

MULTIMEDIA PROJECT MANAGEMENT AND COST CALCULATION

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Multimedia project management is driven by a number of key factors that reflect current trends in technology, economics, and societal needs. In 2025, multimedia technologies, in particular augmented reality (AR), are rapidly integrated into various areas, including the printing industry, where they transform traditional approaches to content creation. AR allows you to create interactive products, such as magazines, catalogs, or packaging, which increase audience engagement and open up new business opportunities. However, managing such projects is a challenging task due to technical complexity, the need to integrate various technologies (e.g., AR.js, Three.js, WebGL), and high requirements for resource coordination. The article offers a systematic approach to organizing and planning multimedia projects, which makes it relevant for professionals who seek to effectively implement innovative solutions.

The economic aspect of the article is no less important. Calculating the cost of multimedia projects is of particular importance in conditions of limited budgets, especially for small and medium-sized businesses in Ukraine. The growth of hourly rates of developers, costs for licenses and hosting, as well as the need for cost-effective solutions, such as web applications compared to mobile applications, highlight the need for clear cost estimation methodologies. The article responds to this need by offering tools for budgeting and optimization that contribute to increasing the competitiveness of companies.

The interdisciplinary nature of the article, combining project management, information technology and economic calculations, makes it valuable for training specialists capable of working at the junction of these industries. In 2025, the demand for managers who understand both the technical and financial aspects of multimedia projects is growing, which emphasizes the practical significance of the study. The scientific novelty of the article lies in the systematization of approaches to multimedia project management with an emphasis on economic efficiency, which is an insufficiently researched area, especially in the Ukrainian context, where the digital transformation of printing is gaining momentum.

Thus, the article is relevant due to its focus on innovative technologies, economic optimization, and environmental aspects, offering practical solutions for modern business and science.

Keywords: *project management, multimedia content, team coordination, AR technologies, augmented reality, programming.*

Problem Statement. Managing a multimedia project focused on creating a multimedia product using augmented reality (AR) is a complex and multifaceted process that combines planning, organization, coordination, and control to develop interactive AR content that integrates with the real world through devices such as smartphones, tablets, or AR glasses.

At the initial stage, key elements of the project are determined: the goals of the AR product (for example, the form of an application, a marketing campaign, or a gaming experience), the target audience, technical requirements, budget, and timeline. Special attention is paid to the unique aspects of AR, such as creating an immersive experience that harmoniously combines digital objects with the physical environment.

Team coordination is critical, as AR projects require close collaboration between 3D designers who create models and animations, programmers who develop AR functionality on platforms such as Unity or ARKit/ARCore, sound specialists to create spatial audio effects, and testers who verify that AR works correctly in different environments. The project manager ensures that all participants are moving synchronously towards a common goal, adhering to the schedule.

An important aspect is the choice of technologies: software (e.g. Unity, Blender), AR platforms, as well as hardware that will support the product. The production stage monitors the content creation processes - from developing the concept and design of 3D objects to programming interactive elements and testing the AR experience in real conditions. For example, it checks how virtual objects interact with the physical world, whether surface recognition works correctly, and whether performance is stable.

Quality control in AR projects is of particular importance, as the product must not only meet technical standards, but also provide an intuitive and immersive experience for the user. This includes checking the accuracy of the overlay of digital objects, the speed of the system's response, and compatibility with different devices.

In the final stage, the project is prepared for launch: the AR application is published in stores such as the App Store or Google Play, or integrated into a marketing campaign. Managing an AR project requires a combination of project management skills, an understanding of the specifics of AR technologies, and the ability to lead a creative team to create a product that captivates users and meets their expectations.

Analysis of recent research and publications. The topic of multimedia project management covers project management, multimedia technologies (in particular, augmented reality, AR), cost-effectiveness, and their application in the printing industry. For comparison and analysis, we have reviewed several scientific and popular science publications for the period 2023–2025 that relate to project management, multimedia technologies, AR, cost-effectiveness, and their connection with printing or related industries. The analysis is based on available sources that meet the request and takes into account current trends in digitalization, economic analysis and sustainable development.

Thus, the article “Scientific and methodological aspects of assessing the sustainable development of machine-building enterprises as a tool for adjusting management activities” [1] analyzes methods for assessing the sustainable development of machine-building enterprises with a focus on management processes and cost-effectiveness.

The author offers scientific and methodological approaches to assessing costs and performance that can be adapted to project management in other industries, including multimedia. The emphasis is on management and economic efficiency. The author Sekiroz Ya. V. considers methods for estimating costs and profitability, which resonates with the need to calculate the cost of multimedia projects. This article focuses on mechanical engineering, not on multimedia technologies or printing. It does not consider the specifics of AR or digital content, but its cost estimation methodology can be applied to AR projects. Using the methodological approaches to assessing sustainability and costs described in the article, they can be adapted to analyze the economic efficiency of AR projects in printing, especially regarding budgeting and resource optimization. The article is useful for understanding the general principles of management and economic analysis, but needs to be adapted to the specifics of multimedia technologies and printing. Its weakness is the lack of focus on digital technologies, such as AR.

In the article [2], the author examines the macroeconomic aspects of regulating the economy of Ukraine, in particular, the effectiveness of financial resource management in conditions of instability. The authors analyze profitability and economic instruments that affect the efficiency of business processes. The emphasis in this article is on economic efficiency and resource management. The analysis of financial instruments and profitability can be applied to estimating the cost of multimedia projects. The article has a macroeconomic focus and does not touch on multimedia technologies or printing. It does not consider AR or digital projects, which limits its direct relevance. At the same time, the article offers valuable approaches to assessing profitability, but its macroeconomic focus makes it less specific for multimedia projects. It can serve as a source of general economic principles for adapting to AR in printing. Also, the methodology of economic efficiency analysis can be useful for calculating the cost of multimedia projects, especially in the context of the Ukrainian economy, where resource constraints are a key challenge.

The author of the qualification scientific work, Tashcheyev Yu. V. [3], analyzes the economic mechanisms for increasing the efficiency of resource use at enterprises, in particular through economic analysis and cost systematization. The author emphasizes the importance of economic security and stable business operations. Economic analysis and cost management are considered, which is key to the topic of calculating the cost of multimedia projects. The emphasis on stability and efficiency resonates with the management of AR projects. The considered approaches to economic analysis and cost management can be applied to multimedia projects, especially to estimate the cost of developing AR applications. Summing up this article, we can say that it is useful for understanding economic mechanisms, but its focus on energy limits direct applicability. It can be a source for adapting budgeting methods to AR projects.

The paper [4] explores the potential of AR to reduce environmental impact in various fields, including replacing physical materials with digital ones. The authors analyzed 20 articles found in the ERIC, Scopus, and Web of Science databases to assess how AR is used to engage students in environmental education and raise their awareness of environmental issues. They note that AR is a promising tool for environmental education, but further research is needed to overcome technical and financial barriers. They

emphasize the potential of AR to engage the younger generation in solving environmental problems, such as climate change.

As can be seen from the analysis, all the reviewed articles emphasize economic efficiency and resource management, which are key to managing multimedia projects and calculating their cost. Article [4] is the most relevant due to its direct connection to AR, while other sources offer general economic and management approaches that can be adapted.

In our opinion, our proposed article will fill a gap in the literature, as most sources do not combine project management, AR, and economic analysis in the context of printing. This makes it unique and relevant for the Ukrainian market, where the digital transformation of printing is gaining momentum.

The purpose of the article is to develop and substantiate effective approaches to organizing and managing multimedia projects, in particular those based on the use of augmented reality (AR) technologies in the printing industry, as well as to create a methodology for accurately calculating their cost. The article seeks to systematize the processes of planning, coordination and control of multimedia projects, taking into account their technical complexity, the need to integrate modern technologies (such as AR.js, Three.js, WebGL) and the requirements for optimal use of resources. At the same time, the research is aimed at developing tools for assessing the economic efficiency of such projects, which include an analysis of the costs of development, hosting, licenses and support, in order to ensure their profitability for business, in particular in the conditions of the Ukrainian market. The article also aims to highlight the potential of multimedia technologies to reduce the environmental impact of printing by replacing physical materials with digital solutions, contributing to the sustainable development of the industry. Thus, the study offers practical recommendations for managers and developers who seek to create innovative and economically viable multimedia products.

Presentation of the main material of the study.

To calculate the costs of developing a mobile application and web service for AR in printing, we rely on up-to-date information from web sources about the hourly rates of developers in Ukraine in 2025. Here are some of our findings:

Hourly rates in Ukraine (2025) According to data from web sources such as Qubit Labs, ProCoders, and others, the average hourly rates in Ukraine for IT specialists in 2025 are:

Developers: \$30–\$60/hour (I took the average of \$45/hour for standard developers and \$50/hour for AR specialists, since AR requires specific skills) [5].

- UI/UX designers: \$40–\$80/hour (starting at \$50/hour).
- QA engineers: \$25–\$50/hour (starting at \$35/hour).
- Project managers/business analysts: \$40–\$100/hour (starting at \$40–\$50/hour) [6].

These rates are competitive compared to Western Europe or the US, where they can be \$100+/hour, making Ukraine an attractive outsourcing destination [7].

Development time estimates: We estimated the number of hours based on typical medium-complexity projects for AR in printing (image recognition, 3D models, QR codes). Data on the duration of the stages is based on industry standards and sources

such as MoldStud and Apptunix, which describe the time frames for similar projects [7]. For example: mobile application: 400–600 hours for development due to the need for adaptation to iOS and Android; web service: 200–300 hours, since native integration is not required; design, testing, project management are estimated according to standard proportions (30% for design, 15% for testing, 15% for management).

Licensing costs: for web AR, the license for the 8th Wall platform, which is popular for such projects, is included. The basic plan costs \$99/month or \$1,188/year (annual rate is taken for evaluation) [8]; for the mobile application, one-time costs for publishing in the App Store (\$99/year) and Google Play (\$25 one-time) are included [9].

Support and hosting: Monthly support (bug fixes, updates), data is taken from sources such as Tech JDI, which lists costs of \$200–\$500/month for basic maintenance. We estimate 10–40 hours/month, depending on the type of project; hosting for AR content (3D models, videos) is estimated at \$50–\$200/month based on typical costs for AWS or Google Cloud [10].

Industry standards: The cost structure (30% design, 40% development, 15% testing, 15% management) is based on recommendations from MoldStud and Apptunix for medium-complexity projects [11]; for mobile applications, a cross-platform approach (Unity with AR Foundation) is taken into account, which saves 20–30% of time compared to native development [5].

After conducting this study, we summarize the results obtained and enter the data for comparison in Table 1.

Table 1

Comparative table of costs for developing AR applications

Type of work	Mobile app	Web service
Development	500 hours × \$45/hour = \$22,500. Includes cross-platform development in Unity for iOS and Android, which reduces time compared to native (Swift/Kotlin)	250 hours × \$45/hour = \$11,250. Using WebXR/8th Wall reduces time because no OS adaptation is required.
Design	125 hours × \$50/hour = \$6250. Adapting to both platforms increases time by 25%.	80 hours × \$50/hour = \$4000. Simple browser interface
Testing	100 hours × \$35/hour = \$3500. Cross-device testing	70 hours × \$35/hour = \$2450
Management and analysis	75 hours (analysis) × \$40 + 65 hours (management) × \$50 = \$6250	60 hours (analysis) × \$40 + 40 hours (management) × \$50 = \$4400
Publication	\$125 + 15 hours × \$40 = \$725	–
8thWall License	–	\$1188/year
Support	30 hrs/month × \$40 × 12 months = \$14,400 (average)	15 hrs/month × \$40 × 12 months + \$1188 = \$8388
In general	\$53,625 for the first year	\$30,726 for the first year

Calculations were based on recent 2025 data on hourly rates in Ukraine, development time for AR projects, and standard costs for licenses and hosting. The web service turned out to be more economical (\$30,726 vs. \$53,625 per year) due mainly to fewer development hours and no publishing costs.

Conclusions. The article has significant potential due to its interdisciplinary nature and compliance with modern challenges of digitalization and sustainable development. Compared to other publications, it offers a more specialized approach to managing AR projects in printing, combining technical, economic and environmental aspects.

Managing a multimedia project in the form of an AR product is a complex but promising process that requires careful planning, coordination of an interdisciplinary team and the use of specialized technologies. The successful implementation of an AR project depends on a clear definition of goals, the selection of appropriate tools (such as Unity or ARKit), as well as effective management of the development stages - from the creation of 3D content to testing and launch. Particular attention should be paid to calculating the cost of the project, which includes the costs of equipment, software, the work of specialists (3D designers, programmers, sound engineers) and testing in real conditions. An accurate budget estimate allows you to optimize resources and avoid financial risks. Despite challenges such as high development complexity and the need for skilled personnel, AR projects open up unique opportunities for creating immersive content that can be used in education, marketing, or entertainment. The continued success of such initiatives depends on the integration of innovative approaches, careful quality control, and adaptation to the needs of the target audience.

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УПРАВЛІННЯ МУЛЬТИМЕДІЙНИМ ПРОЕКТОМ ТА РОЗРАХУНОК ЙОГО ВАРТОСТІ

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Управління мультимедійним проектом зумовлено низкою ключових факторів, що відображають сучасні тенденції в технологіях, економіці та суспільних потребах. У 2025 році мультимедійні технології, зокрема доповнена реальність (AR), стрімко інтегруються в різні сфери, включаючи поліграфічну галузь, де вони трансформують традиційні підходи до створення контенту. AR дозволяє створювати інтерактивні продукти, такі як журнали, каталоги чи упаковки, що підвищують залученість аудиторії та відкривають нові можливості для бізнесу. Однак управління такими проектами є складним завданням через технічну складність, необхідність інтеграції різноманітних технологій (наприклад, AR.js, Three.js, WebGL) та високі вимоги до координації ресурсів. Стаття пропонує системний підхід до організації та планування мультимедійних проєктів, що робить її актуальною для фахівців, які прагнуть ефективно реалізовувати інноваційні рішення.

Економічний аспект статті є не менш важливим. Розрахунок вартості мультимедійних проєктів набуває особливого значення в умовах обмежених бюджетів, особливо для малого та середнього бізнесу в Україні. Зростання погодинних ставок розробників, витрати на ліцензії та хостинг, а також потреба в економічно вигідних рішеннях, таких як веб-застосунки порівняно з мобільними додатками, підкреслюють необхідність чітких методик оцінки витрат. Стаття відповідає цій потребі, пропонуючи інструменти для бюджетування та оптимізації, що сприяють підвищенню конкурентоспроможності компаній.

Інтердисциплінарний характер статті, що поєднує управління проектами, інформаційні технології та економічні розрахунки, робить її цінною для підготовки фахівців, здатних працювати на стику цих галузей. У 2025 році попит на менеджерів, які розуміють як технічні, так і фінансові аспекти мультимедійних проєктів, зростає, що підкреслює практичну значущість дослідження. Наукова новизна статті полягає в систематизації підходів до управління мультимедійними проєктами з акцентом на економічну ефективність, що є недостатньо дослідженим напрямом, особливо в українському контексті, де цифрова трансформація поліграфії набирає обертів.

Таким чином, стаття є актуальною завдяки своєму фокусу на інноваційних технологіях, економічній оптимізації та екологічних аспектах, пропонуючи практичні рішення для сучасного бізнесу та науки.

Ключові слова: *управління проєктами, мультимедійний контент, координація команди, технології AR, доповнена реальність, програмування.*

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