# ALMOST EXPERIMENTAL

**USER–CENTERED DESIGN SS 16/17**

## PROJECT DESCRIPTION

Our idea of the need to have movable and inflatable architecture emerged from (1) thinking of an alternative but also a novel design space that could be moved and installed outside of the conventional academic venues. This design space/venue can be used to conduct any academic and research activities and events by students, researchers, and maybe any other interested groups. (2) We got inspired by the retro-futuristic idea of inflatable architecture. Inflatable architecture is actually a real urban intervention, popping up temporarily, for one or more weeks in the city. It changes the view and the perception of the places. The space is converted into a playful interesting environment where people can gather, talk, dance, relax and work. We would like to rethink the conventional physical academic space in order to shape the activities performed in it.

## IDEA INSPIRATION

Too often, systems are designed with a focus on business goals, fancy features, and the technological capabilities of hardware or software tools. All of these approaches to system design omit the most important part of the process – the end user. User-Centered Design (UCD) is the process of designing a tool, such as a website's or application's user interface, from the perspective of how it will be understood and used by a human user. Rather than requiring users to adapt their attitudes and behaviors in order to learn and use a system, a system can be designed to support its intended users' existing beliefs, attitudes, and behaviors as they relate to the tasks that the system is being designed to support. The result of employing UCD to a system design is a product that offers a more efficient, satisfying, and user-friendly experience for the user (usabilityfirst.com).

# DESIGN STUDIES

## WHAT IS USER-CENTERED DESIGN?

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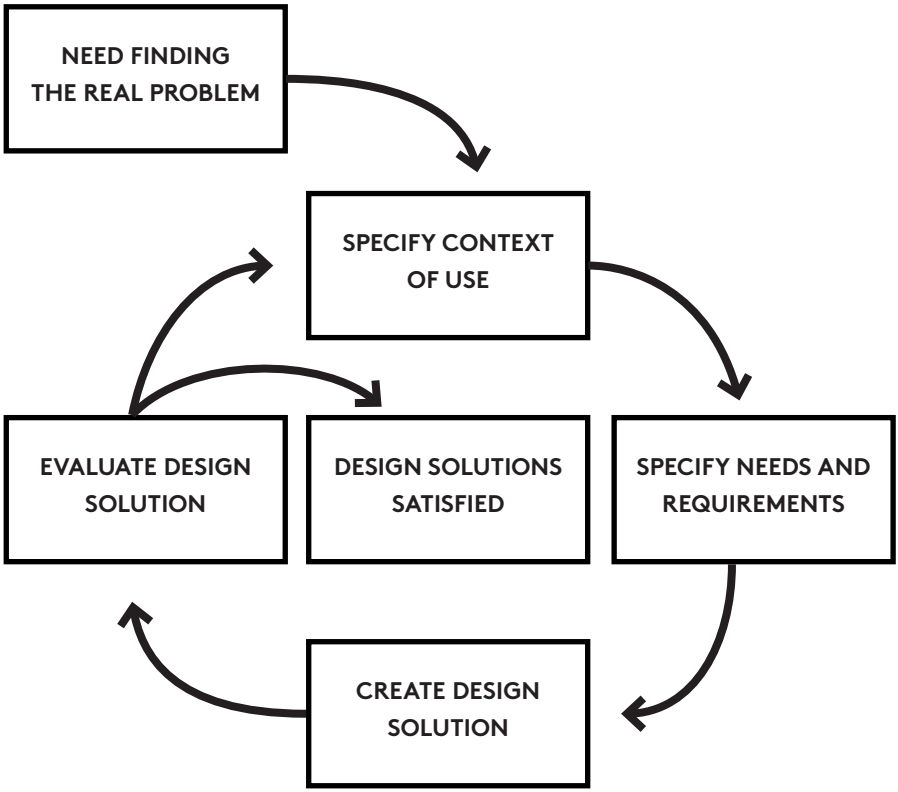
## USER-CENTERED DESIGN PROCESSES

According to userfocus.co.uk, there are multiple principles that underlie user centered design. Design is based upon an explicit understanding of users, tasks, and environments; is driven and refined by user-centered evaluation; and addresses the whole user experience. The process involves users throughout the design and development process and it is iterative. According to usability.gov, there are many variations of the UCD process. It can be incorporated into waterfall, agile, and other approaches. Depending on our needs, the user-centered design process is consist of several methods and tasks. What we are developing, our requirements, team, timeline, and the environment in which we are developing can help to determine tasks we perform and the order where we perform them. For our context, we can say that it's more of iterative approach as we were repeatedly went back and forth to refine and incorporate user needs in the our design solution. In the following, we put the main UCD process stages we have been through the design development cycle.




User-Centered Design process stages

## DESIGN THINKINGS AND NEED FINDING

In this initial stage, we made a lot of design thinkings, brainstorming and ideation sessions at classroom level ( teachers and other students) and outside classroom (among team members) to come up with a clear understanding of our user-centered design goal. Throughout these sessions, we based upon explicit understanding of users, activities, technologies and context of use considering an iterative design processes in mind and a refined user-centered evaluations and feedback outcomes that could serve us as a design solution inputs.

## IDENTIFY CONTEXT OF USE

In here, we tried to identify the target users who will use our design solutions (artifact), what they will use it for, and under what circumstances they will use our proposed design artifact. So basically, what we did here is a PACT (People, Activity, Context and Technologies) analysis so as to frame and align the real problem with respective design solutions in a way that takes into account people/users activities in a specific context. And how we can use a set of technologies to support their activities in that particular usage settings contexts. Puting the user in the center of our design process. We found PACT analysis as a good method to learn and apply for our user-centered design challenge which basically our project.

People**:** The main user of our artifact is an International undergraduate student of psychology or IT`s related field, with a high individual predisposition and motivation in being engaged in a novel and stimulating field of study. The ideal user has high cognitive characteristics and is seeking for a non conventional future career in HCI field. Apart from undergraduate students, future potential users can be considered and extended to researchers, current students and HCI practitioners.

**Activities:** The main goal of the user is to find clarifications about the academic approach and the activities that are performed in the HCI`s MSc. The bubble project hence, is presented as an activity connected

with the master course curated by the students. The user will receive information regarding the future projects performed within the bubble through the calendar section – our main goal however, is to convey an overall idea of innovation, through an aesthetically unconventional website which reflect the equally innovative physical space. After looking at the website, the user will be able to contact directly the current students, professors and stuff in order to have further clarifications.

Context: The physical environment, where the interaction with the website takes place, can be any conventional context such as domestic or academic (i.e., the office or the personal desk of the undergraduate student). However, the website reflects a wide range of academic activities that are ideally performed within the bubble which may be placed in any kind of urban context, a space totally transparent and accessible for anyone.

Technologies: The website can be accessible with any device with an internet connection, the website does not require any particular input by the user, since it is mainly informative; however, contacts of the people involved in the project will be provided for further information.

**SPECIFY NEEDS AND REQUIREMENTS**

This is where we came to identify the potential requirements of target users. In other words, we thoroughly discussed what would be the user goals that should be met for our design solutions to be successful. Besides, we assessed what is required to involve users in the design process to get their evaluation and feedback, which was vital in shaping our design approaches. All in all, we tried to learn about target user needs and characteristics; learned about creating ideas and concepts; learned about the interactions and contexts. In this stage, the two design critique sessions we made with other students were vital to clean up our design ideas so that needs and requirements evolved to be clear and specific.

## PRODUCE DESIGN SOLUTIONS

In this part of the process, we went through different phases, building from a rough concept to low and medium level prototypes. Having user goals defined in the previous stages, we produced an ideal academic website layout and structures using paper prototyping and wireframing. Following this, we designed the demo website as part of our digital artifact and low fidelity prototype of Bubble - we called it "HCI Bubble" as it becomes also our project name at the end. So our final developed design artifacts are low fidelity Bubble and mid-fidelity prototype of an interactive website that is actually all about the "HCI Bubble".

## EVALUATE DESIGN

In this stage, we passed through various processes to evaluate and review our conceptual design idea of the Bubble and having a webspace that can be used reflect the day to day academic activities of students (HCI master students of University of Trento - UniTn). However, as we progressed through usability evaluation methods and design critiques sessions with other students of this master, our focus of design ideas have changed from its original point of interests. As a result, at this design stage, we went through many back and forths to redefine the context of use after each evaluation session we had. And finally, we managed to get the refined conceptual design ideas which basically helped us to develope our final design artifacts (HCI Bubble and an interactive website of the Bubble).

## UX METRICS FOLLOWED: PRAGMATIC AND HEDONIC

Hedonic aspects: According to Marc Hassenzahl et.al, hedonic quality embraces quality dimensions that have no obvious relation to the task the user wants to accomplish with the system or product but instead are related to non-instrumental qualities such as esthetics, innovativeness and originality. Generally, hedonic qualities refer to the psychological needs and emotional experience of the user.

For our purpose we used two hedonic qualities which are explained below. So based on this idea, we want our design artifact, the HCI Bubble in this case to provide:

1) stimulation by its challenging and novel/originality attributes. Through our artifact, we want target users to be stimulated so as to enjoy their experience with it. According to Hassenzahl, rarely used functions can stimulate the user and satisfy the human urge for personal development and more skills.

2) identification by expressing one's self and personal values to relevant others. We humans need for expressing ourselves through objects to control how we want to be perceived by others. Our team has a strong desire to communicate the HCI master identity to the outside world and we do it through making the "HCI Bubble" idea a reality in the near future. It will help to express and speak about our master programme. We want our HCI master to be remembered by the movable HCI bubble that would be installed and used to conduct academic and research activities within the city of Trento/Rovereto or somewhere in the wild.

Hedonic qualities and Symbolism: the digital artifact does reflect a strong inclination to innovation, especially as compared with the institutional website. Hence, the website can be seen as a symbolization of the innovative bubble's physical space used as a context for academic and research activities. The main purpose of the installation is to extend the master's field of activity beyond the walls of the University and encourage a high involvement of anyone interested in this idea. This physical artifact thus, should reflects a novel academic area and elicits a stimulating context of study.

Hedonic qualities and aesthetics: The digital artifact reflects the qualities of identification and stimulation as it can be understood from the results of the questionnaire. The perceived aesthetic features indeed, have got a score significantly higher compared to the institutional website.

Pragmatic aspects: Even though our main focus has been on the hedonic qualities of our digital artifact, we have endeavored to create a "human", manageable and clearly structured website, also these qualities have found feedback in the results of the questionnaire survey.

## METHODS AND TOOLS

Throughout the project timeline, we have been using a couple of methods ranging from need assessment stage to design usability evaluation. Hence, methods such as brainstorming, PACT analysis, paper prototyping, wireframing, questionnaire survey and design critiques had been used at different stages of the project with the aim of getting different information and ideas that can be used as relevant inputs for the final design artifacts. Tools such as Attrakdiff also used to analyze the survey data collected from undergraduate students of UniTn.

# DESIGN PROCESS

**THE BUBBLE**

Imagine if we could co-working or researching within an interdisciplinary team in situ. Once Winston Churchill said: "We shape our buildings; thereafter they shape us."

For this project, we started to reflects upon the difference between the "single universe" in which the academic community lives, and the "multiple universes", in which other communities, other realities live. To be more provocative one could say that each universe tends only to expand their own world, and does not really attempt to discover the others. We are convinced that death comes from right here, from this separatism that marks the disappearance of alternative universes.

Exactly in this territory that we started to work, a trail to move the academic activity onto the street and enable the academic research to discover the authenticity of the ecological environment (and viceversa). But how I could find a tangible way to express it, how could I bridge those universes?

The first inspiration came from the famous RV or camping van from the well know TV show Breaking Bad, where the two protagonists were cooking methamphetamine in a sort of moveable laboratory.

We developed the idea, moving from the RV to the shipping container, which we thought was a very good solution for our propose, quite flexible, robust, but perhaps out of the budget. We had to find a movable and flexible solution that could have been also economically affordable.

Art is always a source of inspiration in our project. You may, for instance, know the very famous Indian–British artist Anish Kapoor with his massive installation part of the Monumenta 2011 in Paris. This installation brought me close to the final stage of our concept: to the retro–futuristic idea of inflatable architecture.

Inflatable architectures are actually a real urban intervention, popping up temporarily, for one or more weeks in the city. It changes the view and the perception of the place, while the space is converted into a playful interesting environment where people can gather, talk, dance, relax and work.

The installation appeared during the Design Week 2016 in Helsinki is just an example how the Berlin-based creative collective Plastique Fantastique is playing with the potentiality of the urban context. Future HCI master student could take advantage of the space and start working on interdisciplinary design research projects that might mediate the gap between technological innovations and people's real needs. An alternative concept that may be, not only the base for a future academic reality but also the right way to promote the master course.

How can people be integrated into research and development as experts of their everyday life? Which forms of technological development and innovations can be utilised to improve social, environmental and economic sustainability? Those are just a couple of question that could be answered by exploring the design practice. According to Findeli: "Design Research is a systematic search for and acquisition of knowledge related to general human ecology, considered from a designerly way of thinking (i.e. project oriented) perspective." (Findeli, 2010)


STOCKMANN
Regus
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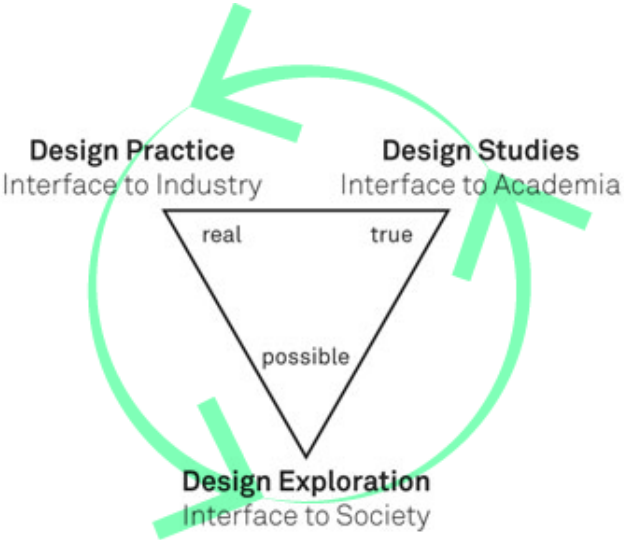
Fällman stated, the process of a design research can be seen as a triangular model defined by the design practice, design studies and design exploration, looking for what is real, true and possible. During this process, the student will be able to change the point of view and walk throughout the three stages.

In this sense, the artefact, the installation, is just the physical representation of what happens digitally on the webspace. A place where people can see and come closer to the students, and perhaps understanding what the HCI master is also about.

Of course, both spaces, the on– and the off–line, to survive need the student support. The ecological physical space is the key factor, the place where activities could take form. The approach is to think of the design practice as a driving force. An ecological immersive outlook, which can easily and affordably change location in accord with the necessity of the design activities and academic purposes. Studying, brainstorming, readings groups, open discussion, seminar, workshops, are just some of the activities that can be organised.

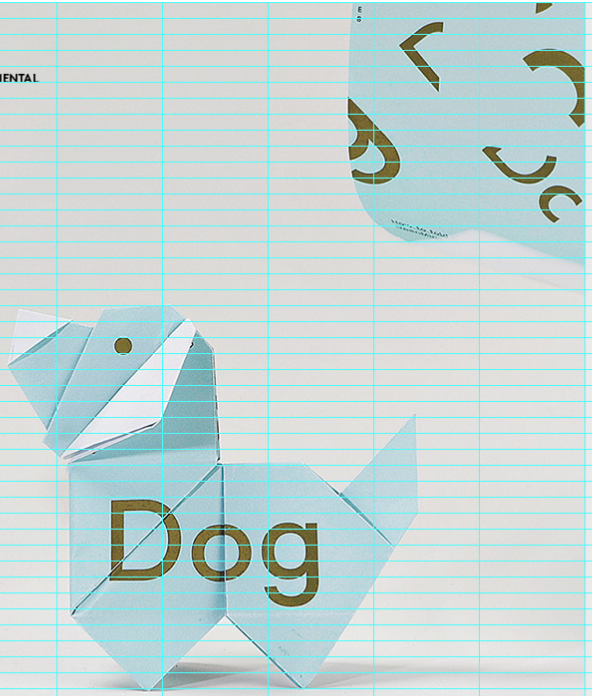



Framework to understand design activities (Adapt from Fällman, 2008)

## THE WEB PAGE

The illustration visible on the homepage is an experiment of visual language. Paraphrasing Italo Calvino, I played with a finite number of elements whose combinations multiplied could create billion of stories. Creating the illustration I created a geometry, a centre and a periphery. In the most general sense, the book is a point, an area, a surface in which three qualitatively different entities meet: the design practice, design studies and design exploration (Fällman, 2008). The book explores time and space, defining a territory. The image, the pictograms, the icons, as well as the different compositions visible on the illustration, are used in order to build a story, hence the metaphor as a creative force, a generating power. According to Calvino, the world is like a labyrinth of indecipherable signs, where the chaos is predominant, is where our story does not leave any marks. Our existence, in fact, is intertwined with other stories. What we have tried to create is a bridge, an interface between the "single universe", in which the academic community lives, and with what Tobie Nathan calls "multiple universes" the "multiple universes", in which other communities, other realities live. In fact, there is not only one truth, one reality, but rather a multitude of equally valid possibilities. All stories created, all new territory explored, all new pages added to the book are linked to each other by the same symbols, but telling completely different stories. The peculiarity is that, a narrated story can be interpreted in completely different ways. You might perhaps, in this very first page recognise the territory among Trento and Rovereto, where this journey started.

While the project page shows the past, present and future project in a more descriptive way, the calendar page shows them more pragmatically and organised by dates. Two more sections are on the menu, the classic about and the ask-us/contact section. And last but not least, social media, very important nowadays.The web page tries to follow the principle of "less is more" from the modernist architect van der Rohe which are reflected in each aspect of the web page. Starting from the Sans-Serif Brown from the type foundry Lineto to the less-distractive colour choices. While the page is well structured and follows the Müller-Brockmann grid systems (1988).




# SYDLEXIA

## MAKING SENSE OF DYSLEXIA

People with Dyslexia can struggle to read even the simplest of words. Sydlexia wanted to generate awareness about this little-known disorder. We created a series of posters that illustrate how difficult it can be to make sense of a word you can't recognize. The designs double up as interactive learning tools in the form of origami posters. Once folded correctly they help forge the connection of the word to the object it represents in the dyslexic mind.

**Section 1.10.32 of "de Finibus Bonorum et Malorum**

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**Section 1.10.33**
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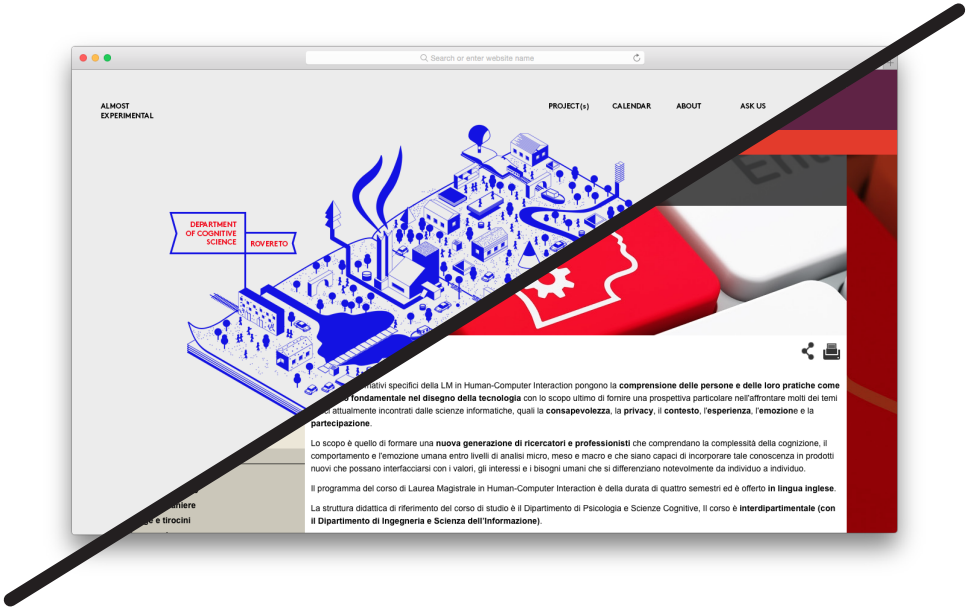
CLOSE

# EVALUATION

## QUESTIONNAIRE SURVEYS AND DATA ANALYSIS

Participants: 20 undergraduate students (7 female, 13 male) participated at the survey and were randomly chosen within universitarian buildings in the course of a day. The participants received no compensation for their participation.

Variables and measurements: as objects of the study we used a serie of screenshots of both the institutional website and the bubble website prototype, the survey was formed by 28 items base on the Attrakdiff two questionnaires based on Hassenzahl's evaluation technique, which was employed to measure four different category of perceived aesthetic qualities: perceived pragmatic quality (PQ), perceived hedonic quality-identification (PHQ-I), perceived hedonic quality-stimulation (PHQ-S) and attractiveness (ATT). The questionnaire consists of twenty-eight 7-point items with bipolar verbal anchor. PQ, PHQ-I, PHQ-S and ATT scores were calculated by averaging the respective items per participant for each object (institutional and bubble website).



**HEDONIC QUALITY–IDENTIFICATION (HQI)**

| | |
|---|---|
| HQI_1 | Isolating—integrating |
| HQI_2 | Amateurish—professional |
| HQI_3 | Gaudy—classy |
| HQI_4 | Cheap—valuable |
| HQI_5 | Noninclusive—inclusive |
| HQI_6 | Takes me distant from people—brings me closer to people |
| HQI_7 | Unpresentable—presentable |

**HEDONIC QUALITY–STIMULATION (HQS)**

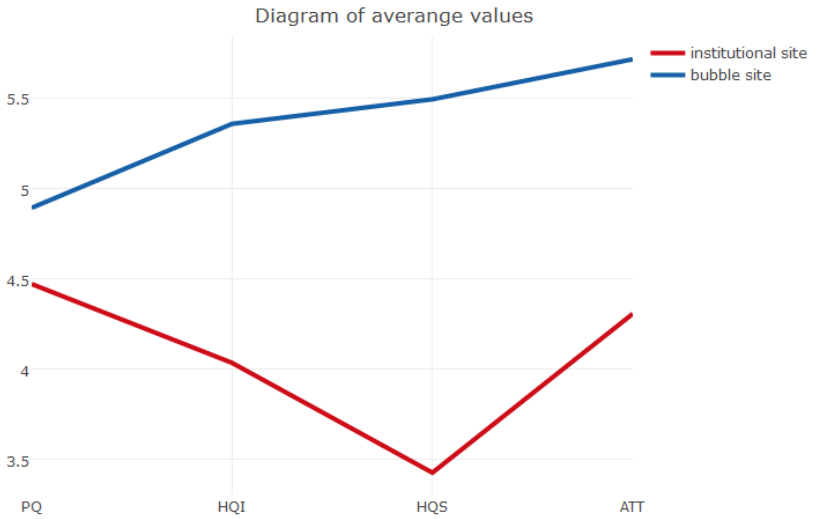
| | |
|---|---|
| HQS_1 | Typical—original |
| HQS_2 | Standard—creative |
| HQS_3 | Cautious—courageous |
| HQS_4 | Conservative—innovative |
| HQS_5 | Lame—exciting |
| HQS_6 | Easy—challenging |
| HQS_7 | Commonplace—new |

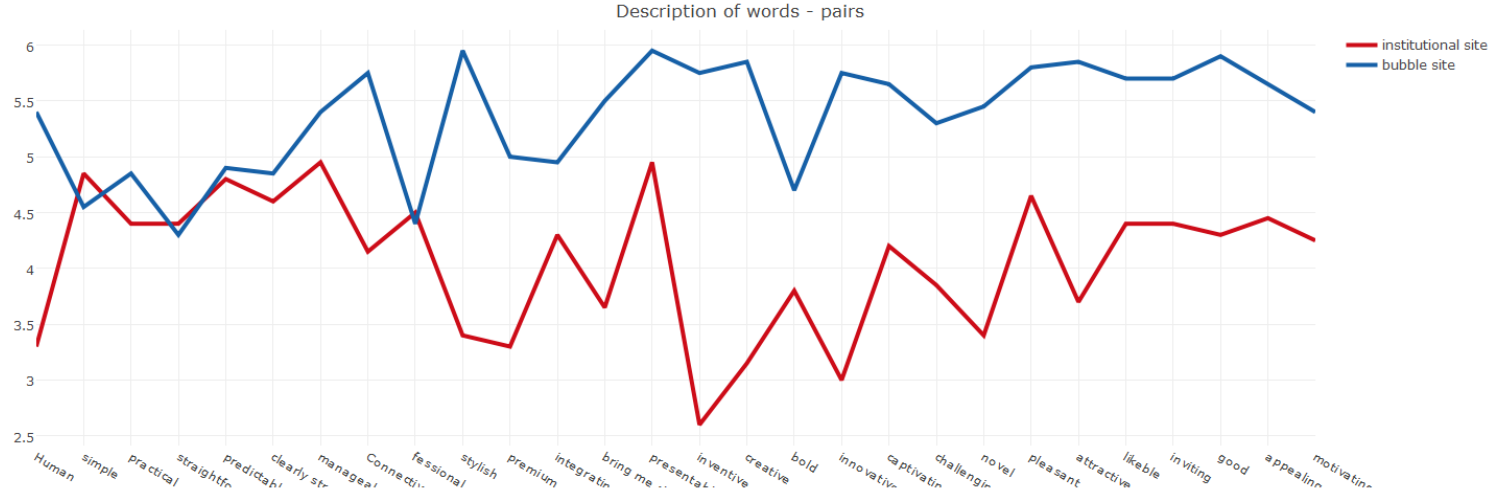
**PRAGMATIC QUALITY (PQ)**

| | |
|---|---|
| PQ_1 | Technical—human |
| PQ_2 | Complicated—simple |
| PQ_3 | Impractical—practical |
| PQ_4 | Cumbersome—direct |
| PQ_5 | Unpredictable—predictable |
| PQ_6 | Confusing—clear |
| PQ_7 | Unruly—manageable |

Procedure: The participants were randomly chosen in the court of undergraduate students, to each of them was shown a set of five images for each of the two object of analysis (institutional and bubble website) the order of presentation was altered and the participants were instructed to evaluate the perceived aesthetic quality of the interface through the images that were presented to them and to rate them with the questionnaires (the same questionnaire for each set of images), for each participant the evaluation of the two websites took around 15 minutes.

Result: The mean values of the word pairs shows a statistically significant difference in the perceived aesthetic quality between the bubble site and the institutional web site, as indicated by the Wilcoxon signed rank test ($Z=94434$, $p<0{,}001$), indicating an overall better level of aesthetic qualities for the bubble website. The highest difference was related to HQS items ($Z=710.5$, $p<0.001$), followed by ATT ($Z=761$, $p<0.001$), HQI ($z=911$, $p<0.001$) and PQ ($Z=2932.5$, $p<0.01$). to sum up, the bubble website has been found highly more attractive and stimulating than the institutional website, less difference has been found in the perceived pragmatic quality of the websites which, however, is still statistically significant.




Description of words - pairs
institutional site
bubble site
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5
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3.5
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2.5
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# CONCLUSION

In conclusion, our purpose is to promote the HCI master in an original, alternative and innovative way. In addition to promoting the master through a website with the requirements that reflect our intent, we wanted to extend our experience with a physical artefact, an ideal physical space where students could perform any kind of academic activities, but immersed in a real ecological environment.

Consequently, we decided that our website is a digital space which can represent what would happen in the physical installation. An aesthetically unconventional website which reflects the equally innovative physical space, encouraging the involvement of anyone interested. Indeed, the UX metrics we have followed - after defining the specific UCD process stages for our project - are the Pragmatic qualities and Hedonic attributes, referring to the psychological needs and emotional experience of the user (hedonic), but we have also tried to create a usable, manageable and clearly structured website (pragmatic).

The "HCI Bubble" is, therefore, a mobile and inflatable design space that can be temporarily moved and installed outside conventional academic structures, useful for performing research and events by students, researchers, or interested groups, and that can affordably change locations in accord with the necessity of the design activities and academic purposes. Our project aims to contribute to rethinking the conventional physical academic space and modelling the activities performed in it, making them engaging, real, modern, innovative, interactive.

Starting from this general idea we delineated the requirements of our interest by applying the PACT analysis and subsequently, we outlined the structure of the website by interviewing, making focus group and run a design critique sessions with the other students of our Master course.

Based on these UCD methodology approaches, we created a prototype for which we performed an evaluation of the perceived qualities of the website, by involving undergraduate students of the University of

Trento with a questionnaire based on Marc Hassenzahl's research of the hedonic qualities. Then, we analysed the data in order to find evidence regarding the goodness of our artefact in relation to the existing one (institutional website), noting an overall better level of aesthetic qualities for the bubble website and also more attractive and stimulating.

For our final presentation, we managed to create a mid-fidelity prototype of the inflatable architecture and a mid-fidelity prototype of the website related to it. As for possible future developments, we think that this conceptual design idea can be implemented as design space in different environments and could be very important for designers, and we are convinced that this experience of conducting events outside of traditional environment can make a positive impact in shaping the future human-to-human interaction and forms of design spaces.

**REFERENCE**

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Findeli, A. 2010. Searching for Design Research Questions: Some Conceptual Clarifications, (pp. 278-292). iUniverse.

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| Typeface | Brown |
| Format | 148mm * 210mm |
| Grid | 14 pt baseline grid |
| Extent | 32 pages |
| Ink | Gray Scale |
| Tea | Oolong, no sugar! |

**Master in Human–Computer Interaction**
**Department of Information Engineering and Computer Science**
**Department of Psychology and Cognitive Science**

**A project by students for students**