USE OF UX AND HCI TOOLS AMONG START-UPS

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ABSTRACT

Today, User Experience (UX) and Human-Computer Interaction (HCI) tools can provide a competitive advantage that might be key of a company's business success or failure. In this paper, the awareness and use of these tools among start-ups is examined with a survey. The results hint that there is lots of room for improvement in terms of raising awareness and adoption of tools that help companies deliver better experiences through their products.

1 INTRODUCTION

Small and Medium sized Enterprises (SMEs), and start-ups as a sub-group, play an important role in the economy [1]. Their business success is determined by various factors: access to financing, ease of administration defined by (local) regulations, and the product/service itself. Differentiating from the competition can be done on technical capabilities or features, price and the experience the product/service offers to the user or customer.

The annual report on European SMEs [2] highlights the importance of small firms (SMEs, start-ups) for economic growth: "*Being and staying small in size does not, however, mean that these firms are unimportant for macroeconomic growth. Due to their large numbers, they provided more than 66% of the total jobs in the EU in 2012. New businesses can also generate important impulses for economic growth and the SME sector has to be regarded as a particular seedbed for further start-ups and for a culture of entrepreneurship,*" and "*Since nearly all new firms start from a very small size – often just the founder with no dependent employees – new business formation directly contributes to the SME sector. Moreover, the great majority of new businesses stay micro-businesses for the whole period of their existence. Only very few exceptional start-ups become larger firms.*"

How to successfully compete and survive? Jim Shamlin argues that "*user experience is becoming the primary means of competition, and involves a sustainable competitive advantage over its competitors.*"[1] Furthermore, he talks about a new era of competition, which is based on UX. In contrast to buying a product/service because it is the

only one and later because it is better (for a specific need or purpose), UX based competition strives towards creating a relationship with the customer over time, based on how he feels during the whole life-cycle of the product/service (e.g. buying, using). This point of view is echoed by Erik Flowers: "*This is what makes businesses successful in the modern age. The age of features is dead. The age of experience has arrived. Look at the top performing companies in the world – all are focused on experience. It is proven. It is quantifiable. Parity on widgets, patents, technological capability has been reached. People demand a higher order experience.*" It is important to have "*a cohesive flow of how we handle designing things. Not just what we see on the screen, but the design of the whole experience. What a user ends up feeling and thinking in their mind cannot be designed, that is the experience that manifests. But the tools and methods we use to set it all up is what brings us as close as we can to setting up that happy journey.*"[2]

Due to the importance of both start-ups in the economy and UX and *HCI tools* and *methods* in start-ups, we examine in this paper how these tools are used. In other words, this paper is focused on the question if HCI/UX tools are being used, whereas related work is mostly focus on how a specific tool is used [3-5]. What follows is a brief description of the tools taken into consideration and the results of a survey about the awareness and use of these tools.

2 SURVEY AND RESULTS

The set of 15 tools and methods taken into consideration in this study was adopted by the usability.gov [6] portal, along with the descriptions in this paper: contextual interview, focus groups, on-line surveys, standard usability questionnaires, heuristic evaluation, first click testing, eye-tracking, mobile device testing, wireframing, card sorting, prototyping, personas, task analysis, individual interviews, and diary study.

The survey focused on the use of these tools among start-ups. The survey was conducted on-line, after entering some background data, respondents were asked to '*rate the following terms based on how much you use them in your*

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work.' The answers were provided on a scale from 1 to 4, namely 1-never heard of, 2-heard of, but never used, 3-used a few times, 4-use regularly. In total 23 people involved in start-ups responded, aged from 21 to 38 (28 average), 2 females and 21 males, on average involved in 3 startups in the last 3 years. 9 were Slovenian, 7 Italian, 2 Romanian, 2 Polish, 1 Czech, 1 Bolgarian and 1 Ukrainian. Their background covered business, design, technical and marketing skills.
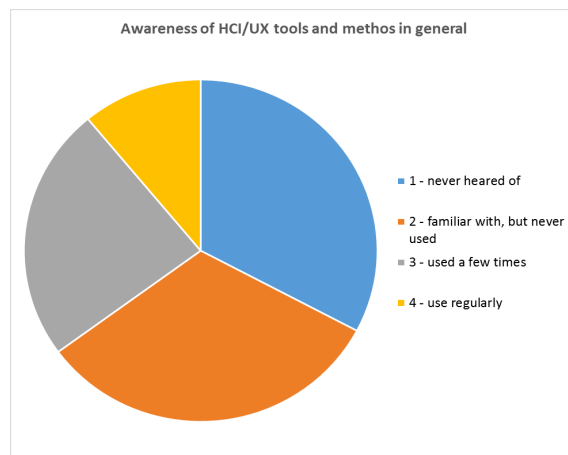

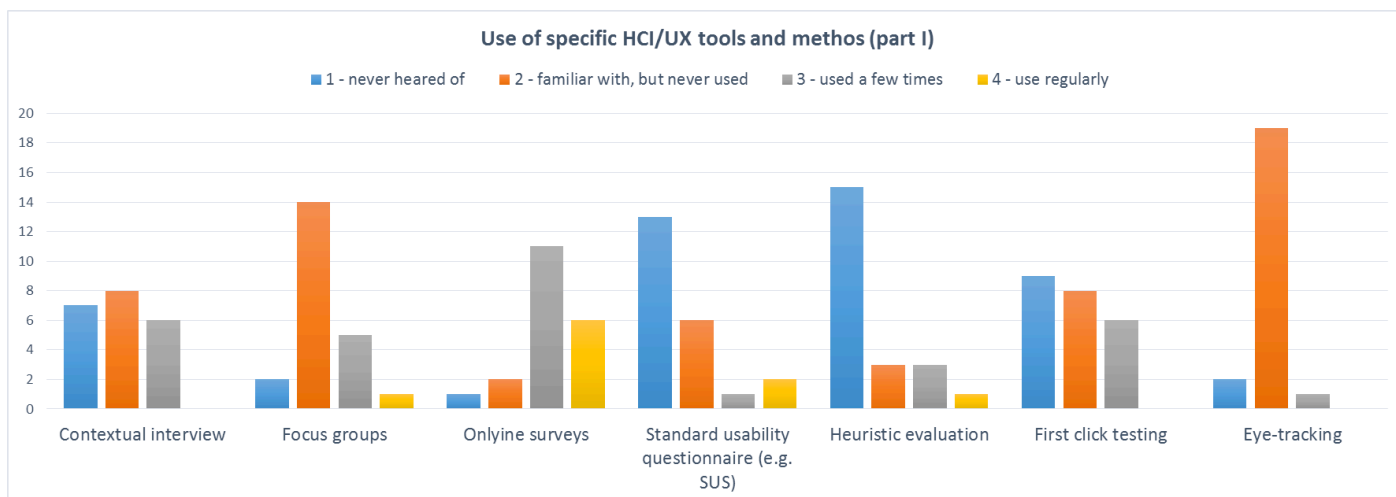**Figure 1: General overview of awareness of UX/HCI tools and methods.**

Figure 2: Awareness and use of specific UX/HCI tools among start-ups, first part.
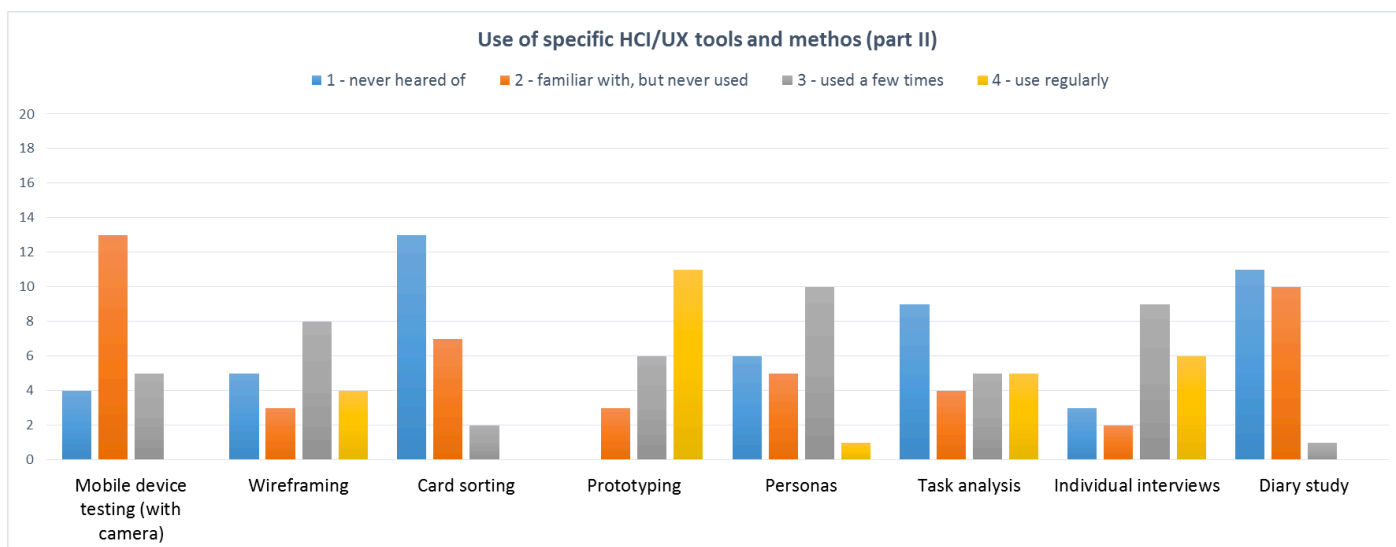

Figure 3: Awareness and use of specific UX/HCI tools among start-ups, second part.

Contextual interview: During these interviews, researchers watch and listen as users work in the user's own environment, as opposed to being in a lab. Contextual interviews tend to be more natural and sometimes more realistic as a result. They are also usually less formal than lab tests and do not use tasks or scripts.

Focus groups: A focus group is a moderated discussion that typically involves 5 to 10 participants. Through a focus group, you can learn about users' attitudes, beliefs, desires, and reactions to concepts. Focus groups differ from usability testing or contextual interviews in the kind of information they produce in two ways: (a) in a typical focus group, participants talk. During the focus group users tell you about their experiences or expectations but you do not get to verify or observe these experiences and (b) in a typical usability test or contextual interview, users act. As a result, you are able to watch (and listen to) them and draw conclusions from that.

On-line surveys: An on-line survey is a structured questionnaire that your target audience completes over the Internet generally through a filling out a form. On-line surveys can vary in length and format. The data is stored in a database and the survey tool generally provides some level of analysis of the data in addition to review by a trained expert. Unlike traditional surveys, on-line surveys offer companies a way to collect information from a broad audience for very little cost. When conducting an on-line survey, you have an opportunity to learn who your users are, what your users want to accomplish, and what information your users are looking for.

Standard usability questionnaires (e.g. SUS): A standardized questionnaires have gone through the process of psychometric validation. They have several advantages over ad-hoc questionnaires: reliability, validity, sensitivity, objectivity, quantification, economy, communication, and norms[3]. An example is the System Usability Scale (SUS), which provides a "quick and dirty", reliable tool for measuring usability. It consists of a 10-item questionnaire with five response options for respondents; from Strongly agree to Strongly disagree. Originally created by John Brooke in 1986, it allows you to evaluate a wide variety of products and services, including hardware, software, mobile devices, websites and applications.

Heuristic evaluation: In a heuristic evaluation, usability experts review your product's interface and compare it against accepted usability principles. Nielsen's heuristics are: Visibility of system status, Match between system and the real world, User control and freedom, Consistency and standards, Error prevention, Recognition rather than recall, Flexibility and efficiency of use, Aesthetic and minimalist design, Help users recognize, diagnose, and recover from errors, Help and documentation. The analysis results in a list of potential usability issues.

First click testing: First Click Testing examines what a test participant would click on first on the interface in order to complete their intended task. It can be performed on a functioning website, a prototype or a wireframe. First Click Testing allows you to evaluate the effectiveness of the linking structure of your site, including the navigation, to see if users how to get around the site and complete their intended task.

Eye-tracking: Eye tracking involves measuring either where the eye is focused or the motion of the eye as an individual views a web page. It discloses the following information: where they are looking, how long they are looking, how their focus moves from item to item, what parts of the interface they miss, and how parts of the interface effects attention.

Mobile device testing: Testing mobile devices such as phones, tablets, and eReaders requires special equipment and methodology. Since traditional desktop screen-capture software cannot adequately capture touch interactions, usability practitioners have been using strategically placed cameras to record usability test interactions on these mobile devices.

Wireframing: A wireframe is a two-dimensional illustration of a page's interface that specifically focuses on space allocation and prioritization of content, functionalities available, and intended behaviors. For these reasons, wireframes typically do not include any styling, color, or graphics. Wireframes also help establish relationships between various templates.

Card sorting: Card sorting is a method used to help design or evaluate the information architecture of a site. In a card sorting session, participants organize topics into categories that make sense to them and they may also help you label these groups. To conduct a card sort, you can use actual cards, pieces of paper, or one of several online card-sorting software tools. It helps understand users' expectations and understanding of topics.

Prototyping: A prototype is a draft version of a product that allows you to explore your ideas and show the intention behind a feature or the overall design concept to users before investing time and money into development. A prototype can be anything from paper drawings (low-fidelity) to something that allows click-through of a few pieces of content to a fully functioning site (high fidelity).

Personas: Personas are reliable and realistic representations of your key audience segments for reference. These representations should be based on

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http://www.measuringusability.com/blog/standardized-usability.php

qualitative and some quantitative user research and web analytics. Effective personas: represent a major user group, express and focus on the major needs and expectations of the most important user groups, give a clear picture of the user's expectations, aid in uncovering universal features and functionality, describe real people with backgrounds, goals, and values.

Task analysis: Task analysis is the process of learning about ordinary users by observing them in action to understand in detail how they perform their tasks and achieve their intended goals. Tasks analysis helps identify the tasks that your website and applications must support and can also help you refine or re-define your site's navigation or search by determining the appropriate content scope.

Individual interviews: In individual interviews, an interviewer talks with one user for 30 minutes to an hour. Individual interviews allow you to probe their attitudes, beliefs, desires, and experiences to get a deeper understanding of the users who come to your site. You can also ask them to rate or rank choices for site content. These interviews can take place face-to-face, by phone or video conference, or via instant messaging system.

Diary study: Diary Study is a longitudinal technique used in User Experience Research primarily to capture data from participants as they live through certain experiences. There are two types of diary studies: (a) elicitation studies where participants capture media that are then used as prompts for discussion in interviews. The method is a way to trigger the participant's memory. (b) Feedback studies where participants answer predefined questions about events. This is a way of getting immediate answers from the participants.

3 DISCUSSION

Generally speaking, we can say that the results are not encouraging and call for improvement. Figure 1 shows that 35% of the listed tools are used regularly or have at least been tried out by start-ups. This leaves almost two thirds of the UX/HCI tool-set unexplored and unused. One the one hand, we could argue that people with non-designer roles don't need to use these tools on a regular basis, but on the other hand, they should at least be aware of them, given that work in a start-up is often done also outside one's field of expertise. Additionally, some doubt can be shed on the correctness of the results as it is highly improbable that someone never heard of on-line surveys.

More specifically, we can conclude that the most widely used tools are: task analysis, individual interviews, prototyping, wireframing, and on-line surveys, while diary studies, card sorting, first click testing, heuristic evaluation, standardized usability questionnaires, and contextual interviews are rarely used or even unknown.

For a more in-depth analysis on which tools are used by people with different backgrounds or nationalities more data is need.

4 CONCLUSION & FUTURE WORK

A general conclusion is that UX/HCI tools and methods are not as widely known and used as they could be. Given the role that user experience has on modern products and services in the economy, it is important to raise awareness of this discipline. UX is part of the broader field of human-computer interaction and as such it should find more place in HCI curricula across universities (in both technical and non-technical programs). It is also the role of local HCI communities to raise awareness and increase knowledge about these tools by providing on-line resources (educational materials and services, for example ready to use templates for standardized usability questionnaires) and seminars on the topic. For starters, spreading the results of this survey among start-ups would raise awareness of the problem, while the brief descriptions of tools and methods in this paper provide an entry point for those seeking a solution.

References

[1] Lukács, E. (2005). *The economic role of SMEs in world economy, especially in Europe*. European Integration Studies, (1 (4), 3-12).

[2] Dimitri Gagliardi, Patrice Muller, Edward Glossop, Cecilia Caliandro, Michael Fritsch, Gabriela Brtkova, Nuray Unlu Bohn, Demetrius Klitou, Gavriel Avigdor, Chiara Marzocchi, Ronnie Ramlogan (2014). Annual Report on European SMEs. Online: http://goo.gl/6q6IS4

[3] Väänänen-Vainio-Mattila, K., Roto, V., & Hassenzahl, M. (2008, April). Now let's do it in practice: user experience evaluation methods in product development. In CHI'08 extended abstracts on Human factors in computing systems (pp. 3961-3964). ACM.

[4] Väänänen-Vainio-Mattila, K., Roto, V., & Hassenzahl, M. (2008, April). Now let's do it in practice: user experience evaluation methods in product development. In CHI'08 extended abstracts on Human factors in computing systems (pp. 3961-3964). ACM.

[5] Obrist, M., Roto, V., & Väänänen-Vainio-Mattila, K. (2009, April). User experience evaluation: do you know which method to use?. In CHI'09 Extended Abstracts on Human Factors in Computing Systems (pp. 2763-2766). ACM.

[6] Usability.gov (2014). *How to & tools*. Online: http://www.usability.gov/how-to-and-tools/index.html Usability.gov (2014). *How to &*