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User Experience and Scrum Teams in the Games Industry

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Abstract

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The way the Scrum development process is implemented in video games industry in relation to the communication among the team members and their definition of User eXperience (UX) was studied in this research. The aim of this study is to analyze the role of "communities of practice" among the team members and investigate better ways for improving UX and user involvement by analysing results from interviews with developers active in video games industry. The results from the interviews show that the game developing companies form strong "communities of practice" and the Scrum process helps in nourishing them. The video games industry has its unique character; both in relation to how the Scrum development process is implemented and the way users are involved. Being aware of this uniqueness and valuing it could be a start for developing more suitable methods and defining novel ways of user involvement for developing games with better UX.

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1. Introduction

In recent years, there has been an increase in the development and refinement of products in the IT sector based on user requirements. Among various fields of software development, video games industry is one of the most popular and growing fields. The video games industry, also known as interactive entertainment industry, refers to an economical sector dealing with designing, developing and selling all sort of computer games. This industry has also been an interest to researchers and there have been a considerable number of studies conducted to investigate different aspects of video games. A number of these publications discuss different matters such as the effects of video gaming on players, the use of video games in education and the ways of improving the development of video games. This growing interest in game design, will lead in discovering better methods, theories and evaluation skills for developing new games [4].

Among the different software development processes, agile methods and especially Scrum is being widely used in different companies [7]. Video games industry was one of the first that started to use Scrum for developing their games [13], and therefore their use of this process can be considered more mature. At the same time, user experience (UX) is defined as one of the most important characteristics for developing successful products [2]. Enhancement of UX is of utter importance for developing all IT products including video games. By considering UX as an important factor, it is interesting to investigate ways for improving UX in video game industry.

Communication among the team members can be considered as one of the important key factors for implementing Scrum better. Since the video game industry consists of various roles with different professions [2], the communication among the team members can affect the process of developing the final product.

A group of people that share a concern or passion in reaching the same goal has been defined by Wenger as “communities of practice” (CoP) [15] The main characteristics of “Communities of practice” is that during interactions for reaching their goal, they learn from one another.. This theory has been used in different ways for investigating video games industry. Some researchers have used “communities of practice” to describe the communications and collaborations among the developing team members. It has also been used to explain how players (users) behave while playing with educational games. As the majority of these studies focus on the positive effect of “communities of practice” in learning with the use of computer games [20], there are few studies that describe how communities of practice are formed in other contexts rather than learning purposes. As an example, a study was done by Carnegie Mellon University on online gaming communities that focused on how gamers form communities of practice while playing online [21].

The purpose of this research is to investigate how Scrum is implemented in the video games industry, since this industry has used this process for a long time. Moreover, this research pays attention to the ways in which game developers communicate with users and what is their impression of user involvement. Also this research tries to investigate the dynamic knowledge that forms during the communications among the team

members in Scrum teams [17,18]. These small teams form “communities of practice”, which will be studied.
The main questions that are going to be investigated in this study are:

1. How do game developers implement Scrum?

2. What are the common characteristics of game developers in Scrum teams and “communities of practice”? How can we make use of this analysis to enhance communication about UX in the Scrum teams?

3. In what ways do game developers communicate with users and what is their impression of users involvement and user experience?

2. Background

This section is going to present the three major subjects for the theoretical background used in this research: User experience, Scrum and “communities of practice”. First the concept of user experience will be presented and discussed. Thereafter, the Scrum process will be explained. By the end of this section “communities of practice”, which constitutes the main theoretical backbone of the analysis in this study, will be been explained.

2.1. User eXperience (UX)

User experience (UX) has become a buzzword in the field of Human-Computer Interaction. Various researchers and practitioners have proposed many different definitions to explain this concept [6]. These differences in interpreting UX range from defining UX based on usability factors such as effectiveness and efficiency to considering it purely subjective as considering beauty or aesthetics.
According to Hassenzahl and Tractinsky different researchers see UX from different points of view [6]. In general these views could be categorized in three main groups, where each one of these perspectives is a way of understanding users and their interactions with technology. As their paper suggests, they could be classified as:

- *Beyond the instrumental:* In the 1980's the focus of HCI research was on the achievement of goals and therefore tasks became the vital point in user-centred evaluation. As time passed by, researchers were more concerned about the non-instrumental needs of the users such as beauty, surprise, diversion and other emotional aspects.

- *Emotion and effect:* If a system is effective, then it could be used as an alternative in many human centre processes such as decision-making and subjective wellbeing. Previously, human interaction with technology mostly raised negative emotions. In this research area, researchers look in through

computerized toys that are cable of soothing a crying child or preventing feelings such as loneliness, sadness, frustration and negative emotions.

- *The experimental:* This perspective emphasizes two aspects: situatedness and temporality. As Hassenzahl and Tractinsky describe, “In this view, an experience is a unique combination of various elements such as the product and internal states of the user which extends over time with a definitive beginning and end [6].”

From an experimental marketing perspective UX is assumed of what customers want from a product. They think of functional features and product’s quality as the main point for increasing UX [5]. Generally, there are few models of user experience in HCI. Hassenzahl presented a model for user experience in 2005 from a designer- and user perspective. He claims that the existing models for describing user experience are often simplistic, so he proposed a more complex model that defines the key elements of user experience. Based on this model, each product has certain basic features such as content, presentation, functionality and interaction. With the combination of these features the designer conveys a product character. First, by perceiving the features of the product, each individual constructs a personal version about the product’s characters. Later on this product characters lead to judgments about the product, emotional consequences and behavioural consequences.
Human-centred design is an approach that focuses on the user's experience of the system or product by applying human factors, ergonomics and usability, according to the ISO 9241-210 [1]. Along with ISO 9241-11, which emphasizes on the effectiveness, efficiency and satisfaction of the final product [25], the ISO 9241-210 standard -the recent version of the ISO 9241-11 standard- talks about the human-centre activities that could be adopted during system life cycle. In the ISO 9241-210 standard, all aspects of the user's experience while interacting with the product are considered. ISO 9241-210 describes user experience as, "person´s perceptions and responses resulting from use and/or anticipated use of a product, system or service” [1]. It includes all aspects of usability and desirability of a product, system and service from the user’s perspective including preconceptions and prejudices. It is a consequence of the presentation, functionality, system performance, interactive behaviour, and assistive capabilities of the interactive system.
In general UX is a consequence of the users’ internal state, the characteristic of the designed system, and the context within which the interaction occurs [6]. Time is a significant factor in changing users evaluations of the final products [23]. There are distinct phases in how users adopt to a product, which are categorized as:

- *From orientation to incorporation*: The novelty of the product becomes less important for the users after several occurrences of usage and after a while the usefulness of the product is more important than the ease of use.

- *From incorporation to identification*: The users make an emotional attachment with incorporated product in this stage.

- *Actual experience more influential than expectation:* After working with the product for a while, users' expectations will evolve during the actual experience. In some cases the users' experience exceed the expectations and so these features become very important in overall satisfaction [23].

In this study, UX is considered as characteristics of the designed system, which includes all aspects of usability and functionality and performance, with a concern towards non-instrumental need of the users. This characteristic will lead to emotional and behavioral consequences for the users while interacting with the system.

2.2. Scrum

Scrum is considered as one of the agile software development processes. There are other approaches in this family such as XP and Kanban, beside Scrum. Scrum is similar to management methodologies, which contain a list of daily activities for software developers [14]. Scrum is considered as the most frequent agile software development process in use [19]. Since this method is flexible, it is easily adopted in different game projects [4].
Others describe Scrum as a philosophy or a set of values that emphasizes the participation and collaboration among the team members and transparency with the users [10,11,12]. Scrum is implemented differently in different companies, and it is adoptable through different situations. Those irregular versions of Scrum are called "ScrumButs" [10,11]. The Scrum methodology consists of different roles, artefacts and activities that are explained in the following [10]:

- *The Product backlog:* A list of requirements for the product that is being developed. It often contains a description, priority and an estimate of time for completing each task.

- *A Sprint:* An iteration period of a month or less, mostly between 2 to 4 weeks. The product owner has the authority to cancel the sprint.

- *A Sprint Planning Meeting:* Is a meeting, where the sprint is planned. In this meeting they will discuss what will be done in the sprint and how the tasks are preformed.

- *The Sprint Backlog:* The outcome of the sprint planning meeting forms the sprint backlog. The key word "doing" shows that the development team is working on that task and the key word "done" is assigned to a task when it is completed.

- *The Sprint Backlog Burndown Chart:* A graph showing the amount of sprint backlog work remaining in the sprint.

- *The Sprint Review Meeting:* A meeting in the end of the sprint, which the team members discuss the good and bad points about the sprint that passed.

- *The Sprint Retrospective Meeting:* A meeting in the end of the sprint where the team members present the functionality of the product at the end of the iteration to the product owner and the stakeholder(s).

- *The Daily Scrum:* A meeting that happens every day and all the members of the Scrum team explain what they had done the day before and what they will be doing in the coming day. Also if they encounter any problems in order to complete their task, they share it with the other members.

- *The Scrum Master:* A member of the team, which is responsible for ensuring that the Scrum team has good work conditions.

- *The Product Owner:* He is a specific individual, which is responsible for managing and controlling the product backlog and setting the priorities.

- *The Development Team:* Normally a team consisting seven people, plus minus two. They are from all of the professions needed to create the product.

Well-organized Scrum teams will lead to productivity and make more job satisfaction and motivation among the developers [14]. Job satisfaction and motivation is considered as one of the main effects of agile development processes. In small teams, the physical proximity and direct communication are the ways to ensure satisfaction among the team members [14].
While the advocates of Scrum describe Scrum as straight forward, relevant and productive [11], there are some practitioners that face different problems in implementing this process. One of the troubles facing Scrum teams is completing the tasks by the end of the sprints. It has been stated that Scrum works better in shorter sprints [22]. The next problem deals with cutting the quality of the work into half in order to reach the velocity [11].
Agile processes and usability practices have much in common but are grounded in their different philosophies. Although the core principle of agile processes is to satisfy the customers by early and continuous developing of the software, it does not ensure how usable the UI is in the end [18]. Therefore there have been attempts in order to integrate usability practices in agile methods in the recent years [18]. One of the differences between agile methods and user-centred design is requirements gathering. Agile processes make a great effort in delivering small feature sets of working software in short iterations, whereas in user-centred design a considerable amount of data is gathered and analysed prior to development [18]. On the other hand there are common characteristics between human-centred design and agile processes such as development cycles and the collaboration and communication among the team members [8]. In general the increase of the communication especially among the stakeholders, will improve the overall usability of the final product [12].

2.3. Communities of Practice

According to Wenger, “communities of practice” are a group of people that share a concern or passion in reaching the same goal, and during their interaction they learn from one another [15]. These communities have three crucial characteristics:

- *The Domain:* The members of a “community of practice” have an identity shared by a domain of interests. This identity separates them from other people.

- *The Community:* In order to achieve the interest of the domain, members of the community join in discussions and activities to help each other to share information. During these discussions and activities a relationship is built and through these interactions, learning happens.

- *The Practice:* The members of these communities are practitioners that develop a shared experience, tool or a story. This development of shared practices maybe more or less self-conscious [15].

The members of the “communities of practice” perform a variety of activities during a day such as: problem solving, requesting for information, seeking experience, reusing assets, coordination and synergy, discussing developments, documentation projects, visits, mapping knowledge and identifying gaps [15].
The concept of “communities of practice” is driven from learning theories. The learning that happens in the “communities of practice” is not limited only to the new comers. All the members of the community are learning in the dynamic system [15]. Recently companies are trying to discover and cultivate these “communities of practice” [16]. According to Wenger et al., there are seven elements in designing such communities to be alive. They are as followed [16]:

1. Design for evolution.
2. Open a dialogue between inside and outside perspectives.
3. Invite different levels of participation.
4. Develop both public and private community spaces.
5. Focus on value.
6. Combine familiarity and excitement.
7. Create a rhythm for the community.

It is worth mentioning that these communities will happen naturally in organization and companies. But their health and existence is first of all reliable on the voluntary engagement of their members and the emergence of the leadership. Their living process more or less depends on their informality and autonomy. It is suggested to the leaders of the “communities of practice”: a) to value the learning they do, b) make the sources available for them, c) encourage participation and d) remove the boundaries. Even without implementing these facilities, “communities of practice” still exist but they might not achieve their full potential [16].

At the same time, agile process encourage a knowledge creation process so “communities of practice” can provide a basis for the communities that are made through adopting agile processes [7]. Software developments, in general, are role based so they transfer knowledge from one stage of the process to the next stage. There is chance of miscommunication due to this long path [3]. Usually documentation was used as a source of knowledge sharing media among the group members. Software development processes are collaborative and bring together different expertise and technological skills for developing a product [3]. There is a list of activities that companies could adopt in order to cultivate the existing communities [7]. For example:

- Build communities around important topics
- Find and build natural networks
- Develop community coordinators and core groups
- Initiate some simple knowledge-sharing activities
- Support communities
- Create a community support team
- Be patient

3. Method

In this section the method for conducting this research is described. The section starts by describing the research approach and explains the reasons behind choosing interviews as the main way of data gathering. The way the interviews were formatted and the procedure towards conducting them, are mentioned in the second part. This part fallows by a subsection describing the main categories of the interview questions. In this section a snapshot of the interview questions is available. The fourth part deals with participants that were involved in this research and a table is provided containing the background information of them. In the end of this section, there is a brief description on how the results are gathered and formed.

3.1. Research Approach

There are three type of research according to Oates [9], which are: a) descriptive investigation, b) relational investigation and c) experimental investigation. However these three types of investigations are not independent of one another. According to Oates [9] a research is a combination of all three. The first step for applying a descriptive research is to identify the phenomena and later on, the research is followed by relational or experimental investigations.
Descriptive investigations are such as observation, surveys, interviews and focus groups that focus on an accurate description of what is happening. Descriptive investigation will be used in this thesis. Interview was chosen as way for data gathering, among these different types of descriptive investigation. The reason for choosing interview was the researcher’s interest on gathering detailed information.

3.2 The Interviews

As like any other research, the researcher first identified the problem. For this reason several meetings were conducted and various suggestions were purposed for the research questions. Based on those the interview questions were formed. The next phase was data gathering and analysing the data. In the end the data was interpreted and conclusions have been drawn.
The first practical step in this research was recruiting ten participants who were working with Scrum in the game industry. During the interviews the participants were asked open-ended questions in order to hear different opinions and thoughts. The interviews were in a semi-structured format with the specific list of themes and questions that were ought to be covered in all the interviews. However the interviewees were free to talk about any other issue that they feel related and provide more details about a specific question.
Most of the interviews took place in the companies where the interviewees were working. Each session took about one hour. All the interviews were recorded with a voice recorder and afterwards they were transcribed word by word.
The interviewees were asked to fill in a form to give their permission for recording their answers and using the data gathered. Finally the sessions ended with a posttest questionnaire regarding the participant's background and at the end of the interview the participants were rewarded with a cinema ticket.

3.3. Interview Questions

The interview questions were grouped in four categories. A snapshot of the questions is provided in Figure 1. The questions that are in red show the importance of them and the fact that they have been asked from all of the participants. For ease of use the questions were arranged in a table, for getting a good overview of the questions during the interview.
The questions have four main categories as the fallowing:

- *Background:* In this section the questions are arranged to become familiar with the participant and to learn more about his responsibilities and his main activities during a working day.

- *Experience working with Scrum:* In this section the main focus was on the Scrum process and how much experience the participant had from working with it. It also included questions about the positive and negative points of the Scrum process from the participant's point of view.

- *Common characteristics of Scrum and communities of practice:* The next section focused on the common characteristics of Scrum teams and communities of practice such as problem solving, sharing the same identity, situated learning.

- *Users' involvement and UX:* In the final category the main questions were about how much users were involved during the development process and the team member impressions of users involvement. Finally, the participant's impression of UX was asked.

The Table of Questions

Background	Exprince Using Scrum	Common Characteristics of Scrum and CoP	Users involvement and User Experience(UX)	Final Questions and questioner
1. How many people are working in the company?	1. How long have you been working with Scrum?	1. Do you usually work together or as an individual?	1. Do you play games yourself? If so how often? 2. What do you like about games? 3. What do you seek when playing games? 4. Do you play the games that you develop?	1. Do you have any suggestions in improving ways to communicate with the users?
2. How many teams are working in your project? How many are in your team?	2. What is your role in the Scrum projects?	2. While working, do you sit close to each other? Or do you work together?	5. Why do you think others play games? 6. Can you tell more about your users? What do you call them, users or players? What is the difference when you call them users/players? Who are they? 7. What do you know about them? 8. How much do you think users enjoy the game you develop? 9. Do you think that the games you develop differ from other games? What makes that?	2. Is there anything more that you would like to add?
3. What is your role in the company? And have you had the same role in company?	3. I am a master student, and I have heard that Scrum is practiced in different ways. I am curious to know how you apply Scrum?	3. Do have anyone special to talk with or ask questions? Would you say that you collaborate closely together?	10. Have you tried to get contact with them? If so, in what ways? Have you ever thought of using new devices such as social medias, forums, youtube recordings and so on? How often do you try to get contact with them? 11. What do think about user's involvement in the process? What kind of effects those it have?	3. Would you please fill in this final questioner: a) Your Name ? b) What is your educational background? c) What is your working experience? d) What other backgrounds do you have? e) What would be your role in the company? f) What is the title of your job?
4. How long are you working in this company?	4. I want to know more how meetings take place while a game is being developed. Also I have some questions about the planning meetings, retrospective meetings, demo meetings and so on.	4. When you have a problem what would you do? 5. Do you try asking questions from others?	12. Do you involve and include users while developing and designing the games? Are they actual users or representatives? 13. Do you use any especial evaluation methods or scurvies? 14. Do you use scenarios, story boards, personas? If so how they made and how much users play a role in developing them	
5. Could you please tell me what are your main activities during a working day/week?	5. By the way, are there any other types of meetings that I have forgotten to mention?	6. Do you learn from each other in the group? If so, how learning is done? 7. Do you have any learning management system? If so, does it include usability aspects?	15. Do you try to receive feed-back from users? If so, How much important do think they are? In what ways do you use the results and how they are applied? 16. How are the results of the users feed-backs, reflected? What happens if you get a feed-back? How it is used?	4. Is it possible to come back with you by email?
6. Whom do you usually collaborate with during your work?	6. What do think are the good points about Scrum? Bad points?	8. If there is a problem, do you know whom to go? Do you know who is more expert in a special field in your group?	17. As a student that has no practical experience, I am wondering what dose User Experience (UX) means in practice? How do you define it as a member of a team that it is developing games?	5. Do you have anything further that you would like to add in relation to what we have talked about?

Figure.1. The table of the interview questions

3.4. Participants

Recruiting the participants was one of the problems that the researchers faced since most of the participants were deeply involved in their current projects and couldn't offer time for the interviews. Note that while recruiting participants, no filters were applied to the type of the games being developed by the developers.
Moreover, there was the lack of single definition about Scrum among those participants that were willing to participate in interviews. Each and every one of them interpreted the Scrum process in his/her own way. In order to overcome this problem the researcher added a section to the interview questions that focused on how the informants interpreted the Scrum process and the way they were implementing it.
A considerable number of emails were sent to those who were active in the game industry in various roles. In addition, a Facebook page was created to enhance the communication with game developers and the researcher used twitter as a medium to ask participants to contribute to the study.

Company	Professional roles	Number of the participants
A (Games developed both for PC and consuls)	Senior Programmer	1
	Character Designer	1
	Senior Gameplay Designer	2
B (Games developed for PC)	Producer/CEO	1
	QA Manager/Community Manager	1
	Sound Designer	2
C (Games developed for online gaming)	UX Designer	1
D (Games developed for online gaming)	Producer/CEO	1

Table.1. An overview of the background information of the participants in the study

The researcher interviewed eleven participants. Because one of the participants was not using the Scrum process, the result of that interview was not considered in the final analysis. One of the participants was female and the rest were male which is quite representative of the game industry. Note that all the participants are referred as he in this report regardless of their gender. Also the participants had different levels of

expertise. Some participants had work for a short period of time while others had more than ten years of experience.
In total the participants had eight different professional roles in the game industry. The participants were from four different companies. Two of them produced online games. One of the companies produced PC games and the last one produced games for both PCs and consoles. An overview of the background information of the participants is provided in the Table 1.

3.5. Analysing the Results

All the interviews were transcribed verbatim. According to Oates [9] for better analysing the results, the transcribed interviews were reviewed and grouped into different categories. Some of the categories were predefined, and some emerged from the data. When coding, the researcher used color-coding technique on the printed and transcribed interviews. In this thesis the results were categorized in three main sections each one represented by one colour. The first category indicated how the Scrum development process was applied by the interviewee, as well as his impression of this method. The second category indicated their work relations and how they communicate. And finally, the last category indicated users' involvement and the concept of UX.
In the presentation of the results the exact phrases of the participants are separated with quotations. The participants are sorted chronologically. Note that the author had edited the sentences in order to made them readable.

4. Results

The aim of this research is to investigate the three main research questions that were described in the introduction.
The research questions are:

1. How do game developers implement Scrum?

2. What are the common characteristics of Scrum teams and game developers with communities of practice? How can we make use of this analysis to enhance communication about UX in the teams?

3. In what ways do game developers communicate with users and what is their impression of users involvement and user experience?

4.1. The Scrum Development Process

The following section will address the different ways in which Scrum is implemented in the participants' companies, and their perceived pros and cons of this process.

4.1.1. The Implementation of Scrum

All participants mentioned that Scrum process is implemented differently in different companies. As the second participant mentioned they are not implementing “proper” Scrum. And the third participant described it in this way: “It is partial Scrum. …We take partial Scrum because it went well with the game development. [Like having] a waterfall model behind and then you dress it up as Scrum because you have the backlog, which is basically all the stuff you need. …. Semi Scrum method works well for the company because there is no overhead work.”

The last participant said that they have used "pure Scrum" only in one of the companies he worked at, and most of the companies use a “semi” type of Scrum. However, he also mentioned that all the companies have used Scrum to some degree since they have used backlogs, feature break down list and planning. The ninth participant said, “Different companies use Scrum in different ways as they implement half of this and half of that. We don’t really get a full picture.”

Finally, the sixth participant replied, “My view of Scrum is that everyone says we are using Scrum and everyone [has] a different way of implementing it. We have used it very differently from time to time. …. It has evolved and changed. …. We are using a different type of Scrum all the times. And from time to time I was wondering, if we used Scrum?”

In general almost all of the participants acknowledged that the Scrum process is not applied purely in any of the companies they had been working at. In most of the companies they use “semi” Scrum and as the sixth participant said there are different ways of implementing Scrum.

The tenth participant pointed out that the fundamental problem in Scrum is having a potentially shippable product after every sprint. “Scrum in a way is better than waterfall not because you deliver [something] at the end of the sprint /.../ In terms of delivery it is a joke really. …. Because of so many factors, you actually need to wait. It is an illusion to think that you can actually deliver a vertical slice of what you are going to have in the end.”

The third participant and the tenth participant mentioned that they have used full Scrum for causal shorter games. They described that Scrum is not suitable for developing large and complex games. “Anything larger than [short mobile games] is going to be a pain”. In the interviews the participants explained the problem of using Scrum while developing large games is related to communication. “Because you can’t control that many people and the amount of time you waste just by doing sprint planning is not cost effective. … The great thing about Scrum is that everybody has an opinion which works in small teams but with two hundred people you will never get anywhere,” one of the participants explained.

Regarding the way Scrum is implemented in different companies, the sixth participant added, “One thing that does not work is that when you start to work for a publisher you would have strict milestones on a delivery schedule and Scrum might not always work well with that because … they want to see progress and for us to say we [do not] have anything to show because we are iterating a certain feature [might be disappointing] ... even though they like you to use Scrum, [but they do not] have total understanding for it.”

Most of the participants attended the interview session were members in the Scrum teams. Only the sixth participant had the product owner role and was not a part of the Scrum team as such. The tenth participant had been the Scrum Master for a while. In their company they rotated the role of Scrum Master between the team members for each sprint, hence one of the team members was the Scrum Master for that sprint. He reflects on the rotated Scrum master method as a good way for involving all the team members in the project.

The second participant said, “In my role it would be quite logical perhaps if I did some project leading, but I tried not to do that because [then] I can not [put] much energy into the design, so I prefer handling over as much as possible to the actual project leader who is the Scrum Master.”
Regarding the role of the Scrum Master, the third participant pointed out, “During the planning, the Scrum Master should be aware of the overall goal and should know what he wants from the sprint.” Therefore, since having leading roles such as Scrum Master has a lot of responsibilities and heavy workload, some of senior developers avoid accepting them and prefer to remain as members.
The most common characteristic among all the companies regardless of their scale was their daily morning meetings. All of the participants mostly start their day be attending the morning Scrum meetings. Only the seventh participant did not attend morning meetings due to their small group of developers they refused to have daily morning meetings. In his previous employment, however, he used to attend these meetings. Beside from the morning, they attend various other meetings mostly dependable on their role. The forth participant stated that they attend different meetings and also they feel free to call for a meeting whenever is needed.

4.1.2. The Pros and Cons of Scrum

An analysis of the results shows that the participants thought that the following things were positive about using Scrum for games development:

- Helps the team members to communicate.
- Makes it possible to identify problems quickly.
- Focuses on deliverables.
- Involves all the team members in production.
- Provides an overview of the process.
- It is an adoptable method.
- It keeps the project on track.

As an example the eighth participant described Scrum as a compass. While as the fourth participant mentioned, “Scrum really fits the game industry, because you know there is so many different areas that needs to fit together with everything else so it really fits.”
The participants described the negative points of Scrum as:

- Planning takes a lot of time
- Scrum process is stressful for the leader
- Mostly The sprints are often interrupted
- In order to reach the sprints and velocity, the quality of the codes is sacrificed
- The meetings can take a lot of time

The third participant described the interruption of the sprints in this way, “It always seem to be [that way that]when you approach for the deadline, the sprints get cut into half. My experience of keep[ing] the sprints in two weeks is impossible.” Later on he mentioned that in this situation the quality of the code reduces and while the programmers are worried about this, on the higher level, the leaderships are satisfied with a quicker turn around and iterations.
In general as the tenth participant mentioned, the experience with using the Scrum is really dependable on the team and the company, for example the first and the eighth participants admired this method the ninth participant founded his experience not pleasing.
Finally, the ninth participant added, “Scrum sounds very sensible basically but in, my experience it is not the process but actually the people who are using the process. You have to manage people differently in a creative industry. … I do not believe in saying look read this book; this is the process now you know everything. It does not work in this way, you have to have [sympathy] and understand the people you work [with] in order to have success in a project.”

4.2. Communities of Practice

This section addresses the aspect of communities of practice and answers the following research question: What are the common characteristics of Scrum teams and game developers from the perspective of communities of practice?
The results include a presentation of the daily collaborations of the interviewees, their policy when they encounter a problem, their impression of informal learning, the learning management system in their company and the formation of their teams and communications.

4.2.1. Daily Collaboration

Most of the Scrum team members in the game industry have much collaboration with other team members especially those that are crucial for the complication of their tasks. Hence, the level of the collaboration is dependable on the role they have. Often the lead designers and developers need to collaborate closely with almost everyone in the team, and the intensity of their collaboration is higher compared to other team members.

4.2.2. Problem Solving

All the participants found themselves confident in asking questions to each other. The first participant said, “Because most of the stuff that we do separately they come together in a game. So when something is not working in a game, I go to someone to

see what the problem is and then it might come back to me depending on what kind of issue it is."
The fifth participant added: "Communication is the best way for the team members to understand what others are doing and [know] their language." Both the fifth and the sixth participant mentioned that they prefer not to directly go to the other team members because they do not want to interrupt their planning. Normally each team member has its own tasks to work on, so team members are aware of not disturbing one and other. However if you have a leadership role then other issues might have higher priority as the sixth participant said, "Sometimes I do [interrupt] them because I am focused in the final project."
"A game is not made by a group of individuals. It is made in groups. You can't have individuals working, everything has to come together," said the ninth participant. And finally the last participant added, "I have actually never worked in a game company where people are discouraged [to ask questions]."

4.2.3. Informal learning

During collaborations informal learning occurs and the game industry is no exception. The majority of the participants mentioned that they are learning much daily from their team members. Although they come from different fields, they generally have a good knowledge of what the other members are doing. As the second participant said, "We learn from each other in different perspectives, ... It is giving and taking." The third participant noted, "You can usually do things in multiple ways and so you know it is load of different solutions. So it takes time discussing what the best solution is."
Some of the participants talked about the role of apprenticeship in the game industry. As the third participant emphasized that, "Most of the learning happens in the same discipline where the senior member transforms the knowledge into the newcomer or a junior member."

4.2.4. Learning Management System

Mostly online documentation or wikis are used as the medium for learning in companies. However, the majority of these documentations are rarely updated after a while. Most of the participants believed that their companies do not have good learning management system.
The second participant added, "I think [most] companies are bad at maintaining knowledge. ... It is good if you maintain knowledge but I think many companies do not do it [properly]." And the seventh participant added, "Game industry is quite bad at [learning management systems]. Most learning comes from people communicating, encountering problems or asking or having a mentor to ask."

4.2.5. Formation of the Teams and Communications

All of the participants were asked about their daily collaborations with their team members. When they were asked if there were any difficulties in these collaborations, most of them pointed out that the personality of the team members have huge effect on how they communicate with each other. As the sixth participant said, “They can [understand each other] but it is not without hassles. ... It is more how we are as person.” Later on he added, whenever he wants to communicate with the team members who have different roles, he avoids talking technical and instead he usually provides examples from available games. It is noticeable that sometimes they use games as a common language for enhancing their collaborations.
Also the third participant stated, “Team members have created the same “lingo” during their collaborations. You might have different goals and you would like to achieve it from things but we share a language because we have to discuss this character mesh.” He believes by spending a couple of years in the game industry you can adopt their language.
Along with Scrum meetings, some companies have other meetings based on their preferences. As an example the eighth participant mentioned that in their company they have line meetings. “Line meetings, [where] all the coders from both projects have a meeting [and the same] for the designers. And they discuss different aspects of their key role in the company and how you can make their work more efficient. These meetings are like a compliment to Scrum and [the] overall work project.”
Finally the ninth participant pointed out, “The whole experience is a package. You have to understand this fact and as a designer you have to utilize the [team members].”

4.3. UX and User Involvement

This section addresses the third research question related to UX and user involvement: In what ways do game developers communicate with users and what is their impression of user involvement and UX?
The results presented in this section relate to the interviewees knowledge about users, their ways of communicating with the user, their impression of user involvement through the process of the design and finally their definition of UX (User eXperience).

4.3.1.Their Knowledge about the User

Most of the participants that did not have a leading role in the companies lacked clear information about their users. As an example the first participant said, “I know it is wrong [but] I usually assume players are like me so they like the same basic stuff that I like. When I think something is cool, they probably think that is cool too. ... But they are different type of players. When the QA (Quality Assurance) department does the tests, they see a lot of stuff that we do not see.”
The second, sixth, ninth and the last participant had a clearer picture of the users due to their roles, as the producer and the senior gameplay designer. For instance the ninth participant mentioned, “That is the problem, they can be anyone. ... That is why sometimes you need to define who[m] you are aiming [for]. Obviously the game that you defined to design for twelve year old girls probably is going to be different than 25-year-old men. So obviously you have to think of the users. [Making] something that applies to everybody is quite hard.”

Normally the game developers call their users as players or gamers. However, during the interview depending on which phase of production they were referring to, they also used the term customer. For instance the last participant said that he mostly calls them gamers or players. When he was asked if it would make a difference for his perception of the users what approach was used to refer to them, he replied, “No, because in the end of the day, they are users. We also call them customers because they pay for our widgets but mostly we call them players.”
The sixth participant mentioned, “It has been a trend in the gaming industry to become more cooperate and start to talk about the customers and users. I think it is a reaction to the first years of independent basement. Now we are getting serious and cooperate and talk about customer based. [I think] although we should have serious business sight to things, I like [to think] we are making games.”

4.3.2. Ways of Communicating with the Users

Most of the participants that attended the interviews have not tried to contact the users personally but the companies they were working at had one or several ways as such:

- Focus group testing
- Playing online with the development team
- Forums and online communities
- Surveys
- One way communicating channels such as facebook and youtube

The seventh participant added, “I think for the big companies is just a matter of developing a product specially, if you have separated developers and [the] publisher. Developers just want to make the game according to the specification of the publisher. [So] communication between the users and developers [is done through the publisher]. It is blocking the communication in both ways and so I think that is the fundamental flaw in this model.” Also other participants emphasized on the importance of focus group testing and it’s effective role during the process of design.

4.3.3. The Team Members’ Impression of User Involvement

The participants mentioned that they try to listen to the feedbacks although it might be with difficulties. These feedbacks are gathered in the last phase of the production. They did send out the game to the testers or gamers or invite them for gathering their feedbacks. Since the tests are in the last phase of the production so there is less that could be done. The first participant said, “I have to redo it but we are pretty much locked. ... There would be a lot of work for the people behind [me].” The second participants mentioned the same sentence in another way. “They would be different reasons why we sort something in a certain way.”
Most of the participant replied that the changes they make after receiving feedbacks are minor in a sense. The tenth participant said, “Minor things often make big differences. We did focus testing on our last game, and we could not make changes in the core functionality but the minor changes make big differences in terms of UX.”

All of the participants think that filters should be applied on the users' feedbacks especially regarding the involvement of the users in the early stages of design. The eighth participant said, "It is difficult to take in people thoughts and ideas when we really do not know what the project is going to be. That would just confuse and mess everything up so it is better to have a good clear perspective. But how we can make it better and how we can make it the best that is where they come in."
There is no doubt that there are too many voices and as the ninth participant mentioned, "If you try to please everyone, the others might be less happy and it is impossible [to satisfy everyone]." Finally, the last participant emphasized on the artistic work they are doing and the creative vision that comes along with it. "We create entertainment art, so there is always a creative vision behind it."

4.3.4. Their Understanding of UX

All of participants either did not have a clear definition of UX, or they mostly defined it based on their roles. The majority of interviewees described UX based on the tasks they accomplish during a working day. As the tenth participants said, "Different people have different options about UX mostly based on their professions."
For instance the first participant that was a character designer defined UX "as visually as pleasant as possible". While the second participant that was a user experience designer said, "Everything from how you sort the layout, to skeleton and wireframe to how you actually colour it and how you do the art. How enjoyable is that and how those it makes you feel like you are having fun."
The third participant as a senior programmer defined UX as "fun and understandable". "The baseline is that the users understand what they are supposed to do and are having fun doing it." On the other hand a sound designer as the fourth participant described it as "how you feel when you listen in a certain place".
The sixth participant as a producer/CEO stated, "For a player user experience is their impression of the final product and as producer, it would be my perception of their perception of the final product. The guesstimate of what I think they would think." The eighth participant as a member in the Quality Assurance (QA) department referred to UX as the learning curve and stated, "The learning curve needs to be very balanced. The games need to be comprehensible especially for the main audience."
The last two participants as senior gameplay designers referred to UX as game play, which is what the player does in second to second, minute to minute and hour to hour. The tenth participant described it as, "[UX] is the second to second, which is whatever I feel from the controller, whatever happens through the screen, what happens that makes me [engaged]. Second to second is whatever the player does that needs to be fun, engaging and immersive. [Then] it is the minute to minute, which is the character progression, [as an example] you pick up things and use them that sort of drive the story. And then there is the hour to hour which is what actually keeps long term returning to the game."

5. Discussion

In this section, the results of the interviews will be discussed. First it will get started by discussing the Scrum process, which is used in video games industry. Later on the role of “communities of practice” is discussed in relation of Scrum teams and in the end, the ways of user involvement and the definition of UX are discussed.

5.1. Implementing Scrum

In this study the key issues that are considered regarding the Scrum process were mainly the way participants implemented Scrum in their companies and the pros and cons of the Scrum process.
Scrum is widely used in developing video games due to its adoptable nature. Working with Scrum or any other agile process provides cultural and social changes for the IT developers adopting agile methods [26]. Implementing Scrum provides changes such as increasing the amount of face-to face communication among team members, increasing the pressure among the team members I the end of sprints in complementing deliveries and interrupts occur in a sprint. As other researchers have also pointed out, cultural issues play an important role in Scrum development teams [26].
On the other hand, video games industry has a unique nature that brings programmers and IT developers close to artists in a same project. Although according to statistics, around 30% of the video games industry consists of programmers and is considered as computer industry, but it has its own specific nature. Looking at game developing companies with this perspective has benefits regarding to all the three main fields that was analyzed in this industry.
Regardless of all the positive and negative points about Scrum, one point cannot be neglected. Scrum is not only software developing process, but in fact it is a philosophy [11]. Scrum is a highly adoptable process; therefore it could be used in different contexts with various expectations. The fact that Scrum is altered is not only negative; it also shows that Scrum is adoptable. As the purpose of using the Scrum process might be involving the team members in the video games industry and involving everyone in the project while as in other industries or contexts, the purpose of using Scrum might be it’s focus on deliverables [11,12].

5.2. Characteristics of Communities of Practice

Scrum helps to nourish “communities of practice” [3, 7], in game developing companies, these communities are already made. Scrum provides away to flourish them. However, detecting “communities of practice” in an organization is quite complicated. Having a valid data on whether such communities exist or not, the best way is to spend time in their work environment and observe the team members’ behaviours. On the other hand these communities normally are not easily visible as an outsider.
The existence of “communities of practice” in the companies that the researcher has been studying was obvious.
All the participants in this study admired Scrum in the sense that it helps them to improve their “communities of practice”. The fact of existence of these communities is

totally dependent from any software development method in the gaming industry. As an example, in the interview the researcher had with one of the participants that was unfamiliar with the concept of Scrum, she could still detect the existence of “communities of practice” inside the developing team. The members on that company had similar collaboration with each other as the same as other companies that practiced Scrum. Therefore it is notable that the “communities of practice” are established due to the nature of the gaming industry. Flourishing these communities will have appositive effect in building a better culture while implementing Scrum. “Communities of practice” can be considered as a way to ease the interpersonal tensions that might occur while adopting Scrum [26].

5.3. UX and User involvement

Some studies have shown that by using proper Scrum, there will been improvement of usability or UX in the final product [12]. In other computer software products, normally there is usability testing in the various stage of production. This feedback gathering from user could start by requirement gathering, followed by using scenarios, storyboards and in the end of the predication phase, there could be usability testing [13]. Whereas, in this study the majority of the participants emphasized the artistic aspect of their work, mostly comparing the game development with other entertainment art such as movie making.

One considerable note is that most of the participants considered their requirements and needs as player’s needs. Mostly they see themselves as players and the players as themselves. Therefore, gaming industry does not have that much usability testing and user involvement processes in the same manner that exists in other IT developing companies.

According to the data gathered from the interviews, it seems that user involvement during the game production is neither related to the level of Scrum that is being practice or the strength of the “communities of practice” that are formed, but rather it is very much related to the culture of the company. From the perspective of those involved in the game industry, it is important for them to understand the value of having reasonable communication with users. While on the other hand, it is important that users and in general all others outside this industry, realize and value the artistic work of the gaming industry. Expecting game developers to design and develop games in the format that other programs are developed, is far from what they really do in practice.

6. Conclusion

The video games industry has its own characteristics. The foremost of all, the game developing companies form “communities of practice” in their essence. That could be caused by the chained nature of their job. In the video games industry, in order to complete a simple task, the developers are very dependable to one another in the

project. Therefore, communication is the main key in their job so it is obvious that communities could flourish more in this atmosphere.
The results in this study show the game developing companies define themselves differently than other software developing companies. One of the specialities is that their groups are formed from various specialties. Therefore, insisting that these companies should follow the same processes as other software companies do could be quite irrelevant. It would be better if special methods and guidelines were designed for this industry. Defining the best level of user involvement and UX evaluation could be a way to improve UX in games and on the other hand make an applicable way for the practitioners to develop better games.
Finally, the results of the interviews show that the game developing companies form strong “communities of practice” and the Scrum process helps in nourishing them. The video games industry has its unique character both in the way Scrum is implemented in this industry and the way users are involved, . Being aware of this uniqueness and valuing it could be a start for developing more suitable methods and defining novel ways of user involvement for developing games with better UX. Methods especially developed for the game developing companies can contribute a great deal for the field of HCI, considering the fact that players of games are increasing everyday.

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