

Technologies and methods of digital project management: how to choose the optimal approach

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Abstract: This study explores the technologies and methods of managing digital projects, focusing on selecting the optimal approach. Based on the growing popularity of agile principles and frameworks such as Agile and Scrum, the study examines their effectiveness in digital transformation projects. It also considers the hybrid approach that combines agile methodologies and the traditional waterfall model. The study aims to determine the optimal approach to managing digital projects and investigate the practical implementation of hybrid management models. The research methodology includes analyzing existing studies and compiling tables for comparative analysis of different approaches. Literature analysis found that agile methods such as Agile and Scrum offer high flexibility and interactivity, enabling active customer involvement and easy adaptation to changes. On the other hand, the traditional waterfall model provides stricter control and predictability of projects. Based on the research findings, recommendations for choosing an approach to managing digital projects have been formulated. It is essential to analyze the nature of the project, align it with the overall company strategy, and consider budget constraints and industry-specific characteristics. Combining agile methodologies and traditional models can lead to optimal results. In conclusion, this study contributes to understanding different approaches to managing digital projects and provides practical recommendations for selecting the optimal path. It has significant implications for project managers and organizations involved in digital transformation in making decisions regarding digital project management. It can also serve as a foundation for further research in digital project management and developing new approaches and methodologies.

Keywords: digital project management, traditional model, approach selection, flexibility, applicability, change management, practical significance, information technology.

Introduction

The global trend of digital business transformation requires reevaluating traditional disciplines and methodologies, including project management. Unlike simple digitization, this transformation is based on innovative business ideas and strategies. A company must be able to implement its strategy [1].

Digitization automates individual business processes, whereas digital transformation involves projects that convert the customer's critical business processes into a digital format. Some surveys show that only a third of projects are completed within the planned timeframes and budgets, and the ratio is even lower for digital transformation projects [3].

The main difference between digital transformation projects is their ability to change the traditional business model into a multi-sided market business model. The difference between automating internal business processes and the competitive market is significant.

The following are the distinguishing features of digital transformation projects [2]:

1. Quality conceptualization of the domain and training of the project team should be initiated from the beginning of the project.
2. Special attention needs to be given to strategy and flexible approaches in planning, including the ability to quickly redirect the project in a three-step scheme: "as-is," "to-be," and "ideal state."
3. It is necessary to reconstruct the traditional business model into a multi-sided market business model or develop a new one in parallel with the existing one.
4. Recognizing that digital transformation involves good software and primarily a sound business model that eliminates transactional costs for market participants, solutions should be provided as early as possible through interfaces and marketplaces.
5. Maintaining a high pace of continuous development and hypothesis testing is essential.
6. The digital transformation process itself should be automated using appropriate management tools.
7. For successful digital transformation projects, it is vital to consider the logic of digital industry platforms, especially considering that the digital economy is a global phenomenon, and the evaluation of digital

transformation projects is always done in the context of international standards. This requires analyzing and studying the experiences of other companies employing similar approaches and constantly updating knowledge and skills in digital technologies and project management.

Ultimately, successful digital transformation requires a deep understanding of the company's goals and strategy, a flexible and innovative approach to project management, and consideration of industry-specific characteristics and global standards context. Applying effective management methods, such as Agile and Scrum, adapted to the specifics of digital transformation projects, can be a key factor in achieving success in this field.

Implementing flexible principles and frameworks like Agile and Scrum is a practical approach for digital transformation projects. Research indicates a growing popularity of the hybrid approach, where certain aspects of the project, such as design systems and data models, are implemented using the Scrum methodology. At the same time, tasks related to delivery, equipment installation, or logistical tasks are addressed using the traditional "waterfall" model. As a result, digital transformation projects can combine the benefits of different management models, and the critical aspect becomes the smooth integration of these approaches within a single task [4].

At the beginning of a digital transformation project in an organization, it is necessary to predefine the desired outcomes and effects, identify the involved business processes, systems, and departments, and establish project timelines and budgets. Exercising control over the project execution process plays an important role, particularly when applying the PRINCE2 methodology, as digital transformation can directly impact critical business processes, and uncontrolled project development can lead to significant financial losses or organizational failure.

However, assessing risks, budgets, and resource requirements for digital transformation can be challenging before project initiation, especially when using traditional methodologies such as PRINCE2 and PMI. It is important to note that digital transformation projects may consist of multiple micro-projects, each with a management approach that deviates from standard project management principles [6, 8].

Agile project management methodologies demonstrate their effectiveness in changes, adjustments, and expanding functionality of systems. During the initial implementation, it is recommended to adhere to a traditional approach that sets clear timelines and functional requirements for the system. This provides confidence in launching the desired service on a specific day. As a canon of project management methodology, change management helps address challenges facing global adjustments to project requirements and goals [9].

Digital transformation should be a continuous process that embodies its essence. However, there are no universal recipes for all industries and companies, and solely focusing on agile management, the style of Agile will only sometimes be optimal for every project without exception. Limited budgets, including budgets for digital transformation, make constant transformations a challenge, and therefore, they are always subject to the three classical project constraints: resources, time, and quality.

In such conditions, it is rational to establish centers of competence for critical systems that will manage a portfolio of micro-projects and focus on their development. These teams should understand the purpose of each improvement and its compatibility, as well as engage in short-term and long-term planning and assess the impact of information technology on modern business. Process and project activities are closely interconnected, and a project represents a transition from one state or quality of a process to another [5].

In fast-paced organizations, changes occur continuously and often take the form of projects that are not necessarily based on Agile. Thus, a continuous cycle of changes is formed. However, a constant transformation process, including digital transformation, should not be seen as an end. Instead, it is a tool for adapting to changing environmental requirements, and its usage should be deliberate.

The model with a portfolio of micro-projects implemented in the Agile style may need to align better with established project management practices. Over time, with the development of a new management culture and the resolution of personnel and legal issues, such approaches may become more widespread. At the current stage, applying a project approach, especially in implementing government programs, is pretty strictly regulated, and deviating from it poses numerous budgetary and legal complexities [4].

The project initiator must demonstrate that implementing changes will benefit the business significantly and justify the invested investments. Additionally, the project should align with the overall company strategy and not harm ongoing projects. Projects of this scale only arise sometimes, but they may include micro-projects that do not require lengthy approvals and significant investments and can be implemented using an Agile approach. Another may follow one digital transformation project with new objectives. Still, an essential condition is that the company's leadership has a "compass" - an understanding of what the digital transformation should lead to [7].

Objective:

This research aims to identify the optimal approach to managing digital projects and explore the practical implementation of hybrid management models.

Hypothesis:

Implementing flexible principles and frameworks like Agile and Scrum represents a practical approach to digital transformation projects.

Methodology:

1. Conduct a systematic review of existing research, articles, and publications on digital project management, flexible methodologies (e.g., Agile, Scrum), and traditional project management approaches.
2. Study real-world digital transformation projects employing different management approaches, including flexible methodologies and traditional "waterfall" models. The analysis will evaluate the effectiveness and advantages of each approach.

Propose continuing the research by presenting three tables for comparative analysis of different approaches to managing digital projects.

Table 1: Comparison of flexible project management methodologies (e.g., Agile and Scrum) and the traditional waterfall model

Criteria	Agile n Scrum	The traditional "waterfall" model
Flexibility	High	Low
Iterativeness	Present	Absent
Results in Phases	Available in early stages	Available only at the end of the project
Customer Involvement	Active participation	Limited involvement
Risks and Changes	Easily adaptable and manageable	More difficult to manage and adapt
Time Forecasting	Challenging due to interactiveness	Relatively predictable
Transparency	High	Limited

Table 1 presents a comparative analysis between flexible project management methodologies such as Agile and Scrum and the traditional "Waterfall" model. It covers several critical criteria that help assess the differences between these approaches.

1. Flexibility: Flexible methodologies like Agile and Scrum exhibit high flexibility, meaning they can quickly adapt to project requirements and conditions changes. In contrast, the traditional "Waterfall" model has low flexibility, and implementing changes can be more challenging.
2. Iterativeness: Agile and Scrum involve iterative project development, breaking the work into short iterations or sprints. In contrast, the "Waterfall" model follows a linear approach, completing each stage sequentially without feedback.
3. Results in Phases: Flexible methodologies provide early accessibility to project results during the development stages, enabling quicker feedback and adjustments. In the "Waterfall" model, results become available only at the end of the project.
4. Customer Involvement: Agile and Scrum actively involve the customer in the development process, ensuring their active participation and feedback. In contrast, in the "Waterfall" model, customer involvement is limited and primarily occurs in the early stages.
5. Risks and Changes: Flexible methodologies allow for more accessible adaptation to risks and changes as they provide flexible control and project management. In the "Waterfall" model, risks and changes can be more challenging to manage and adapt to.
6. Time Forecasting: Due to their iterative nature, Agile and Scrum can complicate time forecasting as changes and adjustments can be made during the development process. In contrast, in the traditional "Waterfall" model, time forecasting is relatively more predictable as each stage has a specific deadline.
7. Transparency: Flexible methodologies like Agile and Scrum provide highly transparent teams with information about the process and work results. In the "Waterfall" model as communication primarily occurs top-down.

Table 2: Comparison of project management methodologies (e.g., PRINCE2, PMI) and agile methodologies (e.g., Agile and Scrum) in digital transformation.

Criterion	Project Management Methodologies	Flexible Methodologies
Flexibility	Low	High
Adaptation to Changes	Limited	Easily adaptable
Process Control	Strict control	Flexible control
Time Forecasting	Relatively predictable	Challenging due to interactivity
Project Size	Suitable for large projects	Suitable for flexible and small projects
Compatibility with Business Processes	Close integration with business processes	Flexible integration into business processes

Table 2 presents a comparative analysis between project management methodologies such as PRINCE2 and PMI and flexible methodologies such as Agile and Scrum in the context of digital transformation. It includes several critical criteria that help assess the differences between these approaches.

1. **Flexibility:** Project management methodologies like PRINCE2 and PMI typically have low flexibility, limiting adaptability to project requirements and conditions changes. In contrast, flexible methodologies such as Agile and Scrum exhibit high flexibility and the ability to adapt to changes quickly.
2. **Adaptation to Changes:** Project management methodologies restrict the ability to adapt to changes as their processes and methods are typically designed for predictable projects. On the other hand, flexible methodologies allow for easy adaptation to changes. Transparency may be limited in requirements and conditions.
3. **Process Control:** Project management methodologies involve strict control over the project execution. In contrast, flexible methodologies provide flexible control, allowing for regular inspection and adjustment of the process according to project requirements.
4. **Time Forecasting:** Project management methodologies enable relatively predictable time forecasting as they strive for predictability and planning. Flexible methodologies such as Agile and Scrum can complicate time forecasting due to their iterative nature and the possibility of changes during the development process.
5. **Project Size:** Project management methodologies such as PRINCE2 and PMI are usually suitable for large projects that require more formalized and structured approaches. In contrast, flexible methodologies such as Agile and Scrum are appropriate not only for large projects but also for flexible and small projects that require rapid adaptation and iterative development.
6. **Compatibility with Business Processes:** Project management methodologies like PRINCE2 and PMI closely integrate with business processes. They provide precise alignment between the project and business strategy. On the other hand, flexible methodologies exhibit flexible integration into business processes, allowing for quick responsiveness to changes and adjustments according to business requirements.

Critical recommendations for choosing an approach to managing digital projects:

1. Analyzing the nature of the project is the first step in choosing an approach to managing digital projects. Assessing the project size, complexity, predictability, and degree of customer involvement is necessary. This will help determine the most suitable management approach.
2. Considering a hybrid approach is an important decision. Flexible methodologies can be used to develop the project's iterative and variable aspects, such as design and development. In contrast, traditional methodologies can be applied to more structured and predictable tasks like logistics and equipment installation.
3. Aligning the chosen approach with the overall company strategy is critical for success. Ensuring that the chosen approach aligns with the company's overall strategy and does not contradict current projects is essential.
4. Assessing budget constraints is also an important aspect when choosing an approach to project management. Flexible methodologies may require more attention and time, so they must be aligned with the available budget.
5. When selecting an approach, it is also essential to consider the characteristics of the industry in which the company operates. Some industries prefer flexible project management approaches, while others prefer traditional methodologies.
6. Studying successful cases and the experience of other companies that have implemented digital transformation projects is a valuable source of information. This will help us understand which approaches have been successful and can be applied to a specific project.

Conclusion

In conclusion, choosing the optimal approach to managing digital projects depends on multiple factors such as project nature, budget constraints, company strategy, and industry-specific characteristics. Flexible methodologies like Agile and Scrum offer practical approaches for digital transformation projects, but they are not universal solutions. Flexible methodologies can be combined with traditional management models like PRINCE2 or PMI in hybrid approaches to make projects more adaptive and efficient. However, when choosing an approach, it is essential to consider the project's specifics, budget constraints, company strategy, and industry requirements.

The research allows for a better understanding of different approaches to managing digital projects and highlights key factors to consider when choosing the optimal approach. The research findings can be valuable for project managers and organizations involved in digital transformation when deciding on project management approaches.

However, it is essential to note that the research has its limitations. Firstly, it is based on assumptions and hypotheses that require further testing and confirmation. Secondly, the research only covers some possible approaches and project management methodologies but focuses on flexible methodologies and traditional models. Additional research may include other aspects and arches to managing digital projects.

Nevertheless, this research provides valuable recommendations and foundations for decision-making in choosing the optimal approach to managing digital projects. It emphasizes the need for adaptation and flexibility in digital transformation. Project managers and organizations pay attention to modern project management approaches, such as Agile and Scrum, combined with traditional models to achieve optimal results.

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