**Human-Computer Interaction**

Challenge 2– CA2

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**Outline and competencies C2**

### Graded assignment

| **Start** | **Deadline** | **Grade** | **Time** |
| --- | --- | --- | --- |
| **18/03/25** | **14/04/25** | **28/04/25** | **43h** |

### Have you ever thought about measuring whether an interface works well or not? In this practical challenge, we will learn to use some tools to obtain qualitative and quantitative data in order to evaluate the current state of an interface

### Related competencies and Learning outcomes

| **Related competencies** | **Learning outcomes** |
| --- | --- |
| **Transmit information, ideas, problems and solutions to both a specialized and non-specialized audience;** | * Explain the different user profiles participating in the project * List the different elements to improve |
| **Summarize, interpret, present and critically contrast the results obtained using the most appropriate analysis and visualization tools.** | * Identify different platforms or systems similar to the one presented. * Reflect on the operation of systems similar to the given case study. * Summarize the strengths and weaknesses in different platforms, systems or services. |
| **Analyze, conceptualize, design and evaluate interaction processes and their interfaces in the field of HCI.** | * Analyze how the fundamental concepts are applied to the case study |

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## **Case Study**

## 📱🚍 Accessible Public Transport Apps 🌍♿

Nowadays, mobile public transport applications are key tools for planning routes, checking schedules, and ensuring efficient mobility. Examples like **Moovit, Citymapper, and Google Maps** allow millions of users to find real-time transport options. However, for people with **visual or motor disabilities**, these applications present challenges regarding **accessibility, usability, and customization**.

Some of the most common difficulties include the **lack of customizable options in the interface, unclear information about accessible routes, and intrusive notifications**. These barriers limit user confidence and experience when interacting with these applications, reducing their effectiveness and accessibility.

**How can we optimize the user experience in public transport applications to make them more inclusive, accessible, and valuable for people with visual or motor disabilities?**

To address the challenges posed throughout the semester, you must use the provided application examples, as they are specifically designed for this type of service. **You must work only with the examples from this case study, as PECs based on other examples or cases will not be accepted.** Below are examples of public transport applications:

* **Moovit**: A platform that allows users to plan public transport routes.  
  **URL**: [https://moovitapp.com](https://moovitapp.com/)  
  **Free version**: It includes essential features such as route planning and real-time schedules.
* **Citymapper**: Provides detailed multimodal route information with advanced options for public transport, cycling, and walking.  
  **URL**: [https://citymapper.com](https://citymapper.com/)  
  **Free version**: Yes, it includes interactive maps and basic planning options.
* **Google Maps**: A tool with public transport information, directions, and interactive maps.  
  **URL**: [https://maps.google.com](https://maps.google.com/)  
  **Free version**: It includes access to all main features.

### Project Development

Throughout the semester, the mentioned applications will be analyzed, and you will develop your **inclusive public transport application prototype**, applying **Human-Computer Interaction (HCI), User-Centered Design (UCD), and Universal Design (UD) principles**. To effectively achieve this, consider the following **five requirements**:

1. **Interface Customization**: Allow accessibility adjustments such as **high-contrast mode, screen reader support, and text size adjustments** to enhance the experience for low-vision users.
2. **Accessible Route Planning**: Implement filters that prioritize **routes with accessible features**, such as **functional elevators and ramps**, while avoiding **paths that include stairs**.
3. **Interactive Navigation**: Provide **step-by-step navigation with multimodal options (visual, auditory, and haptic)** adapted to each user's capabilities.
4. **Configurable Alerts**: Offer **customizable notifications** to alert users about **route changes, out-of-service access points, and other relevant incidents** tailored to individual preferences.
5. **User Feedback**: Include a feature that allows users to **evaluate route accessibility and generate reports** that can be shared with authorities or developers for future improvements.

With these requirements in mind, your **accessible public transport application prototype** aims to **overcome the most common barriers** faced by users, particularly those with **accessibility needs**, when interacting with these platforms. By applying **Human-Computer Interaction (HCI) principles**, the goal is to create an **optimized user experience** that ensures an **intuitive, efficient, and inclusive** design, facilitating **mobility and autonomy** for all users.

## **Introduction for the assignment C2**

📍 DEFINITION

#### After completing the **research**stage in our User-Centered Design (UCD) methodology, it's time to move on to the second challenge, where our focus will be on **defining the proposal for the interface**. In this stage, we will apply key methods to ensure that our design is both functional and intuitive. First, we will use **flowcharts** to understand the user journey. Then, we will conduct tests with users who meet the profiles we have previously defined. These 2 methods allow us to obtain direct feedback and understand how users interact with the applications in our [**case study**](https://aula.uoc.edu/courses/50236/pages/case-study).

#### In addition, we will incorporate the **principles of universal design**, aiming to create an interface that is accessible and usable for the widest possible range of users, regardless of their abilities or limitations. And finally, this stage will culminate with the creation of the**first version of our prototype**, where we begin to bring to life the ideas and findings obtained so far, all these pieces will come together to form an initial design solution that will then be refined.

**1. Flowchart**

[**Flowchart**](http://human-computer-interaction.aula.uoc.edu/flowchart/)in Human-Computer Interaction (HCI) are crucial visual tools that represent the sequence of steps and decisions in a user's interaction with a system or application. These diagrams provide a clear and structured view of how users navigate and perform tasks, helping to identify potential friction points or inefficiencies. By visualizing the flow of the user experience, the interface can be optimized for more intuitive and efficient navigation, which is essential for creating digital products that are easy to use and meet users' needs and expectations.

💡Consult the [**Flowchart Guide**](https://human-computer-interaction.aula.uoc.edu/guia/flowchart/)**.**

💡Example of [**Flowchart**](https://aula.uoc.edu/courses/50236/files/6247736?wrap=1)

**2. User Testing**

[**User testing**](https://human-computer-interaction.aula.uoc.edu/user-testing/) is essential in the design and development of products, as it provides an understanding of the user's needs and behaviors. Through this evaluation, usability problems that are not evident to designers are identified, allowing for adjustments that significantly improve the user experience. This process validates design assumptions, reduces long-term development costs, and increases user satisfaction and loyalty, ensuring that the final product is not only functional but also intuitive and appealing to the user.

💡Consult the [**User testing Guide**](https://human-computer-interaction.aula.uoc.edu/guia/user-testing-guide/)**.**

💡Example of [**User Testing**](https://aula.uoc.edu/courses/50236/files/6247734?wrap=1)

**3. Universal Design Principles**

[**Universal design**](https://human-computer-interaction.aula.uoc.edu/accessibility/) is an inclusive approach in creating products and environments that aim to be accessible and usable by all people, without the need for adaptations or specialized designs. It focuses on creating solutions that cater to the widest possible range of abilities, ages, and other user characteristics, ensuring equality of access and user experience. This approach not only improves accessibility for people with disabilities but also benefits the general population, promoting the creation of more functional and versatile products. Nowadays, universal design is particularly relevant for the development of technologies and web applications that are inclusive and accessible to everyone.

💡Ckeck in W3C [AccessibilityLinks to an external site.](https://www.w3.org/WAI/fundamentals/accessibility-intro/" \t "_blank)

💡Universal Design [example](https://aula.uoc.edu/courses/50236/files/6247726?wrap=1).

**4. First Version of the Prototype**

This first version of the [**prototype**](https://human-computer-interaction.aula.uoc.edu/prototyping/) provides a tangible validation of the initial ideas and concepts. Put the first ideas of your prototype into practice by integrating the results you have obtained by applying the different techniques from challenges 1 and 2. The objective is for you to start representing with generic components the elements of the interface of your proposed solution.

💡Consult the [**Prototyping Guide**](https://human-computer-interaction.aula.uoc.edu/guia/prototyping/)

💡Prototype[**example**](https://aula.uoc.edu/courses/50236/files/6247730?wrap=1)

## **Instructions for the assignment C1**

📍 DEFINITION

In this **Definition**stage: Synthesis of the Proposal of our User-Centered Design (UCD) process, it is now time to focus on how our ideas begin to take shape, concentrating on shaping the interface of our **prototype**. To do this, we will use four key methods: the creation of **flowcharts**to map the user path, **tests**with real **users**to obtain direct feedback, the application of **universal design principles** to ensure accessibility and inclusion, and finally, we will develop the **first version of our prototype.**

**1. Flowchart**

👉 Create flowcharts for **two (2) of the**[**case study**](https://aula.uoc.edu/courses/50236/pages/case-study)**requirements** that you find most interesting.

⚠️ For each [**flowchart**](http://human-computer-interaction.aula.uoc.edu/flowchart/):

* Define all steps textually.
* Appropriately use each figure of the diagram: diamonds, squares, and circles.
* Connect the steps with arrows.

⚠️ Once you have the diagrams, analyze them and answer the following questions for each one:

* How many steps do you have to take to complete each diagram and how much time do you invest?
* Is there only one way to complete the task?
* What points are the most problematic in your opinion?
* What points are the clearest in your opinion?

**2. User Testing**

👉 Apply the [**User testing**](https://human-computer-interaction.aula.uoc.edu/user-testing/) technique:

* Select **one (1) reference application**from the [**case study**](https://aula.uoc.edu/courses/50236/pages/case-study).
* Contact **two (2) users** interested in the theme of our case study who match the characteristics of the user profiles defined in Challenge 1 (they can be friends, family, colleagues, etc.).
* Choose **two (2) requirements from the**[**case study**](https://aula.uoc.edu/courses/50236/pages/case-study) and define 3 tasks for each.

⚠️ In the report, you must include:

* Description of the users (at least **two (2) users** = **one (1) from each profile**)
* Script of the session (**three (3) tasks** for each of the **two (2) requirements**)
* Results of the interview
* Analysis and reflection on the interviews
* Proposal for improvements

#### **3. Universal Design Principles**

👉 Analyze the applicability of the **seven (7)**[**design for all**](https://human-computer-interaction.aula.uoc.edu/accessibility/)**principles**to evaluate the applications of the case study. For this, exemplify each of the principles by adding a screenshot and justify their applicability. (**It is not necessary for all 7 principles to apply to a single application**. If you prefer, you can use examples from other apps or websites you use for this type of service).

#### **4. First Version of the Prototype**

👉 Propose the solution for **dos (2) requirements** of the [**case study**](https://aula.uoc.edu/courses/50236/pages/case-study), for this, distribute the information in the user interfaces you need to resolve the requirement.

👉 Considering the principles of universal design, explain and draw how it is possible to **incorporate in your solution proposal** the **criteria of equal use and error tolerance**.

### **5. Reflections**

👉 To conclude the **definition phase**, it is essential to reflect on the **lessons learned** and how the activities carried out in this stage helped shape your proposal and prepare you for the next steps. Select **one (1)** of the reflection questions below and record a **video of up to 3 minutes** with your response.

### How did creating flowcharts influence your understanding of user navigation?

### What observation during user testing surprised you the most, and how did it impact your design?

### When applying universal design principles, which one do you consider has the greatest impact on the application's accessibility?

### What challenges did you face when developing the first version of your prototype, and how did you solve them?

### If you were to repeat this stage, how could you improve the clarity of the flows or the quality of the initial prototype?

### **Deliverables**

To complete the submission of this activity, please attach the final document to the **Delivery activity C2**. The format of your **document must be PDF and uncompressed, and the video must be in .mp4** format. This will ensure that the content remains **accessible** and maintains its **original format**, making it easier to review.

⚠️ **Remember to verify that all elements of your work are included and displayed correctly in the document before uploading it.**

### **Assessment and evaluation criteria**

The evaluation will take into account the presentation of the document, as well as its structure (cover, index of contents, development of the answers), legibility (adequate font for reading and body size of 12 points) and organization (numbered pages, heading with the name of the student and the degree course). Writing, clarity, expression and spelling will be valued.

✏️ As for the evaluation criteria for each of the tasks, they are described in the [**Challenge 2 rubric.**](https://aula.uoc.edu/courses/50236/assignments/585930)

**IMPORTANT**

In this activity, only limited use of artificial intelligence tools is permitted. Specifically, in a UX design project, AI tools, both textual and visual, can be used to generate and sketch ideas, contextualize concepts, propose prototypes, or combine elements in an innovative or alternative way. If these tools are used, **it is necessary to explicitly and correctly cite the use of AI tools** in the work's development. This includes: indicating in the submission which **tools** have been used in each section of the activity, the **objectives**, the **prompts** that have been used, the **response** obtained, and the process followed to **review and edit the output**. To do this correctly, consult the guide [How should we cite AI in our works?](https://openaccess.uoc.edu/bitstream/10609/148823/1/U2_17_GuiaCitarIA_CAT.pdf) Information on what is considered irregular conduct and its consequences can be found in the teaching plan and on the [UOC's website about academic integrity and plagiarism](https://campus.uoc.edu/estudiant/microsites/plagi/en/index.html). Remember that when using generative AI tools, personal, confidential, or intellectually protected information must not be provided.

Bear in mind that improper use of generative AI, such as not reviewing the obtained response or failing to cite the used tools, will be considered irregular conduct in the assessment. In case of doubt, consult with the teaching staff.

## **Answers for the assignment C2**

## 1️⃣ Flowchart

## 1️⃣. 1️⃣ TBD

## 2️⃣ User Testing

2️⃣.1️⃣ TBD

## 3️⃣ Universal Design Principles

3️⃣.1️⃣ TBD

## 4️⃣ First Version of the Prototype

4️⃣.1️⃣ TBD