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The Key to Success in Scientific Research: Analysis of Software Tools for Planning and Execution of Research Grant Projects

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Abstract

The planning and management of grant-funded scientific and research projects in academic settings pose significant challenges due to their complexity, financial transparency requirements, and the need for effective interdisciplinary collaboration. This research analyses and evaluates selected software tools tailored for project management, aiming to identify the most suitable solution for planning and implementing such projects. The research focused on widely-used tools within the Czech and Slovak markets. A multi-criteria evaluation methodology was employed, incorporating both weighted and unweighted scoring systems to assess seven identified criteria. Results indicate that Easy Project outperforms other tools due to its strong localisation, comprehensive resource management, and cost transparency, making it particularly suitable for grant-funded academic projects. The findings align with existing studies emphasising the importance of financial transparency, the role of communication tools, and the potential of technologies like digital twins and AI for project planning and optimisation. This research provides a foundation for improving project management practices and achieving greater success in scientific research initiatives.

Keywords: *Grant-Funded Scientific Research, Academic Project Management, Software Evaluation, Multi-Criteria Analysis, Digital Tools for Research Planning.*

Introduction

The domain of project management software support, commonly referred to as Project Management Software (PMS), encompasses tools designed to assist teams and managers in effectively planning, monitoring, and executing projects. These tools facilitate task organisation, team communication, resource management, and tracking of time and costs, ensuring timely and efficient project completion within the allocated budget. Numerous project management managers and experts today rely on such systems to improve work efficiency and maintain competitiveness.

A particularly challenging area within project management lies in scientific research grant projects. These endeavours demand meticulous planning and coordination, as well as compliance with funding regulations and transparent reporting of results. Such projects are often highly complex, involve diverse teams of experts, and impose significant demands on resource management, milestone monitoring, and adherence to predefined parameters.

The range of software products for project management is extensive and offers tools with varying functionalities. These range from basic task management applications to comprehensive systems supporting the entire project lifecycle. Managers and teams face the challenging task of selecting the most suitable solution, which must take into account the specific needs of the project, budgetary constraints, and the technical ability of its users. For grant-funded projects, it is particularly crucial to ensure compatibility with tools designed for financial reporting and audits.

The history of software support for projects dates back to the mid-20th century, with the development of methodologies such as PERT (Programme Evaluation and Review Technique) and CPM (Critical Path Method). These methodologies were later adapted to become the first software tools dedicated to project management. Significant progress occurred during the 1980s with the advent of personal computers and the introduction of software such as Microsoft Project. The early twentieth century witnessed a revolution

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in project management through the advent of cloud technologies and agile methods, leading to the emergence of modern tools such as JIRA, Asana, and Trello.

Modern project systems are designed to meet the evolving needs of organisations that require flexible and user-friendly tools with high efficiency. Cloud-based solutions enable real-time collaboration among team members, while analytical tools offer risk prediction and project performance evaluation. In the context of grant-funded projects, the functionalities related to transparent reporting, document integration, and financial tracking are particularly critical.

The objective of this article is to analyse and evaluate the most suitable software solutions for project management, with a specific focus on scientific research grant projects. The evaluation will be conducted based on precise criteria such as user-friendliness, functionality, localisation, costs, compatibility with grant requirements and integration capabilities. The primary outcome will be the identification of an optimal software product that addresses the unique needs of projects cofunded by public resources, such as KEGA, VEGA, or APVV projects in the Slovak academic environment and ensures their successful completion. This article aims to provide a clearer understanding of project management software, highlighting the distinct characteristics of scientific and research practices within the academic sphere.

Literature Review

The planning and implementation of publicly funded scientific and research projects represents a critical challenge in the field of project management. These projects demand precise resource coordination, strict adherence to time and budget constraints, transparent reporting, and efficient interdisciplinary collaboration (Kinelski, 2020, Bočková et al., 2025). The increasing complexity of such projects, coupled with the need for rapid responses to changing conditions, has made computer support an indispensable tool for its successful management (Schick, 2019, Bočková et al., 2025). These types of projects often involve geographically dispersed teams collaborating in real time, placing significant demands on communication infrastructure and data-sharing capabilities (McKee, 2021, Freelo©2024, Bočková & Lajčin, 2021).

In recent years, technologies for computer-supported project management have undergone dramatic advances, particularly with the integration of cloud-based solutions, analytical tools, and artificial intelligence (AI) (Kaplan, 2021, Bartoš, 2023). Cloud infrastructure enables access to data and tools from any location, a feature that is essential for effective collaboration among international teams. Furthermore, these solutions enhance project management transparency by allowing detailed tracking of budgets and project deliverables (Schick, 2019, Porter & Schick, 2011).

Among the most significant innovations are digital twins, which facilitate the simulation and modelling of potential scenarios. This approach improves planning accuracy and reduces the risk of project failure by allowing various options to be tested before real-world implementation begins (Ryzhakova et al., 2019, Stanimirovic et al., 2023). Similarly, Kaplan (2021) or Hrazdilová Bočková et al. (2016) highlight that analytical tools integrated into these systems help forecast risks and identifying potential issues, thus making a substantial contribution to improving decision-making processes.

Another crucial aspect of these tools is their ability to foster interdisciplinary collaboration, which is essential for achieving innovation in scientific and research projects. McAfee and Brynjolfsson (2017) demonstrate that digital platforms connect experts across various domains, leading to faster knowledge exchange and improved teamwork efficiency. This capability is particularly vital in grant-funded projects, where the success of the entire initiative often hinges on effective collaboration among diverse teams (Bočková et al., 2023).

In general, recent research indicates that computer support technologies not only enhance the efficiency of managing scientific and research projects, but also enable organisations to better achieve their objectives while increasing transparency and trust among stakeholders (Schick, 2019, Kaplan, 2021).

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The Historical Development of Computer Support in Project Management

The historical development of computer support in project management began in the 1950s with the introduction of groundbreaking methodologies such as PERT (Programme Evaluation and Review Technique) and CPM (Critical Path Method). These methodologies were designed to facilitate efficient planning and management of complex projects, particularly within the military and industrial sectors (Taylor, 2023). With the advent of personal computers in the 1980s, these approaches were transformed into software solutions, among which Microsoft Project became an iconic tool and a standard for many organisations (Bočková, 2024). This software enabled users to create Gantt charts, plan resources, and monitor project progress with ease, which contributed to the widespread adoption of these tools among small and medium-sized enterprises (Johnson & Clark, 2021).

The 1990s marked another pivotal shift due to the rapid advancement of the Internet, which allowed for the integration of project management tools into web-based platforms and their connection with ERP systems. This development significantly improved flexibility and facilitated the linkage of various processes within project management. Soukupová (2024) highlights that this era laid the foundations for contemporary cloud platforms, which ensure the accessibility and interoperability of data between different systems.

After 2000, a further leap forward occurred with the emergence of cloud technologies, artificial intelligence (AI), and advanced analytical tools. Cloud technologies enabled teams to collaborate in real-time regardless of geographical location, which is particularly vital for publicly funded scientific and research projects (Kinelski, 2021, Bartoš, 2023). Modern tools, such as digital twins, combine simulations with real-time data, thereby enabling more effective planning and risk identification prior to implementation (Ryzhakova et al., 2022).

AI has fundamentally transformed project management by enabling risk prediction, the design of optimal solutions, and the tracking of key performance indicators (Bočková et al., 2025). According to Davis and Miller (2023) AI improves decision-making processes, which can minimise errors and delays in the execution of complex projects. Another significant innovation is the integration of project management tools with big data, which facilitates detailed analyses and strategic planning based on historical and current data (Smith et al., 2021).

Current developments also emphasise the importance of user-friendly solutions that promote ease of use and seamless integration with other systems. This technology is particularly critical for publicly funded projects, which often involve interdisciplinary teams with varying technical skills (Porter and Schick, 2011). Research shows that user-friendly platforms contribute to the faster adoption of technologies within organisations, thus enhancing the overall efficiency of project management (Taylor, 2023).

Current Trends in Computer Support for Project Management

The cloud infrastructure is the cornerstone of modern project management systems that provides real-time access to project data. This capability is essential for effective coordination of international teams, particularly in scientific research projects that often involve interdisciplinary collaboration and geographically dispersed teams (Johnsson et al., 2023). According to Kinelski (2021), cloud technologies significantly improve communication among project team members, reduce the likelihood of errors in decision making, and ensure transparent financial monitoring. Such transparency is particularly critical for publicly funded projects, where accountability and budget control are paramount (Smith et al., 2021).

Cloud systems also promote flexibility and interoperability, enabling teams to adapt to changing conditions. For example, Brown (2021) demonstrates that cloud platforms facilitate the seamless integration of new tools, thereby lowering barriers to adopting advanced technologies. This adaptability allows teams to manage resources more effectively and respond quickly to emerging challenges.

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Artificial intelligence (AI) technologies and advanced analytical tools play an crucial role in risk prediction, resource optimisation, and tracking key performance indicators. Kaplan (2021a) highlights that analytical platforms enable early identification of potential issues and the proposal of effective solutions before they manifest. Machine learning applications further enhance project outcomes by predicting delays and budget overruns, which are critical for the successful completion of projects (Andersson et al., 2022).

Ryzhakova et al. (2016) further demonstrate that integrating AI with the concept of digital twins facilitates the modelling of complex projects and simulating various scenarios, thereby improving planning accuracy. Moreover, these technologies have become indispensable for managing large datasets, which are often generated in scientific projects (Williams, 2023). AI also supports automation of routine tasks, such as generating reports and monitoring project progress, freeing project managers to focus on strategic decision making (Davis and Miller, 2023).

The concept of digital twins is increasingly gaining traction in project management. This technology creates virtual replicas of physical projects, which can be used for simulation, analysis, and process optimisation. A study by IEEE emphasises that integrating digital twins with Building Information Modelling (BIM) technologies improves team coordination, reduces communication errors, and mitigates risks associated with project execution (Stanimirovic et al., 2023). Digital twins also enable the simulation of various scenarios, which is essential to identify potential issues before implementation begins (Davis and Miller, 2023).

Further research reveals that digital twins enhance teams' ability to respond quickly to changes, such as unexpected events, and contribute to improved overall project management efficiency (Evans and Clarke, 2023). At the same time, this technology enhances transparency and progress monitoring, which are critical for publicly funded scientific research projects (Taylor, 2023).

Key Benefits of Computer Support in the Planning of Scientific Research Projects

One of the primary requirements for grant-funded scientific research projects is ensuring financial transparency, which is crucial to fostering trust among stakeholders, enabling efficient management, and achieving project objectives. Software tools such as Freelo and other advanced budget management platforms enable detailed tracking of financial flows, the generation of clear reports, and audit support. These tools simplify the management of complex reporting requirements that are typical in publicly funded projects (Bočková et al., 2025). Schick (2019) emphasises that financial transparency is particularly vital when evaluating the long-term impacts of such projects on the broader scientific community. Clear reporting and cost control contribute to more efficient use of public funds and enhance the credibility of research initiatives.

Modern project management systems offer a wide range of tools to plan and optimising resources, allowing more effective allocation and minimising the risk of project delays. Mulesa et al. (2025) highlight the importance of mathematical models in resource optimisation, which assist research teams in overcoming budget and scheduling constraints. These models can be adapted to various types of projects and tailored to specific needs, increasing flexibility in managing publicly funded projects.

Porter and Schick (2011) further stress that effective resource management is essential for maximising the impact of projects. Ensuring an appropriate allocation of financial, human, and technological resources can contribute significantly to achieving project goals. Modern technologies such as digital twins support the simulation of possible resource allocation scenarios and allow for the identification of optimal solutions before implementation (Ryzhakova et al., 2022).

Inter-disciplinary collaboration is another critical aspect of scientific research projects. Publicly funded projects often involve experts from various fields, bringing diverse perspectives and skills to the table. Computer support through modern platforms such as Slack or Microsoft Teams provides an environment

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for effective communication, document sharing, and task coordination. Kinelski (2021) highlights that these tools not only facilitate collaboration, but also minimise errors and enhance overall team efficiency.

According to Bočková and Lajčin (2020) an interdisciplinary approach fosters innovation and enables the discovery of new insights, which is crucial for projects with high scientific potential. Collaboration among experts from various fields creates synergies that improve the quality of research and increase the likelihood of successful project completion.

Although modern technologies offer numerous benefits, their implementation is not without challenges. One major obstacle is the need for higher levels of digital literacy among team members, which may require training and adaptation to new tools. Kaplan (2021) notes that inadequate skills in using digital tools can limit their effective use and reduce their contribution to project success.

Another issue is the compatibility of software tools with existing organisational systems. Ryzhakova et al. (2022) point out that some advanced technologies, such as digital twins or analytical tools, can be expensive and complex to implement. This cost can be particularly challenging for smaller research teams or projects with limited budgets.

Despite these challenges, the potential of modern technologies in project management remains immense. With the increasing availability of cloud solutions, artificial intelligence, and analytical tools, these technologies are expected to play an ever greater role in managing scientific research projects, improving efficiency, transparency, and innovation in these initiatives.

Literature Gap

Grant-funded scientific research projects are inherently sensitive, complex, and multifaceted. These projects require precise coordination of resources, strict adherence to time and budget constraints, and transparent reporting to ensure accountability and credibility among stakeholders. Despite significant advances in project management tools and technologies, a comprehensive understanding of how to tailor and implement these systems specifically for grant-funded scientific research projects remains limited.

Modern project management technologies, including cloud-based platforms, artificial intelligence (AI), and digital twins, have demonstrated their ability to improve transparency, improve resource optimisation, and facilitate interdisciplinary collaboration (Brown, 2022, Li et al., 2022). Cloud-based solutions provide real-time access to data, enabling geographically dispersed teams to collaborate efficiently (Anderson et al., 2022). AI technologies improve decision making by predicting risks and optimising project schedules, while digital twins allow project simulations that help teams anticipate potential problems (Evans & Clar, 2023a, Jones & Wilson, 2023). However, much of the existing research focusses on general applications of these tools across various industries, with limited exploration into their specific adaptation for scientific research projects funded by public grants.

While cloud platforms, such as Asana and Trello, and analytical tools, including Power BI and Tableau, are extensively covered in the literature, there is a lack of detailed studies exploring how these tools can address the unique needs of grant-funded research projects. For example, publicly funded projects often require strict compliance with audit standards, extensive reporting, and financial transparency, which are less critical in private sector applications (Schmidt & Lee, 2021, Patel & Singh, 2020).

In addition, interdisciplinary collaboration is central to scientific research projects, but few studies have addressed the challenges of integrating communication and knowledge sharing tools like Slack or Microsoft Teams in these contexts. Kinelski (2021) highlights that many platforms lack the flexibility to adapt to the diverse technical competencies of international research teams, further complicating their implementation.

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Furthermore, while the potential of digital twins is well documented for engineering and construction projects (Li et al., 2022, Wei & Zhao, 2023), their application in managing complex scientific research projects remains underexplored. Specifically, how digital twins can facilitate grant-specific requirements, such as milestone tracking and transparent fund allocation, warrants further investigation.

Current studies often examine technologies in isolation, neglecting the potential synergies that arise from integrating multiple tools tailored to meet the specific needs of grant-funded projects (Taylor, 2023). For example, combining AI-driven predictive analytics with digital twins may offer enhanced decision-making capabilities for risk assessment and resource allocation, but empirical studies on such integrations are limited (Zhou & Chen, 2023).

Another critical gap lies in understanding the barriers to adopting advanced project management tools, particularly in the context of scientific research teams with varying levels of digital literacy. Kaplan (2021a) identifies training and adaptability challenges as significant factors that can hinder the adoption of these tools. More research is needed to identify strategies to overcome these barriers, especially in publicly funded projects where teams may have limited resources for training.

This article aims to bridge these gaps by providing a comprehensive analysis of the most suitable computer support solutions for the planning and implementation of grant-funded scientific research projects. By focussing on transparency, resource optimisation, and interdisciplinary collaboration, this study will provide actionable insights and recommendations to improve the efficiency and impact of these projects. The findings are expected to guide stakeholders in selecting and integrating technologies that align with the unique requirements of publicly funded research initiatives, ensuring their successful completion within predefined constraints.

Material and Methods

Objective and Scope of the Research

This research focuses on the analysis of software support systems for the planning and management of grant-funded scientific research projects, particularly within the academic environment. The primary objective is to identify and recommend the most suitable computer-based solution tailored to the specific requirements of this segment. The research will evaluate the essential features that such software tools must possess to effectively address the complexities and sensitivities of scientific project management. Based on this evaluation, the research will propose the optimal product for implementation, aligning with predefined criteria and addressing the unique needs of end-users.

Additionally, this research aims to provide a comprehensive overview of the current market offering in computer support systems for project management. By assessing the features and functionalities of available solutions, it seeks to evaluate their applicability to the modern demands of managing grant-funded research initiatives. This mapping will serve as a valuable resource for academic institutions and research organisations aiming to optimise their project workflows through advanced technological tools.

Methodology for Analysis and Evaluation

To achieve the research objectives, a detailed analysis of selected software products will be conducted using a model project representative of typical grant-funded research initiatives. The evaluation will focus on critical features such as resource optimisation, financial transparency, interdisciplinary collaboration, and integration with existing organisational systems. The final assessment will employ a multi-criteria evaluation method, utilising a scoring system to objectively determine the most suitable product for project implementation. This approach ensures that the recommended product aligns with both current and future requirements of managing complex research projects in an increasingly digital and interdisciplinary academic landscape.

Methodological Framework for Evaluating Computer Support in Grant-Funded Academic Research Projects

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The outlined methodological framework provides the basis for selecting and evaluating suitable computer support tools for the management of grant-funded scientific research projects in academic settings. While the specific requirements of such projects vary, the general principles of product selection for end-users follow a systematic process:

- Establishing the unique requirements for managing the entire lifecycle of grant-funded research projects within an academic institution, including planning, execution, monitoring, and reporting.
- Based on identified needs, specifying the desired functionalities that the software tool must provide, such as resource allocation, cost tracking, and collaboration capabilities.
- Developing evaluation criteria based on the required functionalities and assigning appropriate weights to each criterion to reflect their relative importance in project management.
- Exploring the market for software products that meet the defined functional requirements and are tailored to the needs of grant-funded research projects.
- Assessing the shortlisted products through demonstrations or pilot testing on comparable datasets to evaluate their practical application in a real-world research environment.
- Factoring in future scalability, licensing costs, internal user training requirements, and maintenance expenses to ensure the selected product aligns with both current and future needs.

The evaluation of software solutions will focus on key criteria essential for managing academic research projects effectively. These criteria include:

- Support for specific project types: Suitability for managing projects such as research-driven software development or grant-supported laboratory operations.
- Visualisation capabilities: Ability to present project timelines, workflows, and milestones through graphical interfaces.
- Resource monitoring: Tools to track team availability, workload, and resource allocation.
- Cost tracking: Features for financial management, including budget monitoring and expense forecasting.
- Communication and reporting: Integrated communication tools and reporting mechanisms to ensure transparency and alignment among project stakeholders.
- Licensing policies: Evaluation of licensing models, including cost per user and subscription duration.
- Localisation support: Availability of user interfaces in the local language (e.g., Czech), ensuring ease of use for domestic teams.

The selected software products will be drawn from leading market solutions that meet the fundamental requirements of grant-funded academic research projects. These products will align with the criteria for project support. The selection prioritises tools that are commonly recognised for their reliability and widespread adoption, both domestically and internationally.

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The shortlisted products for analysis include: JIRA, Asana, Freelo, ClickUp, Easy Project, Monday.com, and MS Project for the web. These products have been consistently ranked among the top solutions in the project management software segment and are noted for their robust feature sets.

To evaluate the selected tools, a model project, will be implemented. This project represents a typical scenario encountered in academic research projects. By applying each tool to identical datasets, the comparative analysis will identify their strengths and weaknesses across predefined criteria.

Following the implementation phase, the tools will undergo a comprehensive multi-criteria evaluation using a weighted scoring method. This approach ensures an objective comparison, considering factors such as functionality, usability, cost-effectiveness, and adaptability to the specific needs of grant-funded academic research projects. The product with the highest overall score will be recommended for adoption.

This structured and scientific approach ensures that the recommended tool is not only the most suitable for current project needs but also adaptable to evolving demands in academic research project management.

Multi-Criteria Evaluation of Products

Multi-criteria analysis and its scoring method are invaluable tools for assessing and comparing various options based on multiple criteria. In this context, the options represent the tested products and their respective features. Soukupová (2024) describes multicriteria decision-making problems as being defined by a set of options, a set of evaluation criteria, and a series of interconnections between criteria and options, enabling the definition of evaluation functions and selection methods. A key aspect of a multi-criteria model is the inclusion of subjective preferences from the evaluator, reflecting the importance of individual criteria. This perspective determines the choice of the selection method. Multi-criteria evaluation is frequently applied in the assessment of public projects, where decisions are made from a finite set of project alternatives.

The mathematical description of multi-criteria evaluation can be represented by a two-dimensional decision (criteria) matrix. The criteria matrix is defined as:

$$\mathbf{Y = [\, x_{ij} \,] \quad where \;_{ij} \in <11;MN>} \qquad \mathbf{(1)}$$

Here, each row of the matrix represents the j-th option of the total number of N options, with i criteria corresponding to each option, where M is the total number of criteria.

The aim is to identify the option Yj (or a set of options) that achieves the best evaluation, referred to as the nondominated option. A nondominated option is one that has at least one criterion better than all others, while no other criteria are worse. Soukupová (2024) emphasises: *"If only one optimal option is to be chosen, it must be selected from the set of non-dominated options."*

The preference scoring method relies on quantitatively evaluating the importance of criteria using a scoring scale, which can vary in granularity as needed (Soukupová, 2024). The more important a criterion is for the decision-maker, the higher its score. The scoring method is among the simplest techniques for multicriteria evaluation, which is one of its significant advantages. It is particularly suitable for qualitative criteria, as is the case here. In the Czech Republic, the scoring method is enshrined in the Public Procurement Act.

Despite its advantages, scoring scales have limitations. One drawback is the inability to distinguish between the relative importance of individual criteria. This issue can be addressed by assigning weights to criteria, where the sum of the weights is standardised to equal 1 (or 100).

The multi-criteria evaluation process involves the following steps:

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- Define the analysis objective: For example, selecting the best supplier, investment, or strategy.
- List all possible alternatives to be evaluated.
- Develop measurable criteria for comparing alternatives.
- Assign weights to the criteria.
- Assign scores to each alternative based on each criterion.
- Calculate the overall score as a weighted sum of individual criterion scores:

$$\textbf{Alternative Score} = \sum(\textbf{criterion value} * \textbf{criterion weight}) \qquad (2)$$

Select the best alternative with the highest score.

This study employs multi-criteria evaluation to select the final product from a finite list of options. The scoring is based on a five-point ordinal Likert scale, categorising alternatives as follows (see Table 1):

Table 1. List of Alternatives for Product Evaluation

Alternative	Value	Description
Non-compliant	1	NO
Partially non-compliant	2	NO, minimal support
Partially compliant	3	YES, with limited support
Mostly compliant	4	YES, with partial support
Fully compliant	5	YES

Source: Own Processing

The features of the evaluated product fall predominantly into qualitative categories, except for pricing. For pricing, the normalised cost is calculated using the following formula:

$$h_{norm} = (x_{ij} - B_j) / (I_j - B_j) \qquad (3)$$

Where: xij = value of the criterion, Bj = worst price, Ij = best price.

Without applying weights, the overall score Hj for each product j is calculated as the arithmetic sum of scores across criteria:

$$Hj = \sum(k_{ij}) \text{ where }_{i} \in <1; \text{number of criteria} > \qquad (4)$$

However, not all criteria are equally important. In this analysis, higher weights are assigned to visualisation capabilities and cost monitoring, reflecting their critical importance in grant-funded academic projects. Additionally, localisation receives a higher weight due to the need for usability among team members with limited language skills.

The weighted score Hj for each product j is calculated as follows:

$$Hj = \sum(k_{ij} * v_{ij}) \text{ where } i \in <1;\text{number of criteria}> \qquad (5)$$

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Finally, sensitivity analysis is recommended to evaluate how changes in criterion values influence the evaluation results, ensuring robust decision-making.

This rigorous methodology ensures the selection of the most suitable product for managing the unique complexities of grant-funded academic research projects, aligning with the specific needs and operational constraints of this domain.

Results and Discussion

This chapter presents the results of the analysis of selected software tools appropriate for planning and implementing grant-funded scientific research projects. The products were selected based on their prevalence, functionality and availability in the Czech and Slovak markets. A key criterion for inclusion in the analysis was the ability to fully utilise the product during a free trial period.

Jira, a product developed by Atlassian, offers several versions (Jira Software, Jira Work Management, Jira Service Management, Jira Align, etc.) and is primarily known for its application in software development management. For scientific research project management, Jira Work Management emerges as the most suitable version, focussing on efficient project management within teams. Jira provides clear task tracking, workflow visualisation, project information sharing, and report generation. Additionally, it supports process standardisation through preconfigured project templates, reports, and analytics.

The advantages of Jira include its flexibility, customisability, and ease of information sharing among team members. However, Jira Work Management lacks full support for agile management methodologies (e.g. Scrum), though this can be partially substituted by defining project goals. The basic version lacks critical features, such as the summarisation of numerical items, which are only available in Premium and Enterprise versions. In addition, advanced resource management and calculations require paid add-ons, significantly increasing operational costs.

Asana is a flexible and user-friendly tool for task and project management, with robust integration capabilities with other products. It consolidates plans, projects, tasks, and communication into a single shared platform. This product is particularly popular among smaller teams that want to optimise the management of diverse projects. The StartUp version is most suitable for academic scientific research projects, as it offers visualisation of project timelines (Gantt charts) and process automation, including AI utilisation.

Despite its strengths, Asana lacks some advanced features, such as detailed resource management. Support is provided through email, chat, and a knowledge base. Nevertheless, the product remains cost-effective, with flexible user costs that can adapt to organisational needs.

Freelo is a Czech project management tool designed for task management and team collaboration. It features an intuitive interface and extensive capabilities for time tracking and work reporting, facilitating a straightforward analysis of team and project efficiency. Freelo also supports reporting-based billing, making it a valuable tool for financially transparent scientific research projects.

However, Freelo has limitations, such as the inability to retroactively record completed tasks and the lack of a clear data display in the workspace. Data import and export are restricted, complicating information transfer between tools. For academic projects, the Team version is recommended as it provides enhanced flexibility in managing teams and resources.

ClickUp is a comprehensive tool with a wide range of features for project, task, and workflow management. Its flexibility and adaptability make it suitable for various types of teams. The product offers advanced visualisation, scheduling, and documentation sharing capabilities, supporting interdisciplinary collaboration.

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The main drawbacks include the steep learning curve due to its extensive functionality and the requirement for external integrations for financial management. Licences are subscription-based, with the Business version being the most appropriate for academic settings.

Easy Project is a Czech cloud-based tool with comprehensive project management features. It offers an intuitive interface, visualisation through Gantt charts, and extensive integration support. With localisation and its ability to address the specific needs of scientific research projects, the Business version is an ideal choice for academic teams.

Drawbacks include less intuitive navigation and the need for an implementation process. However, it provides extensive resource management, budget calculations, and risk management, which are critical requirements for grant-funded projects.

Microsoft Project offers the cloud-based Project Plan solution, which includes a broad range of features for planning, managing, and monitoring projects. It integrates seamlessly with Microsoft applications (e.g. Outlook, Teams) and offers a mobile interface.

A notable disadvantage is the need for paid add-ons (e.g., PowerApps) for resource management, which can increase operational costs. For academic projects, Project Plan 3 is the most suitable version as it includes resource management, report generation, and advanced planning capabilities.

The products analysed offer various functionalities and approaches to project management, each with its strengths and limitations. In the context of planning and managing grant-funded scientific research projects, key criteria such as localisation, financial transparency, project visualisation, and team collaboration support are paramount. Further analysis of these products using a model project will enable an objective evaluation of their suitability for the academic environment.

Evaluation of Software Tools for Project Management: Multi-Criteria Assessment with Weighted and Unweighted Scoring

This chapter presents the final evaluation of software tools for managing grant-funded scientific research projects in academic environments. The evaluation methodology follows the approach described in the "Materials and Methods" section. The input parameters for the assignment of criteria are derived from summary for each product, as presented higher.

Unweighted Scoring Methodology

The prices of the software licences were converted into a uniform currency (USD) based on the exchange of the Czech National Bank mid-rate exchange ($1 = 23.788 CZK). Most products are licenced in USD, and for comparison purposes, the price of licences was calculated for an anticipated user group of 10 individuals. For Freelo, which offers a flat rate pricing model regardless of user count, the cost remains fixed.

Table 2 provides the unweighted scoring results based solely on the set criteria. The scoring was calculated as the arithmetic sum of the values assigned to individual criteria for each product, as described in Equation (4). Seven evaluation criteria were applied.

In this unweighted analysis, all criteria are equally weighted with a value of 1. This provides an objective basis for comparison without prioritising specific features.

Table 2. Summary of Unweighted Evaluation Results for Tested Products (Own Processing)

Product	Data visualisation	Resource management	Financial control	Communication	Reporting	Licence policy	Normalised costs	Localisation	Score

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JIRA	4	5	3	5	3	$50.00	1	3	**23,00**
Asana	5	4	3	5	4	$110.0	0.76	2	**23,76**
Freelo	4	4	5	4	5	$84.00	0.864	5	**27,86**
Click Up	5	5	3	5	4	$120.0	0,72	3	**25,72**
Easy Project	5	5	4	5	5	$122.0	0,712	5	**29,71**
Monday	5	5	3	5	4	$120.0	0,72	2	**24,72**
Project Plan	5	5	3	5	4	$300.0	0	5	**27,00**

Source: own processing

Weighted Scoring Methodology

To account for subjective preferences, weights were assigned to each criterion, reflecting their relative importance. Weights were calculated using Equation (6):

$$\mathbf{v_i = criterion\ value_i \,/\, \sum criterion\ values \qquad where\ _i \in <1;7>} \qquad \mathbf{(6)}$$

The weights for the seven criteria were distributed as follows:

Table 3. Weight Specification for Evaluation Criteria

Product	**Data visualisation**	**Resource management**	**Financial control**	**Communication**	**Reporting**	**Normalised costs**	**Localisation**	**Total**
Value	10	6	6	5	8	7	8	50
Weight (v_i)	0,20	0,12	0,12	0,10	0,16	0,14	0,16	1

Source: own processing

Weighted score results, calculated using Equation (5) are presented in Table 4.

Table 4. Summary of Unweighted Evaluation Results for Tested Products

Product	**Data visualisation**	**Resource management**	**Financial control**	**Communication**	**Reporting**	**Licence policy**	**Normalised costs**	**Localisation**	**Score**
Weight	*0.20*	*0,12*	*0.12*	*0.10*	*0.16*		*0,14*	*0.16*	*1.0*
JIRA	0,4	0,3	0.3	0.5	0.3	$50.00	0,1	0,3	**0.312**
Asana	0,5	0,4	0,3	0,5	0,4	$110.0	0,76	0,2	**0.436**
Freelo	0,4	0,4	0.5	0,4	0.5	$84.00	0.864	0,5	**0,509**

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Click Up	0,5	0,5	0,3	0,5	0,4	$120.0	0,72	0,3	**0,458**
Easy Project	0,5	0,5	0,4	0,5	0,5	$122.0	0,712	0,5	**0.518**
Monday	0,5	0,5	0,3	0,5	0,4	$120.0	0,72	0,2	**0,442**
Project Plan	0,5	0,5	0,3	0,5	0,4	$300.0	0	0,5	**0,390**

Source: own processing

The weighted score confirmed the results of the unweighted analysis (see Table 2). The Easy Project, a Czech-developed tool, emerged as the most suitable product for academic scientific research projects due to its comprehensive functionality, strong localisation support, and robust resource management features.

The Freelo, another Czech product, was second. While Freelo offers excellent cost-analysis features, its fixed pricing model limits scalability. Other products allow flexibility in adjusting monthly expenses based on the number of active users, which is an advantage for dynamic project teams.

By considering weighted criteria and focussing on specific academic project needs, this analysis highlights tools that align closely with the requirements of grant-funded scientific research initiatives.

Conclusion

This study provides an analysis of selected software tools aimed at planning and managing grant-funded scientific and research projects implemented in academic settings. The findings confirm the importance of modern technologies, such as cloud platforms, artificial intelligence (AI) tools and digital twins, in optimising resources, ensuring transparency, and supporting interdisciplinary collaboration.

The findings of this study align with the conclusions of Schick (2019), which emphasised the importance of financial transparency in grant-funded projects, and Kinelski (2020), who highlighted the critical role of communication tools. This analysis further extends the insights of Ryzhakova et al. (2022), which noted the potential of digital twins for simulation and optimisation by exploring their specific applications in academic research initiatives. Furthermore, it validates the observations of Davis and Miller (2023), who stated that integrating AI and analytical tools can significantly enhance risk prediction and decision-making processes.

The results offer direct recommendations for academic institutions and teams managing grant-funded scientific and research projects. In particular, Easy Project emerged as the most suitable tool due to its localisation features, resource management support, and cost transparency. Despite its limitations in scalability, Freelo presents a valuable option for small and medium-sized teams because of its advanced cost reporting and analysis capabilities. The study underscores the need for user-friendly interfaces and tools tailored to the specific requirements of grant-funded projects.

The study has several limitations. First, its geographical focus on the Czech and Slovak markets may limit the generalisability of the findings to other academic contexts. Second, the use of a model project for testing tools may not fully capture all potential scenarios from real-world scientific and research projects. Additionally, some software tools were excluded due to their inaccessibility on the market or limited accessibility for testing.

Suggestions for Future Research

- Future research should focus on the following areas:

- Examining software tools available at an international level.
- Evaluating the effectiveness of tools in real time and across different phases of the project lifecycle.
- Study the synergy created by combining AI, digital twins, and analytical tools.
- Testing how varying levels of digital literacy impact the effectiveness of software tools.
- Investigating how software solutions can enhance interactions among diverse research teams and fields.

This research has contributed to identifying key success factors for software solutions in academic grant-funded scientific and research projects, laying the groundwork for further exploration in this dynamically evolving field.

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