Redesign of the Web User Interface for the FRI Urnik

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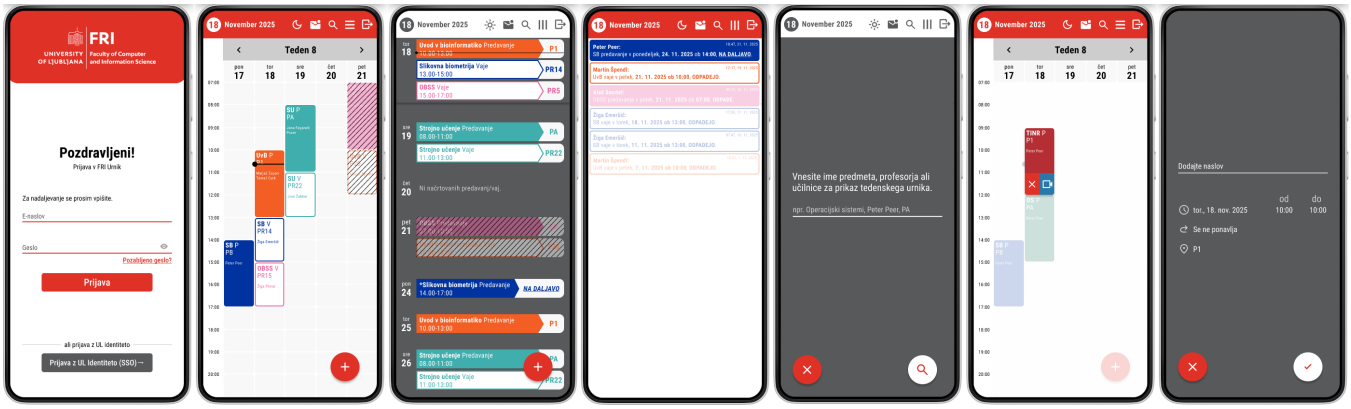

Figure 1: Selected design frames of the redesigned FRI Urnik, illustrating key layout concepts for mobile view.

Abstract

This project presents the redesign of the web user interface for the FRI Urnik application used at the Faculty of Computer and Information Science, University Ljubljana. The redesign process was grounded in a user-centered design approach and informed by a comprehensive analysis of user needs and behaviors. We employed qualitative methods, including persona creation and user journey mapping, to better understand key usage scenarios and pain points. In addition, a user survey was conducted to collect requirements and expectations regarding schedule management. Existing solutions, such as Google Calendar and eAsistent, were analyzed to identify relevant design patterns and best practices. Based on these insights, initial concepts were explored through paper prototyping, followed by the development of two high-fidelity prototypes: a mobile version and a desktop version, both implemented in Figma. The resulting designs aim to improve usability, clarity, and accessibility of the scheduling interface while better supporting the daily workflows of students and staff.

Keywords

Human–computer interaction, User experience design, Interface redesign, Scheduling application

1 Introduction

Scheduling systems play an important role in supporting the daily activities of students and academic staff. At the Faculty of Computer and Information Science (FRI), University of Ljubljana, the existing web-based scheduling application is widely used but exhibits several usability and interaction issues that limit its effectiveness. These issues include unclear information hierarchy, limited support for mobile use, and lack some key features, such as notifications, personalized view, event adding, etc. The goal of this project was to redesign the web user interface of the FRI scheduling application using a user-centered design approach. By combining user research methods, requirement gathering, and iterative prototyping, we aimed to improve usability, clarity, and overall user experience.

2 Analysis of Existing Solutions

As part of the design process, existing scheduling solutions were analyzed to identify relevant features and design patterns. Google Calendar was examined as a widely adopted general-purpose scheduling tool. It provides comprehensive support for creating, editing, and deleting events, along with color-coding of calendars and event types to improve visual differentiation. The system offers multiple calendar views, including daily, multi-day, weekly, and monthly layouts, enabling users to flexibly inspect their schedules. Additional features such as configurable reminders, quick-access controls for adding events and navigating to the current time, integration with

Google Meet for video conferencing, and support for dark mode contribute to its usability and adaptability across contexts.

In contrast, the Slovenian application eAsistent was analyzed as a domain-specific scheduling system tailored to educational environments. It focuses on clear presentation of daily, weekly, and subject-based schedules, with explicit labeling of activities, classrooms, and instructors. Color differentiation of subjects and automatic schedule updates help users quickly recognize changes, which are further supported by notifications about modifications to the timetable. eAsistent also allows users to add custom events and reminders, complementing the predefined academic schedule. Insights from both systems informed the redesign by combining the flexibility and interaction patterns of Google Calendar with the clarity and domain-specific structure of eAsistent.

3 Methodology

The project followed a user-centered design methodology consisting of several sequential and iterative phases:

(1) ***User Analysis*** The process began with an analysis of users and their needs, combining qualitative and quantitative approaches. *Personas* were created to represent key user groups of the scheduling system, while *user journey mapping* was used to capture typical usage scenarios and identify pain points. In addition, a *user survey* was conducted to gather broader insights into user requirements, expectations, and current challenges related to schedule management.
(2) ***Analysis of Existing Solutions*** In parallel, existing scheduling solutions were analyzed to identify relevant design patterns and best practices. This analysis focused on general-purpose tools as well as domain-specific applications and informed early design decisions. More details can be found in Section 2.
(3) ***Iterative Development*** Based on the collected insights, initial design concepts were explored through low-fidelity *paper prototyping*, allowing for rapid iteration and evaluation of core layout and interaction ideas. The later stages of the project focused on the development of high-fidelity interactive prototypes. Both mobile and desktop versions of the interface were designed and refined through two iterative cycles using *Figma*. Each iteration incorporated feedback from previous phases and aimed to progressively improve usability, consistency, and alignment with user needs.

The outcomes of these design activities are presented in the following section.

4 Results

4.1 User Analysis

4.1.1 Personas. The user analysis revealed two primary user groups with distinct but overlapping needs: **students** and **professors**. Students typically attend multiple courses, each consisting of lectures and several exercise groups, which results in complex and frequently changing schedules. The analysis showed that students require a fast and clear visualization of their timetable, with an emphasis on mobile accessibility, high visual contrast, and the ability to personalize the displayed information. Minimizing the time spent on schedule organization was identified as a key goal, as students want to focus on their academic and extracurricular activities rather than administrative tasks. Professors, on the other hand, often manage multiple courses and are responsible for coordinating lectures and numerous exercise groups. Their primary need is a simple, efficient, and centralized interface that enables quick schedule updates and reliable communication with students. The findings indicate that professors aim to reduce administrative overhead while ensuring that students are timely and accurately informed about schedule changes. A personalized view of the schedule was also highlighted as important, allowing professors to focus only on relevant activities.

4.1.2 Journey Map. The user journey map in Table 1 highlights three key stages in the interaction with the FRI scheduling system: **schedule creation**, **schedule review**, and **schedule change management**. At the beginning of the academic year, both students and professors manually construct their schedules by comparing multiple lectures, lab groups, and related events, which often leads to cognitive overload, disorganization, and significant time investment. During regular schedule review, users frequently check the timetable to determine what, where, and when the next activity takes place; however, the current system requires multiple interactions to access this information, resulting in uncertainty and confusion. Schedule changes represent the most critical stage of the journey, as updates are primarily communicated via email, which users may overlook or receive too late. This reliance on external communication channels causes frustration for students and increases the administrative burden on professors, who must manually notify participants of changes. The journey map therefore reveals clear opportunities for improvement, particularly in providing a centralized, in-app overview of upcoming activities, better visualization of available options, and automated notifications to support timely and reliable communication.

4.1.3 User Survey. A user survey was conducted to collect quantitative and qualitative insights into the usage patterns, satisfaction levels, and expectations related to the current FRI scheduling system. A total of **40 participants** responded to the survey, including **75% students**, **15% professors**, and **10% teaching assistants**. The results indicate that the system is frequently used, with 70% of respondents accessing it several times per week and an additional 15% using it multiple times per week. The primary use case is reviewing daily lectures and exercise sessions (92.5%), followed by searching for non-assigned courses (42.5%) and long-term planning (32.5%). Most users access the system on mobile devices (67.5%), highlighting the **importance of mobile-first design**.

Overall satisfaction with the current version of the FRI schedule is **moderate to low**. While 55% of respondents rated their satisfaction as average (score 2 or 3 on a five-point Likert scale), no respondents reported being very satisfied. Similar trends were observed for layout clarity and ease of finding information, where lower and middle ratings dominated. The most frequently reported issues include poor mobile adaptation (75%), lack of clarity (62.5%), limited functionality (52.5%), and difficulty tracking schedule changes (45%).

Table 1: User journey map illustrating key stages of using current FRI Urnik application.

Stage	Actions	Touchpoints	Emotions	Pain Points	Opportunities
Beginning of the academic year	The student/professor manually creates a schedule according to personal preferences.	FRI scheduling web application (mobile).	Distraction, lack of organization.	A significant amount of time is spent comparing different lab groups, lectures, and other events in order to create an optimal schedule.	Visualization of all available labs and schedule personalization (adding events).
Schedule review	The student/professor repeatedly checks what, where, and when the next scheduled activity takes place.	FRI scheduling web application (mobile).	Uncertainty, confusion.	Too many interactions are required to access the desired information.	Quick overview of the next scheduled activity.
Schedule change	The student receives an email notification about changes to lectures or labs from the professor.	Outlook.	Panic, frustration, anger.	The student does not see the notification in time or does not receive it at all. The professor must manually notify students about changes via email.	In-app notification review, event status updates in the schedule, and automated notifications to students.

Open-ended responses further emphasized the need for improved readability, intuitive navigation, personalization, and timely notifications. Users repeatedly highlighted the importance of clear visual separation between days, explicit display of start and end times, filtering options, and the ability to add personal events. Requested features for a redesigned system include **color-coding of events and courses**, **change notifications**, **filtering**, **dark mode**, and integration with external calendar services. A detailed overview of the survey results is provided in Appendix A, Table 3.

4.2 Iterative Development

The design process followed an iterative development approach consisting of low-fidelity exploration, high-fidelity prototyping, and subsequent refinement based on feedback and user research results.

4.2.1 Paper Prototyping. Initially, paper prototypes of both mobile and desktop versions of the scheduling interface were created, as shown in Figure 2. These early prototypes were intentionally developed without incorporating insights from the user analysis, with the goal of freely exploring layout structures, navigation concepts, and core interactions without design constraints.

4.2.2 High-fidelty Protoype. Following the completion of the user analysis and survey, the second phase focused on the development of interactive high-fidelity prototypes in **Figma**. Both mobile and desktop versions were designed using the **Roboto** font and **official FRI color palette** in Table 2 to ensure visual consistency with the institutional identity. Separate views were created for students and professors, reflecting their distinct goals and responsibilities. The redesigned interface included a new login screen, one-click access to the currently active event, in-app notifications for schedule changes initiated by professors, and support for adding custom user-defined activities. Activities such as lectures, exercises, and their respective statuses were visually distinguished using color coding, while schedule personalization was supported through the visualization of all available exercise cycles. In the professor view, functionality for updating the status of activities was introduced to streamline schedule management.

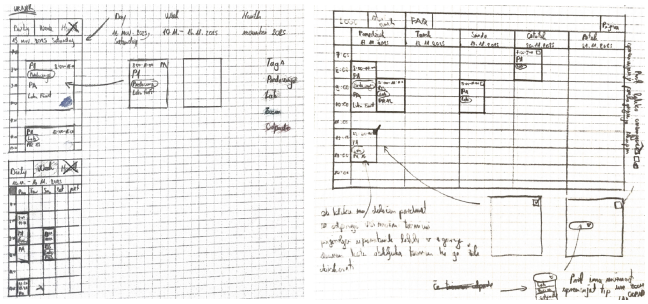

Figure 2: Paper prototypes showing early concepts, with the mobile version on the left and the desktop on the right.

Table 2: FRI CGP Color Palette Used in our design.

Color Sample	Hex Code
	#EE0312
	#58595B
	#CDCDCD
	#2878AC
	#0033A0
	#40AEAD
	#00694E
	#F25E24
	#B42E34
	#F2D25C
	#EC61A0

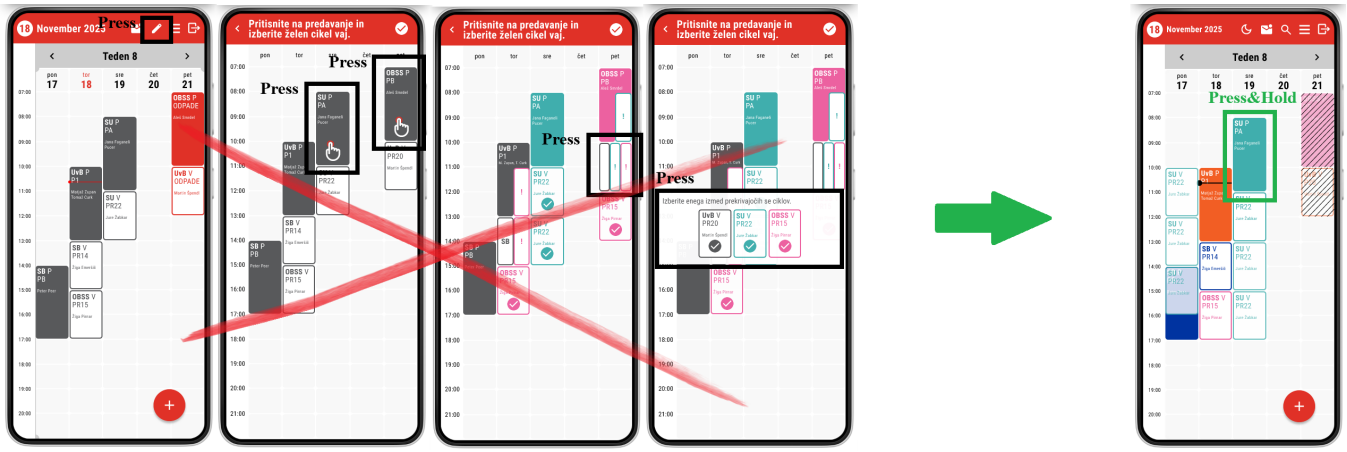

Figure 3: Comparison of the previous multi-step interaction for selecting lab groups with the simplified press-and-hold interaction introduced in the final design.

4.2.3 Iteration. After an intermediate presentation during laboratory sessions and collecting feedback from individual users, as well as revisiting the survey results, a second design iteration was conducted to refine the initial Figma prototypes. This iteration introduced color-coding of courses to further improve visual clarity, redesigned canceled activities using diagonal hatching, and highlighted modified activities with a star icon and italicized change descriptions. A dark mode was added to support different usage contexts and accessibility preferences. In the student view, manual selection of exercise cycles was removed and replaced with a simplified weekly visualization of all relevant cycles. Additionally, a lightweight search feature was introduced to enable quick access to schedules by course, professor, or classroom. The professor workflow for updating activity statuses (e.g., cancellation or remote delivery) was simplified, and alert messages were refined to improve clarity and reduce cognitive load. Some of final mobile desgins of new FRI Urnik app are presented in Figure 1.

5 Challenges

5.1 Flexible Selection of Lab Groups

One of the main challenges encountered during the design process concerned the flexible selection of lab groups, as students are allowed to attend different exercise cycles for the same course. In the first high-fidelity prototype, we attempted to explicitly support this flexibility by allowing students to reconfigure their weekly schedule. By selecting an edit mode, users were presented with a simplified weekly view in which selecting a course would display all available exercise cycles directly within the timetable.

However, due to the large number of courses and overlapping activities, this approach resulted in significant visual clutter, particularly on mobile devices with limited screen space. Multiple exercise cycles often overlapped in time, making it difficult to represent all alternatives in a clear and comprehensible way. We explored several interaction concepts to address this issue, including the use of simplified tabs within overlapping time slots. Selecting a tab would open an overlay displaying all activities occurring within that time window, allowing the user to choose a preferred cycle and confirm the updated schedule. Once confirmed, the entire timetable would be recalculated and updated accordingly.

Despite multiple iterations, this solution significantly increased interaction complexity and cognitive load, negatively affecting overall usability. The feature required multiple steps, introduced additional interface states, and proved difficult to understand without explicit guidance. As a result, this approach was discarded in favor of a simpler and more discoverable interaction. In the final design, users can press and hold an activity in the weekly schedule to temporarily reveal all available cycles for that course. Releasing the interaction returns the schedule to its original state. This solution allows users to quickly inspect alternative cycles without permanently modifying the schedule. If users wish to attend a different cycle, they can either rely on this visual exploration or add a custom event to their personal schedule. The final solution is visualized in Figure 3.

5.2 Managing Activity Status Changes

Another challenge addressed during the design process was the implementation of automated notifications for schedule changes. In order to support reliable communication with students, the professor view needed to provide a clear and efficient mechanism for updating the status of activities such as lectures and exercise sessions.

In the initial high-fidelity prototype, we explored a global edit mode triggered by a dedicated edit icon. Activating this mode transformed all professor-owned activities into an editable state, allowing the professor to change the status of each activity (e.g., canceled or remote) using action buttons displayed on the activity cards. While this approach provided explicit control, it introduced additional interaction steps and increased interface complexity, particularly when managing multiple activities.

Based on feedback gathered during iterative evaluations, the interaction was simplified in the subsequent iteration. Instead of a global edit mode, status management was integrated directly into the professor's weekly schedule view. When the professor

selects an individual activity, a focused interaction state is activated, revealing contextual options to cancel the activity or mark it as remote directly on the activity card. These actions then guide the user through confirmation alert dialogs before the change is applied. This refinement reduced cognitive load, improved discoverability, and streamlined the workflow for updating activity statuses while maintaining support for automated student notifications. The final solution is visualized in Figure 4.

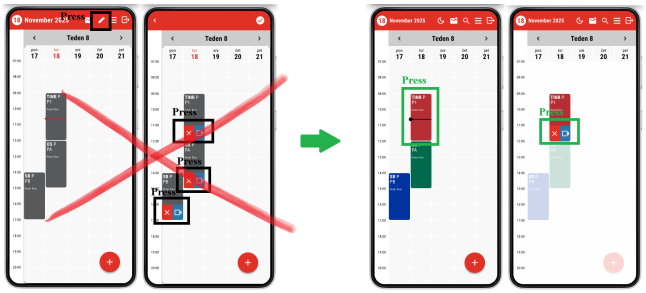

Figure 4: Comparison of the previous global edit-mode interaction (left) with the simplified contextual activity status management integrated into the professor's weekly view in the final design (right).

6 Discussion

The results of this project demonstrate the value of a user-centered and iterative design approach when redesigning complex scheduling systems. The combination of user research methods, including personas, journey mapping, and survey data, revealed that both students and professors experience significant friction when interacting with the existing FRI scheduling system. These issues were not primarily caused by missing functionality, but rather by poor information hierarchy, limited mobile usability, and insufficient support for personalization and change management.

Throughout the design process, several trade-offs had to be carefully considered, particularly between feature richness and interaction simplicity. Early high-fidelity prototypes explored more explicit and configurable mechanisms, such as detailed exercise cycle selection and global edit modes. However, iterative testing and feedback showed that these approaches increased cognitive load and reduced usability, especially on mobile devices. Simplifying interactions—such as replacing multi-step workflows with contextual, direct manipulation (e.g., press-and-hold interactions)—proved to be more effective in supporting users' mental models and everyday workflows.

Another important insight concerns the differing needs of students and professors. While both groups rely on the same scheduling infrastructure, their goals and responsibilities differ significantly. Providing role-specific views and interactions enabled the system to remain flexible without overwhelming users with unnecessary options. In particular, integrating activity status management directly into the professor's weekly view improved efficiency and reduced administrative overhead, while automated notifications addressed a critical pain point identified in the user journey.

Although the redesigned interface addresses many of the identified usability issues, this work is limited by the absence of a full usability evaluation with the final interactive prototype. Future work should therefore focus on systematic usability testing and performance measurements to validate the design decisions and further refine the interface.

7 Conclusion

This project presented the redesign of the web user interface for the FRI scheduling system with the goal of improving usability, clarity, and support for both students and professors. By applying a user-centered design methodology and combining qualitative and quantitative research methods, we identified key pain points related to schedule creation, review, and change management.

The iterative design process—from low-fidelity paper prototyping to high-fidelity mobile and desktop prototypes—enabled the exploration, evaluation, and refinement of interaction concepts. The final design emphasizes simplicity, mobile-first usability, personalization, and clear visual differentiation of activities, while supporting automated communication of schedule changes. Importantly, the project highlights how reducing interaction complexity can be more beneficial than introducing additional configuration options in systems with dense and dynamic information.

Overall, the redesigned scheduling interface demonstrates how thoughtful interaction design can significantly improve the everyday experience of managing academic schedules. The insights gained from this project may inform future development of scheduling systems in educational contexts and contribute to broader discussions on designing usable, flexible, and scalable calendar-based interfaces.

All project material is available in public GitHub repository [1]. Figma demo can be found on this link.

References

[1] Miha Lazić. 2025. Ponovno oblikovanje spletnega uporabniškega vmesnika za FRI urnik. https://github.com/Lazzo23/Redesign-of-the-Web-User-Interface-for-the-FRI-Urnik. Accessed: December 2025.

A Survey Results

Table 3: Overview of Survey Results for the FRI Scheduling System (N=40)

Survey Question	Response Options	Percentage (%)
User role	Students	75.0
	Professors	15.0
	Teaching assistants	10.0
Frequency of use	Several times per week	70.0
	Multiple times per week	15.0
	Very rarely	15.0
Primary use of the schedule	Review of daily lectures/exercises	92.5
	Searching for non-assigned courses	42.5
	Long-term planning	32.5
	Searching for free classrooms	30.0
Primary access device	Mobile phone	67.5
	Desktop or laptop computer	32.5
Overall satisfaction (1–5)	1 (Very dissatisfied)	5.0
	2	40.0
	3	37.5
	4	17.5
	5 (Very satisfied)	0.0
Layout clarity (1–5)	1 (Very unclear)	15.0
	2	25.0
	3	45.0
	4	12.5
	5 (Very clear)	2.5
Ease of finding information (1–5)	1 (Very difficult)	7.5
	2	25.0
	3	37.5
	4	17.5
	5 (Very easy)	12.5
Reported problems	Poor mobile adaptation	75.0
	Lack of clarity	62.5
	Limited functionality	52.5
	Difficulty tracking changes	45.0
	Non-intuitive interaction	27.5
	Information overload	20.0
Desired features (top selections)	Color-coding of event types	55.0
	Color-coding of courses	52.5
	Filtering by course	45.0
	Notifications about changes	45.0
	Dark mode	45.0
	Showing only my courses	45.0
	Minimalistic design	42.5
	Export to Google Calendar	40.0
	Daily, weekly, and monthly views	37.5