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A Case Study From Industry

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The Role of UX Professionals in Agile Development: A Case Study From Industry

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ABSTRACT

A highly debated topic within recent literature in HCI is the integration of UX activities into agile development. While we acknowledge the question of integration to be one of the main challenges for UX professionals, this seems to have received traction and is heading closer towards a resolution. We believe the time is right for gaining an in-depth understanding of the UX roles responsibilities in an agile case company that has moved beyond the question of UX integration. Through interviews with UX professionals, developers and managers we found that the UX professionals have a very broad set of responsibilities, of which some are unseen in relation to previous studies and not classically considered part of the UX role. Interestingly, these newly identified responsibilities are some of the most critical to the success of integrating UX into agile development.

Author Keywords

User experience; Roles; Agile; Case study; Practice.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

INTRODUCTION

Since the 1990s, agile processes, and especially Scrum, have become popular for software development. This as a reaction to the size and complexity of the dominant processes, such as traditional or waterfall [19,26]. Agile processes have received an overwhelming attention, mainly due to their openness and flexibility towards changed

requirements, design ideas, and value contribution, e.g. [12]. Much motivation for agile processes has come from development team members because agile processes allow for greater autonomy. Two of the basic features of agile development is speed and communication [2]. Yet, the requirements on quality, user experience (UX) and other aspects of great importance for the users are not explicit in the agile processes [9]. Although many development organizations report great success of employing agile development, none of these explicitly describe that a UX role should be included [37].

The UX professional role is important for understanding and managing user perspectives in agile projects [9, 13, 29]. Several studies have suggested how UX tasks can be integrated into agile development such as inducing a “sprint 0” before development combined with e.g. parallel sprints [40]. While we acknowledge the question of integration to be one of the main challenges for UX professionals, this seems to have received traction and is heading closer towards a resolution. The time is right for gaining a more in depth understanding of the responsibilities involved in the UX role. To our knowledge no studies have directed an in depth emphasis on the role most central to UX integration. This role has also been subject to a high variety in naming and responsibilities. For these reasons, we find it important to further understand the role.

In this paper we identify the responsibilities of the UX professionals through a case study within a company that has moved beyond the question of UX integration.

The paper covers a review of the most relevant research literature. The research design as a case study is then described, why that is appropriate, and how data were collected and analyzed. This is followed by a description of the development phases in the case company, which provide context for an understanding of the emphasis on the responsibilities of the UX professionals in each phase. This is followed by a section describing in more detail the responsibilities and tasks of the UX professional. Finally we discuss and conclude our findings.

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RELATED LITERATURE

This section presents an overview of the tasks and responsibilities of the UX practitioners from research and practitioner literature. Followed by outlining previous research on how these responsibilities relate to the development phases.

Tasks and Responsibilities of UX Professionals

Tasks and responsibilities of roles in organizations are relevant because they are connected to job specialization and division of labor [30]. In software development organizations there are obvious job specializations differentiating e.g. software developers, project managers and UX professionals. Roles, associated tasks, and responsibilities is a convenient way to provide clarity as to the scope of the specialization: Who gets assigned which roles? What are the expectations? And what is the linkage and coordination between different roles? As a professional role, the UX professional is often subjected to high horizontal job specialization as it requires skills, knowledge, and years of training. The focus in our study is on the tasks and responsibilities associated with the UX professional role.

The tasks and responsibilities of the UX professional spans the entire development process as can be seen in the descriptions of activities provided by the User Experience Professionals Association (UXPA) [39]. UXPA divides UX activities into: Research, Evaluation and Design. This spans from doing user research in contexts, over being responsible for test of products during the entire development process, to having responsibility for interface, information, and interaction design. This broad understanding of the UX professional role prevails in the online practitioner oriented UX Magazine [1]. In UXMag, implementation and data analysis is additionally included in the responsibilities of the UX professional. UXMag describes the multiple roles of the UX professional as being: User Researcher, Usability Tester, Data analyst, Information architect, UI designer, and Senior UX designer, with the latter being responsible for the overall process of UX work. Taken together this shows a desire for broadening the scope of the roles and the responsibilities.

There is a marked paucity of research addressing the roles, tasks, and responsibilities of the UX professionals in particular in the context of agile software development. Table 1 summarizes tasks and responsibilities of the UX practitioners as identified in the research literature.

The UX professionals' understanding of their job role and the need to establish and communicate an overall team vision was pointed out as the two major themes highly important for the success of integrating user activities in agile development [22]. UX responsibilities are often considered important both at the strategic and operational level [23].

McInerney & Maurer [29] interviewed usability specialists in agile projects. They were all positive on their ability to manage UX activities in the projects. Although they could not point to specific improved effects in the projects, they were positive about their ability to contribute, and did not see any negative effect from the fact that the projects followed an agile approach (M og M, 2005).

A study IT professionals showed that it is often unclear who is responsible for the interaction between the development team and the users [9]. UX professionals rarely fit into the team culture and the highly motivated individuals seeking to integrate UX work into Scrum do not always have the support they need to be able to do that work.

Da Silva et al. [36] interviewed UX professionals working within an agile framework. They found the UX profession was divided into three different roles: UX designer, responsible for understanding users, interaction designer, responsible for design and evaluation of the interactions with the product, and UI developer, responsible for the GUI and graphical elements. Similarly Unger & Chandler [38] have three different UX roles, one responsible for research, one for GUI and one for information architecture. The most inclusive description of UX roles is by Hartson and Pyla [18], who describe the roles as: user researcher, interaction designer, usability analyst, and UX manager. Furthermore the following roles are sometimes included: Subject matter expert, Visual designer, Interactive prototype programmer, and Technical writer. It is unclear from these studies if all these differing explanations of the various roles really differ in terms of job specialization or if they are merely to be understood as main activities of the UX professionals.

As a professional role usually involves great leverage in organizing the work, the implication is that a UX professional has much control over their tasks. The responsibility for managing UX work is a potential role [17, 18]. Da Silva et al. [36] writes "Most of the UX designers have not been concerned about project management before their first contact with agile" software development" (ref. p. 600+601).

The integration of UX in agile development has been covered to some degree as reviewed above, but little has been written about when and where in the agile development processes the different UX roles are involved. One exception is Göranson et al. [17] who describe the usability design discipline in more depth as containing the following activities: planning usability design, conducting user studies, performing competitor analysis, developing conceptual design, interaction design and detailed design, develop user assistance, monitor usability work, and perform usability evaluation.

Discipline	Role title	Responsibility	Tasks
<i>Test and evaluation</i>	Usability Tester [1]	Evaluating of a product	Testing product on groups of users check functionality, usability and ease of use.
<i>User research</i>	User Experience designer [36, 39] User Researcher [1, 18]	Research, understanding users, and data gathering	Interviews, surveys, discussions and task analysis, contextual inquiry, work domain analysis
<i>User research including tests</i>	User Researcher [38]	Providing insights in user needs	Interviews, surveys, usability testing
<i>User research including design</i>	Field Study Specialist [17] Data analyst [1] Interaction designer [4, 36] UX analyst or evaluator [18]	Design and evaluation of the interactions with the product. Plan, perform, and analyze user studies. Interpret data for business decisions.	Usability methods and techniques, UX evaluations, categorizing user groups, understanding user needs, analyze UX problems, and suggest solutions.
<i>Design (not defined)</i>	User Experience designer [39]	Design	Interface, interaction, information or experience design.
<i>Interaction design</i>	Interaction Designer [4, 17, 18, 38]	The conceptual, interaction, and detailed design.	Task flows and wireframes, Ideation and sketching, conceptual and detailed design, low-fi prototypes, overall interaction scheme and layout.
<i>Graphic design</i>	UI developer [36] UI designer [1, 18]	Design of GUI and graphical elements, the look and feel of a site.	Designing detailed look and feel, branding, helping interaction designers with aspects of design, based on the requirements already identified.
<i>Information architecture design</i>	Information architect [1, 4, 38]	Building models of information structure and the navigation of the product.	Plan the structure of the page and the site. Development of detailed site-maps
<i>Documentation</i>	Technical writer [18]		Documentation, help systems design, language aspects
<i>Prototype programmer</i>	Interactive prototype programmer [18]		Programming hi-fi prototypes
<i>UX management</i>	Usability Designer [17] Senior UX designer [1] UX manager [18]	Planning and overseeing the overall UX process	

Table 1: Responsibilities and tasks of the UX professional identified in the literature

These activities mentioned in Göranson et al. [17] are carried out by usability designers, field study specialists, interaction designers, graphic designers, usability evaluation specialists, developers for implementing prototypes, etc. Thus, a better understanding of roles, activities, tasks and their interplay is needed to further the research on integrating UX and agile software development.

Table 1 summarizes the above literature review on the UX professional roles, responsibilities and tasks according to the various disciplines the roles have. This shows that the same role title has different responsibilities, e.g. Interaction designer can be responsible purely for design of interaction or for research and design. And that the same responsibility has different role titles e.g. UI developer and UI designer. Based on the above walk-through of related work, it is apparent that the HCI community's perception of the UX

professional role has reached a point with a high level of specialization. In Table 1 we see that the UX discipline is related to at least 16 different roles (naming wise), which in turn are associated with 11 different areas of responsibility. This is a key motivating factor for conducting this study. We aim to uncover the most critical responsibilities, and we want to do so in a case where UX activities already are integrated into agile development.

In Table 1, as well, as in the rest of the paper, we make a distinction between UX role, responsibility, and task. We view the roles as having multiple responsibilities to which several tasks are connected. As an example we consider e.g. the interaction designer (role) as having responsibility for shaping the UI design (responsibility) and one task connected to this is, among others, wireframing (task). This is all related to the discipline of design.

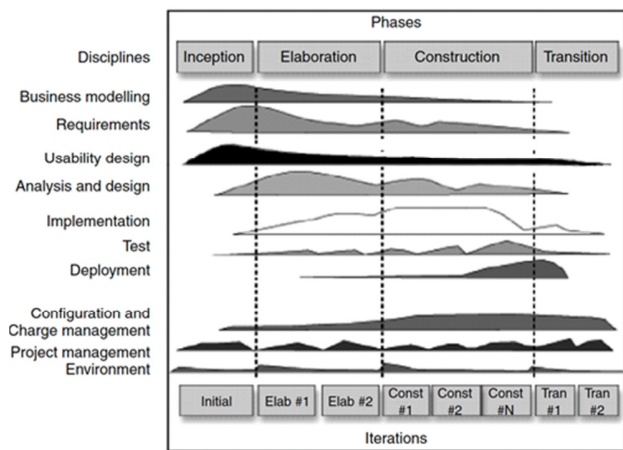


Figure 1: Overview of the UP development process with the added discipline of Usability design [17]

Mapping Responsibilities to Development Activities

There is limited emphasis in related research on the timing of UX responsibilities within development phases [36] consider roles in connection to agile development and discuss the timing of when UX professionals' responsibilities should come into play during development phases, yet this is not examined empirically. They conclude that the responsibilities can be divided into: User Experience Designer, responsible for user research early on in the project. Interaction Designer responsible for design and evaluation through the whole project and UI Developer responsible for the GUI also through the whole project.

Göranson et al. [16] developed a model with Usability Design as a plug-in to the Unified Process (UP), which is a process framework that is considered to be agile in some of its instantiations [24]. Figure 1 is a model where the usability design discipline has been added and it illustrates that it plays a large part in the inception phase after which it fades out in later phases, but is present in the elaboration, construction and transition phases. From figure 1, it is unclear whether the responsibilities of the UX role extend further than the Usability design discipline or whether the persons in the UX role are considered to be responsible for e.g. Analysis and Design or other activities.

METHOD

This paper is based on the case study approach [27] collecting data through semi-structured, qualitative interviews. The case study approach is appropriate for developing an understanding of a contemporary phenomenon (UX work) in its real-life context (a software company). Our case of a software company is highly dedicated to UX and to agile development, and it allows in-depth comparison with established theory (summarized in Table 1). This approach supports making general claims from a case study [15] on what the responsibilities of UX professionals in an agile software company entails in contemporary practice.

The Case Company

The case company includes more than 100 experts in user experience, design and software development. It is a consultancy company and sometimes the employees are situated at the customer location for longer periods. It was awarded as one of the best IT workplaces in Denmark recently. In their process they emphasize combining domain, business and software development knowledge. They focus on the UX of their products and 10% of the employees are UX consultants. UX activities are considered well integrated within the case company, which is documented through various achievements, among these winning the prize of being "IT-comet of the year", which is given to software development companies producing exceptionally high increases in revenues. One of the reasons for winning this prize is the company's emphasis on what they call the "whole IT solution", of which the development of software of course plays a central role, but of equal importance are considerations on the user experiences and customers' business goals.

Data Collection

We conducted 10 semi-structured, qualitative interviews at the company headquarters following the guidelines by Patton [32]. The interviews lasted 45 to 60 minutes and were audio recorded. Two researchers conducted the interviews based on an interview guide: one as the main interviewer and one as an interview observer. The observer sometimes added questions, if needed according to the interview guide.

The interview guide consisted of 32 questions: 4 questions were on demographics; 5 on the general software process; 9 on the UX concept, perception of the UX role, UX methods used and challenges of integrating UX in the process; 9 on the initial workshop with stakeholders and 5 on up-front design. Additionally, after asking the background questions we asked the participants to draw their general software process on a blank sheet of A3 paper. We asked them to explain what they were drawing and participants were not restricted in any way how to draw. We asked them to show their perception of the software process on the drawing. After drawing the process, we asked the 5 questions on the general software process, if information regarding those questions were not already covered with the drawing. The participants explained the process while drawing and the comments were recorded. The drawing was only used for discussing the software process and then set aside, but the participants could refer to the drawing if they wanted.

We interviewed 10 employees at the headquarters of the company: four employees having the role of a UX consultant (as named by the case company), two project managers, one software architect and three software developers. All of these had at least a Master degree related to their role within the case company and more than two years of job experience, some of which also came from earlier employments.

Data Analysis

The procedure for data analysis followed two themes: software process as experienced by the interviewees and challenges with integration of agility and UX.

One researcher analyzed the process descriptions in the interviews, while looking at the drawings of the software process from each interviewee. The drawings were analyzed according to the RAId (Rapid Analysis of Design Ideas) method described by Read et al. [33]. The method suggests to first identify and describe themes and then analyze the drawing according to those. The drawings were analyzed in four thematic units: the artefacts used by the professionals, the activities/methods conducted, the timing of conducting those activities, and the stakeholders involved for each of the methods. Additionally, while analyzing the drawings, the researchers listened to the audio recordings of the interviews to get more data.

Another researcher analyzed the responsibilities and tasks described by the interviewees for integrating UX work in their agile software processes by using thematic analysis [13]. Thematic analysis is well suited for qualitative HCI research in providing an overall structure without overly constraining the analysis in answering our open ended research question [7]. Overall, the chosen methods for analyzing qualitative data increase rigor and validity, without eliminating subjectivity [27], by showing how we developed our interpretations methodologically to be consistent with all available data, and representative of multiple perspectives.

RESULTS

This section outlines the development phases as described by our informants. After this we go into detail with the activities for which the UX consultants are responsible.

Development Phases

Our informants described three main phases of their software development process: a) inception and elaboration, b) construction and c) transition. In their own description the informants describe their development process to be a mix of UP and Scrum with the sprints being active during the construction phase.

That UX activities seem well integrated became apparent through our interviews with employees, who represented various roles. All interviewed considered UX activities crucial for project success, but it came to light that the UX professionals are responsible for managing requirements and they have the leverage to reject implemented designs if they do not live up to the requirements.

Figure 2 illustrates the development phases at the case company in relation to the activities performed by the UX consultants. The dashed vertical lines illustrate the end of the sprints during construction. We emphasize that the figure solely illustrates the activities related to the UX role within the case company and not to other roles as is the case with the model proposed in e.g. Göranson et al. [17].

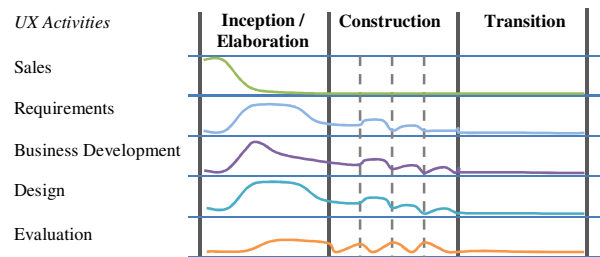


Figure 2: The development phases at the case company in relation to the activities for which the UX consultants are responsible.

Inception and Elaboration Phase

There was general agreement between our interviewees on the UX consultants typically participating full time during the inception phase of the projects. Note that inception and elaboration are collapsed in Figure 2. This phase was also interchangeably referred to as the “foundation” phase by some of our informants. Based on the narratives about this phase, it covers both inception and elaboration as known from Unified Process. During this phase the UX consultants have several responsibilities related to sales activities, business development, requirements elicitation, design and evaluation. These areas of responsibility are detailed further in the following section „Responsibilities“.

The main tasks that they conduct to fulfill their responsibilities in the foundation phase are: Interviewing users, observing users, defining requirements, defining the overall UX, designing wireframes, making design sketches, defining the workflows and the overall flow in the system, and validating the wireframes with the system architect and stakeholders. In this phase, the UX consultants work closely with people in three to four other roles: system architect, project manager and customers or vendors.

The UX consultants often conduct kick-off workshops to define the requirements and gathering an understanding of the customers’ and users’ needs. The objective of the foundation phase is to consider the projects from several perspectives before implementation. At the initial workshops there are participants with various backgrounds representing users, customer management, developers, a system architect and a UX consultant.

Typically for bigger projects (lasting approx. 1 year) this phase takes one to two months. The close collaboration between UX consultants and the system architects is very important for the success of the project, as mentioned by one of the project managers: “*The UX person and the architect should almost hold hands from day one*” (MAN-2)

Another informant explains the close collaboration this way: “*It is often that the UX consultant and the system architect work closely together, because sometimes the UX people can dig something up that will take 3 times longer, than if you design it a little bit differently and use some standard components.*” (MAN-3).

All the informants mention that wireframes created by the UX consultants are central outcomes of the foundation phase. These are used as a communication tool with other roles. One of our informants explains: *“Wireframes are fantastic communication tools, all the way through. The developers know those, everybody looks at those and the customer understands what these are, which is always a challenge, so it is also a good tool for them. I think it is the UX persons primary artifact”.* (MAN-1)

Additionally, the UX consultants collaborate with the project manager on estimating the project size and the risk analysis for making an offer for the customer.

Construction Phase

The first steps in this phase are establishing the development team. Typically a development team includes one UX consultant, 2 to 4 developers and a project manager. In this phase the project manager and the UX consultant are not always full time on the project. Especially the UX consultants' roles diminish, as the projects moves towards the transition phase. Many mentioned that the UX consultants are typically 20% active in the construction phase of each project.

The main tasks that the UX professionals conduct during this phase are: Definition of new requirements with user stories, define features, wireframes for new features, validation of wireframes with customers before these are delivered to the team, detailed design, demo and review with customers and coordinating with UX professionals, System Architects, and Product Owner

Some informants explain a minor phase before construction where the domain knowledge is transferred from the UX consultants to the developers. One of the managers explains: *“Normally, the UX consultant explains the domain and business logic issues, and I add, if I know there is something that needs to be taken into consideration. I will say what I think that needs to be considered from a technical perspective, perhaps how we could design it, if it is more challenging. This is done a bit ahead.”* (MAN-3).

A UX consultant explains: *“When we have our design parts done and the graphic designers have finalized this to pixel level, it is ready for development and we can write user stories about it.”* (UX-2)

The user stories can be quite general, or more detailed describing the user experience of pressing a button.

During construction the UX consultants are located in close proximity to the developers: *“The UX people are a part of the team at our company, so they sit together with the developers, project manager and the architect in the same building”* (MAN-3)

But when the project is reaching the final stages the UX consultants role is reduced, as one UX consultant describes: *“If there would have been big changes in the design, then*

we would be called in, but otherwise we are not involved in the last sprints” (UX-2)

Transition phase

Only two of our informants mentioned the transition phase of the software project and they described it briefly. The main tasks in this phase are Training, Deployment and Documentation. At this point the UX consultants' primary responsibility is to educate future users of the system, as noted by one of the project managers: *“The UX consultants educate the customers' users, they present the system and explain the design.”* (MAN-2).

One of the UX consultants mentioned that in some projects there is no clear separation between development and transition. He explains that if the project is large, they emphasize being able to deploy parts of the system faster to and deliver incremental solutions. This way deployment does not happen at the last weeks of the project.

Responsibilities

The UX consultant role is responsible for performing a wide range of activities, which is acknowledged not only by the UX consultants themselves, but also by project managers and developers. One of the project managers expressed the UX consultants' responsibilities this way: *“The UX consultant is part of the team to ensure that requirements are lived up to. Some would consider UX consultants to just create nice designs and icons, but this is actually not the main part of that role.”* (MAN-2)

One of the developers mentioned: *“Sometimes I do not understand the discipline, I understand the responsibilities of the graphical designers. They make things look good. The UX consultant role is more elusive.”* (DEV-2)

One of the UX professionals made the following overall statement on the UX role: *“It feels natural that the role has so many responsibilities, but it's a lot to grasp.”* (UX-1).

As mentioned independently by multiple informants, the activities for which the UX consultants are responsible covers: Design, Business Development, Requirements, Evaluation, Sales, as illustrated in Fig 2. In the following we unfold the activities,

Design

Creating early designs is considered one of the UX consultants' primary contributions. Wireframing and prototyping are core tasks used to specify the functional design of the system. Typically, the UX consultants create wireframes with no emphasis on aesthetic properties. In the case company aesthetics are induced by dedicated graphical designers in collaboration with the UX consultants, who review the work. Wireframes are used to facilitate discussions with customers in order to clarify requirements before implementation begins, i.e. in the up-front design phase. Once implementation begins the software developers base their work on designed wireframes. In all the interviews, wireframes were highlighted to a greater extent

than any other design artefacts. One of the software developers mentioned: *“... to my understanding it all begins with wireframes, something more invisible is the information architecture. As I understand it, the wireframes provide a good entry point to start discussions with customers”* (DEV-2).

Thus, wireframes are considered more tangible than e.g. an information architecture, which may explain why wireframes are highlighted more than other design artefacts.

Another informant explained when wireframes are needed: *“As a reference point there are always user stories, and if there is a little bit of complexity, or if it is different than what we have done before, then they make wireframes for it, but they are not always needed”* (MAN-3).

Business Development

While focusing on the user often is regarded to be the primary guiding principle for integrating UX activities [16] we see a different image in the case company. Here one of the UX consultants mentions the importance of customer orientation by putting the achievement of business related goals to the forefront: *“At the initial stakeholder workshop, I ask the customer about KPI's and business goals, I ask them how they measure these and their relation to the system. This may not be the most classical part of the UX discipline, but we have a funny role here, in a good way, as we go into business development. It's important to consider this and crucial foundation for a project. It's my compass when talking to users.”* (UX-1).

Note that one of the software developers also mentions that wireframes are suitable for facilitating discussion with customers. The importance in catering for the customers' business goals also become apparent when one of the UX professionals emphasized how he starts to include such goals before eliciting requirements with users: *“It is about aligning business related requirements with the user requirements. I usually start with uncovering the business related requirements, e.g. KPI's and the business case of the solution. After that I will approach the users and uncover their requirements through workshop activities.”* (UX-1).

This responsibility seems atypical for a UX consultant, as pointed out by a participant. It is atypical because the responsibility goes beyond that of understanding the users, their domain as well as the design and evaluation activities emphasizing the user perspective, which is apparent in classical UCD approaches [20]. We return to this in the discussion section of the paper.

Requirements

At times the UX consultant ends up taking the role of the product owner, as described by Schwaber [35], who has the responsibility for describing, managing and prioritizing requirements as well as reviewing whether or not implemented product increments live up to the requirements. This is partly because they are responsible for

including business development goals such as KPI's etc. (as highlighted above), but also as they take on requirements management, as exemplified by one of the UX professionals: *“During development we participate in planning, to answer questions from the developers. This also puts the UX consultant in the product owner role as we tell the developers how the system should behave.”* (UX-1).

The UX consultants also enter the role as reviewer once development starts. This corresponds to one of the responsibilities of the typical product owner as described throughout the literature [35]. This is supported by another UX consultant: *“The UX consultant is responsible for ensuring a good user experience by accepting design implementations, e.g. at the end of every sprint.”* (UX-3).

This is supported by the software developers and project managers, e.g.: *“We consult the UX designer and ask what to code now, and to what extent I can finish off this task.”* (DEV-1).

During one of the interviews the interviewer commented that the UX consultant role seems to overlap with that of a requirements manager, as it was mentioned, at an earlier point, that the UX consultants were also responsible for eliciting and describing requirements. One of the developers replied: *“On some projects that is the case. A lot of the requirements management is also done by the UX consultant.”* (DEV-2)

One of the project managers backed this up, the UX consultants' responsibilities covers requirements management by creating user stories to be put in the product backlog: *“Yes, in collaboration with a stakeholder from the customer side.”* (MAN-2).

Interestingly, this project manager continued by saying that the company 10 years ago had a dedicated requirements manager role, which is now an embedded part of the UX consultant role: *“The UX consultant is the customers' eyes within [the case company]. The UX consultant is part of the team to ensure that requirements are lived up to.”* (MAN-2).

What the manager mentions here is also that the product owner role is shared between UX consultants and a person from the customer organization, i.e. the UX consultant is not alone in acting as product owner, which was also mentioned by one of the software developers: *“Internally, the UX designer puts in tasks, but the customer typically also defines a product owner from their side.”* (DEV-1).

Evaluation

User testing is one of the most studied techniques throughout HCI research and a technique which practitioners have reported to be highly valuable [41]. Yet, this is not one of the main techniques used within the case company. When evaluations are conducted, it is typically done with the participation of the customers. When asked about testing during development, e.g. after completing a

sprint, one of the UX professionals replied: *“That will typically be the customer only. But they may bring in super users at these meetings.”* (UX-1)

Two of the developers support the UX professional’s statement on emphasizing evaluations with the customer: *“In the ideal world we would of course love to have users present during all phases of development, but this is not going to happen, as it will take up too much time.”* (DEV-1).

“There is really not much user involvement during development, of course when working agile, there should be some reviews, not necessarily users, but at least a customer that validates.” (DEV-2).

DEV-1 continued by explaining that customers liked evaluating at the end of the sprints as it gave them a feeling of being in control: *“In relation to the customers it [Scrum sprints] enables them to comment on the product more often, and this way we avoid walking into a large IT scandal where the customer finds out what happened a year later. They seem happy about this as they are in control. This form of ownership is important to them, it seems.”* (DEV-1).

At times, the evaluations are done internally by the development teams, as one of the UX consultants points out: *“But we have no standard procedure for this and it differs across projects. Sometimes a project manager and UX person goes through all completed user stories at the end of a sprint. I believe this should be done systematically in all projects. This could be combined with checking up on KPI goals set from the beginning of the project.”* (UX-3).

Thus, it seems product evaluations sometimes involve others than the internal development teams, although mostly with customers rather than users. This furthermore supports the customer centric view mentioned previously, in particular since the UX consultant also suggested that the case company should evaluate more systematically based on KPI metrics.

Sales

Before any of the above mentioned responsibilities come into play, the UX consultants have a very central responsibility in selling UX related activities to potential customers. During initial contract negotiations with customers, the UX consultants take part in sales meetings with account- and project managers in order to outline what UX is, how the case company works with UX and why it is necessary for the customer to pay for UX activities. One of the managers outlines the challenge of convincing customers to pay for other than non-coding activities: *“Many customers like that we code and really wants us to do exactly that, it is also our main competence. We can code. But all surrounding activities such as management overhead (15%), testing etc. are often questioned by our customers.”* (MAN-2).

He continued by mentioning that one of the main barriers for including UX activities occurs even before a project is started: *“At [the case company] we would really like to include more UX activities and convince the customer to pay for these. When we do succeed in this, the UX integration works very well.”* (MAN-3)

Developers have also noticed this sales responsibility of the UX consultant: *“But UX designers also have other responsibilities before that, e.g. meetings with customers, sales activities.”* (DEV-1).

Thus, UX consultants take part in up-front sales meetings in order to convince customers to pay for UX activities. The impact of such sales meetings and the success of these becomes apparent during development. When asked about the typical extent of user testing within projects a UX professional replied: *“That is not possible to say, it depends on what we can persuade the customer to pay for. I know the rule about including 5 users, but this is typically not within the budget. But I sometimes combine activities, e.g. having a workshop to uncover requirements in the morning followed by user tests in the afternoon. We need to be efficient.”* (UX-1).

Being such a broadly defined role also leads to challenges in selling UX activities as the role is not well understood by the customers. One of the UX consultants made the following statement in relation to this: *“This makes it challenging to explain what you do. How about asking what I don’t do?”* (UX-1).

Thus, selling UX activities to customers is challenging, also because of the broad nature of the UX role. A part of the strategy for selling UX tasks is to be explicit about the outcome of each activity, e.g.: *“When you get out to a customer we need to tell them that we do other things than just designing user interfaces. The best way to explain is really to show what we do in small steps and be explicit about the outcome of each step.”* (UX-1).

When successful in selling UX tasks, there are still heavy budget constraints causing UX consultants to combine multiple activities to be more efficient. The case company would like to sell more UX tasks, yet, another challenge is that the customers perceive the outcome of such tasks as something they already know themselves, e.g.: *“Often we are under heavy pressure budget wise within projects, the UX consultant is telling the customer something that the customer think they know already, so why should the customer pay 27.000 EUR for that?”* (MAN-2).

Turning towards internal challenges, it can also be difficult for developers to understand the responsibilities and tasks for which the UX consultants are responsible. One of the developers mentioned: *“At the beginning of the process there is this black box known as UX, which typically is positioned before the construction phase where developers enter the project.”* (DEV-2).

Although not directly related to sales activities, the point of the developer is in line with that experienced by customers before getting into the process of development.

DISCUSSION

Variations of the UX professional role are denoted in related research using at least 16 different terms such as User Experience Designer, User Researcher, Usability Tester, Interaction Designer etc. (see table 1). Condensing table 1 to the most mentioned disciplines, it is claimed in the literature that this role has responsibilities related to user research, design, evaluation and UX management. Note however, that it is typical in previous studies to make specializations of the UX professional role, i.e. there is often multiple roles responsible for UX related disciplines. As an example, Hartson and Pyla [18] describe up to seven different roles where one e.g. specializes in the user research discipline, another is a UX evaluator, a third a UX analyst etc. In larger software development companies, we typically see a one-to-one relationship between a specialized role and a person [24]. This in part explains why there exist so many terms related to describing the role(s) affiliated with UX.

We do see overlaps between the UX consultants' responsibilities within our case company and related work, e.g. requirements (related to descriptions of user research in literature), design and evaluation. What makes our case different is that these responsibilities are all taken on by the same person, i.e. we do not observe much specializations at the level typical for larger software development companies. Only one informant explained that there were two UX professionals in one of the project and then one was more responsible for the user research and gathering requirements and the other for the interaction design and wireframes. However, while previous research studies and practitioner oriented outlets provide a varied list of at least 11 disciplines in relation to UX activities (cf. Table 1), none of these discuss the UX role having sales and business development responsibilities, which we found in our study.

Considering the UX consultants role over time, we found that this is heavily loaded into the initial development phase to being considerably more inactive once development starts (see Figure 2). This is similar to the UP model suggested by Göranson et al. [17] who added the usability design discipline to the original UP model. The similarity becomes apparent when comparing Figure 1 and Figure 2. Within our case company, the UX role is primarily responsible for reviewing implemented designs in relation to requirements, but also facilitating product evaluations, primarily with customers.

The extent of UX consultants' role in up-front designing in the software company resembles a traditional sequential development process. Nevertheless, following Larman [24], we categorize the process adopted in the case company as an agile instantiation of unified process (UP) with an up-front design phase followed by short iterations. We also

identified specialized roles as prescribed in UP, which deviate from the agile processes such as Scrum and Extreme Programming. However, a comprehensive discussion of the nuances and extend of agility is outside the scope of this paper, we refer to Larman [24] for more details.

UX Professionals as Sales persons

As noted above, the UX consultants in our case company has a wide range of responsibilities and this makes it challenging to describe what they do. Indeed, some of our informants mentioned that the UX consultants firstly participate in sales meetings with customers in order to persuade these to pay for the hours required to perform UX activities. This was mentioned as being very challenging as the UX consultants in the case company have so many responsibilities that it may actually be easier to say what they do not do.

Thus, it is difficult to define what UX consultants' responsibilities are, which is clearly a challenge in our case company that necessitates UX consultants taking part in sales activities to persuade customers. This is necessary because, if the UX consultants find it challenging to explain their role, how should dedicated salespersons be able to?

In relation to the above, it was also found challenging to explain the responsibilities of UX consultants internally. One of the developers explicitly stated that UX seems like a "black box" to him. Yet, it was also mentioned that developers can relate very well to the wireframes they receive from the UX consultants. So, although UX is challenging to explain to external stakeholders such as customers and sometimes internally, we found that the case company had integrated the identified UX disciplines quite well, at least in the sense that all our informants agreed that the UX role is critical and has high influence. This is different from several other reported cases of companies experiencing internal struggles, see e.g. [26]. We believe a part of this well integrated case is due to the UX consultants' continued emphasis on participating in sales activities where they are constantly challenged on the story of how they work with UX and forcing them to be explicit about the outcome of each activity.

Our contribution here also points towards the real world challenge of constantly having to justify UX tasks, even when integration is considered successful internally. Within consultancy companies, such as the one of our case, there will always be a new customer that needs convincing. This aspect has to our knowledge not been discussed in previously published HCI literature. Additionally, the fact that previous studies refer to UX work by applying at least 16 different roles covering 11 different disciplines corroborates the multidisciplinary nature of UX professionals. This in turn creates a need for UX professionals to constantly explain and justify what they do as well as the outcomes of various UX activities. Someone has to pay the salary, and that someone can change quite

often, in particular within consultancies seeking new customers. Hence, we believe there is a need for HCI research to study this newly identified responsibility of UX professionals in order to further understand how this is effectuated in practice and the which extent.

Customer Emphasis over User Centered Design

For decades the HCI research community has argued for emphasizing user needs, e.g. through variations of the user centered design approach originally suggested in Normans work from 1986 [31], McCall's notion of "Quality in Use", which has been brought into the HCI research community by researchers such as Bevan and Cockton [5, 11]. What is interesting about our case study is the primary emphasis on customer needs over user needs. This is apparent from the up-front emphasis on business development by the UX consultants, who firstly seeks to identify the customers' KPI's and requirements after which user requirements are taken into consideration. A clear example on this was provided by one of the UX professionals, who stated that she used the KPI's defined by the customers as her "compass" when talking to users.

Examples on the customer focus is also seen during development where UX consultants evaluate implemented designs at the end of sprints. This is mainly based on customers' feedback and not users'. Basing evaluations on customers' needs is not always a strategic decision made by the UX consultants, but related to the challenges of getting access to users or that customers reject to involve these in the process. UX consultants do express the wish to include more user based evaluations during development, but it all comes down to persuading the customer to either pay or convince them to provide access to users.

In relation to the emphasis on customer needs and business goals versus user needs, it is critical to discuss whether this actually leads to a dilemma of having to choose. Bias and Karat e.g. take a clear stance in claiming that it is always in customers' interest to take a user centered design approach, as that will provide a good return on investment [6]. Clement [10] takes a more nuanced view arguing that the goal of user participation is empowerment. He distinguishes between functional and democratic empowerment with functional relating to users being able to perform their work in an effective and economical manner. Democratic empowerment is about users having the mandate to make decisions. Bias and Karat's stance is in line with Clements functional empowerment, i.e. return on investments can come from the users being able to do their job more effectively. However, we see a need for also considering the view of democratic empowerment in which the potential for conflict is larger. What users want may not be the same as what customers are willing to pay for, and, intuitively, customers will want to have control. Thus, the customer may not have interest in democratic empowerment.

The focus in agile development has been on the customers rather than on the users as is the case in the field of HCI.

Considering the agile manifesto and agile principles, the user is only mentioned once in the text, i.e. the focus is on customers and their needs. As an example, the first principle describes: "Our highest priority is to satisfy the customer" and one of four the statements in the manifesto says: "Customer collaboration over contract negotiation" [3]. At our case company they have used agile processes for a long time and the UX consultants integrate their responsibilities into an agile process of Scrum blended with unified process. This could be one of the reasons for the UX consultants to be emphasizing customers over users.

That said, there are reports of successfully inducing both functional and democratic empowerment in agile software development projects, see e.g. [21]. Our point here is that it is not always possible to work user centered for which reason there is a need for the HCI community to strengthen and further nuance our understanding of the UX professionals' responsibilities in terms of customer centric versus user centric responsibilities.

CONCLUSIONS AND FUTURE WORK

This paper presented an in depth case study to understand the responsibilities associated with UX professionals in an agile case company having successfully integrated UX activities. Through 10 interviews with UX professionals, developers and project managers we found the UX professionals to have a broad set of responsibilities, some of which overlap those mentioned in previous literature. We also identified two new responsibilities: Sales and Business Development, both of which rely heavily on a customer centered focus rather than a user centered focus. UX professionals had to be strong salespersons as they constantly had to justify UX tasks to persuade customers to pay for UX activities. We make the point that it is not always possible to work user centered.

There is a need for the HCI community to strengthen and further nuance our understanding of the UX professionals' responsibilities in terms of customer centric versus user centric responsibilities. We believe there is a need to further study how these responsibilities are dealt with in other cases as well as studying the similarities and differences to what is done compared to our case. While our study is limited to findings from within a single case company, it will arguably be necessary for UX professionals in other organizations to also persuade customers and emphasize their needs. The extent to which this responsibility lies on the shoulders of the UX professionals is necessary to uncover, as economically sustainable UX integration depends on having somebody willing to pay for these activities which in turn has been argued to provide a return on investment, see e.g. [6].

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