -10 to 10), the average was 6.7, and the median was 8. Participants also rated the impact on lead time and data maintenance favorably, with average responses of 5.8 and 5.5, respectively.

The last three questions were open-ended and not mandatory, resulting in a response rate below 100%. When participants were asked about processes that had been improved by the CCC team, 75% of them identified processes or activities related to enhancing efficiency. However, when questioned about what the CCC still needed to improve, 24% of the responses referred to automation and standardization, and 12% mentioned improving time efficiency. It indicates that despite the positive impact over the past year, there is still significant room for improvement in this area, as observed in the KPI analysis.

Additionally, 35% of participants noted that, given the company's presence in the technical engineering industry, sales and business analysts need to enhance their technical product knowledge.

Finally, when participants were asked about activities or procedures to be added to the CCC's responsibilities, the 79% suggested processes that are closely related to and can enhance the team's current responsibilities, and only 21% proposed new, unrelated activities. This further underscores the need for the team to expand its influence in existing areas before considering support for new topics.

6. Results

The chosen methodologies proved the creation of CCC to be a success. Qualitative research allowed the understanding of the development and implementation process from a firsthand perspective. The observational and quantitative methods provided insights into operational and organizational outcomes, respectively.

First, the team positively contributed to both the increase of customer satisfaction and the improvement of financial results. The increase in customer satisfaction is linked with the decrease in both quotation backlog and lead time, showed in the KPI performance analysis, and by the increase in quotation and invoicing quality identified by the remaining of the sales team on the survey. Moreover, the team also is responsible for the enhancement of the financial results due to the increase of the factory margin and claim recovery.

This was achievable because of the principle of automation, that allows the sales analysts to process more, and more accurate, quotations, while account and sales managers gain time to negotiate with the customers. Additionally, the centralization of data management, which directly contributed to the increase in claims recovery, also allow to consolidate information to a better understanding of

the status of the sales, and customer relations. This way, the CCC team members were able to make informed decisions on the prioritization of tasks and to identify improvement possibilities.

Second, the organizational impact of the CCC team was also exceptionally positive. The observational study allowed to identify a paradoxical dynamic that it is both based on autonomy and cooperation. The team members have independence on task management, which guarantees higher adaptation to customer needs, and, in this particular case, higher efficiency. Nevertheless, the leadership was able to preserve a collaboration setting between employees that have the availability to support their colleagues in both emergency situations and in brainstorming sessions. The dynamic is mainly based on kaizen, as it incites a setting of adaptation to the changing day to day needs and instigates collaboration to identify and address more complex issues, from multiple viewpoints.

Also worth noting, that the CCC organizational influence goes beyond the team. In the survey, many non-team members identified as an improvement the sales personal workload decrease. This promotes stress reduction, more efficient work on the other teams and better results on the shared tasks, such claim recovery. The positive feedback on this matter is more relevant considering the initial resistance of the adjacent sales teams, under-covered during the interviews.

Considering the above presented, it is evident the mutually beneficial relation between the CCC and Lean 2.0. On one hand, the CCC success and potential replicability is directly linked to Lean 2.0 values. The later initiative relies on three components, all of which are present in the central team. To start, the maximization of actions impact was accomplished by the development of standard and automatic flows that, as vastly described, allow to increase the productivity and effectiveness of the processes. Then, the presence of teamwork and cooperation in the company is

clear in the CCC work methodology of regular sharing and brainstorming events. Finally, bold leadership development was crucial to the results of the team, as identified in the qualitative interviews. The existence of a leadership that has a focus on lean values allow the transfer of the same ideals to the team, and promotes an environment suitable for sustainable, standardized growth.

On the other hand, CCC made a significant contribution to the achievement of Lean 2.0 objectives. The three objectives proposed by the initiative (an increase in customer satisfaction, the systematization of processes, and an improvement in overall enterprise performance) have been vastly presented in this paper, through the analysis of the CCC impact, and it have been concluded that the team was able to show positive result in all of topics.

7. Conclusion

The CCC team serves as a tangible manifestation of the impact of Aptiv's Lean 2.0 initiative. Derived from a comprehensive analysis conducted within the framework of the adopted methodology, the team's design reflects the core values of the initiative, and its objectives are intricately aligned with the overarching goals of the company. Consequently, the success of the CCC team can be directly correlated with the achievement of the initiative's broader objectives, showcasing its potential applicability to other operational domains. The methodologies employed throughout this thesis substantiate a significant and positive influence on the organization through the CCC team, thereby reinforcing the success of Lean 2.0.

In conclusion, the Lean 2.0 initiative has unquestionably added value to Aptiv, as demonstrated by the success of the CCC team. As such, it is recommended that Aptiv considers replicating the CCC implementation in various other areas of work or regions. Furthermore, the insights gained from

this study suggest that other companies, albeit in different industries, may also derive benefits from adopting a similar model based on the same values and ideals. What needs to be taken into consideration is the consistency in automation and prioritization, the importance of team collaboration, and the fundamental role that leadership plays in the process.

8. Limitations

The study conducted provided valuable insight on the implementation of a central team and on the success of Lean 2.0. Nevertheless, there are some limitations that need to be taken in consideration.

First, the paper analyzes the creation of a central team in a specific area of work, in only an industry. The replicability of results, while probable, cannot certainly be concluded. For future papers, it could be useful to compare the CCC and Lean 2.0 results with other similar initiatives.

Second, the CCC team development started in June 2022, and it is still in course. Therefore, the impact assessed is short-term and the long-term effect may only be understood over the next years. In the future, it may be relevant to study the team process and results after some years of consolidation.

Thirdly, the number of conducted interviews is limited. The intention was to interview more upper management figures involved in the development and results control, along with Lean 2.0 specialists, to understand their perspective on the initiative and the impact on the company. Unfortunately, this was not feasible either because the relevant upper management had already left the company or due to a lack of time availability.

9. Bibliography

Abbadi, S. El Manti and L. El. 2022. "Integration of Visual Management in the Industry 4.0: Case Study." *2nd International Conference on Innovative Research in Applied Science, Engineering and Technology (IRASET).* Meknes, Morocco. 1-4.

Aptiv. 2021. *Lean 2.0: Engaging Everybody, Every Day on Improvements.* 04 12. https://www.aptiv.com/en/insights/article/lean-2.0-engaging-everybody-every-day-on-improvements.

Aptiv. 2022. "Lean 2.0: Pocket Guide."

Chena, Joseph C., Ye Lib, and Brett D. Shadyc. 2010. "From value stream mapping toward a lean/sigma continuousimprovement process: an industrial case study." *International Journal of Production Research.*

Danielsson, Christina Bodin. 2013. "An explorative review of the Lean office concept." *The Stress Research Institute, Stockholm University, Stockholm, Sweden* 167-179.

Dieste, Marcos, Roberto Panizzolo, and Jose Arturo Garza-Reyes. 2021. "A systematic literature review." *Journal of Manufacturing* 101-121.

Freitas, Rodrigo de Castro Freitas and Maria do Carmo Duarte. 2019. "Information management in lean office deployment contexts." *Information Management in Lean Office* 1161-1191.

Garza-Reyes, Jose Arturo, Christos Christopoulos, Anil Kumar, Sunil Luthra, Fernando González-Aleu, Vikas Kumar, and Bernardo Villarreal. 2022. "Deploying Kaizen events in the manufacturing industry: an investigation into managerial factors." *Production Planning & Control* 427-449.

Garza-Reyes, Jose Arturo, Vikas Kumar, Sariya Chaikittisilp, and Kim Hua Tan. 2018. "The effect of lean methods and tools on the environmental performance of manufacturing organisations." *International Journal of Production Economics* 170-180.

Imai, Masaaki. 1986. *Kaizen (Ky'zen), the key to Japan's Competitive Success.* New York: McGraw-Hill Education.

Knol, Wilfred H., Jannes Slomp, Roel L.J. Schouteten, and Kristina Lauche. 2019. "The relative importance of improvement routines for implementing lean practices." *International Journal of Operations & Production Management* 214-237.

Knol, Wilfred H., Kristina Lauche, Roel L.J. Schouteten, and Jannes Slomp. 2022. "Establishing the interplay between lean operating and continuous improvement routines: a process view." *International Journal of Operations & Production Management* 243-272.

Liker, Jeffrey K. 2003. *The Toyota Way: 14 Management Principles From the World's Greatest Manufacturer.* McGraw Hill Professional.

Liker, Jeffrey. 2004. *The Toyota Way: 14 Management Principles.* New York: McGraw-Hill.

Lizarellia, Fabiane Letícia, and Dário Henrique Alliprandini. 2020. "Comparative analysis of Lean and Six Sigma improvement projects:performance, changes, investment, time and complexity." *Total Quality Management* 407-428.

Nikolaos Basias, Yannis Pollalis. 2018. "Quantitative and Qualitative Research in Business & Technology: Justifying a Suitable Research Methodology." *Review of Integrative Business and Economics Research 7* (Review of Integrative Business and Economics Research) 91-105.

Patange, Amitkumar Dhanjibhai Makwanaand Gajanan Shankarrao. 2019. "Strategic implementation of 5S and its effect on productivity of plasticmachinery manufacturing company." *AUSTRALIAN JOURNAL OF MECHANICAL ENGINEERING* 111-120.

Renner, Scott. 2020. *Lean 2.0 - The Synergies of Lean Manufacturing and Industry 4.0.* Redwood : Oracle.

Resetarits, Paul J. 2021. "The Application of Lean Management Principles to Fields other than Manufacturing." *2012 Proceedings of PICMET '12: Technology Management for Emerging Technologies.* 1705-1742.

Rodrigo de Castro Freitas, Maria do Carmo Duarte Freitas. 2020. "Information management in lean office deployment contexts." *International Journal of Lean Six Sigma* 1161 - 1192.

Saabye, Henrik, Daryl John Powell, and Paul Coughlan. 2023. "Lean and action learning: towards an integrated theory?" *International Journal of Operations & Production Management* 128-151.

Spasojević-Brkić Vesna, Tomić Branislav, Perišić Martina, Janev Nemanja. 2023. "Differences in Kaizen implementation between countries and industry types in multinational supply chain." *University of Belgrade - Faculty of Mechanical Engineering, Belgrade* 183 – 191.

Vasconcellos, Luis Henrique Rigato, Mauro Sampaio, and Henrique Fonseca. 2022. "Pull Production Implementation: An Action Research Study." *Journal of Contemporary Administration.*

Womack, J.P., D.T. Jones, and D. Roos. 1990. *The Machine that Changed the World.* New York: Simon & Schuster.

10. Appendix

Appendix I – Interviewees Data

Name	Profession	Age	Male/ Female
Paula Pires	Senior Manager Commercial Competence Center	49	Female
João Morgado	Sales Analyst Lead	26	Male
Anabela Moura	Sales Analyst Lead	36	Female

Appendix II – Interviews Script.

1. What were the key challenges or obstacles encountered during the implementation of this project?

1.2. What strategies or approaches were employed to overcome these challenges?

2. Were there any cultural or organizational factors that either supported or hindered the project's success?

3. Can you describe any specific best practices or lessons learned from this project that may be applicable to other?

Appendix III – Survey Questions

Q1. Do you work in... (multiple choice question)

Commercial Competence Center

Other sales team

Q2. Do you believe that the Commercial Competence Center had a positive impact on the sales processes? (multiple choice question)

Definitely not

Probably not

Might or might not

Probably yes

Definitely yes

Q3. How you rate the impact of the Commercial Competence Center in...

Q3.1. ...the quality provided to the client? (related to price accuracy, number of errors, etc.) (rate from -10 to 10)

Q3.2. ...the time it takes to answer to customer requests? (rate from -10 to 10)

Q3.3. ...the maintenance and organization of customer data and documentation? (rate from -10 to 10)

Q4. What is the process that most improved with the creation of the Commercial Competence Center? (open question)

Q5. What processes do you believe that the Commercial Competence Center still needs to improve? (open question)

Q6. What other processes should the Commercial Competence Center team develop? (open question)

Appendix IV – CCC Team Structure