Communication in Project Management: an action research approach in an automotive manufacturing company

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Abstract. Over the years, countless companies have implemented project management to ensure the integration of people with processes and deliveries, with a direct impact on quality and cost. In the automotive industry, this approach helps stakeholder and challenge management. However, to achieve excellence, communication between project managers and their teams, between stakeholders and sponsors, or simply in the workplace must be efficiently managed.
The objective of this study was to help a PMO from an automotive manufacturing company, which has been experiencing difficulties in terms of communication management, for five years. This study highlights the improvements performed in order to change the situation.
An action research approach was applied, taking in consideration the context of the work developed using the principle of "learning by doing". Participant observation was carried out, namely in meetings and the daily practices of the team. Finally, questionnaires were released in order to obtain the KPIs used in the study.
Subsequently, following the best communication management practices according to PMBOK and using the PDCA method, an improvement strategy was defined. Finally, KPIs were developed providing measurements to the communication improvements.

Keywords: Communication Management, Stakeholder Management, Automotive Manufacturing.

1 Introduction

Many modern organizations carry out their business tasks and activities using a project-based approach. Developing projects requires a specific approach to develop tasks, perform resources mobilization, integrate different stakeholders, and manage different processes, among others.

According to the Project Management Body of Knowledge (PMBOK) guide 6th edition [1], project management can be organized in five processes groups: initiating, planning, executing, monitoring and controlling and closing. In addition, it can be organized in ten project management knowledge areas, one of them being Communications Management.

Muszynska [2] pointed out that communication management is considered to be crucial for the success of the project. Ruão [3] suggests that, on one hand, the communication importance is highlighted by most of the stakeholders but, on the other hand, the communication processes and practices formalized in the company's project management methodology are neither followed nor prioritized by project managers. Almeida, Tereso, Faria, and Ruão [4] recognized that knowledge sharing is also crucial for industrialization projects. And the improvement of project management practices is important in this kind of projects [5].

According to Project Management Institute (PMI) [1], Project Communications Management consists of two parts. The first is focused on developing a strategy to ensure an effective communication process with the stakeholders. The second part is addressed to the activities related to the implementation of this strategy.

These discussions have gained space in scientific communities, mainly because they deal with a sensitive subject. As everything that involves people, it is necessary to keep their engagement. In project management, people are essential for teams, in order to work on project tasks and each member must be aware of their role and responsibilities [3]. Furthermore, it is a challenge to work with others, to ensure the achievement of common goals and it is not possible to perform this without communication.

This study was carried out in a Project Management Office (PMO) of an automotive manufacturing company, established for a department concerned with printed circuit board assembly and interconnection technologies. Due to the increasing number of innovation technology projects the PMO states the process has been very heavy and communication management is not given the proper focus and needs to be improved.

This situation reflected on communication channels, the department documentation and consequently in the team motivation. So this paper described an action research done inside this PMO in order to improve communication among project teams in the section. Several methods were used in order to identify the challenges and difficulties of the communication management process and measures were taken to improve the situation, considering the perspectives of the project teams.

2 Research Methodology

In the context of this study, two Research Questions (RQ) were established, namely:

- RQ1: How is it possible to improve communication management of project teams in an automotive company section?
- RQ2: How much has communication management of project teams improved in an automotive company section?

Thus, to answer these questions, the methodology was carefully chosen considering all aspects of the company, such as the reality of the department and the time available to develop the work.

Considering the practical perspective of the study, the research approach chosen was action research, an approach aimed at action and knowledge creation [6]. The project was developed from the practical perspective of an internship at the company. The chosen methods were applied and provided measurable results.

The techniques and procedures used for data collection and analysis were:

- Observation: in the context of this study, the diagnostic phase is based on the communication structure within the project team that was observed, researched and analyzed. This step was performed with the participation in meetings and the observation of the daily practices, providing a participant observation.
- Semi-structures interviews: they were performed by a pre-questionnaire deployment. It was applied in order to collect information for the final survey, which considered the feedback from the stakeholders.
- Document analysis: it was performed based on the research questions. In order to update and create procedures and work instructions for the department, the existing documents were consulted, characterized and organized.
- Questionnaire deployment: the goal was to get inputs from the entire section through a qualitative survey in order to understand their perceptions and opinions about the current issue, and thus to begin improving procedures using Key Performance Indicators (KPIs) based on the survey.

Using all these methods and considering the PMBOK project communication management approach, which focus on how to develop a strategy to ensure an effective communication process with stakeholders, and then to address activities related to the implementation of this strategy, the Plan, Do, Check, Act (PDCA) method was adopted. It is an appropriate tool to apply in a communication process that can be used repeatedly. By applying the PDCA cycle, communication maturity and effectiveness will be enhanced over time. This definitely helps in achieving the desired outcome that is effective communication [7].

Data analysis was performed in the PDCA Check step, after each questionnaire deployment. An excel file was elaborated to analyze the collected data. In this way, it was possible to understand the exact type of improvements needed to achieve the main goal of improving communication and showing improvement through KPIs.

3 Findings

Cookson [8] argues that measuring the results of internal communication is essential to ensure that communication is aligned with expectations and strategies. The Continual Self Improvement [7] official blog also explains that using the PDCA cycle to ensure this type of communication and deliver expected results is an advantage when aligned with KPIs. Therefore, in addition to measurement, it is possible to ensure that communication management improvements are properly applied.

The findings of this study were obtained through the PMBOK good practices application using the PDCA method to address issues. The development and its results are detailed below.

3.1 Following PMBOK good practices

The first step in ensuring solid work with the PDCA application was analyze the key stakeholders and understand their complaints. Some stakeholders may have limited ability to influence the project work or outcomes. Others may have significant influence on expected outcomes [1].

Depending on their interests, stakeholders may take a strategic and engaged position on projects, or may be at odds with their achievement and, in extreme cases, even try to disrupt it, contributing to failure [9].

In a real project, the project manager will list their stakeholders and rank them based on their level of influence. This way, after classification, the project manager can understand which stakeholder needs the most attention, which will help provide solution to potential issues. Also, and very importantly, the project manager will know which one has the influence of disrupting the project, so he/she needs to be closely managed, performing an analysis as presented in **Fig. 1**, this management became easier.

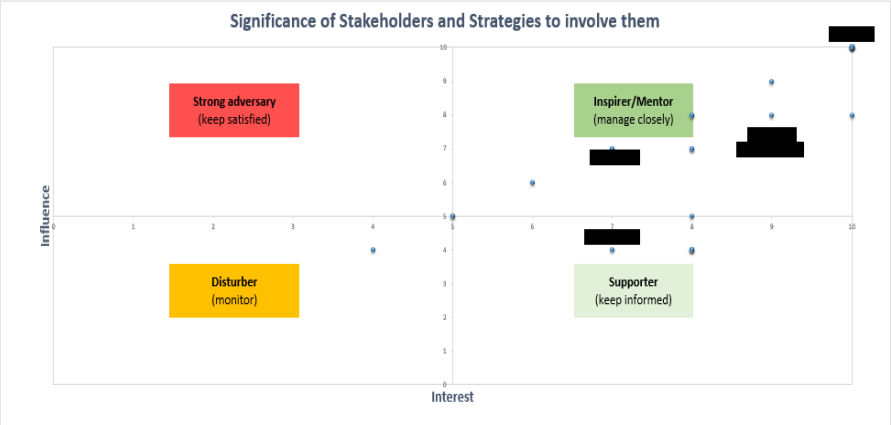

Fig. 1. Stakeholder analysis performed in the case study department

This analysis provided a very clear perception that in the studied department the approach and engagement of the stakeholders was important since most of the stakeholders are in the “Inspire/Mentor” zone or in the “Supporter” zone, so they need to be managed closely or keep informed. Fluid communication is important to improve project success [10], so the research focused on improving several aspects of communication, like communication channels knowledge, information availability, and procedures knowledge.

3.2 1st PDCA Running - Survey deployment methodology: Plan

When the strategy is defined with objective of achieving goals, establishing KPIs can provide actions to obtain a plan of measures. According to this strategy, Kerzner [11] argues that KPIs are the base for surveys.

Based on the explanations of Kerzner [11], a survey deployment proved to be a good way to obtain the solution to the communication problem. Therefore, this primary approach consisted on the first step of the PDCA, which is Plan.

To develop a consistent survey, a prior survey was prepared, considering the suggestions of the stakeholders of the department under study. The chosen ones were three, classified as "multipliers". Their suggestions helped to develop a clear final survey for all stakeholders, a total of thirty people.

3.3 1st PDCA Running - Survey deployment methodology: Do

After this planning, to develop the first survey, we arrived at the final questionnaire applied. This is the second step of the PDCA, that is, Do.

Thus, the final survey was prepared in order to obtain KPIs from each question. For this, meetings with the PMO team were performed in order to develop questions that would provide the right measure to the indicator.

Therefore, the questionnaire was divided in blocks. The 1st block of questions (question 1 divided in two related sub-questions: 1.1 and 1.2), referred to as indicators, aimed to measure situations related to project management. The 2nd block was dedicated to communication channels (composed by questions 2 and 3). Finally, the 3rd block referred to the procedures in the department (question 4). The KPIs and their goal are presented in **Table 1**.

The survey was answered by twenty one people of the department of this study.

Table 1. Key Performance Indicators and their goal.

Question	KPI name	Proposal
1	1.1 Communication Channels Knowledge within MFT3 and 1.2 Relevant Information Availability	- Question 1 is divided in two KPIs. The first one has the goal to measure which are the communication channel most used by people in order to find project documents. - The second one aims to measure the number of people who consider project-related information relevant within these channels.
2	Information Storage	This KPI has the goal to measure which is the channel most used in order to archive project documents.
3	Information Access	The goal of this KPI is to measure how many people have access to the information needed.
4	Procedures Knowledge	The goal of this KPI is to measure how many people know the documents that have been developed.

3.4 1st PDCA Running - Survey deployment methodology: Check

This PDCA step, called Check, is reserved to the survey analysis. Due to the situation of the department the operationalization of the survey assures predictive validity since it is applied two times (at the beginning and after the improvements are done).

Question 1 (1.1). Represents the KPI "Communication channels knowledge". It is a simple question, just to know if people use the correct channel to search and provide information. Each participant answered which communication channel is used to find projects information. Most participants answered that they know O: drive in the scope of finding project information. This is an excellent answer because O: is the central place that works as a repository for the department, as C: in a personal computer, to provide all the information, as long as everyone has the correct access.

Question 1 (1.2) The critical point is the open question related to question 1, which represents the KPI "Relevant Information Availability", where 39% of participants do not consider relevant the information found in the communication channel.

Question 2. In question 2, "Information storage KPI", the analysis comes across question 1, where drive O: is mainly used, however, in this case to archive project documents.

Question 3. "Information access KPI", provides the result that most people have correct access to places where information is available. Here, the attention-grabbing topic is a deviation identified by a stakeholder that "being involved in the middle of a project" is the reason for not having correct information access.

Question 4. The second block of questions is composed by just one question, 4, "Procedures Knowledge KPI". It aims to understand if people know the procedures developed and under development within the section. However, 67% of employees do not have this information, which represents a clear communication failure.

3.5 PDCA Running - Survey deployment methodology: Act

This last step of PDCA, Act, is dedicated to actions implementation in order to address the issues found. This stage, besides the fact that it is the key to implement continuous improvement, ensures that the former phases were correctly developed.

The output is the action plan focused on improvements implementation. With the diagnostic, an analysis was performed in order to get effective changes. The action plan utilized was based on 5W1H method. That consists of asking a systematic set of questions to collect all the data necessary to draw up a report of the existing situation with the aim of identifying the true nature of the problem and describing the context precisely [12].

Besides that, this involvement made them realize that their feedback is important, and they have space to share opinions testifying that it is part of a good communication.

The stakeholder's feedback resulted in the final questionnaire that was the 2nd PDCA running, the continuous improvement.

3.6 PDCA Running – Continuous Improvement

The 2nd PDCA running starts ensuring the best implementation of the actions proposed with 5W1H. The aim was to extend the frontier and engage all section in the communication management improvement cause. The actions were established in order to improve the results stated on the 1st survey. For each question one or more actions were prepared asking: What, Why, When, Where, Who and How will be done?

2nd PDCA running: Plan – section engagement. After the survey results, an agreement with the PMO team leader and the head of section was stablished. It states that, for all activities that were being developed, the whole section should be informed trough an email sent with the information about what was done, updated, changed, etc. Moreover, anything else that was relevant and needs to be communicate face to face, should be done during the monthly department meeting. The official channel became O: to share documentation and Docupedia page to find documentation.

2nd PDCA running: Do – 2nd survey deployment. The timing between the 1st survey deployment and the 2nd was five months and sixteen days. The questions are exactly the same in order to obtain the KPIs results. The goal of this second questionnaire was to measure the improvements regarding the methods implemented and work developed.

2nd PDCA running: Check – KPIs evolution. The 2nd analysis regarding the questionnaire applied had the goal to obtain the KPIs evolution.

Communication Channels Knowledge. In terms of measurement, Docupedia use in order to find projects documentation increased 116% compared to April 11, 2019. Also, O: drive increased 7%, while the other channels presented a significantly decrease 53% and 40%, namely SharePoint (that works as a cloud service in the department) and BGN room (internal communication channel used for document approval deployment), respectively. The number of people who does not know how to find the information has reduced to 0%. The evolution can be observed in **Fig. 2**.

1. Communication Channels Knowledge within MFT3 KPI

	April 11, 2019	September 27, 2019	Evolution
Docupedia	38%	82%	116% ⬆
O:	71%	76%	7% ⬆
Sharepoint	38%	18%	-53% ⬇
BGN room	10%	6%	-40% ⬇
Don't know	5%	0%	-100% ⬇

Fig. 2. Communication Channels Knowledge KPI evolution

Relevant Information Availability. In terms of measurement, the number of people who consider all available information to be relevant has increased 44%. The evolution can be observed in **Fig. 3**.

1.1. Relevant information availability KPI

	April 11, 2019	September 27, 2019	Evolution
Yes	61%	88%	44% ⬆
No	39%	12%	-69% ⬇

Fig. 3. Relevant Information Availability KPI evolution

Information Storage. In terms of measurement, Docupedia use in order to archive projects documentation increased 21% compared to April 11, 2019. Also, O: drive, SharePoint and BGN room increased 52%, 107% and from 0% to 6%, respectively. People who consider not clear where project information needs to be archived has reduced by 75%. The evolution can be observed in **Fig. 4**.

2. Information Storage KPI

	April 11, 2019	September 27, 2019	Evolution
Docupedia	24%	29%	21% ⬆
O:	62%	94%	52% ⬆
Sharepoint	14%	29%	107% ⬆
BGN room	0%	6%	0%->6% ⬆
It isn't clear	24%	6%	-75% ⬇

Fig. 4. Information Storage KPI evolution

Information Access. In terms of measurement, the number of people who consider having access to all project information needed for their daily work has increased 34% compared to April 11, 2019. The evolution can be observed in **Fig. 5**.

3. Information Access KPI

	April 11, 2019	September 27, 2019	Evolution
Yes	70%	94%	34% ⬆
No	30%	6%	-80% ⬇

Fig. 5. Information Access KPI evolution

Procedures Knowledge. In terms of measurement, the number of people that know which are the procedures (processes and work instructions) that have been defined in department has increased 79%. The evolution can be observed in **Fig. 6**.

4. Procedures knowledge KPI

	April 11, 2019	September 27, 2019	Evolution
Yes	33%	59%	79% ⬆
No	67%	41%	-39% ⬇

Fig. 6. Procedures Knowledge KPI evolution

4 Conclusions

It is relevant to mention the relevance of PMBOK guide use in order to understand the importance of following the good practices for project management. These good practices, besides providing a rich field of information and tips to project management daily work, had impact in the work developed by the section and in the employees directly.

At the beginning of this study, the PMO had a lot of running projects and many tasks to develop delayed. They worked just with urgent priorities. The documents to be prepared were stopped, the project team never knew where to find the project documentation. When new documents were developed, no one knew where to store them.

In order to start addressing these problems, a good practice was applied, following PMBOK. It was divided in two parts. The first part focused on developing a strategy to ensure an effective communication process with the stakeholders and the second part was dedicated to address the activities related to implementation of this strategy. To begin this research a stakeholder analysis was implemented in order to methodically evaluate the stakeholders and understand how each one should be dealt with. As part of the strategy developed, the PDCA was adopted. After that, a survey was prepared, as the Plan step of the PDCA cycle. The goal was to engage the stakeholders in this continuous improvement process and obtain KPIs from the survey questions.

The 2nd step of PDCA, Do, was implemented with the survey deployment. The goal was to provide voice to stakeholders and to openly listen to their complaints about documents organization and communication channels.

After the survey deployment, the 3rd step of PDCA, Check, was implemented, analyzing the suggestions. Using the findings from the survey it was possible to set a line about what was more important and urgent to improve. For this, an action plan in 5W1H format was defined, closing this first PDCA running with the Act step.

After almost five and a half months fulfilling the 5W1H, a new PDCA was running again. The Plan step started with planning the implementation, on time, of all actions of 5W1H. The survey was deployed again in order to measure the improvements, as the Do step. And the results, as the Check step, are the KPIs evolution obtained.

The communication channels were reduced. At this point the projects documentation can be found in just one channel. Besides that, the quantity of procedures updated and created increased and the team motivation increased.

Therefore, and answering to the research questions.

- RQ1: How is it possible to improve communication management of project teams in an automotive company section? It was possible to improve communication management of project teams in an automotive company section following the PMBOK good practices. That is, a strategy was developed to ensure an effective communication process with the stakeholders and after that, the activities related to implementation of this strategy were addressed.
- RQ2: How much has communication management of project teams improved in an automotive company section? The communication management of project teams in an automotive company section improved 34% in Information Access, 79% in Procedures Knowledge, 44% in Relevant Information Availability, 116% in Docupedia use and 52% of O: drive storage use.

From this study it is possible to identify two main questions for future research: Continue the PDCA running is a good option in order to lead to further improvements on the KPIs and increase the documentation update, impacting directly the team motivation? Can employees communication competences be develop by performing coach, using different tools and methods exposed in the literature, with a change management perspective, in order to develop different mindsets to the project communications management process? Finding the answer to these questions will lead to interesting research results in our opinion.

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