

Assignment 1

Group #:

Student name:

Type: Group work

Deadline: Monday 9th March 2026 – 17.00

Submit: Brightspace

Evaluation: Graded

Description

You need to write an 8-to-10-page paper which describes the functional and technical features and details of your smart interactive automatic toilet freshener, including the process of building it and a reflection on its success (or lack thereof). This description allows you to elaborate on the topics covered in your video. Use it to add detail to these topics and/or cover subtopics which could not be covered in the video, time-wise. But please make sure that the description can be read stand-alone: if one only has the description, it should be clear what you've built, how you've built it, why you've built it that way and whether you think building it was a good idea.

Be sure to include a state diagram of your system (no specific format required). Please do add pictures to illustrate certain points. For teams of three this is also the place to shine and reflect on your experience with two installations of your system.

For the HCI component of this assignment, report on the context of use (environment + users) of your system, the user needs gathering study and translation into design requirements, and the heuristic evaluation. For the context of use description, make sure to include both the knowledge you already had of this context as well as additional information you acquired from your contextual research. For the user needs gathering, make sure you describe the executed methodology in-detail and highlight how the insights you acquired impacted your system design (i.e. the requirements and the design decisions you made while building). For the heuristic evaluation, describe how you executed the evaluation and reflect on the experts' input to formulate improvements your prototype would benefit from to enhance the user experience of your system.

NOTE: This is a template that can be used to deliver your work. However, you can use other formats, if you prefer as long as you remember to write your group number and student names and adhere to the description.

Context of Use Description

User Needs Gathering Methodology

Explain how you conducted your contextual research. This includes for example a description of how you carried out the study, a description of the participants you recruited, and what questions were asked in the interview/questionnaire. Also, explain how your chosen method suits your research focus. How did this method help you get insights on what you wanted to learn? Would another method have been a better choice or was this method the perfect choice?

Context characteristics

Specify the primary context of your system. For example, you can specify the size, use of the space (only toilet / bathroom with shower), role of the system in the space, etc.

Target group characteristics

Explain which groups of users you identify for your system. These groups can be the main target groups as well as secondary ones who will interact with the device. Describe how they share the context of use and their primary activities. Specify your users groups' relevant characteristics. For example, you can specify physical characteristics relevant to the design/placement of your system, behaviors and habits relevant to system interaction, etc.

Environment of the system

Write about the 1) technical, 2) physical, and 3) social constraints of developing your system considering the context and target groups' characteristics. You can write a paragraph for each of these three aspects of your product development. You can support your description with figures and schematics of the environment of the system.

Requirement Analysis

Describe the design requirements of your system based on the environment of the system and the requirements specified in the assignment. Include for example categories like: 1) functional requirements (functional needs of the users e.g., not spraying when cleaners are working), 2) usability requirements (e.g., system should be placed behind the toilet to avoid bumping into it in the small sized toilet), 3) other requirements derived from your contextual research.

Goals and Tasks

Explain the goals and tasks of your prototype development. Clearly list the features expected from the device and in which scenario context they are needed.

Functional and Technical Features

Describe how the system addresses the above-mentioned requirements and what other features it provides. You can make use of tables to describe the system states and how they are mapped by the prototype sensors/actuators (e.g., LED color/pattern).

Building process

Explain the choice you made to determine the use of the components available to you and the logic that you followed (e.g., we made the choice to use the light sensor as an indicator for when the user would enter or leave the toilet since it is an instant visual clue.) You can explain how you designed the menu system aided by screenshots and photos.

Heuristic Evaluation

Explain how you carried out the heuristic evaluation and the results you collected from it. You can use a table to list the heuristics and the results of the severity ranking for each according to the experts. Following, summarize the results and discuss potential improvements and ways to address issues.

Reflection on success

This section is dedicated to your reflection on the prototype development process and study design.

Appendix: Diagrams and additional material such as dataset and questionnaires.