UDC 658.756.5:005.95
IRSTI 08.05.10

https://doi.org/10.55452/1998-6688-2023-20-3-105-112

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ASSESSING THE PROJECT MANAGEMENT MATURITY LEVEL IN THE PRODUCTION LOGISTICS FIELD

Abstract. This study examines the practice of implementing project management standards in production logistics. The goal of the study is to evaluate the maturity level of PM at the company engaged in the field of production logistics. The research was conducted on the materials of the company "Mehelektromontazh" LLP for the period of 2020-2022 through the analysis of key performance indicators and data from interviews. The study employed comparative and statistical analysis to assess the company's position. Standards in the field of project management, such as PMBOK, ISO, P2M, SSPM, etc. were compared. Research methodology is based on using the OPM3 model which helped to evaluate the PM maturity in logistics company. According to the evaluation results, the most developed areas in LLP "Mehelektromontazh" are procurement and scheduling management (100%), cost management (90%), and human resources management (75%). The least utilized project practices in this company are content management (25%), stakeholders management (50%), senior management (60%), and integration management (55%). The analysis conducted allowed for the formulation of recommendations for the implementation of project management standards to optimize logistics in the company's production process.

Key words: project management, production logistics, project maturity level, PM standard, OPM3 standard.

Introduction

In conditions of high competitive struggle, companies strive to optimize the work of all components of the production process. The logistics approach allows for the development of an open system for the formation and management of material, informational, and financial flows during order fulfillment, as well as ensuring coordination of work among all departments and units involved in the movement of materials from source to consumer.

The effective application of the logistics approach can be enhanced through the implementation of project management. By developing project management within a company, it is possible to reduce costs, increase efficiency, improve interaction with customers and company management, and gain more competitive advantages. According to research by Economist Intelligence, 80% of company executives worldwide consider project management a key competency that helps them remain competitive during economic recessions. Some authors found that on average, higher levels of project management maturity are associated with better cost and schedule results [1, 2]. However, in most organizations, expenditures on project management do not have direct impacts on revenue or profits [3]. Even when an economic downturn is followed by an upturn, there is no doubt that mature project management applied to all company activities contributes to achieving better results and obtaining long-term business advantages. However, managers of domestic companies are not rushing to implement project management standards in their company management, one of the reasons being a lack of sufficient knowledge in this area, indicating the need for this research.

The goal of the study is to evaluate the level of implementing project management standards at the company engaged in production logistics.

To achieve this goal the following research questions have been defined:

What standards are applicable to measure the PM maturity at the logistics companies?

What is the level of PM maturity at the chosen logistics company?

What the company should do to increase its PM maturity level?

Main provisions

The implementation of TSR PT across the entire production program ensures the optimal utilization of resources, enabling the organization to establish a smooth, unidirectional flow of materials.

LLP "Mehelektromontazh" excels in procurement management and time management (both at 100%), cost management (90%), and human resource management (75%). In contrast, scope management (25%), stakeholder management (50%), high-level management (60%), and integration management (55%) are areas where project practices are less utilized.

Scope management's lower percentage is attributed to the infrequent changes in initial customer requirements, even though unique requirements emerge during the initial order formation, necessitating a more comprehensive approach.

The quantitative utilization and qualitative implementation of project practices are assessed, revealing that while quality management has a 70% utilization rate, its qualitative implementation is at 45%.

Streamlining material flows through project management practices offers several benefits, including a tenfold reduction in interdepartmental routes, fewer internal links between production areas, and simplified production planning and management.

Literature Review

PM evolution

The historical origins of project management can be traced back to the development of human civilization, as evidenced by the great projects of the past such as the Egyptian pyramids, the Great Wall of China, the Taj Mahal, and many others.

Project management is associated with the works of classics such as Gantt, Fayol, and Taylor. For example, the American engineer H. Gantt developed the technique of calendar planning, which later became a project planning tool. Henri Fayol is the creator of classical management theory, which established the functions of management and became the foundation of project management.

The project management was established as a knowledge field in 1950s. In 1959, NASA proposed a systemic approach to project management based on the project life cycle stages.

In 1966, the GERT system was introduced, which represents a probabilistic method of network planning. This method is used to assess the probability of event occurrence based on statistical data obtained through modeling. It is applied when it is not possible to determine the exact sequence of work to achieve the project's goal.

In the 1970s, a systemic approach to project management was actively developed, taking into account external project factors. Conflict management methods were developed and implemented, and project organizational structures were formed with the definition of each participant's role.

Project management as a professional field was formed in the 1980s. Concepts such as resource management, risk management, and quality management emerged within project management. Significant attention was given to team formation.

The widespread adoption of project management methods in various industries began in the 1990s. During this period, the process of unification and standardization of project management methods began, leading to the introduction of international and national project management standards.

Production Logistics evolution

In foreign literature, "logistics" is considered a management function associated with planning. American scholars view logistics as a planning structure, a mechanism for cost savings.

English scholars perceive logistics as "the study and prediction of the market, production planning, procurement of raw materials, materials, and equipment, including inventory control and a series of operations related to the movement of goods."

Therefore, logistics allows for the optimization of production and information flows both within and outside the company. In the subsequent years, logistics began to be based on the integration of all spheres of economic activity into a system.

Using PM standards for the assessment of PM maturity in the Production Logistics field

There are many international standards of PM that can be applicable in different fields of economy. They specifically differ from each other depending on particular criteria. Table 1 presents a comparative analysis of international project management standards.

Table 1– Comparative Analysis of International Project Management Standards

Criteria / standards	PMBOK	P2M	PRINCE2
Approach Used	process	systemic	process
Project review	in isolation	Organization context	Organization context
Composition of project management subject areas	Management of integration, content, timelines, cost, personnel, risks, communications, quality, contracts, and deliveries	Management of strategy, finances, systems, project organization, tasks, resources, risks, project IT, relationships, project value and communication	project start, initiation, planning, project management project stage control, product delivery management, completion
Availability of management document templates	No	No	Yes
Availability of an individual certification system	Yes	Yes	Yes

In addition to that, the simplified PMBoK model, known as SSPM (Small and Simple Project Management), is actively used. This model consists of four stages that a project must go through: initiation, planning, control, and closure. The difference from the full model lies in the consolidation of two process groups, namely the "executing" group and the "monitoring and controlling" group, into a single group.

The discussed standards are integrated into a unified system of standards that allows for diagnosing and improving the maturity of an organization in the field of production logistics.

Different models are used to determine the level at which project management is implemented in a particular company. The organizational Project Management Maturity Model (OPM3) is a model that guides organizations to find solutions that bridge the gap between strategy and the realization of their projects [4]. This model includes tools and methods that allow continuous evaluation, through diagnostic techniques that identify potential problems and deficiencies with projects. At the same time, it identifies improvements to be implemented [5]. These standard benefits different organizations in terms of dimension, complexity, and geography. Silva et al stated that this model is one of the suitable tools for measuring PM maturity in the field of logistics. That's why the study uses the mentioned model in the analytical part of the research.

Materials and methods

The study uses statistical data from official internet resources, constituent and financial documents of "Mehelektromontazh," as well as publications from open sources.

The research methods used include logical-structural analysis, comparative and statistical analysis, and graphical analysis method. Data was collected by using the interview method for building an OMP3 model to assess the PM maturity at the chosen company. Respondents were 26 PM managers and project team members at "Mehelektromontazh" experienced in managing projects in the field of production logistics.

Before using the project management evaluation procedure, it is necessary to specify the constraints used. The assessment of project maturity was conducted by compiling a list of project-level questions. The weights of the questions were considered equal, and the process groups and knowledge areas were defined based on theoretical knowledge.

The main method used was in-depth interviews with the director of LLP "Mehelektromontazh" to assess the implementation of project management in the enterprise. The interview questions were derived from the OPM3 model, and the interpretation of the results was carried out by quantitatively calculating the number of project management processes used in the enterprise out of the total number of processes in the considered category. The questions are presented in Appendix A. When using a process in the enterprise, its implementation level was determined on a 4-point scale, where each subsequent category included the previous one:

Standardized process: observed in the company, possibly formally regulated.

Measurable process: quantitative or qualitative analysis is conducted on this process.

Controlled process: controlled to achieve planned results, deviations are promptly identified.

Improved process: negative practices identified in this process are analyzed, and a continuous procedure for their elimination is carried out.

At the end of this interview, a report was generated with a percentage determination of the quantity and

quality of the project management processes used. This percentage represents the level of utilization of only those project practices listed in the questions and may not take into account certain processes.

The interpretation of the results was performed using MS Excel software, whose capabilities allowed achieving the set goal.

Results and discussion

In LLP "Mehelektromontazh" the orderliness of material movement in production is achieved through the design of a typical scheme for the movement of work items in production (TSR PT). Designing TSR PT for the entire production program ensures the utilization of all potential capabilities of organizing unidirectional material flows.

The logistics department, while ensuring the flow of materials, must participate in decisions regarding the launch of production.

Below is a graphical representation of the results of the conducted in-depth interview.

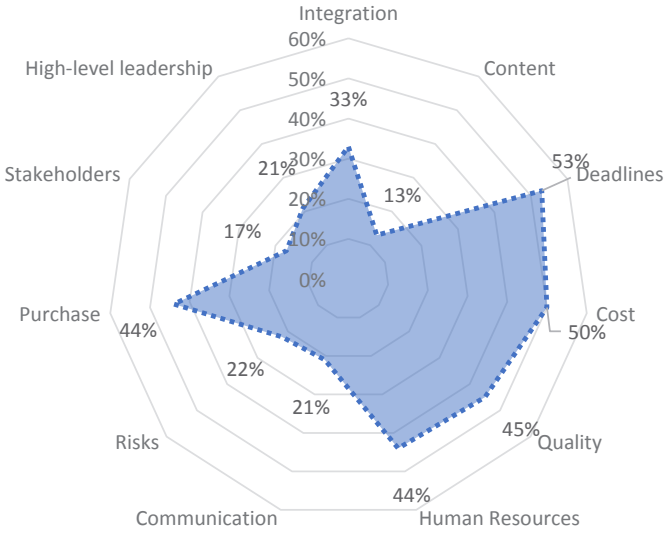

Figure 1 – Diagram of the implementation of PM processes by knowledge areas

As shown in the presented radar chart, the percentage of overall implementation of project management processes is displayed by knowledge areas. The most developed areas in LLP "Mehelektromontazh" are procurement management and time management (100%), cost management (90%), and human resource management (75%). The least utilized project practices in this company are scope management (25%), stakeholder management (50%), high-level management (60%), and integration management (55%).

The low percentage of scope management is due to the formation of initial customer requirements, where the order structure rarely undergoes significant changes. However, during the initial order formation, unique requirements are established, and a more comprehensive project approach for managing the scope is clearly necessary.

Time management and procurement management have demonstrated the highest level of implementation of project practices. This is due to the specific nature of production activities, which operate on a "just-in-time" principle, as well as the serious penalties in case of order delays. Similarly, there is a well-planned distribution of human resources for the same reason.

An important point for the analysis was the visual determination of the percentage of project practice utilization, as well as the cumulative percentage of project management implementation, which was calculated as the ratio of the current indicator of used project practices in production to the total number of project practices from the questions. The percentage of project management implementation in LLP "Mehelektromontazh" is 74%.

As mentioned above, questions were asked about the quality of the utilization of these practices in the enterprise during the interview. In comparison to the level of practice utilization, the percentage of qualitative implementation showed lower results, as presented in the figure.

The most developed areas in the enterprise, after determining the qualitative level, are time management (53%), cost management (50%), quality management (45%), procurement management, and human resource management (44%). The least utilized project practices in this company are scope management (13%), stakeholder management (17%), high-level management and communication (21%), and risk management (22%).

Although the percentage of project management utilization in quality showed an average indicator of 70%, the level of qualitative implementation of project management demonstrates high performance at 45%. The quality management is also crucial to detect and eliminate defects; otherwise, the produced goods may become unsuitable for use.

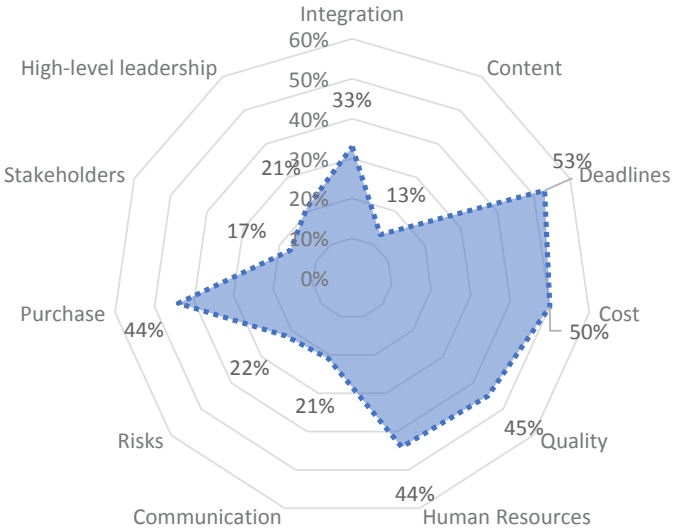

Figure 2 – Diagram of the qualitative implementation of PM processes by knowledge areas

Among the low indicators, new weaknesses have emerged in LLP "Mehelektromontazh", specifically in stakeholder management, communication, and risk management. Project communication management among employees is carried out in an informal manner, and there are only rare procedures for clarification calls with stakeholders. Thus, the administrative staff does not see the need for thorough communication planning, which was confirmed during the analysis of the company's project activities and the identification of only clarification call procedures with major clients. Risk management processes are considered without due attention, as the management perceives the occurrence of risks as completely unpredictable.

The OPM3 model itself serves as an excellent tool for a comprehensive understanding of the extent and quality of project management practices in all knowledge areas of project management. The developed questionnaire, consolidated table, and graphs will be provided to the management of LLP "Mehelektromontazh", allowing them to conduct a re-evaluation of their activities when necessary. However, this model has significant limitations, including unintentional overestimation of results since managers of their own enterprises potentially believe that the practices mentioned in the questions are used in their enterprises, although significant work is still required for their full implementation. Another drawback of this model is the lack of specific recommendations for improving project activities due to the nature of continuous and petal maturity models.

The weaknesses of LLP "Mehelektromontazh" lie in stakeholder management, communication, and risk management. Project communication management among employees is carried out in an informal style, and communication with stakeholders is limited to rare clarifying phone calls. This indicates that the administrative staff does not see the need for thorough communication planning, which was confirmed during the analysis of the company's project activities, where only clarifying phone call procedures were identified for major clients. Risk management processes are considered with insufficient attention, as the management perceives the occurrence of risks as unpredictable.

To increase the sales of services (products) at LLP "Mehelektromontazh" and expand the geographical scope of deliveries, it is necessary to implement new technologies used by foreign companies, both in terms of manufacturing techniques and materials management, i.e., the implementation of logistics management

systems. In a more advanced form of the "Kanban" system, it is possible to reduce material costs related to maintaining the staff and reduce the non-rational use of materials. Additionally, it can shorten the turnover time of materials into products, products into monetary funds, monetary funds into materials, and so on.

The logistical approach to managing material flows in the enterprise allows for the maximum optimization of a complex set of logistical operations, which can be achieved through the implementation of project management. Therefore, the use of design in LLP "Mehelektromontazh" provides the following advantages:

More than a tenfold reduction in the number of different interdepartmental technological routes.

Reduction in the number of internal links between production areas.

Reduced complexity and labor intensity of production planning and management.

Conclusion

Thus, the study results helped to answer the research questions put forward before. Based on the evaluation results of the project management level in LLP "Mehelektromontazh", it can be noted that the company is at an initial level of project maturity, characterized by the following features: limited support for project management, minor implementation of project management practices, the management's lack of awareness about the benefits of project management due to fear of change, decision-making driven by personal interests, lack of project management knowledge, and absence of investment in staff training. Despite the relatively high percentage of implemented project practices in the company and the management's willingness to learn new knowledge, the absence of confident knowledge of project methodology by the management prevents the transition to a higher level of the project management implementation assessment model. The implementation of project management in production logistics will ensure the timely fulfillment of obligations by LLP "Mehelektromontazh", which means delivering supplies on schedule without delays. The research limitation is the fact that the study covered the activity of only one company engaged in production logistics. Therefore, future research can expand the topic by adding new companies or additional fields as an object of the research.

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ҚАЗАҚСТАН КӘСІПОРЫНДАРЫНДАҒЫ ТҰРАҚТЫ ИННОВАЦИЯЛЫҚ ДАМУДЫ БАҒАЛАУ

Аңдатпа. Бұл мақалада өндірістік логистикаға жобалық менеджмент стандарттарын енгізу тәжірибесі қарастырылады. Зерттеу 2020–2022 жж. «Мехэлектромонтаж» ЖШС материалдары негізінде қызметтің негізгі көрсеткіштерін талдау және сұхбат деректерін өңдеу арқылы жүргізілді. Әдебиеттерге шолу кезінде ашық ақпараттық ресурстарда орналастырылған отандық және шетелдік ғалымдардың ғылыми еңбектері пайдаланылды. Зерттеу барысында компанияның жағдайын бағалауға мүмкіндік беретін салыстырмалы және статистикалық талдау қолданылды. PMBOK, ISO, P2M, SSPM және т.б. жобалық менеджмент саласындағы стандарттар қарастырылды. Сұхбат әдісі арқылы зерттелетін объектінің жобалық кемелдену деңгейіне баға беріледі. Жүргізілген талдау компанияның өндірістік процесінде логистиканы оңтайландыру мақсатында жобалық менеджмент стандарттарын енгізу бойынша ұсыныстар қалыптастыруға мүмкіндік берді.

Тірек сөздер: жобалық менеджмент, өндіріс, логистика, жобалық жетілу деңгейі, сұхбат, стандарттар.

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ОЦЕНКА РАЗВИТИЯ УСТОЙЧИВЫХ ИННОВАЦИЙ В КАЗАХСТАНСКИХ КОМПАНИЯХ

Аннотация. В данной статье рассматривается практика внедрения стандартов проектного менеджмента в производственную логистику. Исследование проведено на материалах ТОО «Мехэлектромонтаж» за период 2020–2022 гг. посредством анализа основных показателей деятельности и обработки данных интервью. При обзоре литературы были использованы научные труды отечественных и зарубежных ученых, размещенные в открытых информационных ресурсах. В ходе исследования были использованы сравнительный и статистический анализ, который позволил оценить положение компании. Рассмотрены стандарты в области проектного менеджмента, такие как PMBOK, ISO, P2M, SSPM и пр. При оценке уровня проектного менеджмента в компании была использована модель зрелости управления проектами Керцнера. Посредством метода интервью дана оценка уровню проектной зрелости исследуемого объекта. Проведенный анализ позволил сформировать рекомендации по внедрению стандартов проектного менеджмента с целью оптимизации логистики в производственном процессе компании.

Ключевые слова: проектный менеджмент, производство, логистика, уровень проектной зрелости, интервью, стандарты.