

Economic sciences



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DIGITAL BUSINESS MANAGEMENT TECHNOLOGIES IN THE TOURISM INDUSTRY

The relevance of the development of digitization processes in management does not decrease over time. The development of modern information technology is the basis of the introduction of digital management in the tourism industry. Attempts to automate management processes began with the emergence of computer technology and the processes of its active use in the economy. But the inconsistency of business models and technical capabilities led to the inefficient use of various technical solutions for automating control systems.

Today, the possibilities of various digital platforms and Internet technologies are also not being used to their full extent. The reason for this is the low level of synergy of knowledge of general and information management in organizations of the tourism industry. This especially applies to the activities of enterprises at the international level, because management processes are carried out remotely in the network. But such a combination requires the study of emergent properties because fundamentally new qualities and properties are generated that can only be formed in emergent digital economic systems.

Models of digital management of the tourism industry are considered by many scholars and practitioners. The digital transformation of the travel industry began in the era of automation, the launch of self-learning organizations and the network era of business that «changed at the speed of thought». But the era of the Internet of Things, digital transformations of the 21st century fundamentally changed business models, business processes, and the roles of managers.

This especially applies to international relations and the communications system. The principles of business management adapt to the digital age, combining with the emergent properties of enterprises and associations as economic systems. That is why the modeling of projects and other activities, their implementation in the online space is an urgent issue for many international organizations of the tourism industry.

The principles of management of a tourism industry enterprise in the conditions of the development of the digital economy should be defined as follows¹:

1. Digital technologies in balance with modern management technologies create a single space for effective management.
2. Traditional business models are being improved or completely changed.
3. Constant technological and content updating of the information space and communications in management.
4. Optimization of communication channels and the balance of traditional and electronic business models.
5. Activation of models of remote work – outsourcing, outstaffing, etc.
6. Dynamic stages of the life cycle of products and companies.
7. Constant communication with the client through various channels and forms.

Information technologies of the new generation and the era of digitization in project management in the context of rapid changes in modern times require efforts from many directions²:

- markets;
- infrastructure;
- possibilities of Internet connection and development of high-speed access to the Internet;
- social and cultural aspects;
- norms and standards;
- improved legislative framework;
- content and data;
- investments;
- cyber security;
- electronic government and other measures.

The effectiveness of such a model of modern trends in project management, digital development of society, the economy of a new generation and digitization of business processes also requires greater transparency and greater loyalty on the part of digital platforms: new effective search systems, the development of effective and high-quality social network platforms and sites.

The IT services sector, its software segment in the management of projects in the tourism industry, is the main industry differentiator and the basis for a growing

1 Balan O., Berber O. (2022). Investment projects at industrial enterprises: accounting and implementation control [Електронний ресурс]. *Економіка: реалії часу. Науковий журнал*. № 2. С. 126–134. URL: <http://economics.opu.ua/files/archive/2022/n2.html>.

2 Maslennikov E.I. Strategic assessment of the financial sustainability of the industrial enterprise: [Електронний ресурс] *Економіка: реалії часу*. 2023. № 6 (16). С. 111–115. URL: <http://economics.opu.ua/files/archive/2014/No6/111-115.pdf>

range of innovations and represents one of the most dynamic industries in the world. Numerous technological trends affect the development of the IT services market in the tourism industry. Software can greatly contribute to the growth of the economy and increase the guarantees of fair and honest competitiveness in the world and ensure the creation of hundreds of thousands of jobs.

Electronic business management in the tourism industry means the profit-oriented activity of a tourism industry subject, in which the main business processes, as well as external and internal communications, are carried out through the use of electronic technologies; implementation of business processes using information and telecommunication technologies and systems.

The strategy for the development of new generation information technologies and digitalization in business process management is of increasing interest to both research scientists, entrepreneurs, and the entire world society. The future of the world's tourism industry depends on how successfully it will be implemented.

The strategy for the development of new generation information technology and digitalization in project management should be aimed at:

- to remove regulatory barriers that prevent the expansion of trade in IT goods and IT services, that limit and inhibit the development of the world's tourism industry;
- serves as an impetus for the expansion of tourism industry markets, will allow providing better quality services, will contribute to the implementation of new projects and increase the number of jobs;
- to connect the seller and the buyer by ensuring the free flow of goods, services, people and capital on the Internet;
- expand cross-border access to digital content;
- to ensure the harmonization of the legislation of the countries of the world, the rules for the protection of consumer rights, the fairness of competition.

At the same time, modern trends in the development strategy of new generation information technology and digitalization in project management in all spheres of life require the use of effective S.M.A.R.T. business models. business management.

The goals of effective business models S.M.A.R.T. management for the development of new generation information technologies and digitalization in the management of tourism industry projects should be established at the level of the entire organization or at the level of divisions, departments, teams or individual levels.

In the digital conditions of the development of new generation information technologies and digitalization in the management of tourism industry projects, modern effective principles of S.M.A.R.T. business models should be implemented.

management as: artificial intelligence; the need for rapid data exchange; instant reaction; operational execution; the effectiveness of the management concept; formation of a new organizational ecosystem.

Principles of modern business models S.M.A.R.T. of management regarding the development of new generation information technologies and digitalization in project management are among the most advanced and are focused on³:

- planning a system of actions to achieve effective results;
- implementation of planned actions;
- verification of the obtained results for their compliance with previously established requirements;
- adjusting the system of actions in view of the quality of the obtained results.

Implementation of the principles of modern business models S.M.A.R.T. business management of new generation information technology development and digitalization in project management should be based on organizational strategy and be consistent with corporate vision, mission and values⁴.

Thus, in the context of digital conditions and rapid changes of modern times, there is a growing need for a transition from traditional management of the development of new generation information technology and digitalization in project management, based on computer programs, to fully digital intelligent management in the tourism industry. Modern business models S.M.A.R.T. of management is increasingly considered as the basis of intelligent management of the development of new generation information technology and digitalization in project management, as it contributes to the development of the economy in the conditions of globalization and transformational changes on the basis of continuous improvement and allows the modernization of economic systems with artificial intelligence.

Let's consider the processes of forming a single project and/or organization management space using the MindManager product as an example, which is a component of digital business management in the tourism industry. This product is the basis of an electronic information collective management environment with the possibility of using modern management methodologies and remote work of various international projects.

The basis of any project is the creation of a mental map, which shows that despite the active development of digital technologies, the main thing in

3 Башинська І. О., Новак Н. Г. Ефективне управління проектами підприємства. *Інфраструктура ринку: електронний науково-практичний журнал*. 2022. № 6. С. 113–117.

4 Башинська І. О. Управління ризиками в проектах. *Економіка, фінанси, право. Щомісячний інформаційно-аналітичний журнал*. К.: Аналітик, 2021. № 6. С. 3–5.

management is the personnel (team, person) and their needs in accordance with the strategic goals and mission of the enterprise.

Typical templates⁵:

1. SMART rules.
2. Map of the system of balanced indicators.
3. Various templates of business meetings and meetings with active teamwork and feedback. In particular – Brainstorming.
4. Personal productivity – from life planning to self-assessment and performance indicators.
5. Strategic planning.
 - 5.1. DESTER analysis.
 - 5.2. SWOT analysis.
 - 5.3. Business plan map.
 - 5.4. PEST analysis.
 - 5.5. Five forces analysis.
 - 5.6. Analysis of economic efficiency.
 - 5.7. A template for overall strategic planning.
 - 5.8. Template for business models.
 - 5.9. Matrices for assessing risks, costs by time, monetary equivalent, labor resources.
6. Risk management.
7. Process management.
8. Project management.
9. Forecast maps of balance and sales.
10. Maps of decision-making processes.
11. Analytical maps.
12. Comparison and comparison maps.
13. Problem solving maps.

According to the analysis of trends in the development of the tourism industry, it was determined that the way to the development of project management processes is digital transformation. And the way to such a transformation is management tools in a virtual environment with minimal human involvement – digital project business management (hereinafter – d-PM)⁶.

5 Балан А., Філіпова С. Інтегрування моніторингу і оцінки інвестиційного проекту з енергозбереження в систему контролю діяльності підприємства на засадах контролінгу [Електронний ресурс]. *Економіка: реалії часу*. Науковий журнал. 2021. № 4 (14). С. 180-185. URL: <http://economics.opu.ua/files/archive/2014/n4.html>.

6 Kovalenko N. O. Information management as an element of increasing the efficiency of the airline corporate activity. *Науковий вісник Львівської академії. Серія: Економіка, менеджмент та право: збірник наукових праць*. 2021. № 3-4. С. 131–137.

In the traditional sense, digital project management is considered as a set of processes that use a virtual infrastructure to plan, manage and control the activities of the project team, which can be geographically distributed.

The concept of digital project management, a number of terms are formulated that develop areas of knowledge of project management methodology and complement its conceptual apparatus⁷.

Definition 1. Digital project business management (hereinafter – d-PM) is a form of project management in which typical management processes are implemented in a dynamic digital environment.

Definition 2. Digital project manager (hereinafter – d-MP) is a software and information system that implements typical project management processes in d-PM.

The implementation of digital project management has a number of features related to the fact that some of the management functions are transferred to the virtual environment and transferred to automation tools. These features include:

- the need to divide management functions between traditional management methods (using methodologies familiar to specialists – PMI (PMBoK standard), P2M, Agile, etc.), and functions that are performed automatically in automation tools;
- the need to create project management tools by a digital project manager;
- навчання команд проєктів не тільки управляти проєктами, але ще й взаємодіяти з цифровим проєктним менеджером.

Based on this, the implementation of digital project management should be considered at the intersection of management functions with automation functions. Therefore, the implementation of d-PM requires employees of enterprises to change the way in which they are used to doing their work. A holistic and comprehensive approach is necessary, which includes the development of the correct implementation strategy and implementation plan of project management tools with d-PM elements, which takes into account all the features of the enterprise, its information infrastructure. For this purpose it is proposed⁸:

1. To create a certain superstructure that would ensure the integration of project management methodologies (PMBoK, P2M, PRINCE-2) with methodologies for creating information systems and technologies (Agile methodologies). This superstructure will be in the form of some system

⁷ Müller Klaus-Christoph. Getting Started with Digitization. *How to Find the Right Strategy for Your Enterprise*. <https://intelligencegroup.com/wp-content/usermedia/expert-paper-digitization-strategy-glo-en.pdf> (Accessed 03.09 2023).

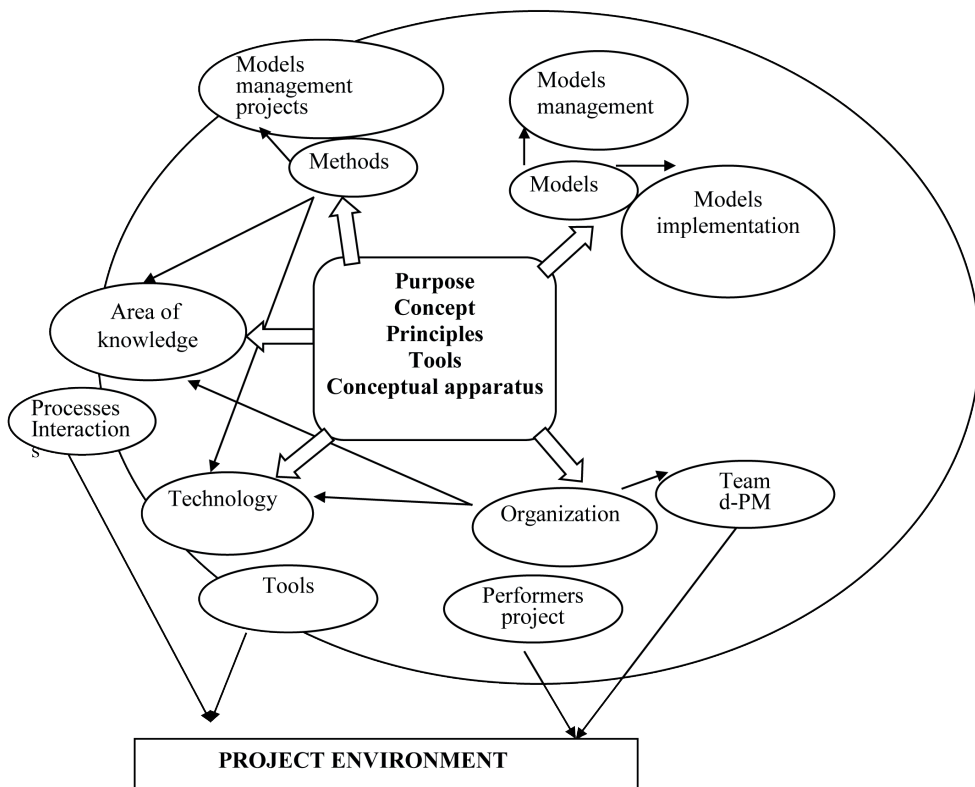
⁸ Kovalenko O. General Model of the electronic information environment, based on the Mirrors concept”. *Scientific works of Vinnytsa National Technical University*, 2023, no. 4. P. 17–25

of principles, approaches, models, structures and schemes for the implementation of project management tools with d-PM elements.

2. Create a project management methodology, which will be based on tools for automatic project initiation, planning and monitoring, and will allow performing typical project management functions in a digital environment.

Definition 3. Project management methodology in a dynamic digital environment – a system of conceptual provisions, models, methods, rules and procedures for the implementation of typical digitized project management processes.

Based on the results of the analysis of project management methodologies, the conceptual foundations of project management methodology in a dynamic digital environment were developed. Conceptually, the project management methodology in the digital environment is proposed to be presented in the form of the «ATOMM» model (Area of knowledge, Technology, Organization, Models, Methods) – a system of areas of knowledge, technologies, organization, models and methods (Fig. 1).



Source: compiled by the author

Fig. 1. «ATOMM» model

A set of classes of objects is defined as a dynamic digital environment that simulates the project management environment in the software and information environment of modern computers and depends on the changing conditions of the external environment of the tourism industry.

This methodology will become the basis for productive interaction of d-MP tools with the project team based on clear rules (instructions) for the implementation of project management functions.

In the ATOMM model, each element is represented as a separate meaningful «proton»⁹:

- Area of knowledge these are defined areas of project management in the digital environment of the tourism industry, which have specific components of processes, inputs, outputs, tools and methods.
- Technology a set of methods and tools designed for project management in the digital environment of the tourism industry.
- Organization the process of systematization of human and technological activities in the project in the digital environment of the tourism industry.
- Models an abstract representation of project implementation processes in the digital environment of the tourism industry.
- Methods a set of rules and actions necessary for managing tourism industry projects.

The «neutrons» of an atom are the purpose, concept, principles, tools and conceptual apparatus of the methodology, which unite protons into a single whole – the nucleus of an atom. The «electrons» of the atom are the means of project management methodology in the digital environment of the tourism industry. The set of «protons», «neutrons» and «electrons» forms the project management methodology in the digital environment.

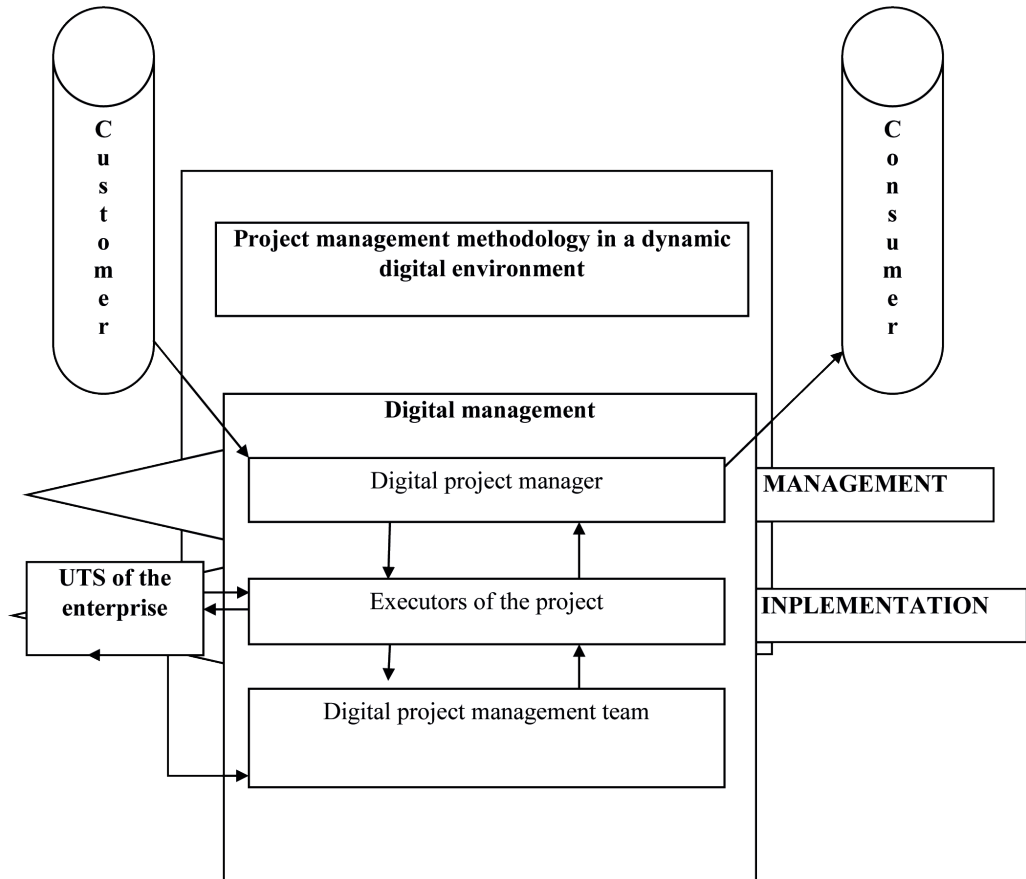
Conceptual model «ATOMM» provides definition of all components of project management methodology in the dynamic digital environment of the tourism industry, which allows to conduct its systematic scientific research.

The conceptual model of the interconnection of processes and principles of management, execution, management in digital project management is shown in fig. 2.

The path to creating a project management methodology in a dynamic digital environment is through the information environment of the tourism industry

⁹ Wrede M. Top managers in the digital age: Exploring the role and practices of top managers in firms' digital. *Managerial and Decision Economics*. 2023. Vol. 41, no. 8. P. 1549-1567. URL : <https://doi.org/10.1002/mde.3202> (Accessed 03.10.2021).

enterprise. More precisely, through computer information stores, which will store all information for project management.



Source: compiled by the author

Fig. 2. Conceptual model of the interrelationship of management, execution, management processes in digital project management of the tourism industry

This classification of projects develops project activity for the enterprise, which is quite relevant and that is why it is the subject of the article's research. In a modern enterprise, the consideration of project management indicates that the project is a way of managing the enterprise and a chance for survival in a competitive environment. The application of this consideration of project management at the enterprise is carried out not only in the activities of the firm, which is aimed at the creation of resources or the sale of products, but also in the internal development of the enterprise.

While performing key tasks, project management goes through several stages⁷:

1. Market analysis, risk analysis, needs analysis, problem analysis, project success probability analysis.
2. Planning of general principles of project implementation, determination of initial data for planning project activities.
3. Planning functions in the project.
4. Planning and determining the cost-effectiveness and efficiency of the project.
5. Implementation of the project.
6. Transfer of results to the project customer or client, project report.
7. Support in the implementation of results.

When implementing information technologies, companies are able to successfully manage projects, establish communication between project participants, find and promptly respond to deviations, prepare reports on all stages of the project and be able to quickly carry out control.

Information technology is a combination of procedures that implement the functions of collection, accumulation, storage, processing and transmission of data based on the use of a selected set of technical means with the participation of management personnel. That is why there is a close connection with the software and technical environment of information technology.

Automated information technology has such components as: technical devices, personnel, software and organizational and methodical materials connected in a technological line. This line provides collection, transmission, accumulation, storage, processing, use and dissemination of information. Processes of transformation of input information into output form the basis of data processing technology. The main goal of information technology is to achieve the necessary information at a sufficient level of quality on a specific medium. And as a result, any information technology ends with the production of an information product.

Project management information systems are used to solve such tasks 10:

- development of the project work schedule;
- determination of the critical path and time reserves of the project;
- determination of the project's need for financing and resources;
- determination of resource utilization level;
- risk analysis;
- project management;

- analysis of deviations from the planned work performance and forecasting of the main parameters.

The main qualitative advantages of using project management systems include:

- increasing control over projects;
- classification of projects according to importance, set goals, expected result, and this enables strategically important projects to be given priority in resources and financing;
- optimization of the project schedule allows for the most efficient allocation of company resources. At the same time, the availability of resources, priority of projects, resource supply schedules, funding limitations are taken into account;
- transfer of acquired experience. The experience gained in the process of project implementation can be used to avoid mistakes in future projects and reduce the time for project planning;
- clear planning of works.

Information technologies of project management allow to automate one or more components of project management: drawing up a work schedule, management of resources, costs, risks, quality, etc. Project management automation systems contain the following structural elements⁵:

- tools for calendar and network planning,
- means of solving individual tasks (among them, pre-project analysis, development of business plans, risk analysis, time management, cost management should be highlighted),
- tools for organizing communications between project executors.

In an automated project management system, the project model is usually built on the basis of three elements:

- structure of project works;
- resource structure;
- resource allocation matrices for project work.

Let's take a closer look at some project management information systems. For a clear perception of the advantages and disadvantages of information systems, let's summarize them in comparative table 1.

Currently, several hundreds of systems have been developed, with the help of which it is possible to implement the functions of calendar planning and project control. Among them are Microsoft Project, Open Plan Professional, Spider Project, Sure Trek Project Manager, Primavera Project Planner (P3), Time Line, CA Super Project, Project Scheduler, Turbo Project, Artemis Views.

Table 1

**Clear perception of the advantages and disadvantages
of information systems**

ISEM	Пакет MS Project	SureTrak Project Manager	Primavera Project Planner (P3)	Primavera Project Planner for the Enterprise (P3e)
1	2	3	4	5
Advantages	easy interface; can be integrated with others software products Microsoft; exchange support information from Microsoft Outlook.	for use on lower levels of management; system interface available set of tools (up to 20 levels).	professional project management package; assigned for analysis project risks through definition probabilities of time and cost of works and the project as a whole.	to work with complex multi-level hierarchical projects; cost analysis; risk analysis; resource planning.
Disadvantages	this package provides a minimum set of tools for resource planning and management. IN Microsoft Project 98 as resources can be scheduled only people and equipment.	restrictions on the number of calendars; allows you to describe only 30 additional calendars.	restrictions on the number of calendars; allows you to describe only 30 additional calendars.	restrictions on number of calendars; allows to describe only 30 additional calendars limitation of schedules due to the number of resources.

Source: author's research

Enterprises, implementing project management information systems, should be aware that the operation of these systems will require some changes in the project management process. Their implementation will include many functions that have an impact on the work of all divisions of the enterprise. After carrying out theoretical studies of information technology implementation models, the enterprise uses them for further effective project management and control of project implementation through automation, which makes project management of the tourism industry enterprise much faster and more accurate.

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