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MANAGING AN EU-FUNDED FMCG R&D PROJECT: FRESHPOT FEDS.01.02-IP.01-0111/24 CASE STUDY

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Purpose: The aim of this article is to present the results of a study on the management of the 'Freshpot' R&D project entitled: 'Innovations in sales technology: the development of smart, self-service healthy-food shops, using artificial intelligence for automatic product recognition, stock optimisation and nutritional advice (FEDS.01.02-IP.01-0111/24), implemented in the FMCG/food tech sector and co-financed by EU funds. The article aims to answer the question of how the project is managed and how the adopted management model influences the course of implementation and the achievement of intermediate outcomes.
Design/methodology/approach: The study uses a single case study approach, analysis of project documentation and participant observation, supplemented by an interview with a project team member. The scope of the analysis includes a comparison of the plan set out in the grant application with the actual course of the project's implementation as at 30 November 2025.
Findings: The article identifies project management methods and tools, including the structure of roles, division of responsibilities, schedule monitoring, milestone control and technological risk management.
Research limitations/implications: The project is still ongoing, so the analysis will not cover full commercialisation or the final assessment of all indicators. The study focuses on intermediate effects, in particular on a selected milestone.
Practical implications: The article may be used to assess the effectiveness of managing other publicly funded R&D projects.
Social implications: At this stage, the social implications of the project should be understood as prospective. The project has the potential to increase the availability of health-promoting food, reduce food waste and educate consumers, but these effects require validation in later project stages and after operational deployment.
Originality/value: The originality of the article does not lie in proposing a new project management methodology, but in providing an empirical case study of a real EU-funded R&D project combining FMCG, food-tech, vending automation, artificial intelligence and the formal requirements of EU-funded projects.
Keywords: project management; R&D project; FMCG; artificial intelligence; EU funds.
Category of the paper: Case study; Research paper.

1. Introduction

Research and development projects funded by the European Union combine two distinct management logics. The first is the experimental logic of R&D work, based on technological uncertainty, testing of assumptions, prototyping and the gradual mitigation of research risks (Wageman, 2024; Wang et al., 2010; Mohagheghi, 2017). The second is the formal logic of a grant project, linked to the necessity of implementing the project in accordance with the funding application, schedule, budget and resources, indicators, documentation and rules on the eligibility of expenditure (Coca et al., 2024; Dubel, 2022). The combination of these two perspectives means that the management of publicly funded R&D projects requires both flexibility and formal discipline (Coca et al., 2026).

A particularly interesting case for analysis is the R&D project carried out by Freshpot (Project funding application Freshpot, 2024), concerning the development of smart, self-service healthy-food shops. The project involves the development of artificial intelligence technology, vending machines, an automatic product recognition system, mechanisms for optimising stock levels, and the personalisation of the food offering. This undertaking is therefore an example of a project in which technological complexity is combined with the formal requirements of an EU-funded project.

The main research question of the article is: how is the Freshpot R&D project managed, and how does the adopted management model influence the course of project implementation and the achievement of intermediate outcomes? The article does not assess the ultimate market success of the solution, as the project is still ongoing at the time of the study. The analysis focuses on management mechanisms and selected intermediate outcomes, in particular the implementation of Task 1 and the achievement of the milestone assigned to it.

Task 1 was selected as the central empirical object because, as of 30 November 2025, it was the only completed R&D stage of the project. It also represented the industrial research phase in which the key technological assumptions of the project were verified for the first time. The milestone assigned to Task 1 was measurable and directly linked to the feasibility of subsequent development work. Therefore, the analysis of Task 1 allows the study to assess an intermediate but critical point in the project lifecycle, without making premature conclusions about final commercialisation or long-term market outcomes.

The article is based on a case study, an analysis of project documentation and participant observation. The approach adopted allows for a comparison of the assumptions set out in the grant application with the actual course of the project's implementation, and an assessment of how management activities supported the achievement of results despite the constraints, uncertainties and deviations typical of research and development projects.

2. Theoretical background

The management of research and development projects differs from the management of routine or investment projects. This is primarily due to the high level of technological uncertainty that accompanies R&D work (O'Connor et al., 2013; Semeniuk, 2026). At the planning stage, it is possible to define the project's objective, intended functionalities and expected outcomes; however, the final form of the solution depends on the results of research, testing, prototyping and the validation of the adopted assumptions (Cividino et al., 2019) In this type of project, the iterative nature of the work is of particular importance, as subsequent design decisions are made on the basis of the results of earlier technical trials and analyses.

R&D projects also require systematic testing of technological hypotheses. This means that the project team not only carries out pre-planned activities but also verifies whether the adopted solutions are technically feasible, effective and capable of further development. Consequently, in R&D projects, there is a higher risk than in standard projects of changes to the scope, modifications to the schedule, shifts in priorities, or the need to redesign selected elements of the solution (Lucena, 2026; Lasso et al., 2022). The expert knowledge of team members therefore becomes a vital resource, as it enables the interpretation of research results, the making of technical decisions and the mitigation of the risk of project failure.

R&D projects funded by the European Union have their own distinct characteristics. In addition to technological uncertainty, they are subject to the formal logic of a grant-funded project. The beneficiary is obliged to implement the project in accordance with the approved grant application, the technical and financial schedule, the budget, the rules on cost eligibility, and the output and outcome indicators (Gonzalez-Varona et al., 2023; Pina, 2024). This means that the research freedom inherent in R&D projects must be balanced by the obligation to document progress, justify expenditure, report results, and demonstrate that activities comply with the project's objectives.

In practice, managing an EU-funded R&D project requires a combination of flexibility and control. On the one hand, the team must be able to respond to research findings, emerging technical issues and changes in implementation conditions. On the other hand, every significant decision should be assessed in terms of its impact on the project scope, budget, schedule, indicators and the eligibility of expenditure. Mechanisms for monitoring progress, managing risk, documenting decisions and checking the achievement of milestones are therefore of particular importance (Lopez et al., 2024; Szczepaniak, 2020).

In the context of this article, a key point of reference is the PRINCE2 methodology, which emphasises project management through roles, responsibilities, stages, deliverables, progress monitoring and risk management (AXELOS, 2017). This methodology assumes that a project should be conducted within a structured decision-making framework, with a clearly defined division of responsibilities and mechanisms for monitoring the implementation of stages.

3. Research methodology

The study is qualitative, descriptive-analytical and exploratory in nature. The primary research method employed in the article is a case study of the Freshpot project, treated as an example of an R&D project carried out in the FMCG/food tech sector and co-financed by the European Union.

The empirical material used in the study comes from two main sources. The first is an analysis of project documentation, including in particular the grant application, the schedule, payment applications, the report on the implementation of R&D work, and documents confirming the achievement of the milestone for Task 1. The second source of data is the author's participant observation, resulting from involvement in the process of preparing, monitoring and analysing the project's implementation, supplemented by an interview with a member of the project team.

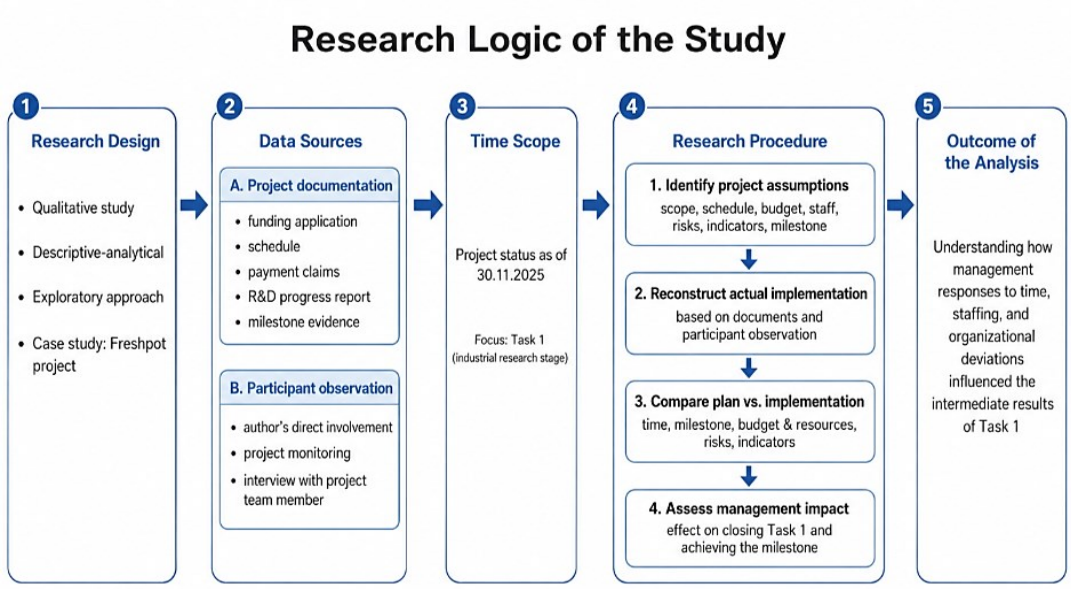

Figure 1. Flowchart of the research methodology.

Source: Author's own work.

In this study, participant observation means structured direct observation by the authors during project preparation, monitoring and analysis. To limit researcher bias, observations were triangulated with project documentation, payment applications, R&D reports, milestone evidence and an interview with a project team member. Factual findings were separated from interpretative conclusions, and the analysis relied primarily on documented project evidence.

The time frame of the study covers the status of the project as at 30 November 2025. As the Freshpot project is still ongoing at the time of the study, the analysis does not cover the final market success or the full achievement of all result indicators. The subject of the study is the implementation of Task 1, i.e. the completed stage of industrial research, and the impact of management on the achievement of the milestone assigned to it.

The research procedure was carried out in four steps:

- In the first step, the project assumptions derived from the grant application were identified, including the planned scope of Task 1, the schedule, budget and resources, risks, indicators and the milestone.
- In the second step, the actual course of Task 1 implementation was reconstructed on the basis of project documentation, payment applications, R&D reports and information obtained through participant observation.
- In the third step, the plan was compared with the actual implementation in selected areas: implementation time, milestone, budget, risks and indicators.
- In the fourth step, the impact of management actions on the achievement of the project's intermediate outcome—the completion of Task 1 and the achievement of its milestone—was assessed.

The adopted methodology allows the project to be understood as a process managed under conditions of technological uncertainty and the formal requirements of a grant-funded project. This makes it possible not only to describe the course of Task 1's implementation, but also to indicate how managerial responses to time, staffing and organisational deviations influenced the achievement of the industrial research phase's results.

4. Freshpot project characteristics

The Freshpot project is a research and development initiative in the FMCG/food tech sector. Its aim is to develop smart, unmanned shops or vending machines offering healthy food, utilising artificial intelligence technologies to automate the purchasing process, optimise stocking levels and personalise the offering for users (Figure 2). The project addresses the need for quick access to fresh and nutritious food products, particularly in places where users have limited time to make a purchase (Project funding application Freshpot, 2024). A key element of the project is an AI system for automatic product recognition. The solution is designed to identify products selected by the user and automatically fill the shopping basket (Project funding application Freshpot, 2024).

The project also involves the development of stock optimisation mechanisms. Their aim is to support decisions regarding the stocking of vending machines based on sales data, predicted demand and product availability (Project funding application Freshpot, 2024).

In accordance with the project's objectives, it has been scheduled to run from 1 November 2024 to 30 October 2026. It is planned to be carried out in several research and development phases, comprising one industrial research phase and three experimental development phases. The industrial research phase was intended to develop core technologies, verify key assumptions and build the first prototypes. Subsequent development phases are intended to lead

to further development, integration, testing and preparation of the solution for implementation in real-world conditions (Project funding application Freshpot, 2024).

Task 1 provides the technological foundation for subsequent project stages, as product recognition, product digitisation and configurable heating are prerequisite components for later stock optimisation, user applications and nutritional advisory functions. Therefore, Task 1 can be treated as a technological gate between industrial research and further experimental development.



Figure 2. A nano-shop, the technology for which is currently being developed as part of an R&D project based on the licence for the first Freshpod shop.

Source: https://freshpod.pl/

From the perspective of this article, the project carried out by Freshpot is an interesting case study, as it combines technological complexity with the formal requirements of an EU-funded project. The remainder of this article focuses not on the entire project duration, but on the completed Task 1, covering the industrial research phase and the achievement of its assigned milestone (Project funding application Freshpot, 2024).

5. Project management model

In accordance with the assumptions set out in the funding application, the project concerning smart, self-service healthy-food shops is managed using the PRINCE2 methodology.. The adoption of this methodology means that the project has been structured in terms of roles, responsibilities, implementation stages, project deliverables, progress monitoring and risk management. (AXELOS, 2017). In practice, this allows the R&D project to be conducted in an organised manner, whilst retaining the ability to respond to the changes and uncertainties typical of research and development work.

Three levels of management have been identified within the project. The first is the strategic level, established by the organisation’s management board. It is responsible for overseeing the project from the perspective of the company’s objectives, ensuring the resources necessary for

the project's implementation, and making decisions of key importance for the project's future direction. The second level is the operational level, for which the project manager is responsible. Their role involves the day-to-day coordination of project implementation, monitoring the schedule, controlling the budget, overseeing documentation, preparing reporting materials, and ensuring that the project is implemented in accordance with the grant agreement. The third level is the project deliverables level, comprising the R&D manager and the research and development team. At this level, the core substantive work is carried out, including technology development, algorithm preparation, prototype construction, solution testing, analysis of results, and documentation of R&D outcomes (Project funding application Freshpot, 2024).

This three-tier management structure is consistent with the PRINCE2 methodology, as it allows for the separation of responsibilities for strategic oversight, day-to-day project management, and the delivery of substantive results. This allows the R&D team to focus on solving technological problems and achieving R&D outcomes, whilst the project manager is responsible for the formal, organisational and financial aspects of the project. The management board, meanwhile, retains control over key decisions and the alignment of the project with the organisation's objectives.

The Freshpot project also utilised management mechanisms characteristic of a structured project approach. These include project meetings, schedule monitoring, milestone tracking, progress reporting, indicator monitoring, maintaining R&D documentation, cost control, risk identification and corrective decision-making. These mechanisms allow for ongoing assessment of whether the project is being implemented in accordance with the assumptions and whether there are any deviations requiring a management response (Project funding application Freshpot, 2024).

Milestones are of particular importance, as they serve as checkpoints within the project. They enable an assessment of whether a given stage has led to the achievement of the intended technical and organisational outcomes. Project and R&D documentation also plays an important role. In a project co-financed by EU funds, documentation is not merely a formal obligation but serves as a tool for control and knowledge management. It allows the course of work to be reconstructed, the achievement of results to be confirmed, compliance with the R&D Agenda to be demonstrated, and material progress to be linked to the expenses incurred.

The project management model adopted by Freshpot can therefore be described as formally structured, phased and product-based, in line with the principles of the PRINCE2 methodology. At the same time, given the research and development nature of the project, this model must be applied flexibly. This means that monitoring of the schedule, budget and indicators is combined with an ongoing response to technological, personnel and organisational risks. Understood in this way, management allows us to maintain the discipline of a grant-funded project, whilst adapting the course of work to the actual challenges arising during the course of R&D implementation.

6. Plan versus implementation

The scope of the study covers the implementation of Task 1 of the Freshpot project, i.e. the industrial research phase, the aim of which was to develop the basic technologies and design for a smart, self-service vending machine for healthy food. The analysis was conducted using the 'plan – implementation – deviation – cause – management response – impact on the project' framework. Adopting this structure allows not only for a description of the project's progress but also for an assessment of how project management influenced the achievement of Task 1's outcomes. Below is an analysis of the individual areas:

Area 1: Task 1 implementation timeframe:

- Plan according to the application – in accordance with the original schedule, Task 1 was to be carried out as an industrial research phase between 1 November 2024 and 31 July 2025, i.e. over a period of 9 months.
- Implementation as at the date of the audit – the actual implementation of Task 1 began on 1 March 2025 and ended on 30 November 2025. This means that Task 1 itself retained its planned duration of 9 months, but its start and end dates were postponed by approximately 4 months compared to the original schedule. As of the date of the audit, Task 1 had been completed and the project was already in the process of implementing the next stage.
- Deviation – there was a time deviation from the original schedule dates. However, the duration of Task 1 itself was not exceeded.
- Cause – the cause of the delay was the later start of the project, resulting from the protracted process of assessing the grant application and the subsequent commencement of implementation.
- Management response – the management response was to maintain the original structure and duration of Task 1 whilst postponing its implementation. The beneficiary monitored the impact of the delay on subsequent project phases and anticipated the possibility of accelerating further tasks, including by potentially outsourcing part of the work to subcontractors. Management therefore involved maintaining control over the scope and outcomes of the phase despite the change in the implementation schedule.
- Impact on the project – the postponement did not prevent the achievement of Task 1's results or the completion of the milestone. However, it did affect the schedule of the entire project, as subsequent tasks had to be rescheduled or coordinated within a shorter timeframe. From a project management perspective, the most important thing is that the external delay was absorbed without any loss of the substantive scope of Task 1.

Area 2: Task 1 milestone

- Plan as per the proposal – the milestone for Task 1 was to develop a prototype system with AI for product recognition and digitisation, including a refrigerator, an ambient storage unit and a configurable heater. Achievement of the milestone was to be confirmed by measurable technical parameters: AI recognition accuracy of at least 95%, microwave programming accuracy of at least 95%, and a false positive rate (FPR) of no more than 5%.
- Status as of the test date – the milestone has been achieved. Quantitative verification confirmed that the required parameters had been met: AI recognition accuracy was 95.2%, microwave programming effectiveness was 99.2%, and the FPR rate was 4.60%.
- Deviation – there was no negative deviation from the milestone parameters. All threshold values were met. In the case of microwave programming accuracy, the result was significantly above the minimum threshold. In the case of AI recognition accuracy and FPR, the values were close to the thresholds but fell on the correct side of the required parameters.
- Cause – achieving the milestone was made possible by an iterative approach to technology development, encompassing database construction, testing of image recognition models, development of a multi-camera system, integration of hardware and software components, and validation of the heating module's operation.
- Management response – involved the team focusing on the parameters critical to the completion of Task 1. In practice, this meant prioritising the functions necessary to achieve the milestone, conducting tests, documenting results, and postponing less critical elements to later stages.
- Impact on the project – The test results formally met the Task 1 thresholds, but AI recognition accuracy and FPR were close to the required limits. Therefore, the results should be treated as confirmation of milestone achievement, not yet as full validation of operational robustness under commercial conditions.

Area 3: Budget and resources for Task 1

- Plan as per the proposal – the budget for Task 1, understood as the industrial research phase, primarily covered R&D personnel costs, operating costs and additional overheads, potential subcontracting, and other costs allocated to the industrial research phase. The largest budget item was project personnel. The application envisaged the involvement of an R&D team with programming, analytical, technical and design expertise.
- Implementation as at the date of the audit – as at the closure of Task 1, expenditure was incurred primarily in relation to personnel and operating costs. No budget overrun was recorded for Task 1. At the same time, Task 1 was completed without the employment of one of the planned staff members – a developer. The remaining staff continued their

work and took on some of the duties not carried out by the missing team member. In practice, this meant that the key scope of Task 1 was completed with fewer people than originally planned.

- Deviation – a budget and resource deviation occurred. The most significant deviation concerned personnel costs, as one of the planned staff members was not hired. From a human resources perspective, there was a staffing deviation consisting of the planned team not being fully staffed. This did not result in a missed milestone or the interruption of Task 1, but it did affect the way the team's work was organised.
- Cause – The main cause of the deviation was the lack of an effective recruitment process for a new employee, as candidates did not meet the requirements set for them. Consequently, part of the personnel budget was not utilised in accordance with the original plan. Additionally, some of the costs may have remained unspent due to the team carrying out the work using its own resources and focusing on priority tasks.
- Management response – the management response was to prevent costs from rising despite staffing constraints. Instead of immediately increasing the budget or seeking costly external solutions, the work was reorganised internally. Some of the responsibilities were taken over by other developers, and the scope of activities was reorganised according to the priorities necessary to achieve the milestone.
- Impact on the project – the budget for Task 1 was not exceeded, which has a positive impact on the formal and financial assessment of the project's implementation. At the same time, the underutilisation of part of the personnel budget was not organisationally neutral, as it meant a greater workload for the remaining team members.

Area 4 – Risks

- Plan as per the proposal – the proposal anticipated risks typical of an R&D project, in particular: inaccuracy and insufficient effectiveness of AI algorithms, system integration issues, delays in electronics design, component unavailability, regulatory risks, operational risks, organisational risks, missed deadlines and increased component costs. Preventive measures were to include, amongst other things, testing, iterative algorithm refinement, modular design, schedule monitoring, cost control and ongoing team management.
- Implementation as at the date of the study – During the period analysed, some of the risks materialised to a limited extent. This primarily concerned technological risks related to AI algorithms, including isolated instances of false detection of products with similar packaging. Limited issues also arose in the areas of electronics design component availability and the schedule. However, there were no significant issues with system integration, regulatory compliance, user acceptance or the team's ability to carry out the tasks set out in the R&D Agenda.

- Deviation – Deviations were partial and non-critical in nature. The identified issues did not prevent the completion of Task 1 or the achievement of the milestone. Technological risks highlighted the need for further optimisation of AI models and refinement of diagnostic mechanisms, whilst schedule risks resulted in a delay in project delivery compared to the original plans.
- Cause – The primary cause of the risks was the technological complexity of the project, encompassing the integration of the AI system, training data, the sales application, electronics and hardware components. In the case of AI algorithms, the problem was the quality and unambiguity of the input data, particularly for products with similar appearances or packaging. Component risks stemmed from limited availability or the need to change the originally planned hardware solutions.
- Management response – In response to product detection issues, clearer labels were designed, additional barcode verification was implemented, and data collection from detection sessions was initiated to further train the models. In the electronics area, additional analyses of the power supply architecture and EMC were carried out. For components, an alternative supplier and a solution meeting the project requirements were selected. With regard to the schedule, the impact of the delay on subsequent stages of work was monitored.
- Impact on the project – The risks did not have a critical impact on the implementation of Task 1. They were treated as a natural part of the R&D process and used to improve the solution.

Area No. 5 – Indicators

- Plan as per the application – the application set out output and outcome indicators. Output indicators included, among others, the number of R&D projects carried out, the number of micro-enterprises supported, enterprises receiving support in the form of grants, and the number of enterprises supported in the implementation of R&D work. Outcome indicators included, among others, the value of private investment complementing public support, the number of product and process innovations introduced, revenue from the sale of new or improved products/services, the value of expenditure on R&D activities, publications, and applications for industrial property protection.
- Progress as at the date of the review – at the Task 1 stage, some of the output indicators were achieved, relating primarily to the launch and implementation of the R&D project and the provision of support to the enterprise. Financial indicators, such as the value of private investment and the value of expenditure on R&D activities, were partially achieved, as expenditure was incurred as the project progressed.

- Deviation – the failure to achieve the final indicators should not be interpreted as a negative deviation at the Task 1 stage. Indicators such as product innovation, process innovation, sales revenue, publications or intellectual property applications are logically linked to later stages of the project or to the period following its completion.
- Reason – the reason for the partial achievement of the indicators is the phased nature of the project. Task 1 was of an industrial research nature and served to develop the technological basis and prototypes, rather than the full commercialisation of the solution.
- Management response – the management response involved the ongoing monitoring of indicators through payment applications, project documentation and reporting. The indicators were treated as a tool for monitoring project progress, rather than merely as a formal requirement.
- Impact on the project – analysis of the indicators confirms that Task 1 contributed to the achievement of formal project progress, but could not yet result in the full implementation of the innovation.

7. Discussion and Summary

The case of Freshpot's smart and automated nano-shop food shop project demonstrates that managing an EU-funded R&D project requires combining two distinct operational logics. The first stems from the experimental nature of research and development work, which is fraught with technological uncertainty, requires testing of assumptions, prototyping, iterative refinement of solutions, and responding to results obtained during the course of the work. The second stems from the formal logic of a grant-funded project, in which it is necessary to comply with the funding application, schedule, budget, indicators, milestones and project documentation.

An analysis of the implementation of Task 1 indicates that the Freshpot project is managed in a phased, product-based and formal manner, utilising mechanisms characteristic of the PRINCE2 methodology and EU-funded projects. The phased approach is evident in the division of the project into successive R&D tasks, corresponding to the gradual development of the technology. The product-based nature of management is evident in the focus on specific deliverables, such as prototypes, system modules, algorithms, R&D documentation and milestones. The formal dimension of management, on the other hand, stems from the need to monitor the schedule, budget, eligible costs, indicators and compliance with the grant agreement.

In direct response to the research question, the Freshpot R&D project is managed through a three-tiered structure of responsibility, comprising the organisation's board, the project manager, the R&D manager and the R&D team. The board is responsible for the strategic level and key decisions regarding the direction of the project. The project manager is responsible for the operational level, covering the schedule, documentation, budget, reporting and compliance with the grant project requirements. The R&D manager and the R&D team, on the other hand, are responsible for delivering the project outputs, i.e. carrying out technological work, testing solutions, preparing prototypes and achieving substantive results.

The adopted management model influenced the course of the project primarily by enabling the monitoring of deviations. During the period under review, two significant deviations occurred: a delay in the implementation of Task 1 and a change in the composition of the project team. However, these did not prevent the stage objectives from being achieved. Task 1 was closed, the milestone was achieved, and the budget was not exceeded. This means that the effectiveness of management did not lie in completely avoiding problems, but in the ability to limit, document and compensate for them through corrective actions.

A strength of Freshpot's management model is the clear division of roles and responsibilities. It allows responsibility for substantive outcomes to be separated from responsibility for the formal management of the project. The R&D team can focus on solving technological problems, whilst the project manager is responsible for monitoring the schedule, budget, indicators, grant accounting and documentation. The phased nature of the project and the focus on deliverables and milestones are also of significant importance, as they enable progress to be assessed in circumstances where the final technological outcome is not fully known at the start of the project.

The case of Freshpot also highlights the importance of formal monitoring. Payment applications, reports on the implementation of R&D work, technical documentation and the monitoring of indicators do not serve a purely administrative function, but are tools for project management. They allow the course of work to be reconstructed, the achievement of results to be confirmed, expenditure to be justified and the project's compliance with its objectives to be demonstrated. In EU-funded R&D projects, documentation thus becomes one of the key mechanisms for mitigating formal and organisational risks.

At the same time, the nano-shop project highlights typical challenges associated with managing R&D projects. These include, above all, technological uncertainty, the need to integrate hardware and software, ensuring the appropriate quality of training data for AI models, maintaining continuity of work despite staff changes, and documenting decisions and changes within the project. Of particular significance is the tension between the need for flexible responsiveness to the outcomes of R&D work and the necessity of maintaining formal compliance with the grant project. In practice, this means that R&D project management must simultaneously enable adaptation and ensure accountability.

The findings should distinguish between demonstrated results and prospective effects. This study confirms the completion of Task 1, milestone achievement, budgetary control and management of schedule and staffing deviations. Broader effects, such as stock optimisation, food-waste reduction, nutritional advice and commercial value, remain prospective and require further validation.

A limitation of the study is that the Freshpot project was still ongoing at the time of the analysis. The article therefore does not assess the project's full commercial results, the final implementation of the technology, or the achievement of all outcome indicators. The analysis was limited to the project management approach and intermediate effects, in particular the implementation of Task 1 and the achievement of the milestone assigned to it. However, this approach allows the project to be captured during its implementation and assesses how management mechanisms influence the achievement of interim results.

Further research should include an evaluation of the project upon its completion. In particular, it is worth analysing whether the final project indicators were achieved, whether the solution was successfully implemented, whether the projected revenues were generated, and how the AI technology performed in real-world test locations. It would also be important to compare the planned and actual commercialisation outcomes, the effectiveness of the product recognition system under operational conditions, and the impact of stock optimisation on reducing food waste.

In summary, the Freshpot case study contributes to our understanding of R&D project management by demonstrating that an effective management model should combine a structured framework of roles, stages, deliverables and milestones with operational flexibility. A formal management methodology does not eliminate technological uncertainty, but it allows it to be controlled and translated into measurable results. In the case studied, this enabled the completion of Task 1, the achievement of a milestone, and the creation of a foundation for continuing further development work.

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