

Manual UI/UX Advanced

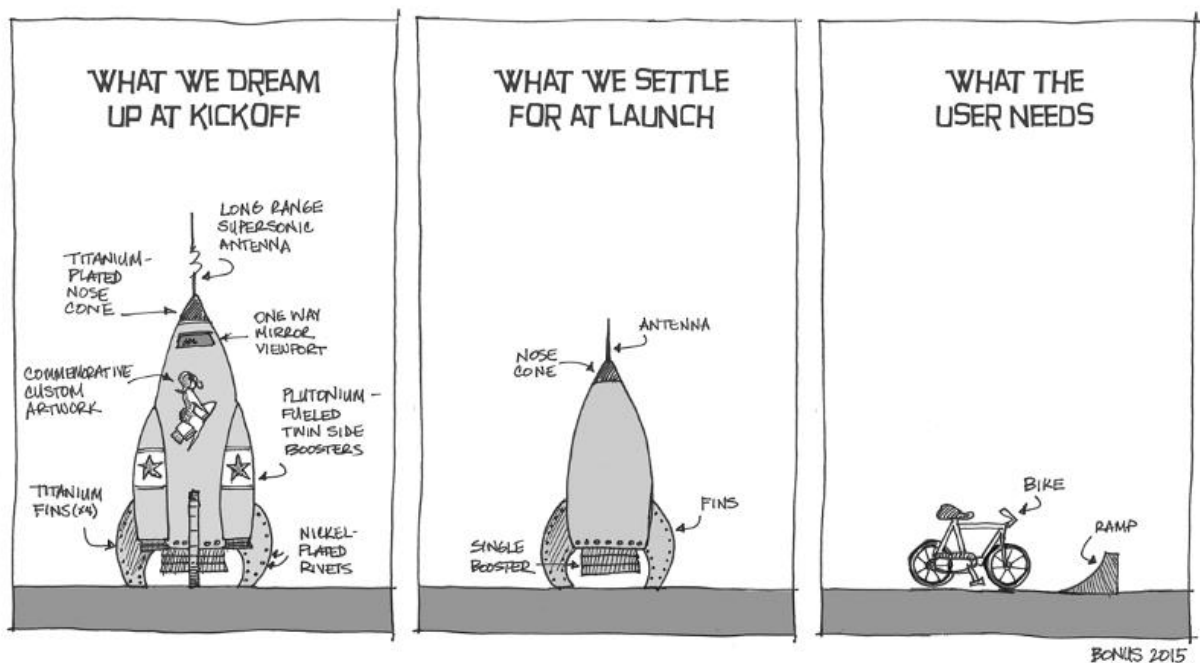
Term 2.2

Course Manual study year 2020/2021

Bachelor Creative Media and Game Technologies (CMGT)

School of Creative Technology

THE UX DESIGNER PARADOX



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Module coordinator Alejandro Moreno

Lecturers Patrick Huitema, Tim Roosen, Herman Paassen, Mark Boerrigter

Guest lecturers Yvens Rebouças Serpa, Boris Slaghuis

CMGT roles All

1 General overview

Module Name	UI/UX Advanced
Unit code	L.25886
Year and Term	2.2
CMGT roles	All
Credits	3 ECTS
Lessons	3 lectures (90 mins); 2 guest lectures (120 mins); 5 labs (195 mins)
Study load	50-60 hours
Responsible lecturer	Alejandro Moreno (a.m.morenocelleri@saxion.nl)
Module summary	The student properly applies principles of UI and UX in the development of a web-based or Unity application. The student will need to set up an A/B test, use a between-subjects experimental design to evaluate the developed system's usability, and employ statistics to derive valid insights from the test results.
Industry relevance	Any system that requires user input needs to be designed with proper UI and UX principles to make sure it is easy to learn, easy to use, efficient, and that it solves the problem the user has. The knowledge gained from this course is required by virtually every company that develops interactive systems.
Type of exam	Hand-in
Exam code	T.51698
CMGT Competencies	1. Technical research and analysis 2. Designing, prototyping and realizing 3. Testing and rolling out 4. Investigating and analyzing 5. Conceptualising 6. Designing 11. Learning ability and reflectivity 12. Responsibility
Required prior knowledge and skills / conditions for enrolment	1.1 Design Thinking 1.3 UI/UX
Preparatory for:	Future CMGT projects and modules.

2 Why this module?

With the rapid development of technology, and the number of devices and services that compete for our time and attention, it makes sense that people want to consume services and experiences as quickly and as to the point as possible. They also need to be enjoyable to use and easy to pick up, or else people move on to the next thing that requires our attention. This is why UI/UX, which focuses on how users interact with a system in order to improve its acceptability and ease of use, is so important nowadays.

In the previous module (UI/UX), students learned and applied UI/UX design theory to develop wireframe interfaces for several systems, or improve existing flawed ones. In this module, students will a) **acquire practical knowledge on developing fully functional solutions** from **Hi-Fi prototypes**, b) acquire a **deeper understanding of the design of user tests/experiments**, and c) learn how to **analyze the results** obtained from user tests using descriptive statistics.

2.1 What happens in the labs and lectures?

There will be **three lectures related to testing and evaluation of the UI/UX of digital systems**, and **two guest lectures where practical content on how to implement UI in Unity (Unity UI) and Web (CSS)** will be covered. In the labs, the students will be working towards building (parts of) a functional digital solution (selected at the beginning of the module) in their chosen application domain (Unity or Web). To do that, first they will need to design a Hi-Fi prototype of such a solution in a prototyping tool, test it, and then translate that design into Unity/Web. It is important to note that in this module the students will **focus on the Ideation, Prototyping and Testing phases of the Design Thinking framework** instead of going through the whole process.

2.2 How does this module relate to other modules in the CMGT study programme?

This module is a **follow up to the 1.3 UI/UX module** taken by all CMGT students. In that module, essential UI/UX theory, as it applies to several contexts, is covered and used in designing wireframe prototypes. In this module, students will go beyond developing wireframe designs and implement a functional Unity or Web-based system and test it methodically. Since students will need to apply the covered UI/UX theory in their designs for this module, it is expected that they have either passed the UI/UX module of the 1st year, or are able to familiarize themselves with the theory seen in that module before beginning this one. Likewise, **1.1 Design Thinking is also a requirement** for this module since knowledge about the framework and best practices in each of the steps will be essential. Several other modules can be of help depending on the application and how many assets the student wants to develop themselves, namely the following modules (not an exhaustive list): 1.4 Behaviorism, 1.4 Unity Game Scripting, 2.1 (Advanced) Web, among others.

3 What are you going to learn in this module (learning objectives)?

The student:

1. Is able to **design** a prototype by applying **standard UI/UX theory**
2. Is able to **implement** a functional, interactive **Web/Unity solution**
3. Is able to set up **A/B user tests** accounting for **experimental control (validity)**
4. Is able **interpret** experimental **results** using **descriptive statistics**

4 Which resources do you need?

This module's slides (lectures and labs) will be available on Blackboard. In addition to that, the content covered in the first year UI/UX module will also be available through Blackboard. Besides this, common tools for the developing applications will be required: Laptop/PC, Unity (we recommend using the latest stable release), Prototyping software (InVision, Marvel, Adobe XD, etc.). The two guest lectures will also be recorded and available in Blackboard, along with all the files and resources covered in those lectures. Students can use these resources when implementing their applications.

5 What does the schedule of this module look like?

On Blackboard you'll find the course content and a detailed course overview.

Week	Lecture/Lab	Topic(s)
2.4	Lecture	Introduction to the module + Recap of UI/UX + User journeys.
2.4	Lab	Choose application context, theme; Start working on Lo-Fi prototype.
2.5	Lectures x 2	Unity UI; Advanced CSS.
2.5	Lab	Finish 1 st iteration of Lo-Fi prototype; Usability testing.
2.6	Lecture	Experimental Design (A/B testing).
2.6	Lab	Start working on Hi-Fi prototype w/improved design based on usability tests.
2.7	Lecture	Designing Questionnaires and Descriptive Statistics.
2.7	Lab	Finish Hi-Fi prototype; Start working on Web/Unity application.
2.8	Lecture	No lecture – use this time to set up user A/B tests.
2.8	Lab	Finish Web/Unity application; A/B testing of Hi-Fi prototype.

6 How is this module assessed?

In this module, the students will **build a Hi-Fi prototype of an application** of their choosing (out of a selection of 5). This Hi-Fi prototype should be **fully finished in terms of aesthetics, functionality, and content**. This prototype will then be used as a base to **implement the designed solution in one of two application domains: Web or Unity**. The students will also need to **conduct two user tests** during the development of their prototype and application: **one usability test and one A/B test**.

The student will need to submit two reports for the assessment, namely a **Product and an Evaluation report**. The Product report will contain information regarding the design and implementation of the solution, whereas the Evaluation report will be used to describe the user tests and their results. **Report templates will be made available in Blackboard** that students just need to fill in with the required information. The students should not take any creative freedom with the structure of the template – if an item in the template is not going to be delivered, it should be left empty and not removed. In addition to this, the student will also need to **submit a screen-recording showcasing their Hi-Fi prototype and application**. There is no need to provide any explanation when recording the video (but it could be useful anyhow). The only requirement is that both the prototype and the application are extensively showcased in action.

Below we explain the deliverables and their associated products in detail. The rubrics for the grading are detailed in Section 8.

6.1 Product report

The information that needs to be filled in the product report is the following:

- URL of the Hi-Fi prototype
- URL for the Web/Unity application
- Application's stylesheet
- Optional items (e.g. user journey of the Hi-Fi prototype)

The most important products related to this report are the prototype and the application. Therefore, more information is provided for these two items.

6.1.1 Lo-Fi/Hi-Fi prototype

The students will use the first three labs to build a Hi-Fi prototype of their chosen product. The student can choose from five distinct products that need developing, which are the following:

- CMGTwitch (E-Lecture manager)**. A system where students find their current and past modules in their education trajectory. In these modules, they should be able to find past, current and upcoming lectures, and join them if possible. The student should be able to find specific topics covered in recorded lectures so they can skip to what they are looking for. For live lectures, there should be a built-in chat function that encourages constructive discussions rather than spam, and allows for good interaction between lecturer/presenter and students/audience.
- Looking for a room (mate)**. A system that helps students find places to rent for a short/long term period. In addition to common filtering options, the system should also allow the applicant to look for flats/houses based on the renter's personality or other tenants if it's a shared accommodation, education being followed, and other important interests. It should be particularly easy to use for people outside the cities/countries they are looking to move.
- Wellbeing guardian**. A system that should help students track their physical and/or mental wellbeing and encourage them to care for their bodies and minds. The system should provide instructions on different indoor/outdoor exercises selected specifically for the student, or provide ideas for nearby

activities that are particularly beneficial and enjoyable. The system should also have a way to facilitate students to get in touch with other students easily and discreetly.

- d) **Sharing-is-Caring.** A system that helps students borrow/lend things to other people. The system needs to allow transactions at the smallest of scales, such as a “spoon of sugar” or “some flour”, for which a quid pro quo or an “I owe you” system would work well. The system should also provide some sort of tracking tool or security measures so that people cannot simply vanish with an item they have borrowed (especially expensive items). The context of use is envisioned mostly related to student housing items.
- e) **EduBrainTrust.** A system that groups people at the same level of expertise on a certain topic for study group sessions. Other characteristics could also be used, such as the history of collaboration, rate of successful collaborations, endorsements, etc. The system should enable the group to schedule meetings, share resources amongst them, or ask for help in the selected topic from other groups or more knowledgeable people (classified as tutors by the system).

Even though the student can choose which product they want to develop, to more evenly distribute the solutions to be built amongst all students, **there is a limit of 5 students per product per lab**. The assignment will be carried out on a **first-come-first-serve basis**, so as soon as the student knows what they would like to develop, **they need to sign up to it in Blackboard**. To do this, they should go to Solution Sign up, choose the solution they want, and then sign up to their lab class group for that particular assignment. If the student is unable to join a particular group, it means it is full and they will need to select a different product. The sign-up will become available after the first lecture.

Once the student has successfully signed up to one of the products, they can start working on the Lo-Fi prototype of the solution, which will be used as the base for the Hi-Fi prototype. The **Hi-Fi prototype has to be a complete solution in all aspects: aesthetically, functionally and content-wise**; in other words, it should be an accurate representation of what the final product would be like (of course with certain limitations inherent to the prototyping tool). Therefore, implementing the final solution should be a matter of translating the design of the prototype to the chosen application domain.

6.1.2 Unity/Web application

During the last two labs the students will **implement, at the very least, one screen from their Hi-Fi prototype** in one of two application domains: Unity or Web. It is very important to note that **students do not need to implement the entire prototype**, but only **one key interface within the prototype** (e.g. not the login or settings screen). For a better grade, students can implement one important user journey (i.e. the screens needed for the user to perform one important task) instead of just one screen, but this is not mandatory. The **application should visually resemble the prototype** and be **fully functional** as expected from the finished application, which could mean that it has more functionality compared to the prototype due to the limitations of prototyping tools.

Even though the application development is planned to start in the 4th lab, it would be wise for students to decide which platform (Unity/Web) they are going to be developing for early. Also, once the lectures on UI implementation for both platforms have been carried out, it would be advisable for the student to start tinkering with the chosen platform and start trying to translate the art style they have chosen into it.

Important note regarding reuse of code/art: The goal of this module is to assess whether students can design a professional prototype and translate this to an application domain. Being capable of creating professional art assets or implementing complex functionality through code helps in this regard, but should not prevent students from achieving the learning goals and passing the module. Therefore, **students are free to make use of resources not made by them when developing their prototype/application**. This applies to the following resources: **code, text, icons, fonts and images**. Students are also free to use any of the guest lecturers’ resources from their UI implementation lectures. If the student wishes to use something besides what has been mentioned previously, they need to consult with their lab teacher. It is of **utmost importance that the student credits where the resource was obtained from and where it is used**. Not doing so will count as plagiarism, which entails failing the

module and possible additional measures. Making minor changes to an asset and passing it off as the student's own also counts as plagiarism. Overall, it should be clear to the teacher what was developed by the student and what was made by someone else.

6.2 Evaluation report

The most important information that needs to be filled in the evaluation report is the following:

- Usability test documentation (design, protocol, results, etc.)
- A/B test documentation (design, protocol, results, etc.)
- Survey and raw results

6.2.1 Usability testing of Lo-Fi prototype

This test has to be carried out with **at least three students** and the goal is to find usability issues with the Lo-Fi prototype. The students will need to design and execute the test as they see fit, and fill in the appropriate information in the report. The **results of each tester have to be presented individually, together with a set of actions points/improvements derived from all the tests**. These improvements are to be implemented in the Hi-Fi prototype.

6.2.2 A/B testing of Hi-Fi prototype

To conduct the A/B testing, students need to make **two slightly different versions of the Hi-Fi prototype** that they will test against each other. **The change has to be approved by the lab teacher**, and must be related to how the user interacts with the interface (e.g. layout, menu structure, etc.) or a change in the user journey (e.g. change in how a task is carried out, different screens to go through, etc.). **Aesthetic changes are not accepted as different conditions for the A/B testing (e.g. changing color, font, etc.)**. It is possible to conduct the A/B test with the application rather than the prototype for a better grade, but the same rules apply – two slightly different versions and the change has to be functional. The actual test has to be carried out with **at least 12 students (six for each condition)**. It should be possible to conclude **which condition worked best using descriptive statistics** on the survey results.

6.2.3 A/B test survey

The A/B test needs to be administered together with a survey made by the student. The **survey should consist of at least four relevant questions** related to the hypothesis being tested. The student will need to provide, in the report, the questions they asked and the raw results obtained from the survey. **Only providing the URL to the survey or the results is not sufficient.**

6.3 Final submission deliverables and date

All the deliverables need to be handed in through Blackboard at the appropriate submission point. Make sure the file name of all the deliverables clearly states the name of the item you are handing in, your name, and student number (e.g. ShowcaseVideo_AlejandroMoreno_011235). The items that need to be submitted are the following:

- Product report (PDF)
- Evaluation report (PDF)
- Showcase of Hi-Fi prototype and application (5 minutes maximum screen recording)

Deadline: All the required deliverables need to be submitted by **mid-week 2.9 (Wednesday 27th of January 2021, 23:59h** at the latest).

6.4 Redo submission deliverables and date

For students taking part in the module's redo, nothing changes concerning the expected deliverables or their hand-in method. However, depending on whether the student already has a challenge assigned to them by their lab teacher, there are two possibilities:

- If the student already has a challenge, nothing needs to be done and they can keep working on the same challenge. If they wish to change, they need to contact their lab teacher to get confirmation.
- If the student does not have a challenge, they should contact the module coordinator to inquire about one. Once the student has been assigned one challenge, they can begin working on it.

Redo deadline (Subject to change, but notification would follow): All the required deliverables need to be submitted by the **end of week 3.6 (Sunday 28th of March 2021, 23:59h** at the latest).

7 Who are the contact people for this module?

Module coordinator: Alejandro Moreno (a.m.morenocelleri@saxion.nl)

Lecturers:
 Patrick Huitema (p.g.t.huitema@saxion.nl)
 Tim Roosen (t.p.roosen@saxion.nl)
 Herman Paassen (h.paassen@saxion.nl)
 Mark Boerrigter (m.j.boerrigter@saxion.nl)

Guest lecturers:
 Yvens Rebouças Serpa (y.reboucasserpa@saxion.nl)
 Boris Slaghuis (b.slaghuis@saxion.nl)

8 Rubric

Note: the rubrics are used to determine your grade and are visible in Blackboard under 'Grades and Feedback' → 'View rubrics'.

Rubric UI/UX Advanced				
Preconditions: <ul style="list-style-type: none"> • The student needs at least a sufficient in each criteria to pass the module. • The student has designed a Lo-Fi prototype and a Hi-Fi prototype. • The student has implemented (at least one screen of) the solution in Unity or Web. • A screen-recording video of the prototype and application is uploaded to Blackboard. If you don't meet the preconditions you will not be assessed and fail the module.				
	Insufficient	Sufficient	Good	Excellent
Hi-Fi Prototype – UI Design You are able to apply graphic user interface design principles to develop professional prototypes.	3% The fundamentals of graphic design (layout, typography, color, etc.) are not applied (correctly).	9% The UI can be considered market-ready (professional-looking icons, good color matching and readability, etc.)	12% See sufficient+: The UI can be considered ready to be shipped for implementation	15% See good+: A significant amount of the UI elements have been created by the student.

(15%)		A style sheet (art style, color palette, fonts, etc.) has been defined and fits the concept and target user.	(relevant content is finished completely, no placeholder texts or images, etc.).	
Hi-Fi Prototype – UX Design You are able to design systems that are enjoyable and easy to use by the intended audience. (15%)	3% The prototype is difficult to use without external guidance (feedback is lacking, unintuitive, etc.). The user is not able to use the prototype to solve their problem(s).	9% User feedback is given properly and in a timely manner. The structure and flow of information are understandable and facilitate user processes (menus, the order of screens/steps, etc.)	12% See sufficient+: Interaction with the prototype is intuitive and requires no assistance. If assistance is needed, it is built into the prototype. Error prevention strategies are implemented in the prototype.	15% See good+: A detailed user journey of at least one key functionality of the solution has been created and provides valid insights (opportunities) on the prototype.
Application – UI/UX Implementation You are able to produce a functional and professional solution based on a given design. (20%)	4% The design has not been properly translated to the application context. The chosen solution's interface is not in a finished professional state (bugs, typos, missing content, etc.) or is of little relevance (e.g. login page).	12% The chosen solution's interface clearly resembles the prototype aesthetically and functionally. The solution is (almost) bug-free.	16% See sufficient+: The chosen solution's interface clearly demonstrates (is complex enough to showcase) good skill in implementing a solution.	20% See good+: One key user journey (not just one screen) has been implemented in the application context satisfactorily.
Testing You are able to properly set up and conduct user tests to enable the collection of meaningful data that can be analyzed purposefully. (25%)	5% A/B test hypothesis is of a trivial nature. Less than 12 responses to the A/B test survey were procured. Less than three users took part in the usability testing.	15% The survey consists of at least four relevant questions (not including demographics questions). The test protocols were filled in correctly for both the usability and A/B tests.	20% See sufficient+: A/B testing has been set correctly to measure the intended effect and the hypothesis. The type of questions used in the survey are appropriate for the information being	25% See good+: The A/B testing was conducted using the implemented solution instead of the Hi-Fi prototype.

			collected and the planned analysis.	
Analysis of results You are able to derive meaningful insights from user test results, and are able to present both results and insights in a clear and professional format. (25%)	5% Results are not present, or important information to understand the results is missing (number of participants, duration of test, A/B conditions, etc.).	15% Individual usability test results are presented clearly and a set of action points are derived from all of them. Descriptive statistics (mean, median, standard deviation) are used to analyze the A/B test results.	20% See sufficient+: Box Plot charts have been used to present the results of the A/B test. Valuable insights and recommendations for future work are derived from the A/B results.	25% See good+: The whole process has been critically reflected upon (what and why), together with a number of do's and don'ts for future CMGT projects.