Management of the relocation project of a production line using the critical path method

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Abstract. The paper provides an in-depth analysis of the strategic factors and management processes involved in relocating production systems within a globalized economy. This relocation is increasingly relevant due to competitive pressures, technological advancements, and shifting geopolitical landscapes. The study highlights key motivations such as cost optimization, access to resources, and enhanced market reach, while addressing the complex decision-making framework that considers supply chain reconfiguration, labor dynamics, and regulatory impacts. A case study at automotive factory in Oradea illustrates the practical steps and challenges in relocating a semi-automated production line for electric motors, emphasizing stages like site selection, resource allocation, personnel training, and equipment transport and installation. Using project management tools like Microsoft Project, the study evaluates different project versions to optimize resource allocation, cost, and duration, ultimately recommending strategies that align with organizational goals without overextending resources. This approach underscores the importance of balancing efficiency with long-term adaptability in production line relocation projects.

1. Introduction – Relocation of production systems

The relocation of production systems represents a crucial topic in the contemporary global economic landscape. In an environment marked by rapid, competitive, and often unpredictable changes, organizations are increasingly focused on optimizing the location and structure of their production. This evolution is driven by a series of complex factors encompassing economic, technological, social, and geopolitical aspects. Therefore, the purpose of this bibliographic study is to provide a detailed insight into the phenomenon of production systems relocation, highlighting current trends, motivations, benefits, and risks associated with this process.

In the context of accelerated globalization, businesses are increasingly aware of the need for continuous adaptation to remain competitive and ensure operational efficiency. Production system relocation thus becomes a vital strategy for addressing the constant shifts within the business environment. At the same time, this phenomenon is influenced by economic turbulence, technological innovations, and reconfigurations of global supply chains.

The importance of relocating production systems extends beyond economic aspects, affecting workforce dynamics, sustainability, and adaptability to climate change. The reasons underlying this process are varied, including cost reduction, access to key resources, market expansion, and the need to adapt swiftly to technological advancements.

Through this bibliographic study, we aim to highlight the complexity of production systems relocation by analyzing the key factors that drive this trend, the benefits and risks involved, as well as

the methods and tools used in the decision-making process. Furthermore, we will explore the influence of geographic and geopolitical factors on relocation decisions, providing a comprehensive perspective on current developments and future trends in this field.

1.1. Defining the relocation of production systems

The relocation of production systems is a strategic process whereby an organization decides to move its production operations, either partially or entirely, from one location to another. This strategic decision goes beyond simply changing the production site; it entails a thorough evaluation of multiple factors that can influence the efficiency, costs, and overall performance of the enterprise. Relocation is not a static process; on the contrary, it is a continuous adaptation to economic, technological, and social changes.

Global Relocation: This term describes the transfer of production operations to another country or region of the world. The choice of a global location can be driven by advantages such as lower labor costs, access to natural resources, and emerging markets.

Supply Chain Reconfiguration: The relocation of production systems often involves a reassessment and reorganization of an organization's entire supply chain. This process aims to optimize workflow, reduce costs, and improve operational efficiency.

Figure 1. Top Project Manager Skills

Labor Costs: One of the main reasons for relocation is the pursuit of lower labor costs. Companies often seek to take advantage of wage differences between countries to reduce production expenses.

Access to Resources: The choice of location can be significantly influenced by access to necessary production resources, such as raw materials, energy, and specialized expertise.

Economic Climate and Government Regulations: Factors such as the economic climate, regulatory levels, and government policies can play a crucial role in the relocation decision. Companies often seek stability and predictability in their business environment.

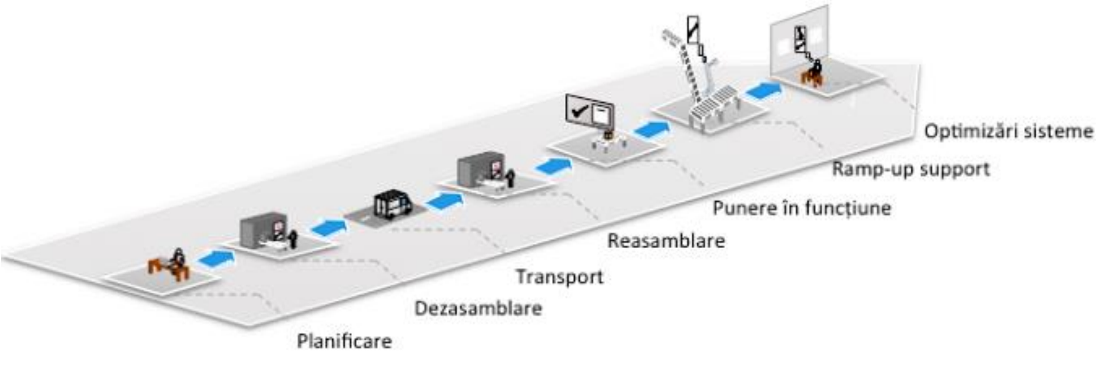


Figure 2. Outline for relocating Production Systems

Job Creation: The relocation of production systems can have a significant impact on the labor market in both locations, the old and the new. Job creation or loss can affect local communities and their respective economies.

Transfer of Know-How: With relocation, there is also a transfer of knowledge and technology between the initial and new locations, impacting the technological development and innovation capacity of both sites.

Thus, the relocation of production systems is a complex and strategic process that requires a thorough analysis of a wide range of factors to ensure the organization’s long-term success. This decision must carefully balance costs, efficiency, and social impact, and decision-makers need to be mindful of the long-term implications of this process.

2. Description of HP & HF products

2.1. The HF motor (High flow)

The assembly ensures the oil flow, which is regulated by a controller situated on the base plate, connected via this to three contact pins. The rotational speed is monitored by a sensor positioned centrally within the component, thereby facilitating highly accurate readings of the motor's rotations. The motor is coupled with an oil pump that maintains a consistent flow within the assembly; the linkage between the oil pump and the electric motor is achieved through internal gears housed within the rotor.

The motor specifications are as follows: supply voltage: 10-15 V, maximum power: 168 W, maximum speed: 3300 rpm, and minimum speed: 1000 rpm.

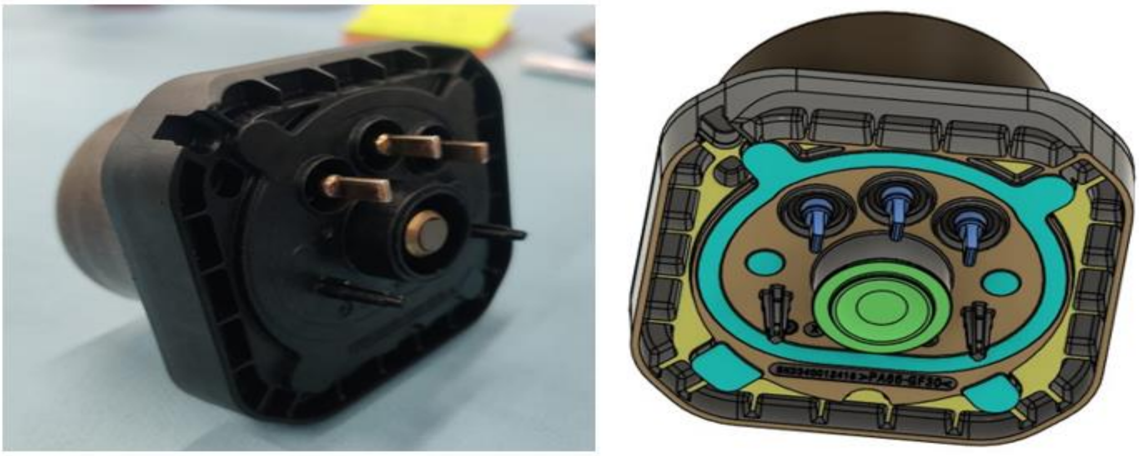


Figure 3. HF motor

2.2. The HP motor (High Pressure)

The assembly maintains the pressure, with the motor immersed in oil, leaving only the connector portion exposed outside the assembly. The motor's sealing is achieved through two O-ring gaskets that prevent oil leakage.

Motor control is facilitated by a controller located at the top of the motor, allowing for variable rotations according to the pressure requirements of the assembly. The motor is connected to an oil pump that ensures a constant flow within the assembly; the linkage between the oil pump and the electric motor is achieved through internal gears located within the motor.

The motor specifications are as follows: supply voltage: 10-15 V, maximum power: 168 W, maximum speed: 3300 rpm, and minimum speed: 1000 rpm.

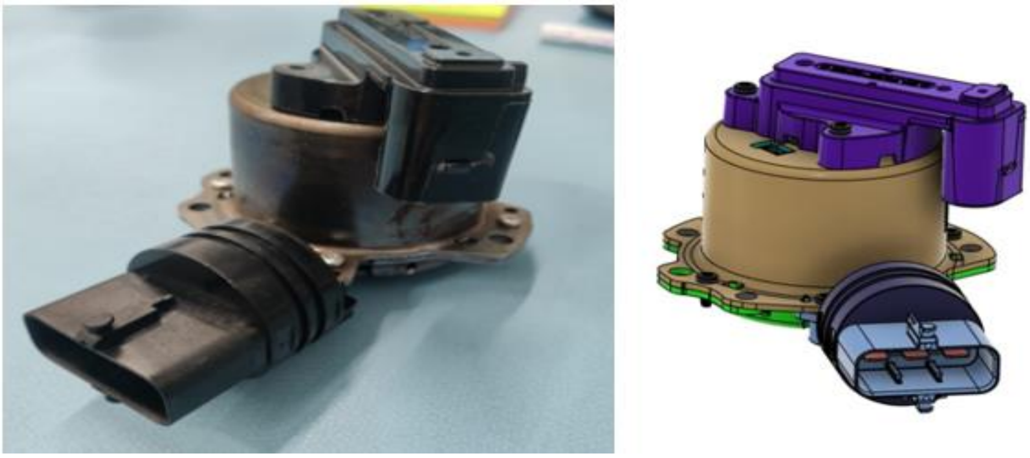


Figure 4. HP motor

3. Description of the line subject to relocation

The relocation project described in the paper takes place at an automotive factory in Oradea, currently existing only as a relocation project drafted in Microsoft Office. The line referenced in the project is a production line relocated to Romania in 2020 by the line's original manufacturer. This is a semi-automated line, where operators only load parts, while the assembly processes are automated and performed by production robots. This production line can alternately produce two types of motors, with the assembled product being an electric motor that drives an oil pump used in the automotive industry.

The production line is structured into two segments to avoid the need for a long 36-meter line, instead divided into two equal 18-meter segments. The line features work trolleys that stop at each station, allowing for the necessary parts to be loaded. The trolley is started by the operator pressing a green button. Each loading point is equipped with part presence sensors and light barriers to ensure operator safety.

In the first segment, there are two workstations for operators, where two assembly operations are performed.

At workstation 1.1, the following operations are carried out: loading the housing, loading the coil, loading the rotor, loading the shaft, loading the bearing, and unloading the stator and rotor for line 2.

During assembly operation 1.1, the following steps occur: the housing is heated with an inductive coil to facilitate pressing the stator into the housing, engraving the stator and rotor package. The system automatically records these codes, allowing for the identification of pressing curves and tracking the progress of the part within the process, both in real-time and offline, with data saved since the start of the project.

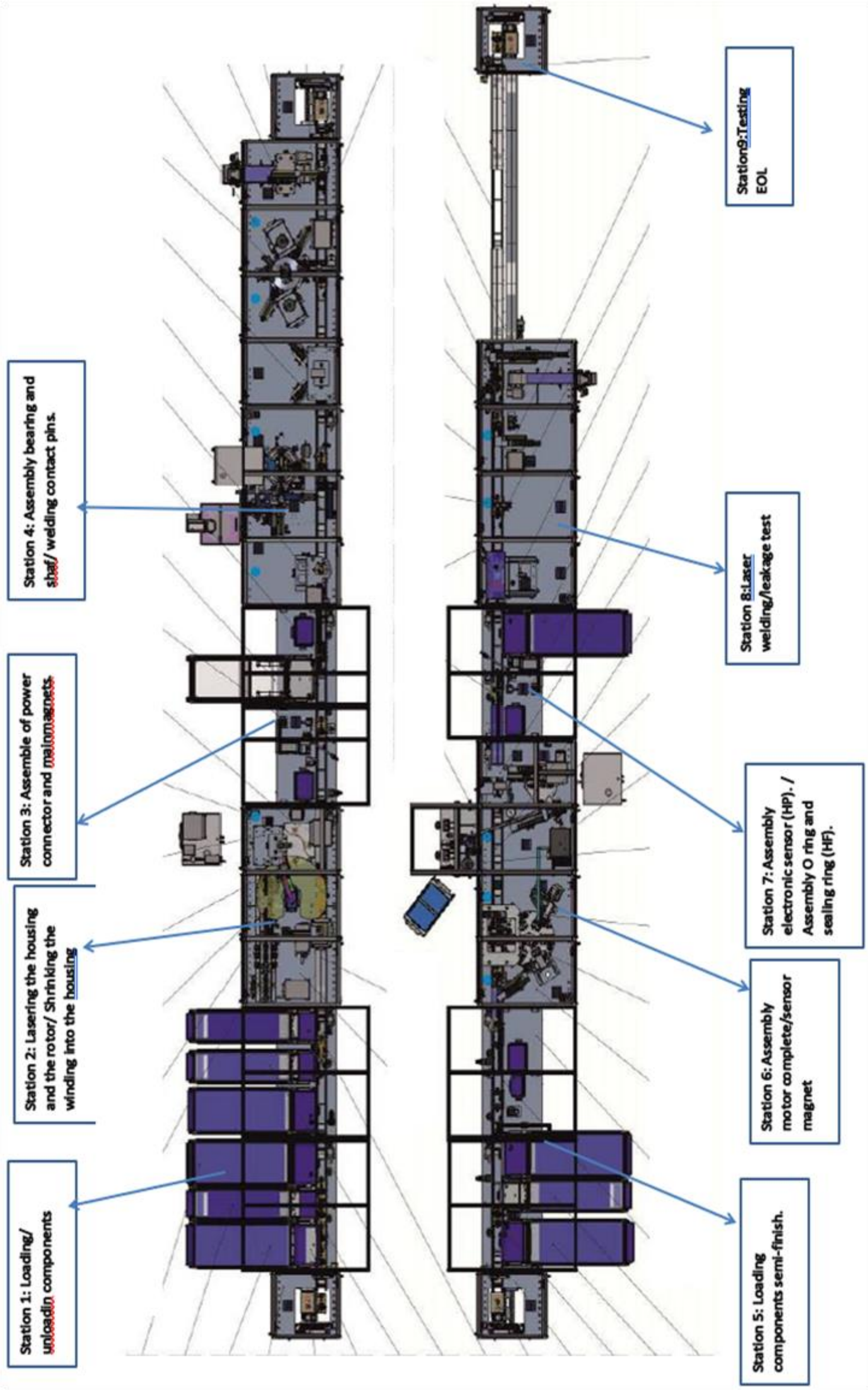


Figure 5. Production Line Layout

At workstation 2, the operator performs the following operations: assembly of the power connector, assembly of magnets in the rotor package, and pressing the bearing into the housing.

Figure 6. Workstation 1.1 **Figure 7.** Assembly 1.1

During assembly operation 2, the following steps are carried out: applying adhesive in the rotor package pockets to hold them in place, curing the adhesive with UV rays to reduce wait time, laser welding of the power connector to the stator of the part, and pressing the shaft into the rotor package.

Figure 8. Workstation 2.1 **Figure 9.** Assembly 2.1

After completing all activities, the conveyor belt carries the trays under the production line, returning them to point 1, where the stator and rotor are unloaded and placed in special trays for transport to segment 2. Segment 2 is organized with four workstations and three assembly stations. At the first workstation in segment 2, the following operations are carried out: loading the rotor and stator manufactured in segment 1, loading the motor closure flange, loading the spring, and loading the bearing. Assembly station 1 performs these operations: checking the spring force, assembling the spring and bearing into the motor flange, pressing the rotor into the bearing located in the stator, pressing the bearing in the flange onto the rotor shaft, and automatically screwing the motor flange onto the motor.

Figure 10. Workstation 1.2 **Figure 11.** Assembly 1.2

Workstation 2: assembly of the magnetic sensor in its bushing holder and sending it to the soldering and drying station, followed by supplying the production line with the sensor soldered in the bushing holder. Assembly 2: applying adhesive to the sensor in the bushing holder and heating the bushing holder to facilitate rapid drying of the adhesive.

Workstation 3: cosmetic inspection of the sensor with the connector, positioning the sensor with the connector in the three positioning bushings, and fastening the sensor with the connector to the housing with screws. Assembly 3: motor functionality testing and laser engraving.

Figure 12. Workstation 2.2 + Assembly 2.2

Figure 13. Workstation 3.2

Workstation 4: final cosmetic inspection of the motor and packaging of the motor in its specific packaging.

Figure 14. Assembly 3.2 part one

Figure 15. Assembly 3.2 part two

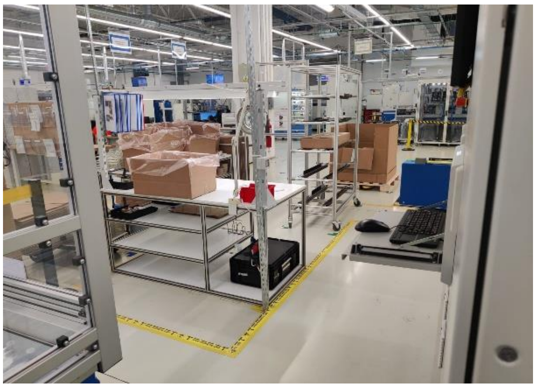


Figure 16. Workstation 4.2

4. Specific Activities of the Relocation Process

In the company, line relocations are carried out by the project management department, which is based in Romania. All activities are recorded in electronic tables using Excel. In the table below, we can find such a table; it is structured into groups, with specific activities listed for each group.

Table 1. Specific activities of the relocation process

No.	Task Name	Duration (days)	Predecessors	Resources (required)
1	Decision on Relocation Location	1		Management
2	**Selection of Personnel in Romania**	**84**		
3	Selection of Shift Supervisors	14	1	Shift Supervisor (2)
4	Selection of Production Operators	14	1	Operators (9)
5	Selection of Process Engineers	14	1	Process Engineer (1)
6	Selection of Quality Engineers	14	1	Quality Engineer (1)
7	Selection of Process Technicians	14	5	Process Technicians (2)
8	Selection of Quality Technicians	14	6	Quality Technicians (2)
9	**Training of Personnel in Romania**	**28**		
10	Training of Production Personnel	14	3, 4, 7, 8	Shift Supervisors (2), Operators (9), Process Technicians (2), Quality Technicians (2)
11	Training of Engineering Personnel	14	5, 6	Process Engineer (1), Quality Engineer (1)
12	Planning the Location in Romania	19		
13	Request for Quotation from Relocation Company	5	1	Project Manager (1)
14	Request for Quotation from Construction Company	5	1	Project Manager (1)
15	Decision to Accept Offer	2	13, 14	Management
16	Creation of Location	7	15	Process Engineer (1), Construction Company
17	Creation of Procedures	14		
18	Creation of Work Procedures	7	11	Process Engineer (1)
19	Creation of Verification Procedures	7	11	Quality Engineer (1)
20	**Actual Relocation**	**17**		
21	Preparation of Line for Transport	7	19	Process Engineer (1), Relocation Company
22	Line Transport	3	21	Relocation Company
23	Installation of Line in Romania	7	22	Process Engineer (1), Relocation Company
24	Line Inspection	3		
25	Calibration of Measuring Equipment	1	23	Process Engineer (1), Quality Engineer (1), Metrologist (1)
26	Line Testing	1	25	Process Engineer (1), Quality Engineer (1), Process Technicians (2), Quality

Table 1. Specific activities of the relocation process

No.	Task Name	Duration (days)	Predecessors	Resources (required)
				Technicians (2)
27	Acceptance of Line Installation	1	26	Project Manager (1)
28	**Start of Production**	**21**		
29	Production Line Capability (Run & Rate)	2	27	Process Engineer (1), Quality Engineer (1), Process Technicians (2), Quality Technicians (2)
30	Process Audit	1	29	Internal Auditor (1)
31	Creation of PPAP (Production Part Approval Process)	2	29, 30	Quality Engineer (1)
32	Customer Audit	2	31	Process Engineer (1), Quality Engineer (1), Process Technicians (2), Quality Technicians (2), Shift Supervisors (2), Operators (9), Project Manager (1), Management, Internal Auditor (1), Metrologist (1)
33	Customer Approval of PPAP	14	32	Quality Engineer (1)
34	Start of Production	0	33	Shift Supervisors (2), Operators (9), Process Engineer (1), Quality Engineer (1), Process Technicians (2), Quality Technicians (2)
35	**Conclusions**			
36	Performance Index Verification	42	34	Quality Engineer (1), Management
37	Closure of LOP (List of Open Points)	35	34, 36	Process Engineer (1), Quality Engineer (1), Process Technicians (2), Quality Technicians (2), Shift Supervisors (2), Operators (9), Project Manager (1), Management, Internal Auditor (1), Metrologist (1)
38	Lessons Learned from Relocation	1	37	Process Engineer (1), Quality Engineer (1), Process Technicians (2), Quality Technicians (2), Shift Supervisors (2), Operators (9), Project Manager (1), Management, Internal Auditor (1), Metrologist (1)
39	Assumption of Full Responsibility in Romania	0	38	Project Manager (1), Management

5. Implementation in Microsoft Project

5.1. Version 1

The first version of the project implementation in Microsoft Project involved entering data from the Excel file created within the company to track the activities necessary for the relocation project of the production line. Below, the image represents the first page of the project.

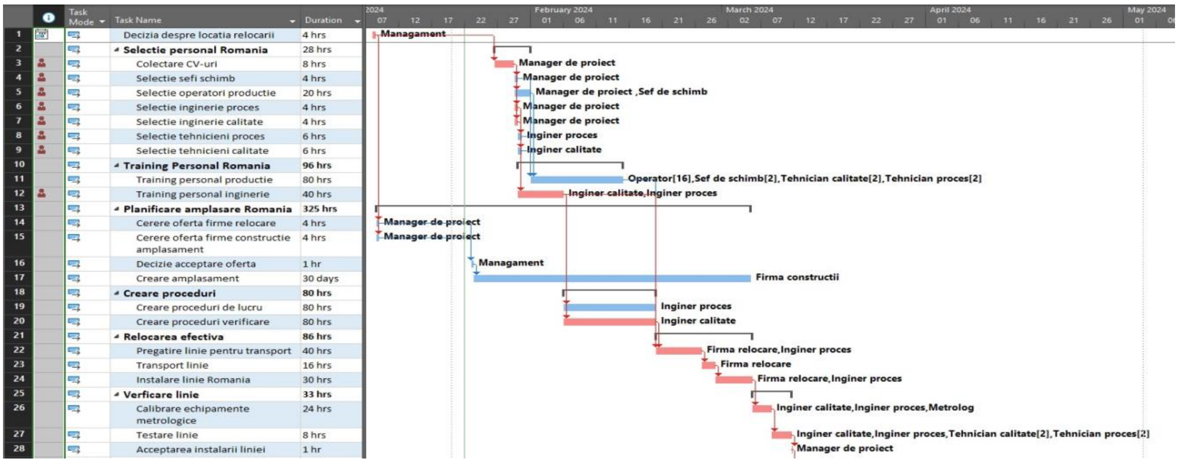


Figure 17. Gantt Chart in Microsoft Project. Version 1

After entering the data into Microsoft Project, we observed that some activities were over-allocated. Below, we present an example of charts obtained from Microsoft Project for the over-allocated resources.

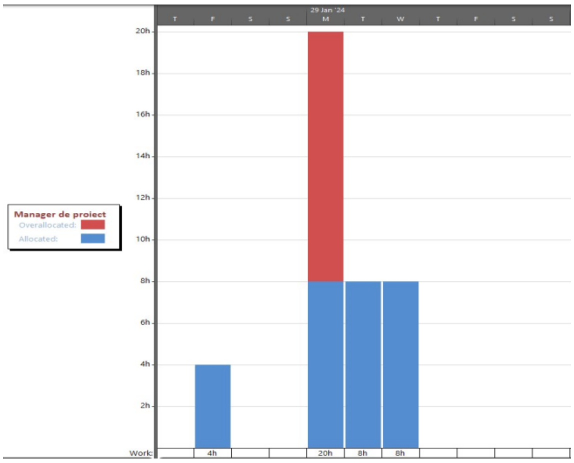


Figure 18. Over-allocated of Project manager

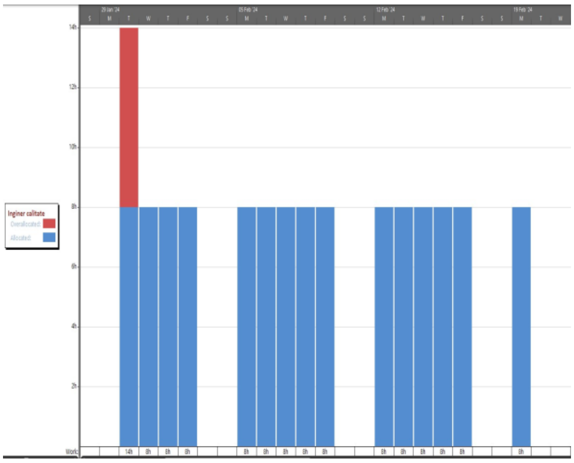


Figure 19. Over-allocation of Quality Engineer

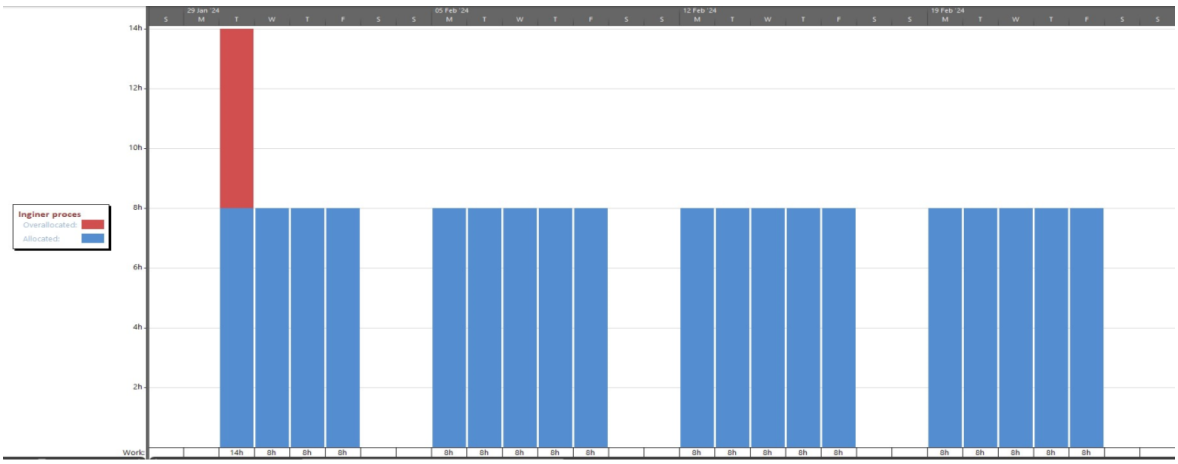


Figure 20. Over-allocation of Process Engineer

The figure below presents the general information of the project as displayed through Microsoft Project.

	Start	Finish
Current	Mon 08.01.24	Fri 03.05.24
Baseline	NA	NA
Actual	NA	NA
Variance	0h	0h

	Duration	Work	Cost
Current	677h	3,324h	127,123.24 lei
Baseline	0h	0h	0.00 lei
Actual	0h	0h	0.00 lei
Remaining	677h	3,324h	127,123.24 lei

Percent complete:

Duration: 0% Work: 0%

Close

Figure 21. General information of the project

After entering the data from Excel into Microsoft Project, we observed that the project is not feasible due to the red icons in the first column indicating over-allocation of resources.

Following the data entry into Microsoft Project, we were able to identify the critical path, as shown below (**Figure 22.** Activities with Over-Allocated Resources), which includes the activities that are part of the critical path, as well as the duration of each activity and the resources allocated to each activity.

From the identification of the critical path, we noted the activities and resources that are over-allocated, namely.

ID		Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
2			**Selectie personal Romania**	**28 hrs**	**Fri 26.01.24**	**Wed 31.01.24**		
3			Colectare CV-uri	8 hrs	Fri 26.01.24	Mon 29.01.24	1FS+14 days	Manager de proiect
4			Selectie sefi schimb	4 hrs	Mon 29.01.24	Mon 29.01.24	3	Manager de proiect
5			Selectie operatori productie	20 hrs	Mon 29.01.24	Wed 31.01.24	3	Manager de proiect ,Sef de schimb
6			Selectie inginerie proces	4 hrs	Mon 29.01.24	Mon 29.01.24	3	Manager de proiect
7			Selectie inginerie calitate	4 hrs	Mon 29.01.24	Mon 29.01.24	3	Manager de proiect
8			Selectie tehnicieni proces	6 hrs	Tue 30.01.24	Tue 30.01.24	6	Inginer proces
9			Selectie tehnicieni calitate	6 hrs	Tue 30.01.24	Tue 30.01.24	7	Inginer calitate
10			**Training Personal Romania**	**96 hrs**	**Tue 30.01.24**	**Wed 14.02.24**		
12			Training personal inginerie	40 hrs	Tue 30.01.24	Mon 05.02.24	6,7	Inginer calitate,Inginer proces

Figure 22. Activities with Over-Allocated Resources

Table 2. Critical Path

Name	Remaining Work	Resource Names
Decision on Relocation Location	4 hrs	Management
Collection of CVs	8 hrs	Project Manager
Process Engineering Selection	4 hrs	Project Manager
Quality Engineering Selection	4 hrs	Project Manager
Engineering Staff Training	80 hrs	Quality Engineer, Process Engineer
Creation of Verification Procedures	80 hrs	Quality Engineer
Preparation of Line for Transport	80 hrs	Relocation Company, Process Engineer
Line Transport	16 hrs	Relocation Company
Line Installation in Romania	60 hrs	Relocation Company, Process Engineer
Calibration of Measuring Equipment	72 hrs	Quality Engineer, Process Engineer, Metrolog
Line Testing	48 hrs	Quality Engineer, Process Engineer, Quality Technician [2], Process Technician [2]

Table 2. Critical Path

Name	Remaining Work	Resource Names
Acceptance of Line Installation	1 hr	Project Manager
Production Line Capability (Run & Rate)	104 hrs	Quality Engineer, Process Engineer, Operator [8], Shift Leader, Quality Technician, Process Technician
Process Audit	24 hrs	Internal Auditor, Quality Engineer, Process Engineer
Creation of PPAP (Production Part Approval Process)	20 hrs	Quality Engineer
Client Audit	16 hrs	Internal Auditor, Quality Engineer, Process Engineer, Management, Project Manager, Metrolog, Operator [16], Shift Leader [2], Quality Technician [2], Process Technician [2]
Client Approval of PPAP	4 hrs	Client Audit
Start of Production	8 hrs	Operator [8], Shift Leader, Quality Technician, Process Technician
Performance Index Verification	2 hrs	Quality Engineer, Management, Project Manager
Closing of LOP (List of Open Points)	2 hrs	Quality Engineer, Process Engineer, Management, Project Manager, Internal Auditor, Metrolog, Shift Leader
Lessons Learned from Relocation	1 hr	Internal Auditor, Quality Engineer, Process Engineer, Management, Project Manager, Metrolog, Shift Leader [2], Quality Technician [2], Process Technician [2]
Assumption of Full Responsibility in Romania	1 hr	Management, Project Manager
Decision on Relocation Location	4 hrs	Management

5.2. Version 2

For version 2, we decided to increase the resources to avoid overallocation, thus making the project feasible. Below are the resources presented before the modification (**Figure 23.** Resources before modification) and after the modification, namely the increase in resources **(Figure 24.** Resources after modification).

		Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base
1		Managament	Work		M		1	200.00 lei/hr	400.00 lei/hr	0.00 lei	Prorated	Standard
2		Sef de schimb	Work		S		2	35.48 lei/hr	70.96 lei/hr	0.00 lei	Prorated	Standard
3		Operator	Work		O		16	20.62 lei/hr	41.24 lei/hr	0.00 lei	Prorated	Standard
4		Inginer proces	Work		IP		1	41.24 lei/hr	82.48 lei/hr	0.00 lei	Prorated	Standard
5		Inginer calitate	Work		IC		1	41.24 lei/hr	82.48 lei/hr	0.00 lei	Prorated	Standard
6		Tehnician proces	Work		TP		2	31.23 lei/hr	62.46 lei/hr	0.00 lei	Prorated	Standard
7		Tehnician calitate	Work		TC		2	29.50 lei/hr	59.00 lei/hr	0.00 lei	Prorated	Standard
8		Metrolog	Work		ME		1	33.50 lei/hr	67.00 lei/hr	0.00 lei	Prorated	Standard
9		Manager de proiect	Work		MP		1	45.00 lei/hr	90.00 lei/hr	0.00 lei	Prorated	Standard
10		Auditor Intern	Work		AI		1	41.00 lei/hr	82.00 lei/hr	0.00 lei	Prorated	Standard
11		Firma constructii	Work		FC		1	0.00 lei/hr	0.00 lei/hr	0.00 lei	Prorated	Standard
12		Firma relocare	Work		FR		1	0.00 lei/hr	0.00 lei/hr	0.00 lei	Prorated	Standard
13		Audit client	Work		AC		1	0.00 lei/hr	0.00 lei/hr	0.00 lei	Prorated	Standard

Figure 23. Resources before modification

		Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base
1		Managament	Work		M		1	200.00 lei/hr	400.00 lei/hr	0.00 lei	Prorated	Standard
2		Sef de schimb	Work		S		2	35.48 lei/hr	70.96 lei/hr	0.00 lei	Prorated	Standard
3		Operator	Work		O		16	20.62 lei/hr	41.24 lei/hr	0.00 lei	Prorated	Standard
4		Inginer proces	Work		IP		2	41.24 lei/hr	82.48 lei/hr	0.00 lei	Prorated	Standard
5		Inginer calitate	Work		IC		2	41.24 lei/hr	82.48 lei/hr	0.00 lei	Prorated	Standard
6		Tehnician proces	Work		TP		2	31.23 lei/hr	62.46 lei/hr	0.00 lei	Prorated	Standard
7		Tehnician calitate	Work		TC		2	29.50 lei/hr	59.00 lei/hr	0.00 lei	Prorated	Standard
8		Metrolog	Work		ME		1	33.50 lei/hr	67.00 lei/hr	0.00 lei	Prorated	Standard
9		Manager de proiect	Work		MP		3	45.00 lei/hr	90.00 lei/hr	0.00 lei	Prorated	Standard
10		Auditor Intern	Work		AI		1	41.00 lei/hr	82.00 lei/hr	0.00 lei	Prorated	Standard
11		Firma constructii	Work		FC		1	0.00 lei/hr	0.00 lei/hr	0.00 lei	Prorated	Standard
12		Firma relocare	Work		FR		1	0.00 lei/hr	0.00 lei/hr	0.00 lei	Prorated	Standard
13		Audit client	Work		AC		1	0.00 lei/hr	0.00 lei/hr	0.00 lei	Prorated	Standard

Figure 24. Resources after modification

After the increase in personnel, we observed that the red icons had disappeared, indicating that the project was now feasible. Below, we present the general information regarding the project.

	Start	Finish
Current	Mon 08.01.24	Fri 03.05.24
Baseline	NA	NA
Actual	NA	NA
Variance	0h	0h

	Duration	Work	Cost
Current	677h	3,324h	127,123.24 lei
Baseline	0h	0h	0.00 lei
Actual	0h	0h	0.00 lei
Remaining	677h	3,324h	127,123.24 lei

Percent complete:

Duration: 0% Work: 0%

Close

Figure 25. General project information version 2

We also observed in the resource-related graphs that the over-allocated resources are no longer highlighted in red, indicating that they are no longer over-allocated.

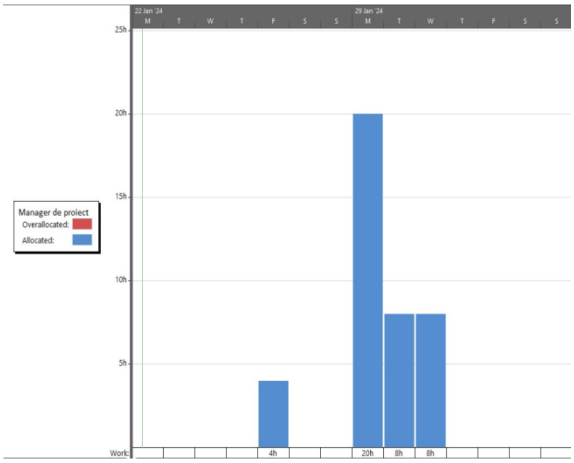


Figure 26. Graph of Project Manager resource allocation

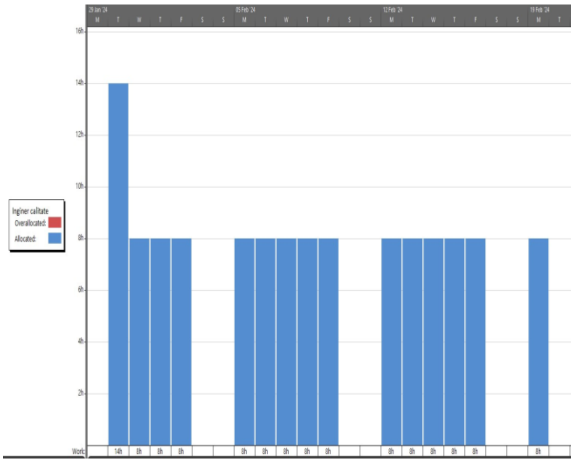


Figure 27. Graph of Quality Engineer resource allocation

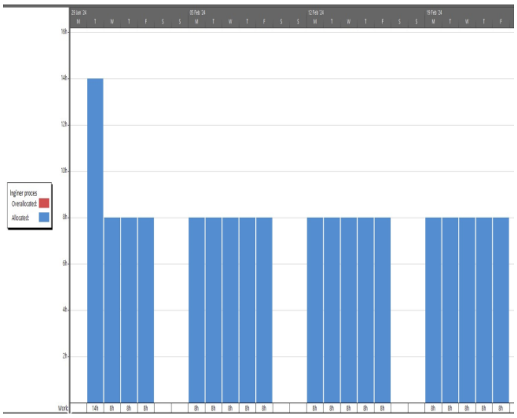


Figure 28. Graph of Process Engineer resource allocation

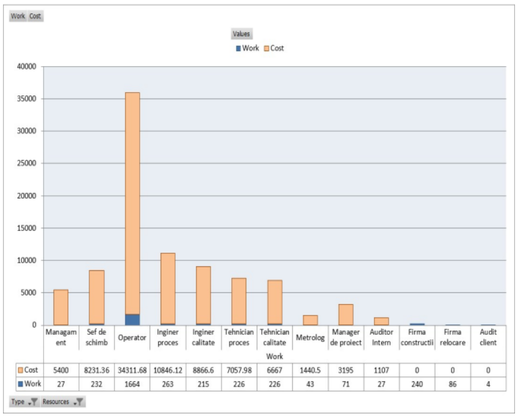


Figure 29. Cost/Hours worked report

5.3. *Version 3*

For version 3, we decided not to increase resources but to use the “Level All” function within Microsoft Project. This function resolves issues arising from resource overallocation by delaying or splitting tasks, ensuring that resources are no longer overallocated.

This decision to not increase the team for a brief period of time is the most suitable for the company's interests; however, it does not negatively impact the relocation process of the line, the only aspect affected being the duration of the project. The compensation regarding the extended duration of the relocation project is reflected in the reduced number of actual working hours, as well as the total cost of the project being lower, as evident from the general information of version 3.

	Start	Finish
Current	Mon 08.01.24	Wed 08.05.24
Baseline	NA	NA
Actual	NA	NA
Variance	0h	0h

	Duration	Work	Cost
Current	699h	2,424h	108,146.84 lei
Baseline	0h	0h	0.00 lei
Actual	0h	0h	0.00 lei
Remaining	699h	2,424h	108,146.84 lei

Percent complete:

Duration: 0% Work: 0%

Close

Figure 30. General information version 3

After using the "Level All" function, the Gantt chart has been modified as we can see in the figures below.

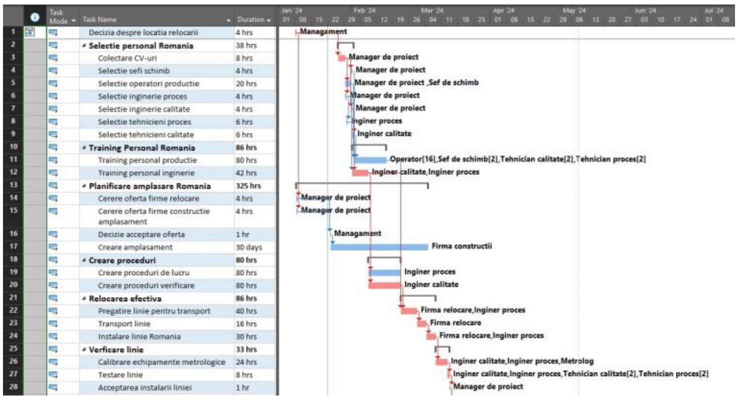
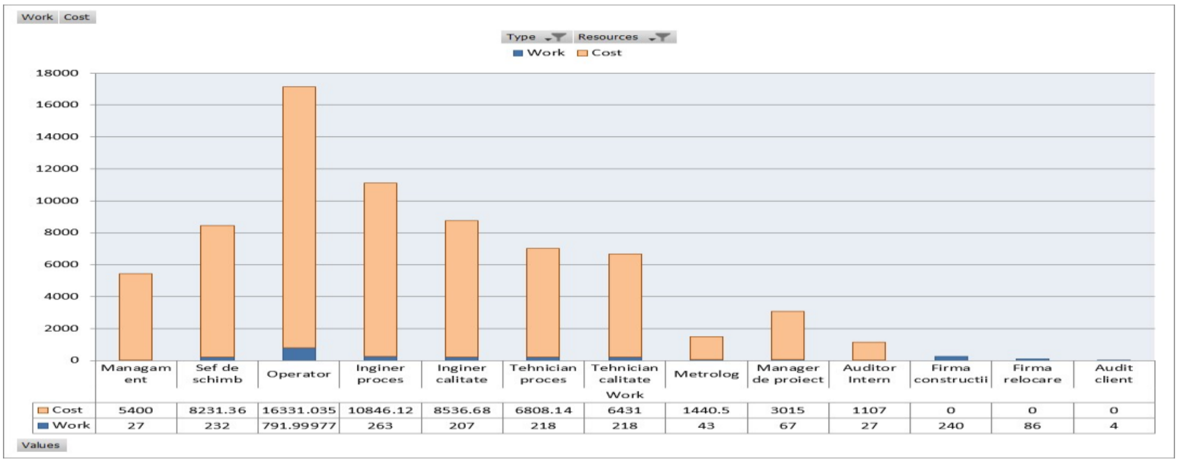


Figure 31. The first page of the Gantt chart. Gantt Chart in Microsoft Project. Version 3



	Managament	Sef de schimb	Operator	Inginer proces	Inginer calitate	Tehnician proces	Tehnician calitate	Metrolog	Manager de proiect	Auditor Intern	Firma constructii	Firma relocare	Audit client
Cost	5400	8231.36	16331.035	10846.12	8536.68	6808.14	6431	1440.5	3015	1107	0	0	0
Work	27	232	791.99977	263	207	218	218	43	67	27	240	86	4

Figure 32. Cost/Hours worked report

6. Conclusions

After implementing all versions within Microsoft Project, we observed that the first version was not feasible due to insufficient resources, which were overall allocated to certain project activities. Consequently, the second version led us to consider increasing the number of resources to facilitate project completion. However, this increase in team size for a short duration was deemed unproductive for the company’s interests, as post-relocation, the operational efficiency of the production line would be unfeasible due to personnel exceeding the established organizational structure.

To identify where this increase was necessary in the second version, we determined the critical path, allowing us to pinpoint the areas that required additional resources. We ultimately selected the third version, as it did not necessitate personnel exceeding the organizational chart of the production line, despite resulting in an extended duration for the relocation process. Below, we present the general information obtained for all versions in Microsoft Project.

	Start	Finish
Current	Mon 08.01.24	Fri 03.05.24
Baseline	NA	NA
Actual	NA	NA
Variance	0h	0h

	Duration	Work	Cost
Current	677h	3,324h	127,123.24 lei
Baseline	0h	0h	0.00 lei
Actual	0h	0h	0.00 lei
Remaining	677h	3,324h	127,123.24 lei

Percent complete:
Duration: 0% Work: 0%
Close

Figure 33. General Information about the Project Version 1

	Start	Finish
Current	Mon 08.01.24	Fri 03.05.24
Baseline	NA	NA
Actual	NA	NA
Variance	0h	0h

	Duration	Work	Cost
Current	677h	3,324h	127,123.24 lei
Baseline	0h	0h	0.00 lei
Actual	0h	0h	0.00 lei
Remaining	677h	3,324h	127,123.24 lei

Percent complete:
Duration: 0% Work: 0%
Close

Figure 34. General Information about the Project Version 2

	Start	Finish
Current	Mon 08.01.24	Wed 08.05.24
Baseline	NA	NA
Actual	NA	NA
Variance	0h	0h

	Duration	Work	Cost
Current	699h	2,424h	108,146.84 lei
Baseline	0h	0h	0.00 lei
Actual	0h	0h	0.00 lei
Remaining	699h	2,424h	108,146.84 lei

Percent complete:
Duration: 0% Work: 0%
Close

Figure 35. General Information about the Project Version 3

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