A COGNITIVE MODEL FOR ANALYSING AND MONITORING TEAM PERFORMANCE IN PROJECT MANAGEMENT: PART 2

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ABSTRACT: The increasing complexity of projects and the diversification of team members' responsibilities demonstrate the need for tools that support performance monitoring beyond the traditional indicators used in project management. Building on the Cognitive Load Index conceptual model defined at an earlier stage of the research, this article proposes the development of a software prototype for monitoring team members' cognitive load. The prototype was developed in Figma and includes functionalities for managing projects and teams, assessing cognitive variables, automatically calculating the CLI and displaying the results in an interactive dashboard. The article also presents the application design process, the definition of functional and non-functional requirements, and the structure of the main interfaces and user flows. The results show that the conceptual model can be translated into a software solution, providing a basis for developing a functional application that supports project managers in monitoring cognitive load and making decisions about team management.
KEYWORDS: Cognitive Load Index, project management, software prototype, Figma, cognitive load

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1. INTRODUCTION

The development of digital technologies has significantly changed the way projects are planned, coordinated and monitored. Organisations increasingly use dedicated project management software applications to plan activities, manage resources, follow progress and facilitate collaboration with team members. These tools improve the efficiency of management processes and give managers rapid access to information on project status, the extent to which objectives have been achieved and the utilisation of available resources.

However, most existing applications are built around traditional project performance indicators, such as time, cost and quality, or emphasise operational aspects such as task allocation, compliance with deadlines and activity monitoring. Although these functionalities are essential to project management, they provide limited information about the team's state and the factors that may influence its performance throughout the project. In practice, the difficulties encountered by teams arise not only from planning problems or a lack of resources, but also from high cognitive demands, deadline pressure, mental overload and the need to manage a large number of activities simultaneously.

In the first stage of this research, the Cognitive Load Index was developed as a conceptual model for assessing the cognitive load experienced by members of project teams. The model was grounded in a review of the literature on project management and cognitive load theory, and it proposes integrating five variables considered relevant to assessing cognitive demands: perceived stress, mental fatigue, multitasking, ability to concentrate, and task clarity. By aggregating these dimensions into a single indicator, the CLI supplements traditional performance assessment methods and provides an additional perspective on how team members' cognitive states may influence project execution.

Although developing a conceptual model is an important step, its practical value depends on whether it can be used via a user-accessible tool. Without a software implementation, calculating the index,

interpreting the results and monitoring its development over time may be difficult in project managers' day-to-day work. Transforming the conceptual model into a software application is therefore a necessary stage in assessing its applicability and integrating it into the project management process.

Prototyping is one of the most widely used methods in software application development because it enables functionalities to be tested, workflows to be organised and the user experience to be assessed before the application is implemented. Particularly in interface design, platforms such as Figma facilitate the development of interactive prototypes that simulate the main functionalities and enable assessment of how users interact with the system. Prototypes also support identifying potential usability problems at an early stage and allow the solution to be optimised before the final version is developed.

This article addresses the design and development of a functional prototype that implements the Cognitive Load Index model in an application intended for project management. Developed in Figma, the prototype demonstrates how the conceptual model can be translated into a software solution capable of collecting data, calculating the index value and presenting the results in an intuitive, readily interpretable manner. The application also integrates project-management functionalities, including project and team administration, activity management and the visualisation of relevant indicators in a unified dashboard.

The principal contribution of this article is the translation of a theoretical model into a software prototype that demonstrates the practical value of the Cognitive Load Index. Unlike the initial research, which focused on establishing the conceptual framework for and developing the conceptual model, the present study concentrates on designing the digital solution and analysing how the indicator can be integrated into a tool for project managers. The two stages of the research therefore complement each other: the first defines the conceptual framework of the index, while the second demonstrates that it can be implemented in a software application, representing an important step towards developing a functional solution for use in organisational settings.

2. LITERATURE REVIEW

Software applications dedicated to project management have developed significantly in recent years against a background of organisational process digitalisation and increasing project complexity. Whereas early software solutions focused primarily on activity planning and deadline monitoring, modern applications integrate complex functionalities that facilitate collaboration among team members, resource administration, communication and performance-indicator analysis. In this context, project management applications have become decision-support tools, giving users rapid access to relevant information on project execution and the progress of activities [1].

An essential feature of these applications is the use of dashboards, which make it possible to summarise a large volume of information in an easily interpretable interface. Dashboards bring relevant indicators together in a single workspace and facilitate continuous project monitoring, the rapid identification of deviations and support for decision-making. The literature indicates that a dashboard's effectiveness depends not only on the information displayed, but also on how that information is organised and presented to the user. A clear, structured, and interactive design reduces the time required to interpret information and improves decision-making [2].

Alongside the development of dashboards, recent research emphasises the importance of digital tools that provide real-time information on project progress. Integrating data from team activities, project documentation and other digital sources provides an overview of the state of a project and facilitates the early identification of risks or situations that may affect team performance. These tools improve project monitoring and support managers in making decisions based on up-to-date data [2], [3].

In addition to the functionalities provided, the success of a software application is influenced to a considerable extent by user experience (UX) and user-interface (UI) design. An intuitive, logically organised interface adapted to users' needs reduces the cognitive effort required to interact with the application and facilitates the efficient use of the available functionalities. The literature emphasises that UX/UI design should be integrated from the early stages of application development because decisions concerning information organisation, navigation and workflows directly influence the system's efficiency and degree of user acceptance [4].

Prototyping is therefore an important stage in software application development. Developing a

prototype makes it possible to simulate the system's principal functionalities, evaluate navigation flows and identify potential usability problems before the application is implemented. Recent literature points out that prototypes are not exclusively a technical stage in the development process, but also a tool that facilitates communication between developers and users and contributes to improving the quality of the final product [5].

Specialised UX/UI design platforms are frequently used to develop interactive prototypes, and Figma is one of the most widespread. The platform enables interface design, the simulation of navigation flows and real-time collaboration among members of the development team. Because of these functionalities, Figma is used in both academic and workplace settings to design and validate software concepts before implementation. In the present research, Figma was selected as the prototype development environment because it enables the application's full range of functionalities to be simulated and makes it possible to assess how the Cognitive Load Index can be integrated into an interface intended for project management [4].

The literature review highlights the importance of dashboards, interface design and prototyping in developing software applications for project management. Building on these aspects, the present article continues the research on the Cognitive Load Index by translating the previously developed conceptual model into a software prototype. The purpose of this stage is to demonstrate how the index can be integrated into a project management application and used to monitor team members' cognitive load, thereby assisting monitoring and decision-making.

3. METHODOLOGY

The purpose of this article is to develop a software prototype that implements the Cognitive Load Index model presented in the previous stage of the research. To achieve this objective, the study used design science research, an approach frequently employed in research aimed at developing information-technology solutions to practical problems. In this case, the research outcome is not merely a theoretical analysis, but a prototype demonstrating how the conceptual model can be used in an application intended for project management.

Principles of user-centered design were also applied throughout prototype development. This approach was selected to guide the design of an easy-to-use application in which information is clearly organised and users can rapidly access the functionalities they need. Rather than creating an overloaded interface, the aim was to develop a simple, intuitive navigation flow so that users could interact with the application without difficulty.

The prototype was developed in Figma, which was used to design the interfaces and simulate the application's functionalities. The platform was selected because it supports the development of interactive prototypes that simulate how users will use the application before it is implemented. Figma also facilitates rapid interface modification and the testing of several information-organisation variants without requiring the application itself to be developed.

3.1 Defining the application requirements

Prototype design began by identifying the functionalities that the application needed to provide. These were established on the basis of the structure of the Cognitive Load Index model and the activities specific to project management. The objective was to develop an application that would support both project and team administration and the monitoring of team members' cognitive load.

From a functional perspective, the application supports user authentication, project administration, the management of activities and team members, completion of the questionnaire used to calculate the CLI, and the display of results in a dedicated dashboard. Functionalities were also envisaged for tracking changes in the index over time and visualising the principal project indicators.

The interface was also designed to meet user-experience requirements. Information was grouped logically, menus were simplified and visual elements were kept consistent across all application screens. These measures were intended to reduce the time required to use the application and facilitate interpretation of the information displayed.

3.2 Application users

The application was designed for two principal categories of users: project managers and members of project teams.

Managers have access to project-administration functionalities: they can create and modify projects,

manage team members and analyse CLI values for each user. They can also track the development of indicators through dashboards and identify situations in which the level of cognitive load may influence the execution of activities.

Team members use the application to manage their own activities, complete the assessments required to calculate the CLI and consult information on the projects in which they are involved. Separating functionalities according to user role contributes to a more efficient organisation of the application and simplifies interaction with the system.

3.3 Prototype functionalities

Based on the previously defined requirements, a prototype was designed to reproduce the application's principal functionalities.

It includes pages for authentication and registration, project administration, team and activity management, completion of the cognitive-load assessment questionnaire, automatic calculation of the CLI value, and display of the results in an interactive dashboard. Users can also view changes in the index through graphical representations and consult recommendations generated according to the level of cognitive load.

4. PROTOTYPE DEVELOPMENT

4.1 Functional and non-functional requirements of the application

The application's functional and non-functional requirements were defined before the prototype was developed. They provided the basis for interface design and helped establish the functionalities required to implement the Cognitive Load Index model.

Table 1. Functional requirements

Code	Functional requirement	Description
CF1	User management	Administration of users and the team.
CF2	CLI data entry	Entry of values for the five cognitive variables.
CF3	CLI calculation	Automatic calculation of the CLI.
CF4	Display of results	Visualisation of the level of cognitive load.
CF5	Performance monitoring	Display of project and team indicators.
CF6	Comparison of results	Comparison of CLI values among users.
CF7	Graphical visualisation	Representation of data through graphs and dashboards.
CF8	Alerts	Flagging of high levels of cognitive load.
CF9	Data updating	Modification of the information entered.
CF10	Data centralisation	Visualisation of individual and team data.
CF11	CLI history	Tracking of changes in the index over time.
CF12	Decision support	Provision of information for team analysis.

The functional requirements describe the operations that the application must perform to support users in managing projects and monitoring cognitive load. These include managing users and projects, entering the data required to calculate the Cognitive Load Index, displaying the results and monitoring the indicator's development over time. Table 1 summarises the principal functional requirements identified during the analysis process.

The analysis of functional requirements showed that the application must integrate both functionalities specific to project management and components dedicated to cognitive-load assessment. These requirements formed the basis for defining the structure of the application and organising the principal screens developed in the prototype.

In addition to the functionalities provided, the application was designed to meet non-functional requirements that influence the quality of the user experience and the way the application is used. These requirements concern ease of use, clarity of information, interface consistency, accessibility and the possibility of extending the application in future stages of development. Particular attention was given to ensuring a responsive and intuitive interface that enables users to complete tasks with minimal effort and without requiring extensive training. The application also prioritises reliability by providing consistent behaviour across different usage scenarios and preventing common input errors through validation mechanisms. Furthermore, the modular architecture facilitates future enhancements, allowing additional functionalities and analytical components to be integrated without significantly affecting the

existing system. The principal non-functional requirements are presented in Table 2.

Table 2. Non-Functional Requirements

Code	Non-functional requirement	Description
CNF1	Ease of use	Intuitive, easy-to-use interface.
CNF2	Clarity of information	Clear display of data and indicators.
CNF3	Response time	Rapid updating of information.
CNF4	Visual consistency	Consistent design across all screens.
CNF5	Compatibility	Use on desktop devices.
CNF6	Reliability	Correct display of data and results.
CNF7	Scalability	Possibility of extending the application.
CNF8	Accessibility	Simple, readily understandable organisation.
CNF9	Data organisation	Logical structuring of information.
CNF10	Availability	Rapid access to application information.

Meeting these requirements contributed to the development of an easy-to-use, well-organised prototype in which information is presented clearly and accessibly. Defining the requirements during the design phase also facilitated the structuring of the interfaces and the establishment of the navigation flows used in the application.

4.2 User Flow Design

The main user flow was also defined in order to organise the sequence of actions performed by users within the application. Defining this flow made it possible to establish the relationships among the principal functionalities and design a logical navigation structure adapted to activities specific to project management.

The user flow begins with authentication, after which the user is directed to the application's main dashboard. Depending on their role, the user can access modules dedicated to project administration, team management, activity organisation and cognitive-load assessment. Navigation among the modules was designed so that frequently used information could be accessed rapidly and the number of steps required to perform an action could be reduced.

In addition, the User Flow structure (Figure 1) was designed to integrate the CLI calculation process into the application's normal user flow. Data entry, index calculation and result display are therefore integrated into a logical sequence of steps without interrupting activities specific to project management.

The diagram highlights the principal navigation paths

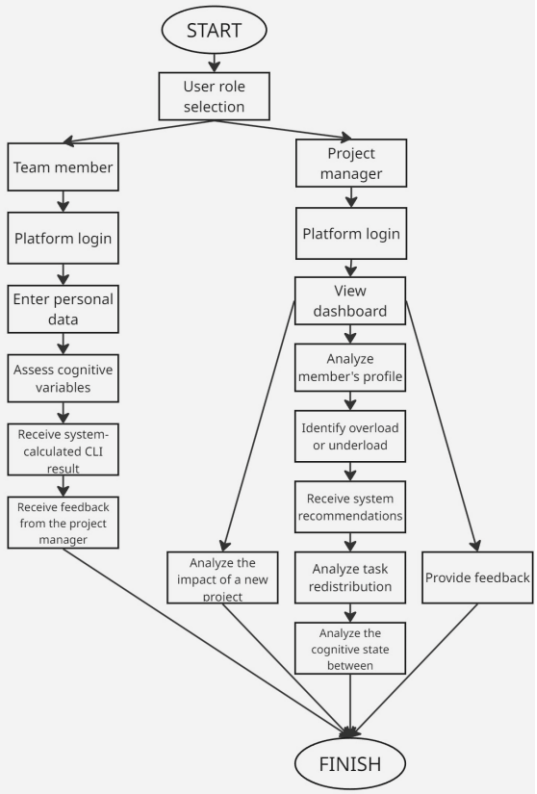

Figure 1. User Flow

available in the application and how its functionalities are connected. The organisation of the user flow was intended to reduce navigation complexity and facilitate access to relevant information, thereby contributing to the development of an intuitive, easy-to-use interface.

After authentication, team members enter their personal information and complete the assessment of the five variables used to calculate the CLI. On the basis of the responses entered, the application automatically calculates the index value and displays the result to the user. The user subsequently receives feedback from the project manager, and the information is used in the team-monitoring process.

For the project manager, the user flow is oriented towards analysis and decision support. After accessing the dashboard, the manager can consult team-member profiles, identify situations of cognitive overload or underload and analyse the recommendations generated by the system. The application also enables the manager to assess task redistribution, analyse the impact of a new project on

the team and provide feedback to team members involved in the project.

This flow is organised to integrate cognitive assessment into routine project management activities without altering the team's usual working process. At the same time, separating functionalities according to user role simplifies navigation and supports the efficient use of the information available in the application.

4.3 Prototype Screens

On the basis of the previously defined requirements and user flow, the application prototype was developed in Figma. The interfaces were designed to give users rapid access to the principal functionalities while maintaining a consistent visual structure and intuitive navigation.

4.3.1 Authentication and access

The application's first interface (Figure 2) is the entry point to the platform and allows users to select their role within the project. Depending on the option selected, the user is directed to the workflow corresponding to the role of project manager or team member.

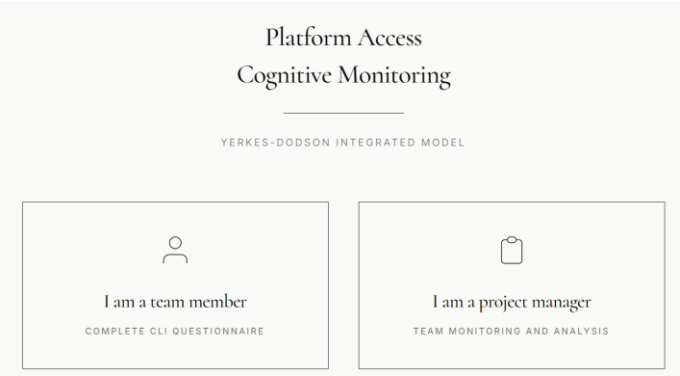

Figure 2. Platform access and user role selection

This separation was introduced to adapt the application's functionalities to the responsibilities of each user category and to simplify navigation.

The interface was designed to make access to the platform as intuitive as possible by using a limited number of visual elements and a clear structure. Selecting the role at the first stage makes it possible to configure the user path and display only the functionalities relevant to that user. In this way, the application avoids overloading the interface and enables swift access to the system's principal modules.

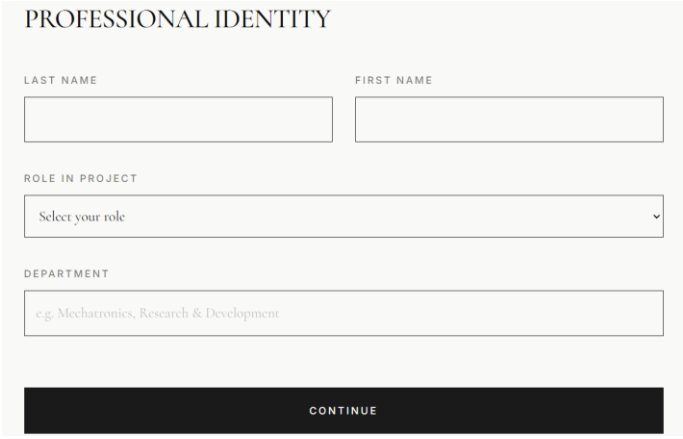

Figure 3. Data entry window for team members

When accessing the application as a team member, the system additionally requests identification data (Figure 3), including the user's surname, first name, role within the project and department. This information is used not only for identification, but also to segment and contextualise the data collected. It thereby supports detailed team-level analyses, such as comparing cognitive load among different roles or departments, detecting areas with a high potential for overload and informing managerial decisions.

For users acting as project managers, the authentication process is simplified and requires only authentication by an institutional email address and the project code. Once authenticated, they have access to extended functionalities focused on monitoring and analysing team performance, without needing to enter additional profile data (Figure 4).

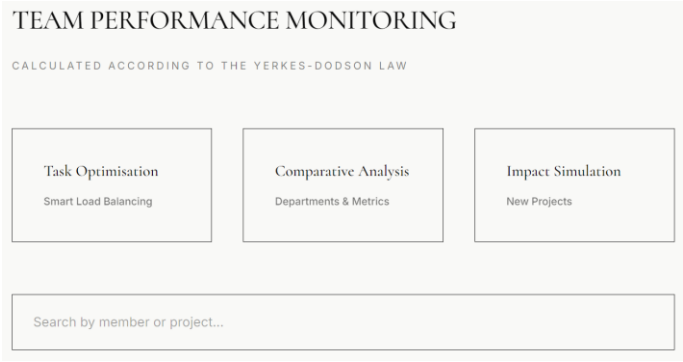

Figure 4. The main window after the project manager logs in

The authentication module performs an essential role in the application's architecture by ensuring access control, data security and personalisation of the user experience. At the same time, it contributes to structuring the system's database and facilitates the organisation of information according to project, role and organisational context.

4.3.2 Cognitive task assessment window

After completing the authentication process, the user accesses the cognitive task assessment module, a central component of the application responsible for collecting the data required to calculate the CLI. This module is implemented as an interactive questionnaire based on the five cognitive variables defined in the theoretical model: stress level, mental fatigue, multitasking, ability to concentrate and task clarity.

The assessment uses a numerical scale from 1 to 5, on which the values indicate the apparent intensity of each variable (Figure 5). This scale provides a simple and intuitive means of quantifying cognitive state while permitting data to be compared across users and assessment points. The interface is designed so that each variable is assessed individually using a slider, which gives the user simple visual control over the selected value.

To increase answer precision and reduce ambiguity, each variable is associated with a specific question formulated to reflect concrete situations in professional activity. Stress level is assessed through the question, 'What level of stress do you experience in relation to deadlines?'; mental fatigue is determined through the question, 'How would you rate your level of mental exhaustion at present?'; as well as multitasking is analysed through the question, 'How many tasks are you managing simultaneously at this stage?'. Ability to concentrate is assessed through the question, 'How easy is it for you to maintain your attention on a task?', while task clarity is determined through the question, 'To what extent do you understand the responsibilities associated with your tasks?'.

The system requires all items to be completed before the data are submitted, thereby preventing missing values and guaranteeing the integrity of the dataset used to calculate the index. Once the assessment has been completed, the user submits the responses to the system, triggering the cognitive-load index calculation process.

After completing the questionnaire, the user receives immediate confirmation that the responses have been successfully recorded. The collected values are then validated and prepared for processing by the cognitive-load calculation algorithm. This automated process ensures that all responses are consistently interpreted and converted into the corresponding numerical input required for the Cognitive Load Index. The interface provides a smooth transition between the assessment stage and the results section, maintaining a responsive and user-friendly experience. By automating data validation and processing, the system minimizes the risk of errors while ensuring reliable and reproducible assessment results.

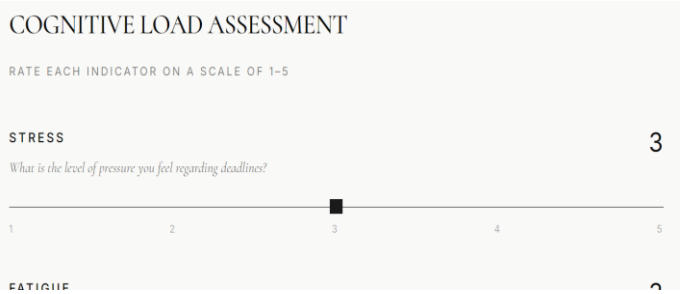

Figure 5. Window for assessing cognitive variables using a 1-to-5 scale

The interface is designed so that each variable is assessed individually using a slider, which gives the user simple visual control over the selected value.

On the basis of the data entered by the user, the system calculates the cognitive-load index using the mathematical model defined in the previous chapter. The process entails aggregating the five cognitive variables, each with an identical weight of 0.2, so that the weights sum to 1. In the calculation, variables that have an inverse effect on cognitive load are adjusted to ensure a consistent interpretation of the index.

The CLI is therefore determined as a weighted sum of the variables, in accordance with the scale used at the assessment stage. After submitting the responses, the user is directed to an interface where they can view the numerical value of the index together with the interpretation corresponding to the level of cognitive demand.

Figure 6. Window for viewing the CLI index value

To preserve transparency, the application provides direct access to the individual's score (Figure 6), helping users become aware of their cognitive state. The system also includes a notification mechanism through which the user can receive feedback from the

project manager, consequently facilitating the assimilation of results into the team-management process.

4.3.3 Team monitoring module

When accessing the application as a project manager, the user is directed to a dashboard dedicated to team monitoring (Figure 7), which centralises relevant information on team members' cognitive load. This module displays CLI values for all project members, providing an overview of the distribution of cognitive demands across the team and facilitating the rapid identification of imbalances.

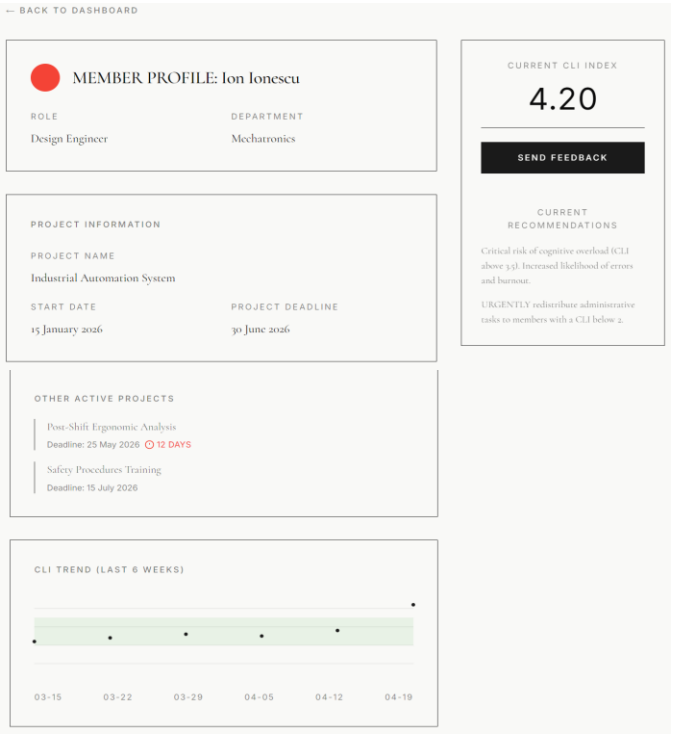

Figure 7. Project member analysis form

The interface includes search and filtering functionalities that enable the manager to identify team members rapidly and analyse individual situations. Detailed information can be accessed for each user, including their name, role in the project, department, associated projects and period of activity. The system also makes it possible to view changes in the CLI over time in graph form, enabling trends to be analysed and variations in cognitive demands to be identified.

An important element of the module is the possibility of interacting directly with team members by providing personalised feedback. This functionality enables the manager to step in swiftly in situations of overload or underload, helping to balance task distribution and optimise team performance.

4.3.4 Advanced features of the prototype

The project manager's interface embeds advanced functionalities oriented towards decision support and the optimisation of task distribution within the team. These functionalities use cognitive-load index values to provide a analytical perspective on the state of the team and facilitate managerial interventions.

The task-optimisation functionality identifies imbalances within the team by comparing CLI values among members. On the basis of these differences, the system suggests redistributing tasks between underloaded and overloaded members, thereby helping to balance cognitive demands and increase work efficiency (Figure 8).

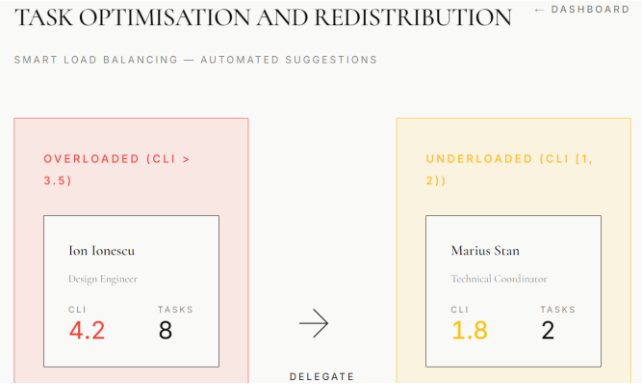

Figure 8. Task optimization and redistribution window

The optimisation interface presents the recommended task redistribution in a clear and intuitive visual format, allowing the project manager to quickly identify overloaded and underloaded team members. The proposed recommendations are generated automatically based on the calculated CLI values, providing objective support for workload balancing. By highlighting cognitive-load disparities within the team, the system facilitates informed managerial decisions and contributes to a more efficient allocation of responsibilities. This functionality helps reduce the risk of employee overload while promoting a more balanced and productive working environment.

The comparative-analysis functionality makes it possible to assess differences in cognitive demands among departments, teams or work groups. It supports the identification of areas with high levels of mental load, thereby facilitating corrective measures at organisational level. This functionality is illustrated in Figure 9.

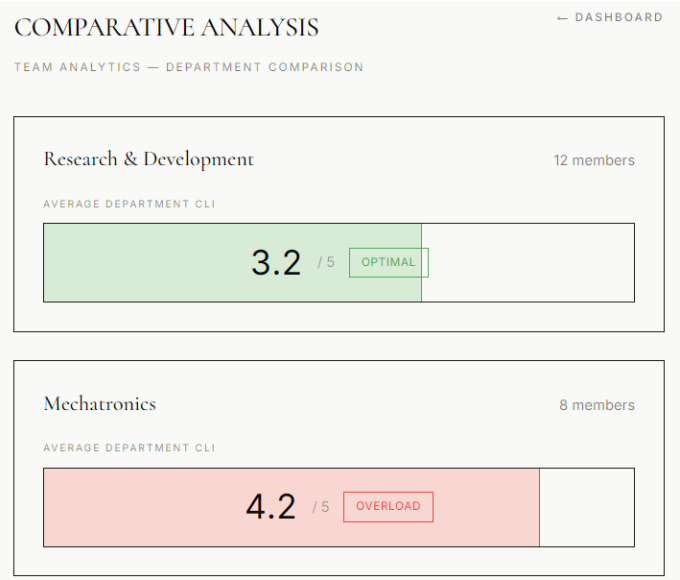

Figure 9. Department comparison analysis window

The impact-simulation functionality (Figure 10) makes it possible to estimate how the cognitive-load index would develop if new requirements or projects were introduced. By simulating hypothetical scenarios, the manager can anticipate effects on the team and make informed decisions regarding resource allocation and activity planning.

Figure 10 shows that adding a new project with a complexity level of 2 for this team produces a favourable forecast; the project manager can therefore continue planning the project concerned.

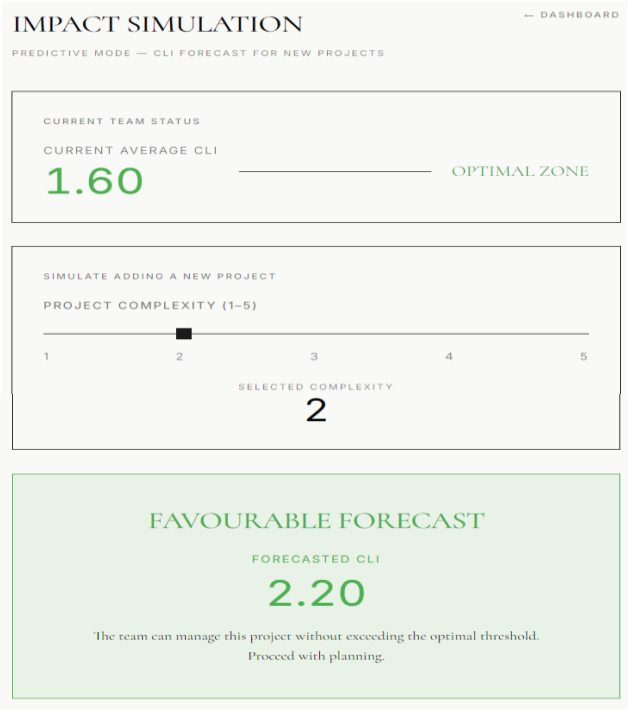

Figure 10. Add another project simulation window

4.3.5 Feedback and interaction module

The manager can provide individual feedback to team members, as illustrated in Figure 11, on the basis of cognitive-load index values and the information available in the application. This mechanism enables recommendations to be tailored to each user's level of cognitive demand, helping to adjust working practices and improve individual performance.

The feedback provided may concern matters such as task redistribution, activity prioritisation or measures to reduce overload when CLI values are high. Similarly, in situations of underload, the manager may encourage greater involvement or allocate additional responsibilities.

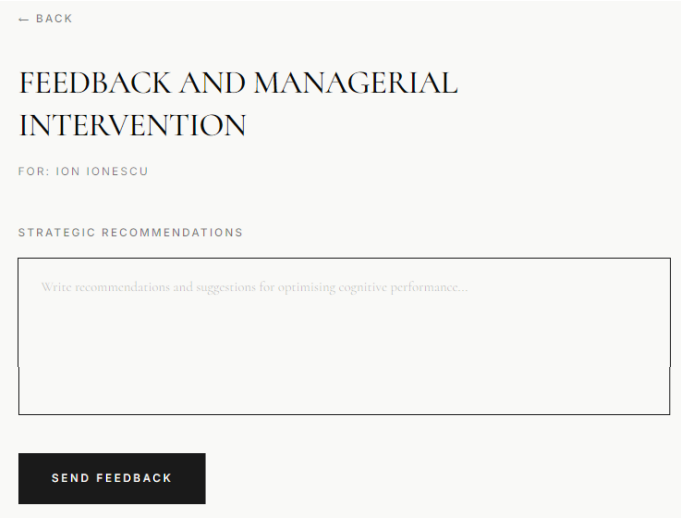

Figure 11. The project manager's feedback option for project members

Functionally, the messages sent by the manager are integrated into the application's notification system and are visible to the user in their personal interface. This approach facilitates direct and rapid communication between the manager and team members without requiring external communication channels.

By introducing this module, the application is not limited to monitoring cognitive load; it actively supports team management by providing an intervention mechanism based on concrete, up-to-date data.

4.4 Integration of the database and intelligent decision-support mechanisms

Efficient operation of the prototype requires the integration of a database that supports the storage, organisation and updating of information associated with the users and projects analysed. The database is

the central component of the system and manages both team members' identification information and the data generated by cognitive assessments conducted through the application.

This structure stores information including users' names, their roles in the project, their departments, the projects in which they participate, the history of CLI assessments and the development of recorded values over the course of project activities. By centralising these data, the application can monitor team members individually and comparatively and analyse variations in cognitive demands over time.

Integrating the database also enables CLI values to be correlated with particular organisational or operational contexts. The system can therefore identify situations in which team members are simultaneously involved in several projects, differences between departments or imbalances in task distribution. This information provides a clearer perspective on the relationship between cognitive load and team performance.

For the prototype's advanced functionalities, the integration of a decision-support mechanism based on artificial intelligence algorithms is proposed. This component is intended to analyse CLI values and generate suggestions concerning task redistribution, the identification of overload risk and the optimisation of activity volume at team level.

The intelligent system uses the data collected to identify patterns of cognitive load and formulate indicative recommendations for the project manager. For example, when particular individuals record high CLI values over consecutive periods, the application suggests redistributing some activities to members in the optimal or underload range. Similarly, the system can flag imbalances between departments or estimate the cognitive impact that introducing a new project would have on the team.

The artificial intelligence component is not intended to make autonomous decisions and does not replace managerial responsibility. Its role is exclusively supportive: it provides recommendations based on analysis of the data collected. Final decisions on task redistribution, changes to priorities or the reorganisation of activities remain entirely the responsibility of the project manager.

Integrating a database and a decision-support mechanism extends the prototype beyond a monitoring function, transforming it into a tool capable of supporting the analysis and management of team performance in contexts characterised by high cognitive demands.

4.5 Technologies used to develop the prototype

The application prototype was developed using tools and technologies that support interface design, the organisation of navigation flows and the simulation of the application's principal functionalities. These were selected with the objective of creating an easy-to-use prototype that illustrates how the proposed cognitive model can be integrated into a digital tool for monitoring project-team performance.

The principal technology used to develop the prototype was Figma, which supported the design of the graphical interface and the development of the navigation flow among application screens. Figma made it possible to develop an interactive prototype in which the application's principal functionalities can be simulated, including user authentication, completion of cognitive assessments, dashboard visualisation and analysis of results at both team and individual level.

A modular approach was used to organise the information and define the structure of the application, with each module associated with a principal system functionality. The prototype therefore includes modules dedicated to authentication, cognitive assessment, calculation of the cognitive-load index, team monitoring and feedback generation.

The prototype architecture was designed to support subsequent integration with a database and the development of a fully functional application. The structure developed at conceptual level can thus provide the basis for the subsequent implementation of a software system for monitoring cognitive performance in project management.

5. DISCUSSION

5.1 Contribution of the proposed prototype

The development of the prototype presented in this research demonstrates that the Cognitive Load Index model can be translated into a software application for monitoring project teams. Unlike traditional project management tools, which primarily track activity progress, adherence to deadlines or resource allocation, the proposed application introduces an

additional perspective on how team members manage the cognitive demands generated by their work.

Platforms such as Jira, Trello, Asana and Monday.com currently provide complex functionalities for project planning, task tracking and collaboration among team members. These applications facilitate the organisation of activities and the monitoring of project progress, but performance is assessed primarily through operational indicators such as activity status, adherence to deadlines or degree of project completion [6]. In the proposed prototype, this information is supplemented by integrating the Cognitive Load Index, which gives the manager an additional perspective on team members' cognitive demands.

Integrating this type of information may help identify at an early stage situations in which cognitive load becomes high and may affect individual or collective performance. The project manager thus has additional information that can support decisions on activity allocation, resource planning or task reorganisation in response to changes within the team. Although the prototype does not replace the functionalities available in established project management applications, it demonstrates how cognitive indicators can complement the tools already used in practice.

The research also highlights that translating a conceptual model into a software prototype is an important stage in developing digital solutions for project management. The prototype provides a starting point for the development of a functional application and enables assessment of how users interact with the interface and interpret the information presented. From this perspective, the research contributes both to the development of the CLI model and to the exploration of opportunities for integrating cognitive indicators into software tools used in project management.

5.2 Practical benefits of the proposed prototype

Implementing an indicator such as the Cognitive Load Index in a project management application can provide information additional to that supplied by commonly used indicators. Whereas most existing platforms make it possible to monitor activity progress, completion deadlines and degree of project completion, they provide limited information about how team members experience the demands generated by their work. Integrating the CLI supplements this perspective by introducing a cognitive dimension into team performance monitoring [6].

By centralising information on stress levels, mental fatigue, ability to concentrate, multitasking and task clarity, the project manager can obtain a broader view of how the team's cognitive state evolves over the course of the project. This information is not intended to assess individual team members; rather, it provides additional support for identifying situations that may influence the execution of activities and the achievement of project objectives.

Another benefit of implementing the CLI is the possibility of monitoring changes in cognitive load over time. Analysing trends can help identify periods during which the team is exposed to high demands and can provide the manager with useful information for planning activities or redistributing responsibilities. Decisions are therefore no longer based exclusively on operational indicators, but can also take account of how team members manage the cognitive demands associated with the project.

Integrating the CLI into a software application also establishes a basis for developing digital tools capable of combining traditional project management indicators with information on human factors. Such an approach may contribute to a more comprehensive understanding of team performance and may represent a direction for the development of future software solutions dedicated to project management [7].

6. CONCLUSIONS

The article aimed to develop a software prototype for implementing the Cognitive Load Index model proposed in the first part of the research. Whereas the previous article focused on establishing the theoretical foundation for and defining the index, this stage addressed the translation of the model into a software interface capable of supporting cognitive-load monitoring within project teams.

The prototype demonstrates how information on cognitive demands can be integrated into an application dedicated to project management. By defining functional and non-functional requirements, designing the user flow and developing the interfaces, the research demonstrates the feasibility of implementing the CLI model in a digital tool intended for project managers and team members.

One of the prototype's principal advantages is that it integrates cognitive-load assessment into routine project management activities without significantly changing users' working practices. The application therefore provides a means of continuously monitoring the state of the team and may serve as a starting point for better-informed decisions on activity allocation and human-resource management.

The research nevertheless has several limitations. The prototype developed represents a design stage rather than a fully functional software application, and the functionalities presented were validated at conceptual level by simulating user interaction in Figma. Furthermore, the application has not yet been evaluated in real projects or through analysis of the user experience.

7. REFERENCES

[1] B. Hicks, S. Culley, J. Gopsill, and C. Snider, "Managing complex engineering projects: What can we learn from the evolving digital footprint?," *Int. J. Inf. Manage.*, vol. 51, p. 102016, Apr. 2020, doi: 10.1016/J.IJINFOMGT.2019.10.001.

[2] K. A. Saeed, D. Wu, and D. J. Xu, "Effect of Designer- versus User-driven Network-monitoring Dashboard Design on User Flow Experience and Performance: The Role of Augmented Virtuality," *Information & Management*, vol. 61, no. 3, p. 103926, Apr. 2024, doi: 10.1016/J.IM.2024.103926.

[3] J. Pedrosa, L. G. Magalhães, and R. Martinho, "Process Mining for IS Project Management:," *Information Resources Management Journal*, vol. 38, no. 1, Jan. 2025, doi: 10.4018/IRMJ.373155.

[4] A. Hinderks, F. J. Domínguez Mayo, J. Thomaschewski, and M. J. Escalona, "Approaches to manage the user experience process in Agile software development: A systematic literature review," *Inf. Softw. Technol.*, vol. 150, p. 106957, Oct. 2022, doi: 10.1016/J.INFSOF.2022.106957.

[5] S. Paust, C. Thrane, and S. Korsgaard, "An integrative literature review of prototyping in management research: Definition and research agenda," *Journal of Business Venturing Design*, vol. 4, p. 100026, Dec. 2025, doi: 10.1016/J.JBVD.2025.100026.

[6] C. Marnewick and A. L. Marnewick, "Digitalization of project management: Opportunities in research and practice," *Project Leadership and Society*, vol. 3, p. 100061, Dec. 2022, doi: 10.1016/J.PLAS.2022.100061.

[7] O. M. Yigitbasioglu and O. Velcu, "A review of dashboards in performance management: Implications for design and research," *International Journal of Accounting Information Systems*, vol. 13, no. 1, pp. 41–59, Mar. 2012, doi: 10.1016/J.ACCINF.2011.08.002.