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MODERN APPROACHES TO MANAGING MOBILE MARKETING IT PROJECTS

The article describes the main problematic issues and modern approaches to managing mobile marketing IT projects. The principles and development models of modern web-projects are analyzed. A comparative analysis of the features and areas of applicability of flexible IT project management methodologies is presented. The critical problems of using flexible methodologies in mobile marketing IT projects are highlighted. The logical and structural diagram of the stages of the Mobile App Design Timeline is proposed, which contributes to increasing the effectiveness of the implementation of IT projects. To assess the applicability of the flexible methodologies of Kanban and Scrum, an IT project of mobile marketing was simulated, and recommendations were proposed for building a self-organizing team and conducting a continuous retrospective.

Keywords: mobile marketing, mobile marketing IT project, IT project management, flexible IT project management methodologies, MVP (minimum viable product).

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Statement of the problem in general form and it's connection with important scientific or practical tasks. The use of certain marketing concepts in enterprises is mainly due to the characteristics and trends of the market. In the process of market transformation, the marketing approach to it is changing.

One of the global modern trends in digital marketing is the steady growth of mobile traffic, which is associated with both an increase in the number of mobile users, mobile Internet connections, mobile communications, and an increase in the speed of data transmission on mobile networks. The average annual growth rate of mobile traffic over the next five years will be 60-70%. Mobile devices will generate more than 90 percent of traffic in 2020. In 2019, over two-thirds of Ukrainians are connected to the Internet, most of them using mobile devices to access the Internet [25].

Today, mobile marketing is the preferred method of digital marketing – a set of promotions, events and campaigns carried out via mobile devices via SMS (Short Message Service) to promote goods and services [6, p. 174].

With the transition to the mobile marketing model, the processes of adapting and modifying the new functionality of web applications are accelerated, which requires the use of effective and adequate technologies for managing mobile marketing IT projects (creation of web applications for use with mobile devices). Reducing the timing of such projects, increasing the requirements of usability and the need for dynamic improvement of the quality assurance functionality requires formalizing the processes of web application development and modification based on the application of effective methods of managing mobile marketing IT projects.

Analysis of the latest research and publications, which initiated the solution of this problem and on which the author relies. Research on digital transformation of marketing; places of digital marketing in modern conditions of social development; features of digital marketing as a modern tool of communication management with consumers; components and tools of digital marketing are dedicated to the work of many domestic and foreign scientists: Oklander M. [7], Oklander T., Yashkina O. [20], Pedko I. [1], Danilenko M. [6], Gritsenko S. [12], Ruban V. [23], Shafalyuk O. [24], Kwilinski A., Trushkina N. [15,]Kotler F.[14], Kaplan A.[13], Jeffrey M. [10], Lengard I. [16], The analysis of the essence, prospects, methods, features and tendencies of the development of mobile marketing in the world and in Ukraine was carried out in the works of Mazurenko V.P., Matviienko N. [18], Marchuk O. [17], Romanenko O. [21], Yatsyuk D. [27]. The issue of IT-project management at the theoretical level is considered in the works of Bourque P., Fairley R.E [2], Fatrell R., Donald Schafer F., Larman K., Cohn M., Cobb G. [5], developed plenty of standard methodologies for process manufacturing software: ISO9001, ISO12207, ISO15504 [23], CMM (Capability Maturity Model) [17], MSF (Microsoft Solution Framework), RUP (Rational Unified Process), SCRUM, XP (eXtremal Programming), Crystal Clear, ASD (Adaptive Software Development), Agile [4, p. 68-80].

Highlighting the previously unresolved parts of the general problem to which the article is devoted. However all attempts of formalization have failed, uniqueness of mobile marketing IT projects highlights the issue of choice of methods, practices and rules of lowering project risks.

Formulation of the purpose of the article (statement of the problem). The purpose of this study is to analyze the features of mobile marketing IT project management, systematize the development models of modern web projects, highlight critical problems of using flexible methodologies in mobile marketing IT projects, and develop recommendations for overcoming them.

Statement of the main material of the research with full justification of the scientific results obtained. Mobile applications are one of the most successful and promising marketing channels to date. According to Gartner, more than 10 billion mobile devices are registered in the world in 2019, including 1.7 billion machine-to-machine (M2M) connections. The number of mobile users has grown from 4.3 billion in 2012 to 5.3 billion in 2019. The current annual growth rate is 2.4%. The average mobile data rate has increased more than 7 times since 2012 [11].

The highest Internet speed in the world is in South Korea, 95.1 mbps, and within a year this figure grew by 120%. In 2019, this country was the first in the world to launch 5G high-speed Internet. In second place in speed - Qatar (69.1 mbps), in third - Norway (68 mbps). The average speed of mobile Internet in the world is 29.5 mbps. Global mobile traffic in 2019 increased by 30.6% compared to 2017, and in the desktop segment it dipped by 3.3% . 70% of searches come from mobile devices, up to 30% of visitors go to sites and leave orders from mobile devices, the average user spends at least 87 hours on performing Internet search activities [8].

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The country with the highest prevalence of smartphones was South Korea - 94% of adults use smartphones and 6% use phones. In second place is Israel with smartphone prevalence of 83%, in third place is Australia with 82%. The United States is in eighth place with 77% [9].

Similar global trends are observed in Ukraine. The use of the second and third screens is growing, people are using several mobile devices at the same time. In 2019, the number of Ukrainians in the network amounted to almost 23 million, or 71% of the population, against 63% of the population in 2018. 66% of Ukrainian Internet users use mobile devices. 76.2% of mobile Internet users access the network via Android, 22.5% through Apple devices [26].

Moldova has a relatively high level of Internet penetration. In 2012, Moldova was significantly behind in this indicator. She occupied only 37th place in Europe. But in recent years, the country has shown accelerated growth. In 2016, the number of people over 6 years of age using the Internet was 71%, compared with 63% in 2015. In 2017, the number of mobile telephony service users who used 4G mobile Internet via smartphones increased by 45.8%. The volume of traffic generated by mobile Internet users via smartphones in 2018 increased by 64.2%. As a result of such dynamics, the penetration rate of mobile Internet access services per 100 residents in 2019 increased by 14.3 percentage points and amounted to 82.7% [25].

Increasing importance of mobile traffic requires a change in approach to the development of modern web-projects with a focus on improving usability based on the principles of ergonomics and customer-centricity. The issue of web application development, adapted for use with mobile devices, is critical in digital marketing. Mobile versions have a number of features that must be considered to ensure high usability. Ergonomics means fitness for use, availability of conditions and pre-conditions for easy, enjoyable, non-burdening use. There are several usability models: responsive web design, adaptive design, Mobile First, Mobile Only (Table 1).

Table 1 – Models of development of modern web-projects

Type	Characteristics	Advantages	Limitations
Responsive web design	The site is readable on various monitors, does not require zooming or scaling, there is no need for horizontal scrolling	The need to develop only one version of the design that will automatically adapt to the screen size of the device	Excessive overload of web page traffic (by downloading CSS styles and JavaScript files); difficulties with image adaptation
Adaptive design	The content is automatically adapted to the screen of the device used by the user. First, the developer creates content for PC users, and only then "trims" for the smartphone	Wide versatility. Suitable for almost any category of websites	Difficulty in adapting an existing site; significant requirements for the choice of server solutions
Mobile-first	Development of web-based solutions for mobile users, with further adjustments to those solely for workplace users	Laconic design, Minimal functionality. The connection speed of the network is taken into account	Requires more detailed work on the prototyping and development phase of the site concept, given the need to reduce the amount of content. Design is limited, scripts are truncated, background images are missing, images are minimized

Continue tabl 1

Mobile Only.	mobile users only receive content that is prepared for their screen and device solution	reducing page load time on mobile devices by reducing the number of resource downloads requests	There are risks associated with browser incompatibilities, differences in operating systems (OS) of user devices, restrictions on the mobile version only

Improper model selection causes the site to lose a large share of the market. To provide the most user-friendly interface and navigation, an adequate choice of technology is required at the stage of designing the structure of the web-resource and program code. When choosing a technology, consider the limitations of content minimalism requirements, the complexity of the project, the type of device screens, mono- or multi-variant versions of web-projects, the type of operating system that will be applied.

Mobile marketing IT project management methodologies can be divided into traditional and flexible (iterative).

Traditional – based on fairly strict planning of the project before launch and minimal interventions after. With this approach, each subsequent phase begins after the completion of the previous one. The traditional approach correlates with the classic project management standard from PMI – PMBoK [22].

Agile Agencies are more effective in a rapidly changing business environment. Agile methodologies encourage change at all stages. This makes them more competitive in current realities. The use of flexible methodologies in the management of IT projects for mobile marketing increases the manageability of the project and allows you to get an effective return on investment; provide structure flexibility.

Agile methodologies are based on adaptive development, focusing on people and their interaction, rather than on processes and tools. They are characterized by flexibility, iterativeness, adaptability. Conducive to breaking into small manageable work packages.

An iterative and incremental approach to project and product management, focused on the dynamic formation of requirements and ensuring their implementation as a result of constant interaction within self-organizing working groups consisting of specialists of various profiles. A working product is more important than comprehensive documentation; cooperation with the customer is more important than agreement on the terms of the contract; readiness for change is more important than following the original plan. Suitable for open end projects.

The share of Agile projects in the total array is steadily increasing (from 9% in 2010 to 25% in 2019), while traditional approaches are losing popularity, which is particularly noticeable in application development [5, p. 115]. Among the methods based on the ideas of Agile, the most popular are Scrum and Kanban.

Kanban (Toyota, 1953) a development management method that implements the principle on time and contributes to an even distribution of workload between employees. The product increment is passed forward from stage to stage, and at the end, an element ready for delivery is obtained. Accurate calculation of the load on the team, the correct placement of constraints and focus on continuous improvement. The main task of Kanban is to reduce the amount of "work currently in progress". In Kanban, estimates of the deadlines for the task are optional or none at all. Kanban is a tool for visualizing the process and limiting the execution of the simultaneous number of tasks, but it alone is not enough for a successful project. Suitable for fairly cohesive teams with good communication.

Scrum - is the most structured of the Agile family, combines the elements of the classical process and the ideas of a flexible approach to project management. Scrum is a set of principles

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on which the development process is built, which allows to provide a product to a customer in hard-fixed and short-term iterations, called sprints. The scrum methodology is aimed at interacting with the customer, and despite the fact that the development team decides what tasks it will perform during one iteration, there is a leader (scrum master) in this methodology who monitors the process. Using this methodology makes it possible to identify and eliminate deviations from the desired result at earlier stages of software product development.

Table 2 shows a comparative analysis of the features and areas of applicability of flexible methodologies for managing mobile marketing IT projects.

Table 2 – Analysis of the application of IT project management methods in the company

Method	Features	Usage in projects
Micro-management	Problems regarding involving the team in the development process; internal security threat (project, information, staff)	The number of people in the project does not exceed 10. Leadership lacks delegation skills or is reluctant to delegate
Kanban boards	Just in time (JIT) principle. Helps to identify bottlenecks in the project. A visual solution that involves prioritizing. Panoramic view of the project. Provides business opportunity to be reactive to customer needs. It's hard to combine testing and development in one team	Task-oriented. High volume of tasks. The requirements are constantly changing. Many tasks may be out of date and get “demoted”
Scrum	Aims for interaction with the customer. More communications. The beginning of the sprint is accompanied by planning: analysis and evaluation of tasks. Weekly mandatory stand-ups. After the sprint, a retrospective is held. As a result, all communications (meetings, workshop, sprint retrospective, etc.) take about 30% of the time	Team-oriented. Projects with flexible workflow algorithm, uncertainties, variable requirements, inability to determine the time limits of tasks in advance. Quick launch of the project with the most priority functions

When using flexible methodologies in mobile marketing IT projects, it is necessary to take into account a number of critical problems associated with determining the target market, designing, prototyping, organizing teamwork, and choosing the MVP functionality (minimum viable product). Underestimating the importance of these issues leads to the fact that only 29 out of 100 IT mobile marketing projects reach the stage of successful implementation [4, p. 68].

Figure 1 shows the logical and structural diagram of the Mobile App Design Timeline stages, which helps to increase the effectiveness of the project.

1. Building an autonomous, self-organizing team in practice. You should not consider such a team as completely independent, leadership is still being implemented: goals are set from the outside, and the team itself is formed by management. However, the team independently determines the path by which the goal will be achieved. The process of becoming a team, let alone a mature and self-organizing one, does not go instantly and painlessly.

2. Decide what functionality will be the MVP (minimum viable product), how to think of architecture for future expansion, what technologies to choose, and, in addition, determine the time and cost of the project. In order to optimize this process, it is recommended to do the design. Designing requires applications with unique, deliberately new functionalities that integrate many features and systems that provide ambiguity for possible solutions.

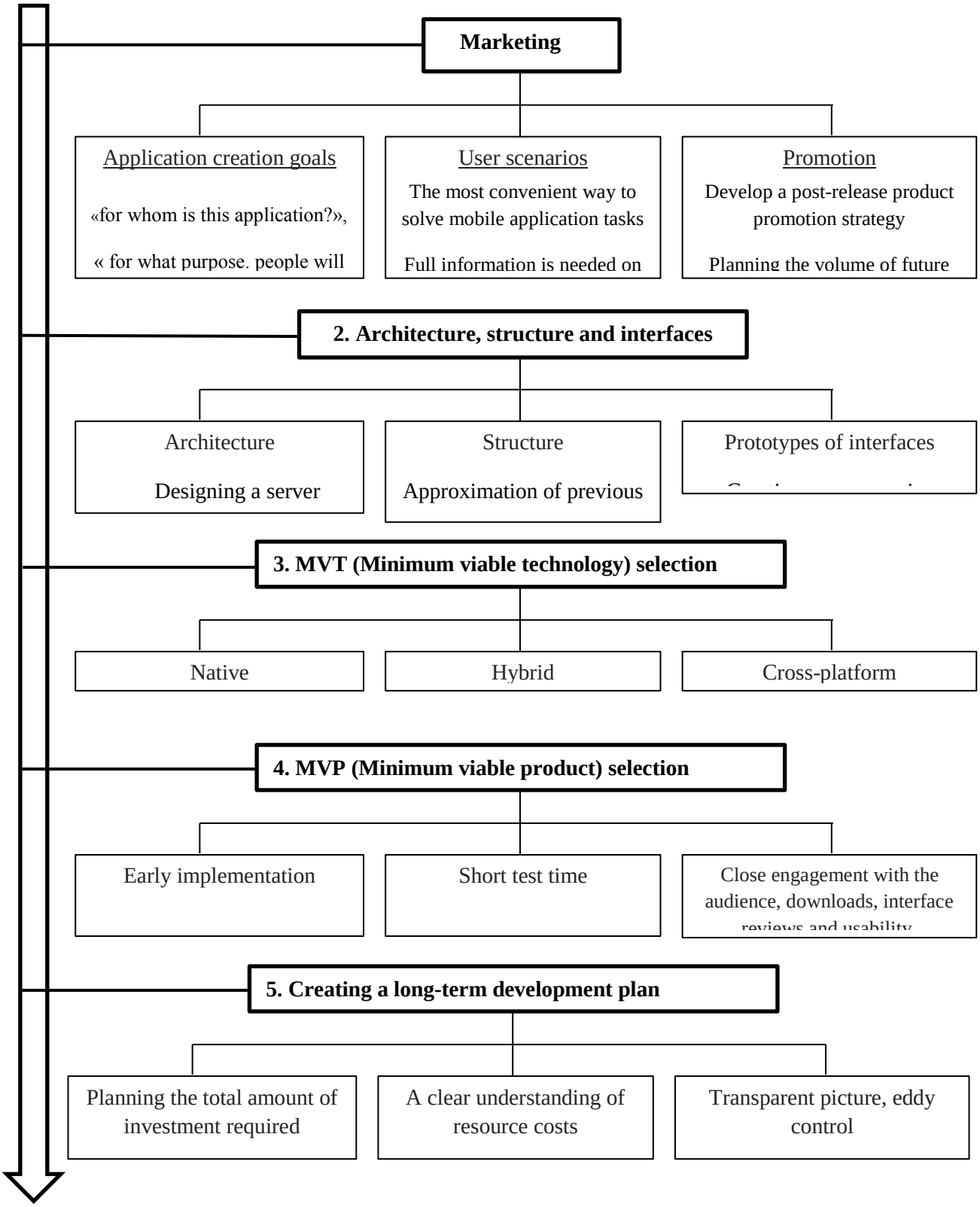

Figure 1 –Mobile App Design Timeline

3. Ignoring the principles of building interfaces for Android and requirements for iOS, laying the wrong structure of screens. Application of non-native elements. This makes the app unintelligible to the user and increases the development time. The lack of clarity of the scripts in the TK and their detailing in the design, the difficulty of integrating the mobile application with CRM systems and ERP.

4. Conducting A/B-testing of the apps and the retrospective of the IT project. In practice, it often turns out that carrying out a retrospective at the end is difficult: the team does not have enough time, many problems are solved already during the iteration

To evaluate the applicability of Kanban and Scrum, a mobile marketing IT project was modeled. Despite the fact that the baseline duration of a project modeled using the Scrum methodology is the same as the duration of a project implemented using Kanban, the variance in both the duration and cost of a project modeled using the Scrum methodology is much less than in Kanban with an obvious gain in product quality.

Sprint results, a report of the performed work are shown in Fig. 2, Fig. 3.

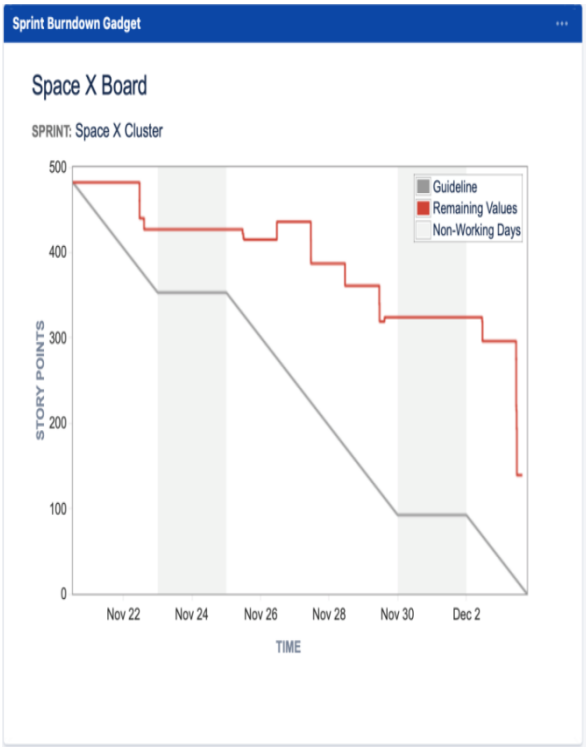

Figure 2 – Sprint Results

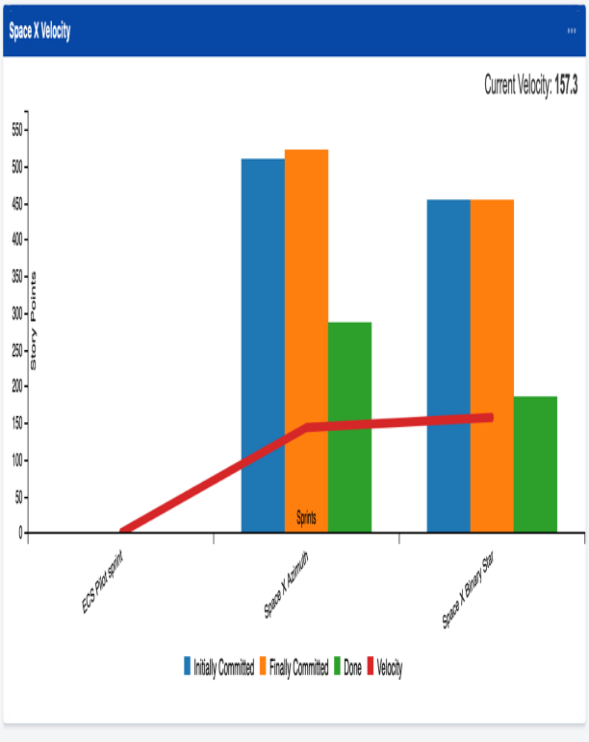

Figure 3 – Report of the performed work

Tables 3, Tables 4 show the relation of the common criteria of the two models: Kanban and Scrum:

Table 3 – Effectiveness of Scrum and Kanban

Model	Duration (days)		Deviation (%)	Cost ($)	
	Base	Factual		Estimate	Factual
Kanban	40	46	15%	13400 $	15410 $
Scrum	40	35	-12,5%	13400 $	11725 $

Table 4 – Comparison of Scrum and Kanban by criteria

Criteria	Scrum	Kanban
Evaluation of terms	+	-
Long-term planning	+	-
Roles	+	-
Changes after scheduling	-	+
Technical task	+	-
Quick reaction	-	+
Narrow specialization in the team	+	-
Daily meetings	+	+
The division of tasks into several stages	+	-

The basis of flexible IT project management methodologies is a retrospective. However, there are various approaches to conducting a retrospective, to choosing a model and an algorithm for its implementation. According to the cascade model, a retrospective should be carried out in the late stages of an IT project. An alternative approach recommended in benchmarking is the continuous retrospective of an IT project. The main feature of this approach is the departure from a phased model to a spiral one, with daily milestones ("stand-up" assemblies) [3, p. 57].

Continuous retrospective is implemented by the following activities: visualization of the problem, development of a business process model for its implementation, analysis of alternative options for its operational resolution.

Conclusions from this research and prospects for further developments in this area. Mobile marketing is constantly evolving. In a world where people read their correspondence, socialize and search for different information through mobile devices, businesses need new marketing strategies and tools, new approaches to managing. Applying these flexible approaches will encourage customers using mobile services to visit the site. It will contribute to creating applications that provide unique usability content, and among other things, digital presence.

One of the main tasks that directly affect the effectiveness of software development is choosing a model for the development process. There is no single optimal choice. The model may vary depending on the scale, novelty and criticality of the project, distribution of participants, customer requirements. Today, the traditional approach to managing IT projects is having considerable difficulties when project requirements can change at almost any stage, as it is necessary to respond to the rapidly changing environment.

These are exactly the challenges inherent to mobile marketing IT projects. Flexible methodologies have their own challenges. It is important to perceive them as "challenges" and not advantages or disadvantages. Micromanagement and Kanban are good for small business website projects that don't take much time to plan. Scrum is suitable for a large project (3 months in duration) that has full specification and requirements before development begins.

In this case, the team can easily draw up a detailed development plan and split the whole process into a sprint. Implementing Scrum and switching to flexible methodologies takes time and effort. Flexible team goes through the stages of formation, conflict, normalization, and cooperation. Productive work is only possible at the last stage, at which point the manager needs to help and support the team.

The transition to flexible methodologies involves a dramatic change in the tasks and methods of executives' work. The leadership style of the manager should focus on delegation,

virtually all authority is transferred to the team, and the task of the manager is to teach them to act independently, to organize and support the work process.

The underlying complexity of using flexible methodologies is that it is not just a change in the work process, it is also a change of mindset: working together to achieve a goal that determines the direction of further research.

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Сучасні підходи до управління ІТ-проектами мобільного маркетингу.

У статті описані основні проблемні питання та сучасні підходи до управління ІТ-проектами мобільного маркетингу. Проаналізовано принципи та моделі розвитку сучасних веб-проектів. Наведено порівняльний аналіз особливостей та сфер застосування гнучких методологій управління ІТ-проектами. Висвітлено критичні проблеми використання гнучких методологій у ІТ-проектах мобільного маркетингу. Запропоновано логико-структурну схему етапів розробок мобільних додатків, що сприяє підвищенню ефективності впровадження ІТ-проектів. Для оцінки застосування гнучких методологій Kanban та Scrum було модельовано ІТ-проект мобільного маркетингу та запропоновано рекомендації щодо створення команди, що самоорганізовується, та проведення безперервної ретроспективи.

Ключові слова: мобільний маркетинг, ІТ-проект мобільного маркетингу, управління ІТ-проектами, гнучкі методики управління ІТ-проектами, MVP (мінімально життєздатний продукт).

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