



TECHNICAL UNIVERSITY OF CLUJ-NAPOCA

ACTA TECHNICA NAPOCENSIS

Series: Applied Mathematics, Mechanics, and Engineering
Vol. 67, Issue III, Septembrie, 2024

PERSONNEL DEVELOPMENT THROUGH IMPROVEMENT PROJECTS IN THE FIELD OF MODERN TECHNOLOGIES

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***Abstract:** The current paper presents the case study of an improvement project implemented in a manufacturing company employing modern technologies that has been used as a starting point for creating a new training strategy for production personnel. The benefits of the direct applied know-how stemming from the project are investigated for adequacy in developing self-learning and self-management skills for the staff when preparing for a long-term career in this field. The paper also includes a discussion about the possibilities to generalize this model in other types of companies from the industry, proposing an adapted training approach and plan of action.*

***Key words:** training approach; process improvement; production management*

1. INTRODUCTION

In a period defined by rapid technological changes brought on as a result of research progress and various momentous economic and political worldwide events, disruptive technologies have emerged as a driving force behind innovation, addressing global challenges and revolutionizing various industries, but most importantly reshaping our daily lives, simply becoming “the new normal” [1]. As organizations harness the power of these unconventional technologies, a critical aspect of their success lies in the development and upskilling of their personnel.

The project that lays the basis for this article was centered on disruptive technologies that have been employed in the automotive components manufacturing sector, mostly to enhance competitiveness and respond to market changes. To excel in this field, professionals need a diverse set of skills to navigate the complexities of global markets, changing consumer preferences, and evolving technologies [1], [2]. Such a customized mix of competencies must usually be developed in-house, tailored to each firm’s needs.

2. IMPROVING THE NON-PRODUCTION PURCHASING PROCESS

Supply chain management (SCM) is the backbone of any organization’s operations regardless of their field of activity [2]. As it was conceptualized over the past 4 decades, SCM is focused on establishing and managing the material and information flow in both directions along the value building process that is expected by the end customer or user [3]. In order to achieve this, companies must maintain a localized and global coordination of various processes, from sourcing raw materials and equipment to delivering finished products and processing the received feedback [3]. The agents involved in the supply chain are not limited only to the suppliers, manufacturers, and final clients (direct stakeholders), but they also include transporters, warehouses, wholesalers, retailers, or any other intermediaries that might appear before the product reaches the targeted customer (indirect stakeholders) [4].

Procurement is the process of acquiring goods and services for a company and is a vital function for any organization across any industries and sectors [4].

The procurement team works for a sole purpose: to facilitate the obtaining of quality products at a competitive price and adding value to the business. Up until recently, procurement

and purchasing were used similarly, but nowadays, when talking about procurement one discusses about a process that includes purchasing amongst other activities, such as outsourcing, contract negotiation, shipping and receiving, and incoming inspection of goods, while involving the process in a continuous improvement loop [4].

In the company where the improvement project that serves as case study was implemented, the main products to be manufactured are standardized cables, special wires and complex wiring systems used in the automotive industry. That is why the procurement department inside this company is dealing with two different conceptual areas, as it can be seen in Figure 1: the logistics department, that handles acquiring goods used for the manufacturing of wires, cables and harnesses, such as raw materials, and the support or non-production purchasing department (called NPP), that deals with acquiring any product or service that help the company produce the end product, such as machines or tools used in production, but also maintenance of equipment services or facility repairs [5].

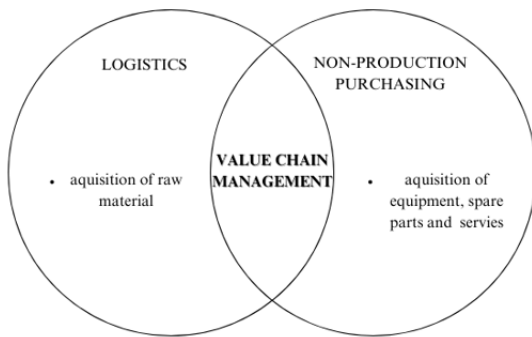


Fig. 1. The structure of the VCM department in the automotive company involved in the project

The project brought focus to the NPP department as the acquisition of goods procedure inside the company is a complex and lengthy one. In the flow chart shown on the next page, in Figure 2, there can be identified a number of approximately 25 steps [5], on condition that everything runs smoothly from beginning to end. Even so, the process of acquiring new equipment or services can last more than 45 days from the moment an internal

request was placed until the order is sent out to the supplier.

In order to be able to identify solutions that could potentially improve the purchasing process, a series of data collection plans were put into place. The plans were grouped according to three variables and were collected over a period of two weeks. The variables were as follows:

- the time it takes to place the final order with the supplier;
- the time it takes for a feeder (internal order) to be approved by each department;
- the number of rejected feeders.

After a thorough analysis it was observed that in regard to:

- variable 1 – feeders with a total of 5000 euros or higher spend more than 1 week on the approval flow;
- variable 2 – a feeder spends around 12 hours in the non-production department before it is approved;
- variable 3 – most feeders that were rejected were either missing an internal request order, a signature of one of the department heads or were simply filled out wrongly (different currency, wrong assignment account, wrong description etc.)

Finally, after applying the Failure Mode and Effects Analysis (FMEA) and the 5W1H analysis, a series of potential causes for these long times of approval were identified. As it can be seen in table 1 below, *Potential causes in the NPP process* [5], a number of six causes were recognized, and finally only four were singled out according to their score (Table 1).

Table 1.

Potential causes in the NPP process [5]

No.	Causes	Feasibility	Efficiency	F X E
1	Inefficient process	5	5	25
2	Lack of instructions	5	5	25
3	Lack of standardization	5	4	20
4	Changing policy/rules	5	5	25
5	Untrained employees	2	3	6
6	Usage of 2 systems (SAP/xFlow)	3	3	9

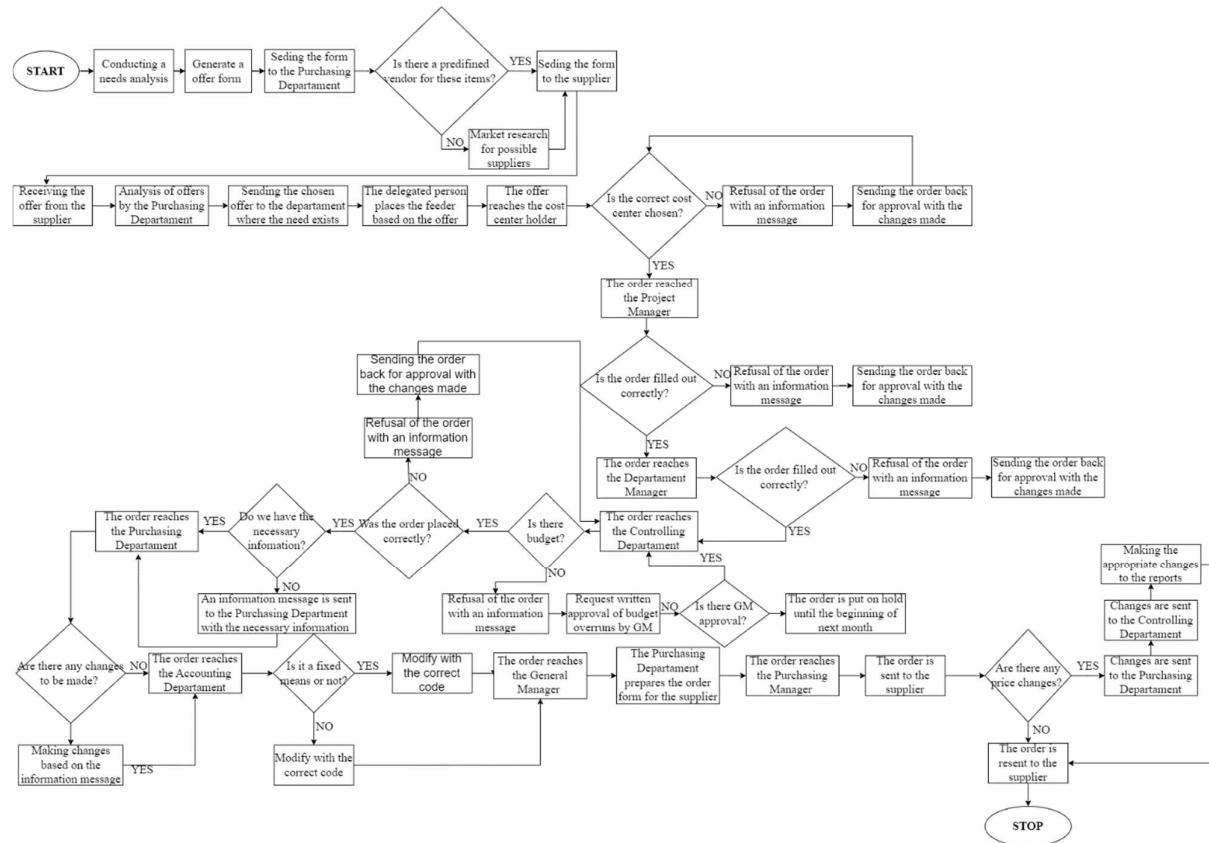


Fig. 2. The flow chart of the non-production purchasing process in the automotive company involved in the project [5]

For each of these possible causes there were also six solutions identified, and after a rigorous analysis two of these solutions were picked out as the most important: standardizing the NPP process in regard to steps and times of actions and introducing a series of training sessions for the employees who place orders into the system.

After roughly two months these solutions were put into action and improvements could be noticed: the approval times were reduced as was the time it takes to send the order to the supplier, but most importantly, the number of rejected feeders went down to one rejected feeder after the first training session.

3. PERSONALIZED TRAINING PLAN AND KEY SKILLS FOR SUCCESS

An effective training plan serves as a catalyst for skill enhancement among manufacturing employees. In an industry where technological advancements occur rapidly, ensuring that workers are equipped with the latest skills is imperative. Regular training sessions not only

update employees on the newest technologies and methodologies but also enhance their ability to adapt to changes, fostering a culture of continuous learning.

As mentioned in the previous chapter, and shown in Table 2, one of the solutions to the identified problems was introducing a monthly training session oriented towards the employees filling out internal procurement forms [5]. The training session can be considered an effective answer to the rejected feeder problem.

Table 2. Potential solutions to the potential causes in the NPP process

No	Potential solutions	Benefits	Costs	B X C
1	Reducing the number of approvals needed	5	2	10
2	Developing an instructions sheet	5	2	10
3	Standardizing the NPP process	5	3	15
4	Introducing a monthly training	5	3	15

When filling out an internal order form, employees from various departments have to use an interface of the SAP (Systems, Applications and Products) platform, namely the planning system used in the aforementioned company, called xFlow. This interface is a tool used for optimizing the internal procurement process by creating purchase requisitions and the associated documents and establishing the proper processes for their management.

The main goal of the training plan was to systematically and strategically develop the knowledge, skills, and abilities of individuals and/or teams using the xFlow interface in order to reduce the number of rejected internal procurement orders by the departments involved in the approval process [5].

The objectives of the training plan were as follows:

1. Reduce the volume of rejected feeders by 20% by implementing the training sessions in the company and measuring the performance after one month [5].
2. Develop technical and communication skills among approximately 80% of the employees operating the xFlow interface within the first month of implementing the training sessions in the company [5].
3. Reduce the approval time of all feeders by 50% by reducing the number of rejected feeders within the first month of implementing the training sessions in the company [5].

The target audience for this training course was composed of the company's employees who have to place orders into the system, individuals with ages between 20 and 55 years old, from all departments, with different positions within the company, such as production engineers, human resources specialists, maintenance technicians and others. The team chosen to hold the monthly training sessions was composed of employees from three different areas, all involved in the approval process: purchasing.

Firstly, and foremost, they focused on helping the participants in the training session develop their digital skills. This is seen as one area where employees, new and old, must improve. As it can be identified in specific

literature, citizens aged 16-74 in Romania, have 28%, respectively 9% in terms of basic digital and advanced digital skills, thus ranking below the EU average level (54%, respectively 26%) [6]. What is even more worrying is the fact that overall Romania is the country with the lowest rate of people with basic skills in the whole of Europe, and in terms of higher digital skills it surpassed only the neighboring country, Bulgaria [6].

Developing basic digital skills, such as using the technology available (computers, tablets, or mobile phones), various operating systems and common software applications, as in this case, is the foundation upon which more advanced skills can be built, and it is something that can be done within companies small and big, as long as the technological context of the institution permits it. Therefore, in the case of the studies company, this context had to be factored in when developing the training program aimed at improving the ways in which the xFlow system is used. Simply showing the correct way to create and manage orders or making available a training manual is not sufficient and more concrete and effective measures had to be devised to achieve the desired results in the allocated time frame.

This was mostly done by practical training or workshops, through which participants were demonstrated the proper way to fill out an internal requisition form, by paying attention to the most important features, such as, opening up the right xFlow interface, adding and deleting order lines, choosing the correct currency, and looking up the vendor code. In addition, when it was required, employees were taught to add text to the requisition by accessing the header portion of the interface – the text can be used by the internal solicitors to leave important comments about the delivery address, delivery methods and/or other crucial information that might be needed. Besides achieving the targeted skills to a good degree, the practical methods have the added benefit of allowing the trainees to learn from each other's good and bad experiences.

An example of a correct internal requisition order can be seen in Figure 3, where the internal applicant has made use of all the fields provided to him/her in order to place an accurate feeder in the system.

Menu ✓ [] Cancel

Display Agents
Create Attachment

Attachments
Attachment to xFlowProcu

Display
Settings
History

Feeder

Document Number 0000242463
Plant [REDACTED]
Document Date 10.10.2023
Created by [REDACTED]
Process ID 4992058
Total Feeder Amount [REDACTED]

Avem nevoie de cerneala pentru imprimanta Roland, pentru a printa planouri noi [REDACTED] modificari tehnice si imbunatatiri (avem 2 imprimante cu care lucram, iar imprimanta foloseste simultan cate 2 cutii de cerneala de aceeași culoare)

Item	OT	A	Short Text	Material	Quantity	BUn	Valn. Price	Total Amount
1	ZGE	K	Cerneala ECO V2 1L YE		4	EA	[REDACTED]	[REDACTED]
2	ZGE	K	Cerneala ECO V2 1L MG		4	EA	[REDACTED]	[REDACTED]
3	ZGE	K	Cerneala ECO V2 1L BK		4	EA	[REDACTED]	[REDACTED]
4	ZGE	K	Cerneala ECO V2 1L CY		4	EA	[REDACTED]	[REDACTED]

Save Get Template

Fig. 3. An internal requisition order as seen in the xFlow interface for SAP

Furthermore, these training sessions also focused on developing communication skills and abilities within the target group in order to foster effective collaboration, reduce misunderstandings, and enhance overall workplace productivity. Participants were presented with a series of issues that might appear when filling out an internal requisition order and were asked to think of solutions that will help them, or others, fix the problems. They received feedback from the trainers, feedback that they were able to use in real-life situations as seen in the fact that after the implementation of the training, the number of rejected feeders due to errors in filling dropped from 22 to 5 in the same amount of time.

4. CONCLUSIONS

The case study provided in this paper demonstrates the possibilities of firms to merge process improvement and personnel training in an effective manner. This should be considered part of a larger human resources strategy for enhancing the company's results with respect to customers and internal goals such as better project [7] performance or sustainability [8].

One thing remains sure, in today's dynamic and competitive workplace, continuous learning and improvement either through internal workshops or organized courses, are the key factors that contribute to any employee's success and overall career growth, thus positioning themselves at the top of a rapidly evolving professional landscape. Companies should want highly trained employees as they do not only develop their own abilities, but also contribute to the overall growth and the success of the organization. This is even more important for the automotive sector that has high competitiveness pressures and is currently in the midst of changing from internal combustion engines to electric motors.

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Dezvoltarea personalului prin proiecte de îmbunătățire în domeniul tehnologiilor moderne

Rezumat: Lucrarea actuală prezintă studiul de caz al unui proiect de îmbunătățire implementat într-o companie de producție care folosește tehnologii moderne care a fost folosit ca punct de plecare pentru crearea unei noi strategii de instruire a personalului de producție. Beneficiile know-how-ului direct aplicat care decurge din proiect sunt investigate pentru adecvarea dezvoltării abilităților de auto-învățare și auto-management pentru personalul care se pregătește pentru o carieră de lungă durată în acest domeniu. Lucrarea include și o discuție despre posibilitățile de generalizare a acestui model în alte tipuri de companii din industrie, propunând o abordare de instruire adaptată și un plan de acțiune.

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