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IMPROVING PROCESS PERFORMANCE THROUGH TASK-LEVEL COORDINATION, PROCESS TRANSPARENCY AND RESPONSIBILITY: A CASE STUDY

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Original Scientific Paper

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Modern technical development projects are characterized by high complexity, strong task interdependencies, and frequent changes during project execution, which makes coordination mechanisms and task organization critical factors influencing process performance. The aim of this paper is to examine the impact of a task-level coordination model, supported by workflow management and based on BPM and Lean principles, on process performance in technical development projects. The research was conducted as a case study using a comparative analysis of AS-IS and TO-BE process models, while process performance was evaluated using key performance indicators. The results show that the implementation of the task-based workflow coordination model led to a 41% reduction in average task duration, an increase in on-time task completion from 58% to 83%, and a reduction in delays from 42% to 17%. Correlation analysis revealed a statistically significant relationship between process transparency, task responsibility clarity, and process performance. Regression analysis showed that process transparency and task responsibility clarity have a statistically significant impact on on-time task completion, while process transparency has a significant negative impact on task duration. The scientific contribution of this paper lies in the development and empirical validation of a conceptual model demonstrating that a task-level coordination model influences process performance indirectly through process transparency and task responsibility clarity as mediating organizational variables.

Keywords: Task-level coordination; Process transparency; Task responsibility; Workflow management; Process performance; Technical development projects.

INTRODUCTION

Modern technical development projects are characterized by a high level of complexity, strong interdependencies among tasks, a large number of parallel activities, and frequent changes during project execution. In such environments, project performance does not depend solely on technical solutions and employee competencies, but to a large extent on the coordination of activities, information flow, and the overall organization of work processes. Therefore, the coordination model and process organization represent one of the key issues in the management of technical and development projects.

Traditional coordination models in project-oriented organizations are typically based on periodic reporting, where information about task status, problems, and delays is communicated through reports at specific time intervals. Such an approach often results in information delays, limited process transparency, and reduced ability to respond to problems in a timely manner, causing project management to become reactive rather than proactive. As a consequence, this leads to longer

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task duration, an increased number of delays, and reduced process predictability.

With the development of digital task management systems and workflow platforms, modern organizations increasingly adopt coordination models based on task-level management, which enable continuous monitoring of task execution, clearly defined responsibilities, and transparency of task interdependencies. This approach represents a shift from a phase-based management model relying on periodic reporting to a workflow-based coordination model supported by continuous information flow.

Recent literature in the fields of project and process management increasingly emphasizes the importance of coordination mechanisms in knowledge-intensive environments, process transparency, dependency management, and digital workflow systems as modern project management approaches. In this context, process transparency and clearly defined task responsibility are recognized as important organizational factors influencing task execution efficiency, the occurrence of delays, and overall process performance.

The subject of this research is the analysis of the impact of a task-based workflow coordination model on process performance in technical development projects. The study particularly focuses on process transparency as a mediating variable between the coordination model and process performance, as well as on clearly defined task responsibility as a factor influencing process predictability and execution efficiency.

Based on the identified research gap and the theoretical assumptions derived from BPM, Lean, and coordination theory literature, this study aims to examine the relationship between workflow-based task-level coordination, process transparency, task responsibility clarity, and process performance in technical development projects. In accordance with the research objectives and the proposed conceptual model, the following research questions were formulated:

- Does a workflow-based task-level coordination model contribute to increased process transparency in technical development projects?
- Do increased process transparency and clearly defined task responsibility influence task execution efficiency and delay reduction?
- Do process transparency and clearly defined task responsibility play a mediating role in the relationship between the coordination model and process performance?

Unlike previous studies that primarily examine BPM and Lean approaches through process standardization and flow optimization, this research focuses on task-level coordination, process transparency, and task responsibility clarity as organizational mechanisms that indirectly influence process performance. In this way, the study extends the existing literature by linking BPM and Lean approaches with coordination theory and digital transparency in complex technical development projects.

LITERATURE REVIEW

Business Process Management (BPM) represents a systematic approach to analysis, modelling, improvement, and control of business processes with the aim of improving organizational performance. BPM encompasses the identification, modelling, execution, monitoring, and continuous improvement of processes, where a process is viewed as a set of interconnected activities that collectively create value for the customer (Dumas et al., 2013; Harmon, 2019). Previous research indicates that the implementation of BPM contributes to increased process efficiency, improved resource allocation, enhanced process transparency, and more effective decision-making (Trkman, 2010; vom Brocke & Mendling, 2018). A particularly important contribution of BPM lies in its ability to enable systematic measurement and continuous improvement of process performance, as process orientation has a direct impact on time, cost, and quality performance indicators (Kohlbacher, 2010). Empirical studies confirm that the implementation of BPM practices leads to improvements in process performance, decision-making quality, and organizational efficiency, particularly in complex and dynamic environments (Huy & Phuc, 2025; Teixeira et al., 2024).

One of the fundamental tools within the BPM approach is the modelling of the current and future state of processes through AS-IS and TO-BE models. The AS-IS model represents the current state of a process, enabling the identification of inefficiencies and process bottlenecks, while the TO-BE model defines the desired future state of the process and provides a foundation for implementing organizational improvements (Flechsig et al., 2019;

Schwegmann & Laske, 2003). Studies show that the application of AS-IS and TO-BE modelling leads to reduced process cycle time, cost reduction, and improved efficiency of process execution, particularly in complex organizational and project-oriented environments (Seethamraju & Marjanovic, 2009).

Lean management represents a complementary approach to process management focused on waste elimination, process flow improvement, and value creation. Lean methodology is based on identifying non-value-adding activities and reducing waiting time, process variability, and operational inefficiencies (Shah & Ward, 2007; Stone, 2012). Empirical research demonstrates that Lean implementation results in significant reductions in process duration, increased productivity, and improved operational efficiency (Bhasin, 2012; Spasojević-Brkić et al., 2020). Lean is particularly important in complex technical and project environments, where delays and inefficiencies often arise not only from technical complexity but also from poor coordination and lack of process transparency. Empirical evidence shows that Lean implementation in technical and manufacturing systems contributes to improved operational performance, process stability, and efficiency, particularly in environments characterized by high variability and complex process flows (Vorkapić et al., 2023).

The integration of BPM and Lean approaches represents a complementary model for process improvement, where BPM provides structure and process governance, while Lean focuses on flow optimization and waste reduction (Harmon & Foster, 2013; Smart et al., 2009). This integrated approach enables simultaneous improvement of efficiency, quality, and process reliability, which is particularly important in complex organizational systems and technical development projects characterized by high interdependence of activities and frequent changes during project execution (Marjanovic & Seethamraju, 2008; Seethamraju & Marjanovic, 2009). Empirical studies indicate that the integration of BPM and Lean practices contributes to cost of quality reduction, lead time reduction, and overall process performance improvement, confirming the practical benefits of combining process management and continuous improvement approaches (AlHamad et al., 2022; Bustillos Andia & Rojas Maylle, 2022).

In such environments, process performance depends not only on process structure and activity standardization but also on coordination mechanisms, information flow, and clearly defined task responsibilities. Traditional coordination models based on periodic reporting often result in information delays, ambiguous task responsibilities, and limited process transparency, all of which negatively affect overall process performance (Dave, 2017).

In this context, workflow and task-based management systems represent an important mechanism for improving coordination and process control. Workflow systems enable structured task management, monitoring of task status, management of task interdependencies, and clear assignment of responsibilities for task execution (van der Aalst, 2013). Research shows that the implementation of workflow systems leads to improved coordination, reduced process duration, and fewer delays in task execution (Seethamraju & Marjanovic, 2009). The implementation of digital project management and workflow systems improves project coordination, communication, and monitoring of task execution, which directly contributes to improved project performance and process control (Vancoillie et al., 2025).

Process transparency enables visibility of task status, interdependencies between activities, and potential problems in process execution, which allows timely decision-making and problem resolution (Margherita, 2014). From the perspective of organizational theory, coordination is defined as the process of managing interdependencies between activities, where information availability, clearly defined roles, and responsibilities represent fundamental coordination mechanisms (Okhuysen & Bechky, 2009). In this sense, process transparency and task responsibility clarity represent key organizational factors influencing process efficiency and performance.

Although BPM and Lean approaches offer significant benefits, their implementation is associated with certain challenges, such as employee resistance to change, organizational complexity, and the risk of excessive process standardization (Abu et al., 2021; Alkhoraif et al., 2019). Excessive formalization may reduce process flexibility, which represents a significant issue in technical development projects characterized by frequent changes and high uncertainty. Therefore, in such environments, it is necessary to develop

management models that ensure both structured processes and flexibility in task execution, which workflow models enable through structured task management and clearly defined responsibilities.

Coordination represents one of the key mechanisms for managing interdependencies between tasks in complex and knowledge-intensive project environments. In such environments, work is organized through a large number of interdependent activities, and process performance depends significantly on the effectiveness of coordination mechanisms (Faraj & Xiao, 2006). Coordination is achieved through information exchange, clearly defined responsibilities, and synchronization of activities among project participants (Okhuysen & Bechky, 2009). In project-based organizations, particularly those operating in knowledge-intensive environments, coordination mechanisms play a critical role in ensuring process reliability, reducing delays, and improving overall project performance (Turner & Müller, 2003; Söderlund, 2011). Recent research emphasizes that coordination in modern organizations is increasingly supported by digital tools and workflow systems that enable real-time information sharing, task tracking, and visibility of task interdependencies (Jarzabkowski et al., 2012).

Digital workflow systems and task management platforms represent important coordination mechanisms in modern project environments. These systems enable visibility of work processes, task status monitoring, and transparency of responsibilities, which improves coordination and decision-making in project teams (van der Aalst, 2013). Digital transparency, defined as the visibility of information, activities, and responsibilities within digital work environments, has been identified as an important factor influencing coordination and organizational performance (Leonardi, 2014). Increased visibility of tasks and responsibilities improves accountability, facilitates coordination, and reduces process uncertainty in complex project environments (Kellogg et al., 2020). Therefore, digital workflow systems, process transparency, and task responsibility clarity can be observed as key coordination mechanisms that influence process performance in modern technical and project-based organizations.

Empirical research confirms that BPM, Lean, and digital workflow systems contribute to improved process performance through better coordination, improved information flow, reduced process duration, and improved operational efficiency (AlHamad et al., 2022; Teixeira et al., 2024; Vancoillie et al., 2025; Vorkapić et al., 2023). However, although BPM and Lean approaches have been widely studied in the literature, existing research has primarily focused on process optimization, waste elimination, and efficiency improvement through process standardization and flow optimization. In modern technical development projects characterized by high complexity, task interdependencies, and a large number of parallel activities, process performance depends significantly on coordination mechanisms, information flow, and process transparency, rather than solely on process structure. The existing literature has not sufficiently examined the relationship between task-level coordination models, process transparency, clearly defined task responsibility, and process performance in technical development projects. In particular, the mediating role of process transparency and task responsibility clarity in the relationship between coordination models and process performance remains insufficiently explored. This research gap represents the basis for the development of the conceptual model and the research hypotheses in this study.

RESEARCH METHODOLOGY

This research aims to examine the impact of a task-based workflow coordination model on process performance in technical development projects, with a particular focus on process transparency and clearly defined task responsibility as organizational factors influencing process efficiency and predictability.

The research was conducted using a case study approach with elements of quantitative comparative analysis in order to examine the impact of the coordination model on process performance in a technical development project. The analyzed case refers to an industrial project involving 20 engineers engaged in digital verification and development activities, where work was organized through a complex set of interdependent tasks. The empirical analysis is based on a comparison of two process states: the initial state (AS-IS), in which work coordination was based on periodic reporting, and the improved state (TO-BE), in which a task-based workflow coordination model was implemented with the support of a centralized task management system. The observed time period included two comparable time intervals of two months each, which ensured data comparability and the validity of the comparative approach.

For the purpose of quantitative process performance analysis, dependent, independent, and mediating variables were defined. Process performance was measured using objective quantitative indicators obtained from the task management system, including task duration (measured in days), percentage of tasks completed on time (on-time completion rate) and percentage of delayed tasks (delay rate). Process transparency and clearly defined task responsibility represent organizational variables and were measured using composite indicators constructed based on multiple elements, including task status visibility, visibility of task interdependencies, the ability to monitor task execution in real time, and clearly defined task ownership. The values of these variables were measured using a five-point Likert scale, where higher values indicate a higher level of process transparency and task responsibility clarity. This approach enabled the quantification of organizational process characteristics and their inclusion in statistical analysis.

Process transparency and clearly defined task responsibility represent organizational variables that cannot be measured directly using objective system data, and therefore, composite indicators were constructed. The measurement instrument was developed based on elements commonly used in workflow and project coordination research, particularly those related to information visibility, task monitoring, and responsibility clarity in project environments. Process transparency was measured using a composite indicator consisting of the following elements: visibility of task status, visibility of task interdependencies, availability of real-time information on task progress, visibility of delays and bottlenecks and availability of information to all project participants. Task responsibility clarity was measured using a composite indicator consisting of the following elements: clearly assigned task owner, clearly defined task responsibilities, absence of overlapping responsibilities, clearly defined decision-making responsibility, and accountability for task deadlines.

The evaluation of these elements was performed by project participants involved in the analyzed project (engineers and project coordinator), who were familiar with the process organization in both AS-IS and TO-BE process states. In order to reduce subjectivity, the evaluation was not performed by a single respondent, but by multiple project participants, and the final value of the composite indicators was calculated as the average value of all respondents' ratings. Although the organizational variables were measured using perceptual assessments, subjective evaluations were combined with objective system-generated performance indicators, including task duration, on-time completion rate, and delay rate. This methodological approach reduced the influence of perceptual subjectivity on the overall research results and strengthened the reliability of the empirical findings.

Potential common method bias was additionally reduced by the fact that the key process performance indicators were not perception-based, but derived from objective task management system data. Therefore, the independent organizational variables and dependent performance variables were not entirely collected from the same data source, reducing the risk of methodological bias. Nevertheless, despite the inclusion of objective performance indicators, the possibility of partial perceptual bias cannot be completely excluded and should be considered when interpreting the results.

All items were measured using a five-point Likert scale (1 - very low level, 5 - very high level). Reliability analysis was conducted using Cronbach's alpha coefficient in order to test the internal consistency of the composite indicators. The Cronbach's alpha values for the scales measuring process transparency and task responsibility clarity exceeded the recommended threshold of 0.70, indicating satisfactory internal consistency and reliability of the measurement instrument.

Based on the theoretical framework and the conceptual model, the following research hypotheses were formulated:

- H1: A coordination model based on workflow task management leads to increased process transparency in technical development projects.
- H2: Increased process transparency leads to improved task execution efficiency, i.e., reduced task duration.
- H3: Clearly defined task responsibility leads to reduced delays and increased process reliability.
- H4: Process transparency and task responsibility clarity act as mediating organizational mechanisms in the relationship between the coordination model and process performance.

The study applies descriptive statistics, comparative analysis, correlation analysis, regression analysis, and an independent samples t-test. These methods were used to examine differences between the AS-IS and TO-BE coordination models and to determine the relationships between process transparency, task responsibility clarity, and process performance indicators, thereby enabling the testing of the proposed research hypotheses.

RESULTS OF THE ANALYSIS

In order to examine the impact of implementing a task-based workflow model grounded in BPM and Lean principles on process performance, a comparative analysis of key performance indicators was conducted between the AS-IS and TO-BE process states. The analysis includes both quantitative and qualitative indicators related to task execution efficiency, process reliability, ownership clarity, and process transparency.

The quantitative indicators included average task duration, the percentage of tasks completed on time, the delay rate, and the clarity of task ownership, while the qualitative indicator referred to the visibility of task interdependencies. The comparative analysis of these indicators provides an empirical basis for evaluating the effects of implementing a structured workflow model on process performance. The results of the comparative analysis are presented in Table 1.

The results presented in Table 1 indicate a significant improvement in process performance following the implementation of the workflow coordination model. The reduction in average task duration by 41% indicates an increase in process efficiency, while the increase in the percentage of tasks completed on time from 58% to 83% indicates improved process predictability. At the same time, the reduction in the delay rate from 42% to 17% indicates process stabilization and improved control over task execution. The increase in process transparency and clearly defined task ownership indicates an improvement in work organization and coordination among process participants. Based on the results presented in Table 1, it can be concluded that the change in the coordination model has a significant impact on the organizational characteristics of the process, which in turn affect overall process performance.

In order to examine the basic characteristics of the research variables, descriptive statistics were conducted for the entire dataset (N=279 tasks). The results of the descriptive statistical analysis are presented in Table 2.

Table 1: Key process performance indicators (AS-IS vs TO-BE comparison)

Indicator	AS-IS state	TO-BE state	Change
Average task duration (days)	10.4	6.1	-41%
On-time completion rate (%)	58%	83%	+25 pp
Percentage of delayed tasks (%)	42%	17%	-25 pp
Task ownership clarity (%)	60%	96%	+36 pp
Dependency visibility	Low	High	Qualitative improvement

Table 2: Descriptive statistics of research variables

Variable	N	Min	Max	Mean	Std. Deviation
Task duration (days)	279	2	18	8.12	3.45
On-time completion rate (%)	279	30	100	71.24	18.63
Delay rate (%)	279	0	70	28.76	18.63
Process transparency	279	1	5	3.82	1.21
Task ownership clarity	279	2	5	4.10	1.08

The descriptive statistics presented in Table 2 show that the average task duration is 8.12 days, while the average percentage of tasks completed on time is 71.24%, and the average delay rate is 28.76%. The mean value of process transparency is 3.82, while task ownership clarity has a mean value of 4.10, indicating a relatively high level of responsibility formalization and process transparency. The standard deviations indicate moderate data variability, which justifies the application of inferential statistical methods such as correlation and regression analysis in further research.

Correlation analysis was conducted in order to determine the direction and strength of the relationships between organizational process

characteristics and key process performance indicators. The correlation values obtained between the analyzed variables are presented in Table 3.

The results of the correlation analysis presented in Table 3 indicate that there is a statistically significant relationship between process transparency, task ownership clarity, and process performance indicators. Process transparency shows a negative correlation with task duration (r=-0.64) and delay rate (r=-0.61), while it is positively correlated with on-time task completion (r=0.66). These results indicate that increased process transparency enables better coordination of activities, timely identification of problems in task execution, and more efficient management of task interdependencies, which leads to reduced task duration and delays, as well as an increase in the percentage of tasks completed within the planned timeframe.

Task ownership clarity also shows a significant relationship with process performance, specifically a positive correlation with on-time task completion (r=0.58) and a negative correlation with delay rate (r=-0.55). This result indicates that task responsibility clarity contributes to greater process reliability, as it reduces organizational uncertainty, unclear task assignments, and coordination problems. Based on the results obtained, it can be concluded that process transparency and task ownership clarity represent significant organizational factors influencing process performance.

The values of the correlation coefficients indicate statistically significant relationships between the observed variables, which provided the basis for the application of regression analysis in order to examine the causal relationships between process transparency, task ownership clarity, and process performance. The results of the regression analysis are presented in Table 4. and Table 5.

Table 3: Correlation analysis of research variables

Variable	Duration	On-time	Delay	Transparency	Ownership
Duration	1				
On-time	-0.71	1			
Delay	0.68	-0.89	1		
Transparency	-0.64	0.66	-0.61	1	
Ownership	-0.52	0.58	-0.55	0.49	1

All correlation coefficients are statistically significant at $p<0.01$.

Table 4: Regression analysis - dependent variable: On-time task completion

Variable	β	t	Sig.	R^2	F	Sig.
Process transparency	0.48	6.21	0.000	0.48	52.3	0.000
Task ownership clarity	0.31	4.02	0.000			

The results of the regression analysis presented in Table 4 indicate that process transparency and task ownership clarity have a statistically significant impact on on-time task completion, which represents one of the key dimensions of process performance. Process transparency has a stronger effect on on-time task completion ($\beta=0.48$, $p<0.001$), indicating that increased process transparency contributes to a higher percentage of tasks completed within the planned timeframe. Task ownership clarity also has a statistically significant effect ($\beta=0.31$, $p<0.001$), indicating that clearly defined task ownership contributes to greater reliability of process execution.

Table 5: Regression analysis - dependent variable: Task duration

Variable	β	t	Sig.	R^2	F	Sig.
Process transparency	-0.51	-6.88	0.000	0.52	61.4	0.000
Task ownership clarity	-0.28	-3.74	0.001			

The coefficient of determination is $R^2=0.48$, which means that process transparency and task ownership clarity explain 48% of the variance in on-time task completion. The F-statistic value ($F=52.3$, $p<0.001$) indicates that the regression model as a whole is statistically significant, meaning that the observed

independent variables have a significant impact on the dependent variable.

The results of the regression analysis presented in Table 5 indicate that process transparency and task ownership clarity have a statistically significant impact on task duration. Process transparency has a stronger negative effect on task duration (β=-0.51, $p<0.001$), indicating that increased process transparency leads to a reduction in task duration, i.e., an improvement in process efficiency. Task ownership clarity also has a statistically significant negative effect on task duration (β=-0.28, $p<0.01$), indicating that task responsibility clarity contributes to more efficient task execution.

The coefficient of determination in this model is R^2=0.52, which means that process transparency and task ownership clarity explain 52% of the variance in task duration. The F-statistic (F=61.4, $p<0.001$) confirms that the regression model is statistically significant. The obtained results indicate that organizational factors, such as process transparency and task responsibility clarity, have a significant impact on the efficiency and reliability of process execution.

Based on the results of the regression analysis, it can be concluded that process transparency has a stronger impact on process performance compared to task ownership clarity, indicating that information availability and process visibility represent key factors for effective coordination in technical development projects.

In order to examine statistically significant differences between the traditional coordination model (AS-IS) and the structured workflow coordination model (TO-BE), an independent samples t-test was conducted. This analysis was applied to determine whether the change in the coordination model leads to statistically significant differences in process performance, particularly in terms of task duration, on-time task completion, and delay rate.

Table 6: Independent samples t-test - differences between AS-IS and TO-BE models

Variable	AS-IS Mean	TO-BE Mean	t	Sig.
Task duration (days)	10.4	6.1	7.12	0.000
On-time completion rate (%)	58	83	-6.85	0.000
Delay rate (%)	42	17	6.44	0.000

The results presented in Table 6. indicate that there is a statistically significant difference between the AS-IS and TO-BE coordination models across all observed process performance indicators. The average task duration is significantly lower in the TO-BE model compared to the AS-IS model, while the percentage of tasks completed on time is significantly higher in the TO-BE model. At the same time, the delay rate is significantly lower in the TO-BE coordination model.

The obtained results indicate that the implementation of a structured workflow coordination model leads to a statistically significant improvement in process performance, both in terms of task execution efficiency and in terms of process reliability and predictability. Based on the t-test findings, it can be concluded that changes in the coordination model represent a significant organizational factor influencing process performance in technical development projects.

These results, together with the results of the correlation and regression analyses, indicate that the improvement in process performance is not solely the result of technical changes in the process but primarily the result of changes in the coordination model, increased process transparency, and task responsibility clarity for task execution.

The model presented in Figure 1. represents the conceptual framework of the research and illustrates the cause-and-effect relationships between the coordination model based on BPM and Lean principles and process performance. The model is based on the assumption that the implementation of a structured workflow coordination model affects the organizational characteristics of the process, primarily process transparency and task responsibility clarity for task execution.

Process transparency in the model has a mediating role, as it enables better visibility of task status, activity interdependencies, and information flows, which leads to increased process efficiency and predictability. On the other hand, clearly defined task ownership has a direct impact on process performance, as task responsibility clarity contributes to process stability, delay reduction, and increased reliability of task execution.

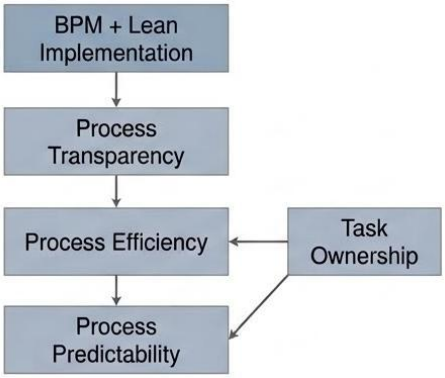

Figure 1. Conceptual model of BPM and Lean impact on process performance

The results of the correlation and regression analyses confirm the proposed conceptual model and indicate that process transparency and task ownership clarity represent key organizational mechanisms through which BPM and Lean principles influence process performance.

Figure 2. illustrates the transformation of the process from a traditional coordination model based on periodic reporting to a structured workflow coordination model.

In the AS-IS model, activity coordination is based on hierarchical information transfer and periodic reporting, which leads to information delays, limited process transparency, and a reactive management approach. In such a model, problems in task execution are identified with a time delay, resulting in longer task duration and increased delays in process execution.

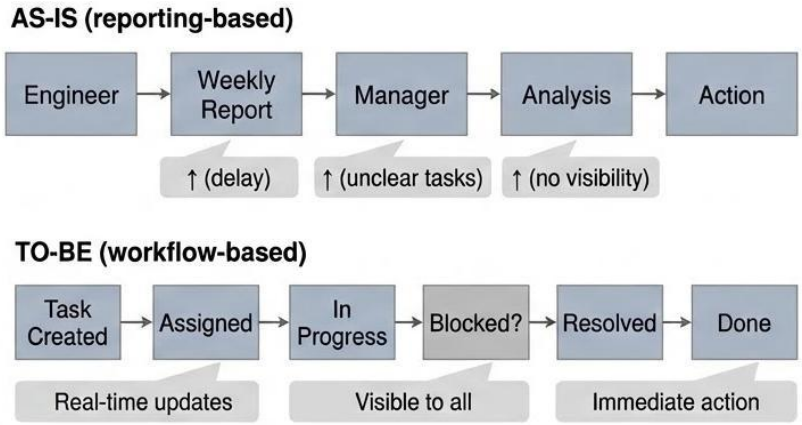

Figure 2. Transformation from reporting-based to workflow-based process model

In contrast, the TO-BE model introduces a continuous task flow with clearly defined task statuses, task interdependencies, and task responsibility clarity for task execution. Such a model enables real-time process visibility, rapid identification of bottlenecks, and timely response to problems in task execution, thereby shifting process management from a reactive to a proactive management approach.

The transformation presented in Figure 2 represents an organizational mechanism that explains the results obtained through statistical analysis, particularly the reduction in task duration, reduction in delays, and increase in the percentage of tasks completed on time, confirming that the change in the coordination model has a significant impact on process performance.

The conceptual model presented in Figure 1 and the process transformation presented in Figure 2 together provide a theoretical and organizational explanation of the statistically identified relationships between the coordination model, process transparency, task ownership clarity, and process performance.

DISCUSSION

The results of the conducted research indicate that the coordination model based on task-based workflow management has a significant impact on process performance in technical development projects. The implementation of a structured workflow model led to increased process transparency, clearer responsibility allocation, and improved process performance, as reflected in reduced task duration, reduced delays, and an increased percentage of tasks completed on time.

The obtained results indicate that the improvement in process performance is not solely the result of technical changes, but primarily the result of changes in the coordination model, process organization, and information management within the process.

The results confirmed hypothesis H1, indicating that the implementation of a workflow-based coordination model contributes to increased process transparency. The introduction of structured workflow management enabled continuous monitoring of task status, improved visibility of task interdependencies, and clearer responsibility allocation, thereby reducing informational uncertainty within the process. This finding is consistent with previous BPM research emphasizing the importance of structured process management and information visibility for improving process control and coordination (Teixeira et al., 2024).

The results also confirmed hypothesis H2, showing that increased process transparency contributes to improved task execution efficiency, reflected in reduced task duration and higher on-time completion rates. Regression analysis demonstrated that process transparency has a statistically significant impact on process performance, indicating that improved visibility of activities and information flows enables more effective coordination and timely problem identification. These findings are consistent with BPM and Lean research showing that structured workflow management and continuous information flow contribute to improved operational efficiency and reduced process duration (AlHamad et al., 2022).

Furthermore, the results confirmed hypothesis H3, indicating that clearly defined task responsibility contributes to greater process reliability through delay reduction and improved task execution predictability. Increased task ownership clarity in the TO-BE model reduced organizational uncertainty and improved coordination among project participants. Similar findings have been identified in digital project management and workflow coordination research, emphasizing the importance of clearly structured responsibilities and real-time task tracking in complex project environments (Vancoillie et al., 2025).

A particularly important finding of this research is that the coordination model does not influence process performance directly, but indirectly through process transparency and task responsibility clarity, thereby confirming hypothesis H4. The obtained results indicate that organizational and informational mechanisms represent key mediating factors between workflow coordination and process performance. These findings are consistent with BPM and digital project management research emphasizing the importance of communication, coordination, and information visibility in improving process efficiency and reliability (Teixeira et al., 2024; Vancoillie et al., 2025).

Unlike previous studies primarily focused on process standardization and operational optimization, this research specifically examines the mediating role of organizational variables in the relationship between coordination mechanisms and process performance. Therefore, the study contributes to the existing literature by providing a conceptual and empirical link between coordination theory, workflow transparency, and process performance in technical development projects. In this sense, the study shifts the focus of BPM and Lean research from process standardization and operational optimization toward coordination mechanisms, informational transparency, and task-level organizational dynamics as determinants of process performance in complex project environments.

Although the research is based on a single case study, the obtained findings provide important insights for similar engineering-oriented and digitally supported project environments characterized by high task interdependence and dynamic workflows. The proposed task-based workflow coordination model is particularly applicable in project environments where process performance depends significantly on coordination mechanisms, information transparency, and clearly defined task responsibility.

The findings suggest that the effectiveness of the proposed model depends on several contextual and organizational factors influencing its applicability across different project environments. The model appears to be particularly effective in knowledge-intensive projects characterized by high task interdependence, dynamic workflows, and continuous information exchange, where coordination complexity significantly influences process performance. The availability of digital workflow systems represents a key enabling factor, as these systems ensure real-time process visibility and improved coordination efficiency. In addition,

the effectiveness of the model depends on organizational maturity and a culture that supports transparency, accountability, and coordination. Consequently, the applicability of the model may be more limited in highly standardized environments with low coordination complexity or in organizations characterized by rigid hierarchical structures and limited information transparency. Therefore, project complexity, organizational context, digital maturity, and cultural readiness should be carefully considered when generalizing the findings and evaluating the applicability of the proposed coordination model.

CONCLUSION

The results of this study show that improving process organization, based on the integration of BPM and Lean principles, can have a significant impact on the performance of technical development projects. The transformation from a traditional coordination model based on periodic reporting to a structured workflow model resulted in increased process transparency, clearer responsibility allocation, and improved process performance, reflected in reduced task duration, reduced delays, and an increased percentage of tasks completed on time. The results of the regression analysis showed that process transparency and task ownership clarity have a statistically significant impact on process performance, thereby confirming the conceptual research model and all proposed hypotheses.

The scientific contribution of this paper is reflected in the development and empirical verification of a conceptual model that explains the relationship between the coordination model, process transparency, task ownership clarity, and process performance in technical development projects. The results show that the coordination model does not affect process performance directly, but indirectly through organizational factors such as process transparency and task ownership clarity, thereby contributing to the literature in the fields of business process management, Lean management, and project management.

From a practical perspective, the research results indicate that organizational changes, such as the implementation of a structured workflow model, clearly defined task responsibilities, and continuous monitoring of task execution, can lead to significant improvements in process performance without the need for large technological investments. This is particularly important for organizations involved in technical development projects, as it shows that process performance improvement can be achieved through improvements in work organization and coordination models, rather than exclusively through technological investments. The findings also indicate that workflow-based coordination models may improve process reliability and predictability without requiring substantial structural or technological changes, which increases their practical applicability in engineering-oriented project environments.

The limitation of this study lies in the fact that the research was conducted on a limited sample of tasks within a single technical development project, which may limit the generalizability of the results. In addition to the previously mentioned limitations, the potential effect of organizational learning and increased team experience during the project should also be considered. Since the AS-IS and TO-BE phases were analyzed sequentially within the same project, part of the identified improvements may be associated with increased team experience and adaptation over time, rather than exclusively with the implementation of the workflow coordination model. Although the statistical analysis indicates a significant relationship between process transparency, task responsibility clarity, and process performance, future research should include control groups or longitudinal research designs in order to more precisely isolate the effect of the coordination model from the effect of organizational learning. In addition, the study included a limited number of organizational variables, primarily process transparency and task ownership clarity, while other factors, such as organizational digital maturity, employee competencies, organizational culture, and the use of digital tools, were not included in the research model. In addition, several methodological limitations should be considered when interpreting the results. The research is based on a case study approach, which means that the results are influenced by the specific organizational context, project type, and team structure in which the study was conducted. The evaluated organizational variables, such as process transparency and task responsibility clarity, were measured using perceptual assessments, which may include a certain level of subjectivity, despite the use of multiple respondents and reliability analysis. Furthermore, the analyzed project team was relatively small and consisted of highly skilled engineers working in a knowledge-intensive environment, which may have influenced the

effectiveness of the coordination model. Therefore, the results of this study should be interpreted within the context of similar project environments, and future research should test the proposed model on larger samples, in different industries, and in different organizational contexts in order to further validate and generalize the research findings. Future studies may also examine the impact of digital project management systems and Industry 4.0 technologies on coordination efficiency and process performance.

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UNAPREĐENJE PERFORMANSI PROCESA PRIMENOM KOORDINACIJE NA NIVOU ZADATAKA, PROCESNE TRANSPARENTNOSTI I JASNO DEFINISANE ODGOVORNOSTI: STUDIJA SLUČAJA

Savremene tehničke razvojne projekte karakteriše visok nivo kompleksnosti, izražena međuzavisnost zadataka i česte promene tokom realizacije projekta, zbog čega mehanizmi koordinacije i organizacija zadataka predstavljaju ključne faktore koji utiču na performanse procesa. Cilj ovog rada je ispitivanje uticaja koordinacionog modela na nivou zadataka, uz podršku workflow upravljanja i zasnovanog na BPM i Lean principima, na performanse procesa u tehničkim razvojnim projektima. Istraživanje je sprovedeno kao studija slučaja primenom komparativne analize AS-IS i TO-BE modela procesa, dok su performanse procesa merene korišćenjem ključnih indikatora performansi. Rezultati istraživanja pokazuju da je implementacija task-based workflow koordinacionog modela dovela do smanjenja prosečnog trajanja zadataka za 41%, povećanja procenta zadataka završenih na vreme sa 58% na 83% i smanjenja kašnjenja sa 42% na 17%. Korelaciona analiza pokazala je statistički značajnu povezanost između procesne transparentnosti, jasno definisane odgovornosti za zadatke i performansi procesa. Rezultati regresione analize pokazuju da procesna transparentnost i jasno definisana odgovornost imaju statistički značajan uticaj na izvršenje zadataka na vreme, dok procesna transparentnost ima statistički značajan negativan uticaj na trajanje zadataka. Naučni doprinos rada ogleda se u razvoju i empirijskoj verifikaciji konceptualnog modela koji pokazuje da koordinacioni model na nivou zadataka utiče na performanse procesa indirektno, preko procesne transparentnosti i jasno definisane odgovornosti kao medijatorskih organizacionih varijabli.

Ključne reči: Koordinacija na nivou zadataka; Procesna transparentnost; Jasno definisana odgovornost; Workflow upravljanje; Performanse procesa; Tehnički razvojni projekti.