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A survey of Game Usability Practices in Northern European Game Companies

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Abstract. In today's heavily competitive game market, it has become very important to make a game that stands out from the other games. Even though the game design might not be very unique, a game can still offer a better playing experience by having a better usability than a similar game with worse usability. The human-computer interaction research could provide game companies with the practical tools and methods needed to improve the game usability. This study investigates the views of the Northern European game companies on the concept of game usability, the extent to which the game companies utilize usability methods, and the methods they use. Data from two surveys conducted in Northern European game companies were analyzed; the unit of analysis of the survey data was company. The respondents – professionals with different roles in game development – regarded usability as a broad concept and rated it as having high importance in games. Game companies used multitude of usability methods, but these methods and their usage have not stabilized. Surprisingly, only a few game companies used heuristic evaluation, mostly employing in-house game usability heuristics.

Keywords: Game usability; Playability; Heuristic evaluation; Game heuristics

1   INTRODUCTION

The general interest to play computer and video games has increased in the past decade. Games have become an important part of majority of Europeans daily lives and they are swiftly rising to be a central medium of culture. The computer and video games are so popular that they are competing equally with movie and music industries to attract consumers and are quickly becoming the leading entertainment medium [1]. As a result, the game industry is highly competitive, characterized by a large volume of competing products and many companies producing similar games. Thus, differentiating from the masses is becoming very important for a game company. Making games that grab consumer's attention is important in this highly competitive entertainment market [2].

Usability has been recognized as being an important factor in games, because buying and playing games is voluntary, and if the game has problems affecting its user experience or entertainment value, players can easily stop playing it and do something else instead [3]. Furthermore, game usability and the quality of game's user interface have been found to be very important for players when they are

deciding to buy a game [4]. The fact that there are several similar game titles to choose from further highlights the importance of game usability; players can choose a game that does not suffer from poor usability. In addition, the potential sales of a game can be reduced when the reputation of a game's poor usability spreads fast and far in the game player communities. Many authors also point out that taking usability into account in the game's development, especially in the early phases by employing methods such as heuristic evaluation, could help lower the costs [5-8] and make the game stand out.

Game usability is a relatively young field [7] and the language and terminology of usability professionals is not typically used within the games industry [3]. Even among researchers, the concept of game usability is difficult to define exactly as it can have different meanings to different persons. Additionally, different terms and concepts – such as game usability, game experience, game user experience, playability and player experience – are used either interchangeably or meaning completely different concepts. This leads to the need to find out what terminology game developers and usability professionals use. In addition, having such a young age, game usability, its methods and terminology have not yet been standardized. It is therefore important to study the usability practices in game companies in order to improve the game usability research and the game development in practice.

This study contributes to game usability research through answering the following research questions:

RQ1: *How the Northern European game companies define game usability?*

RQ2: *How the Northern European game companies perceive game usability?*

RQ3: *What usability methods and tools are used in the Northern European game companies to improve game usability and to what extent these methods are utilized?*

RQ4: *To what extent heuristic evaluation is used in Northern European game companies?*

The scope of this study was limited to Northern European game companies. In this study the Northern Europe is defined according to United Nations Statistics Division definition, where Northern Europe consists of Iceland, the Faroe Islands, Denmark, Norway, Sweden, Finland, Estonia, Latvia, Lithuania and the British Isles (United Kingdom, Republic of Ireland, the Channel Islands, and the Isle of Man). To answer the research questions, we conducted a survey where companies were included based on the databases at www.gamedevmap.com and Neogames.

The paper is organized as follows. Section 2 presents an overview of research on game usability, playability, and game heuristics. Section 3 describes the research methods and the implementation of the survey. Section 4 presents the results. Sections 5 and 6 discuss the results and present our conclusions.

2   GAME USABILITY, PLAYABILITY, AND HEURISTICS

Playing computer and console games is very popular among European youths and it is also popular among the older citizens. Statistics show that almost all 7 to 25 year old males and females play video games regularly and about half of the 25- to 50-year olds also play those [1]. Online games and social games have rapidly gained popularity among the gamers, and on average 81% of European gamers are playing

online [9]. The availability of high speed internet and good mobile network coverage, smartphones and handheld consoles, which allow gamers to play casual games while they are away from home, could be few of the reasons why games have become so popular in Europe. New business models like Free-to-play (F2P) and the growth of online distribution are also contributing to the game industry's growth.

Recently many games like Angry Birds, Clash of Clans and Hay Day have become very popular hits, which have led to other companies taking notice of the talent that European game developers have. This has led to many high value acquisitions of Northern European game companies such as Microsoft buying the small Swedish game company Mojang, developer of "Minecraft", for $2.5 billion, and Japanese SoftBank Corp acquiring 51 percent cut of the Finnish game company Supercell, which is known from the hit game "Clash of Clans".

3   Game Usability

Computer and video games and productivity software share some similarities with each other but they are also fundamentally different from each other [2]. Because of this, many researchers have tried to formulate a definition for usability in computer and video game context, but there are not yet any commonly agreed on definition for it.

Federoff [3] divided game usability into three components that are game interface, game mechanics, and gameplay; from these gameplay is considered to be the most important, although all three components are needed for the game to be functional and satisfying. Federoff also observed that the term 'usability' is not very familiar and can be associated only to the interface, which has led her to propose that the term 'user experience' might be better for describing all three areas of game usability, because it might be a broader and more accessible term [3].

Pagulayan et al. [2] pointed out that players' subjective experiences and attitudes towards the game also have to be measured, because measuring games usability through normal means like errors and task times is not enough. Thus, attributes like ease of use, challenge, and pace are important when evaluating games, because they have an effect on games overall quality or fun that is often the goal of usability testing.

Desurvire et al. [5] defined game usability to be part of playability alongside with gameplay, game story, and game mechanics. Their definition of game usability covers the user interface and the methods of interaction with the game. Korhonen and Koivisto [10] presented very similar definition of game usability, but they have added a new module for mobile content and placed game story and game mechanic elements under gameplay. Like [5, 10], Laitinen [11] noticed that game usability focuses on user interfaces, but he also pointed out that gameplay, game type, and platform must also be taken into account, because they are connected to each other and must be addressed in order to make the game successful.

Pinelle et al. [6] interpreted the game usability to be "the degree to which a player is able to learn, control, and understand a game"; entertainment, engagement, and storyline issues are excluded from this definition because of their ties to artistic and

technical issues. Papaloukas et al. [12] adopted a similar definition as [6], but they added player enjoyment and intrigue elements to it.

4   Playability

From the above account of game usability conceptualizations, it is observed that, generally, in games, usability is seen in relation with two main aspects: the game interface (which is commonly associated with the concept of game usability) and the gameplay (e.g., storyline, entertainment, flow, which are commonly associated with the concept of game playability). However, there seem to be no consensus on how to define playability, and thus several definitions are proposed.

Fabricatore et al. [13] defined playability as an instantiation of usability and identified three global elements of playability: entity, scenario, and hierarchy of goals. These elements, with their own design aspects, affect how players perceive games quality and its playability. Järvinen et al. [14] defined playability as a "collection of criteria with which to evaluate a product's gameplay or interaction". These criteria are categorized into four components: functional, structural, audiovisual and social playability.

Kücklich [15] described playability as being the game capacity to provide enjoyment. Replayability is also brought forward in [15] as another relevant concept for games, that defines the capability of a game to keep players challenged even when played repeatedly. Although playability is defined and determined by the properties of the game, the player's skills and expectations should also be taken into consideration when figuring out what keeps the player playing [15]. However, Sánchez et al. [16] viewed playability as a concept which should not be limited to the degree of fun or entertainment, because these concepts are subjective. In their model, playability has been characterized by seven attributes: effectiveness, learnability, satisfaction, immersion, motivation, emotion, and socialization. It is observed that for some authors, playability and usability concepts share common characteristics (e.g., effectiveness, learnability, satisfaction) and that personal factors such as motivation and emotion are specific to playability. In addition, new dimensions such as immersion and socialization that characterize new media in general are associated with playability.

5   Game heuristics

Game heuristics is one of the most popular methods that is used to evaluate games usability. Researchers have developed several heuristics lists to be used for game evaluation, because heuristics used in software evaluation do not take game's characteristics into account. Although most of them can be used in game interface analysis, they still fail to address game play issues [3]. The qualities that makes the heuristic evaluation to be preferred among researchers and to stand out among other usability methods are: (1) it is fast to perform [7], (2) it is quite inexpensive in terms of time and cost [17], and (3) even a single person can perform it, although using more evaluators is recommended in order to find more problems [18].

Early game versions would be ideal for using usability heuristics, because finding and fixing usability problems in later phase of development will be more and more expensive and difficult as the development progresses [5,6]. Heuristics can be used in game development as early as in concept design phase, where they can help to inspire a creative player experience [17].

Federoff [3] has created a list of forty game heuristics that are categorized into game interface, game mechanics, and gameplay. This list is the first set of heuristics for games and acts as a starting point for further development of game heuristics. Desurvire et al. [5] have created a broad set of playability heuristics (known as HEP - Heuristic Evaluation for Playability), categorized into gameplay, story, mechanics, and usability. It has been found to be very helpful in early game design and it is best suited for evaluating general issues. In a later publication [19], a more refined version of HEP was published. This was called PLAY (Heuristics of Playability) and it covers playability principles for First-Person Shooters (FPS), Real-Time Strategy (RTS), and Action Adventure game genres.

Korhonen & Koivisto [10] have developed a modular set of playability heuristics for mobile games. These heuristics are divided into game usability, mobility and gameplay modules. Also a module for multi-player heuristics was added later on [20]. The modular structure of these heuristics enables their usage on other platforms. Schaffer [21] has created a set of specific usability heuristics, which include examples for easier implementation by game designers. This set of heuristics is divided into five categories: general, graphical user interface, general gameplay, control mapping, and level design. Song & Lee [8] studied massive multiplayer online role-playing games (MMORPG) in order to find out key factors of heuristic evaluation that can affect game design. Their list covers 54 key factors for game design in four categories: game interface, gameplay, game narrative and game mechanics.

Pinelle et al. [6] created a set of usability heuristics which focus mainly on finding usability problems, because they thought that earlier heuristics [3,5] focused too much on engagement and fun and did not consider usability in detail. A set of usability heuristics for new genre video games was introduced in 2009 [12]. This genre covers games that use specific or unique equipment to control the game (Wii Remote) or are played through social networking site (like Pet Society on Facebook).

6   Summary of the previous research

When talking about usability, it is important to remember that it has different meanings depending on the context, since productivity software and games are different and have different goals [2]. This has led to the need for defining usability in game context. There have been several researchers [2,3,5,6,10-12,14] who have tried to define game usability, but so far there has not been a consensus on its definition.

Researchers' definitions for game usability can be divided into two groups. The first group [5,6,10,11] views game usability in a more traditional way where the focus is more on the interface, controls and other methods of interaction with the game. Whereas the second group [2,3,12] sees game usability as a broader concept, which includes gameplay and game mechanics alongside game interface, and includes abstract concepts like fun, user enjoyment, and experiences which are linked to the concept of playability.

Although the definition of game usability varies and includes various elements/attributes which have different importance depending on the author, all these elements/attributes are nevertheless important in order for the game to reach its full potential [11] and to be functional, satisfying, and fun [3,12]. Thus, Federoff [3] suggested that the term "user experience" would better cover the broad concept of game usability; "user experience" is preferred because it is more descriptive and is not limited to interface.

The concept of playability has been seen as a top concept by game researchers, that comprises or is part of game usability [3,5,10]. Playability has been defined differently over the years; it has been seen as an instantiation of the general concept of usability [13], as an evaluation tool, and as design guidelines [14]. Some see playability as the extent to which the game provides enjoyment through immersion [15], while others define it in a broad sense as player experience [16].

Defining and separating these terms is important for the game design process, in particular for the selection of the methods and the stage in the design process when these methods are applied. The definition of game usability also affects heuristic evaluation, its scope, and the categories in the heuristic list: does the list includes only on interface usability issues [6] or is usability viewed as a broader concept and thus the heuristic list includes aspects of gameplay and mechanics such as in [3].

Heuristic evaluation is a quick, efficient, inexpensive and flexible method for finding usability problems [3,11]. This method can be used very early in the design process, which makes it a valuable tool for finding and avoiding mistakes early on before they become expensive to fix in the later stages of development. Recently, researchers have created heuristics for computer games [3,6,10,21], in order to better address games characteristics, since the traditional heuristic lists only address usability issues in software interface and thus can only be partially used in computer game context.

To summarize, as a relatively young field, usability in games has yet to find commonly-agreed definitions for its concepts and a conclusive comprehensive list of playability heuristics [5,7]. The available game heuristics need further development, since they have some problems in their comprehensibility and clarity [22]. Although playability heuristics are useful, they are just one tool among other tools that are needed in order to test the game's usability as thoroughly as possible [7].

7   RESEARCH METHODS AND IMPLEMENTATION

This study utilized a survey method in order to investigate the views of the Northern European game companies on game usability and the usability methods and tools they use. Two surveys were conducted to gather information from game companies: (1) in Finland in 2012 [23], and (2) in other Northern European countries in 2014 [24]. For the survey in Finland, 63 companies were selected based on the list maintained by the Finnish Neogames organization. For the second survey, a list of game developers in Northern Europe was gathered by visiting various websites that list game companies, but most of them were found from www.gamedevmap.com, a website that catalogs game development organizations. This resulted in a list that contained 268 game companies from all Northern European countries except from Estonia, because there

were no Estonian game companies listed at that time (Finnish companies were not included in this survey). In both surveys, the invitation to participate was sent by e-mail message that contained the link to the questionnaire. The same questionnaire and procedures were employed in both surveys. Remainder notification was sent, after three weeks, to those game companies that had not participated yet.

The questionnaire was created and administered using Google Docs Form. The questionnaire consisted of 39 questions: 29 multiple choice questions and 10 open questions. The questions were in English. Multiple choice questions utilized 5-point Likert scale where 1 was "Strongly disagree" and 5 was "Strongly agree".

8   RESULTS

A total of 47 responses in both surveys were received from the game companies, but two of those were disregarded, because of a) the company was not situated in Northern Europe and b) the company had already participated. The response rate was 16,8%, with 45 responses. The respondents were professionals with different roles in game development; the unit of analysis of the survey data was company.

The size of the game companies that participated in this study varied from very small (1 to 5 employees) to large (over 100 employees). The companies were mainly located in Finland, Sweden and UK. No game companies in Iceland or Norway responded to this study. Most of the companies (67%) were relatively small, with fewer than 20 employees.

The most popular game development platforms were PC and mobile devices with 36 respondents (80% of all respondents) developed games for either one or both of them. Consoles (PS3, Xbox 360, Xbox One and handheld game consoles) were the preferred platform for 17 game development companies. Action and puzzle games were the most popular genres among the respondents, while MMO, sports and racing games were least popular genres.

9   Usability activities

Respondents regarded usability to be very important in games (average score 4,69 on 5-point Likert scale) and also in productivity software. In total, 34 companies (75,5%) reported some form of usability activity during game development. Table 1 shows that almost all large and medium-sized companies conduct usability activities; in contrast, only 40% of small-sized companies perform any form of usability activity.

In most cases (31/34), the company itself is in charge of the usability evaluation but there were ten companies which said that either a publisher and/or external company is also in charge of usability activities together with the company. One company stated that their "publishing QA manager" is in charge of usability with specialists.

Most of the reasons for not conducting usability activities referred to the lack of expertise and resources (Table 2). However most of these companies were interested to conduct usability activities in the future and perceived usability as being very important in games (average importance score 4,29).

Table 1. Game companies responding the survey

Company size	Respondents (total 45)	Game companies conducting usability activities (total 34)	Game companies with no usability activities (total 11)
1-5	10	4	6
6-10	11	10	1
11-20	9	6	3
21-30	5	4	1
41-70	5	5	0
71-100	2	2	0
101+	3	3	0

Table 1. Reasons for not conducting usability activities

Reason	Number of responses
Too expensive	6
Not enough expertise	5
Too time consuming	4
Perceived as not worthwhile	1

Usually the game companies started to test and evaluate their games' usability when a working prototype was available (26 out of 45 respondents) and the testing continued to the release version of the game. By conducting usability testing, the companies were trying to find out issues concerning enjoyment, controls, interface, playing experience, intuitiveness, game design and gameplay. Table 3 illustrates the development phases where game companies tested game usability.

Table 1. Development phases where Northern European game companies tested game usability

Game usability is tested with	Game companies conducting usability activities (total 34)
Paper prototype or similar	9
Working prototype	26
First playable version	26
Alpha version	28
Beta version	23
Release version	19
Competitors' product	14

10   The concept of usability

For game companies, the concept of game usability includes aspects of user interfaces (42 out of 45 respondents), controls (41/45), user experience (38/45), flow (32/45), level of challenge (26/45), gameplay (25/45), and fun (20/45). Game mechanics was also mentioned to be part of game usability, but it did not receive as much recognition (20/45) as the other aspects. On the other hand, the game companies that did not conduct any usability activities (11) rated the user interfaces (10/11), controls (10/11) and user experience (10/11) to be far more important aspects of game usability than flow (5/11), gameplay (4/11), fun (3/11), game mechanics (3/11) and level of challenge (3/11).

Table 1. The aspects of game usability

Aspect of game usability	Game companies conducting usability activities (n=34)	Game companies with no usability activities (n=11)
User Interfaces	32	10
Controls	31	10
User Experience	28	10
Flow	27	5
Challenge	23	3
Gameplay	21	4
Fun	19	3
Mechanics	17	3

In the open answers, respondents added that game usability was about making the game easy and intuitive to learn and easy to use. Immersive experience was described as being reached when the interface layer of the game disappears. The development of more easily understandable user interfaces and controls and finding problems in user experience and playability were mentioned as important goals in order to achieve good game usability. The following are extracts from respondents' answers.

- *"A good usability basically extends the users' ability to experience the game without noticing the interactive context"*.
- *"Usability helps the player to get into the game experience by making sure the player focuses on playing the game rather than how to control it"*.
- *"This question* [of defining game usability] *is difficult to answer because playability is sometimes but not always considered to be part of usability and it* [i.e. playability] *answers different questions"*.

11   Usability methods

Game companies used multiple different usability methods (on average 5,1 methods) while they developed their games. These methods have been tailored to fit the company's current needs. Large game companies appeared to be using more usability methods than the smaller ones.

The surveyed companies used as test participants their own employees (28 of 34), friends and acquaintances (27/34), random persons (22/34), players from the target group of the game (21/34), and employees of other game companies (2/34) when conducting game usability evaluation. The companies performed the usability evaluation and testing usually in their office, but testing online, at home, in the test laboratory, or in the field (cafes, public events, and universities) were also reported by few companies. The types of tasks given to test participants were structured tasks, open tasks, and no tasks (observation of natural playing).

The most used usability method was playtesting, which was used almost in every company (32 of 34 companies using usability methods). The second most popular method was observation of gameplay, which was used in 67,6% of the companies (23/34). Usability testing (20/34) was the third most popular method (58,8%), closely followed by interviews (16/34), focus groups (16/34), think-aloud (13/34), questionnaires (13/34), data logging (12/34), and filmed play-sessions (11/34). The

least used methods were heuristic evaluation (6/34), empirical guidelines (4/34), eye tracking (3/34), and cognitive (3/34) and pluralistic (0/34) walkthroughs. Group playtesting, rapid iterative prototyping, and engagement monitoring through physiological measures were also reported by a couple of the companies. One company reported that direct communication with their player community through forums, Twitter, and Facebook was a useful usability method. When asked about what new methods game companies might try in the future, the most popular method was focus groups (7 respondents).

One major difference between the countries regards the usage of usability testing; in Finland 9 out of 11 (81,8%) game companies used usability testing, compared to 11 out of 23 (47,8%) game companies outside Finland.

12   Heuristic evaluation

Only six respondents have reported the usage of heuristic evaluation in their game development. Other respondents did not seem to know this method; majority of them reported the lack of knowledge about this method among the reasons of not using it. Other reasons were that it is too time consuming, and company does not have enough people or lacks the knowledge to utilize it. One respondent said that the existing heuristic lists do not suit their games, and another that it is too expensive.

The game companies that were using heuristic evaluation are mostly large and they have created their own game heuristic lists. The existing game usability heuristic lists are viewed to be too general and any single heuristic list lacks comprehensiveness. They also supported the creation of specialized heuristic lists for different game genres.

13   DISCUSSION

This paper aimed to answer three research questions:
RQ1: *How the Northern European game companies define game usability?*
RQ2: *How the Northern European game companies perceive game usability?*
RQ3: *What usability methods and tools are used in the Northern European game industry to improve game usability and to what extent these methods are utilized?*
RQ4: *To what extent heuristic evaluation is used in Northern European game companies?*

Regarding the RQ1, the results showed that surveyed game companies did not define game usability as being only user interfaces and controls, but rather a mixture of usability as it is traditionally defined along with aspects from definitions from user experience and playability. Thus, the surveyed game companies regarded game usability as a broad concept that includes aspects from definitions of usability, user experience, and playability, such as user interface, controls, user experience, flow, level of challenge, gameplay, and game mechanics, in line with the definitions in [2,3, 12,14]. Interestingly, the companies which did not conduct any usability activities viewed user interface, controls, and user experiences as being the most important, while aspects such as flow, fun, gameplay, game mechanics and the level of challenge were regarded as less important when defining game usability. For the game

companies game usability is about making the game easily approachable for the players, intuitive to learn, and easy to use. The interface layer between the player and the fun should be as transparent as possible in order to give an immersive experience to the players. Finding problems in user interface and playability, as well as developing more understandable user interfaces and controls were seen as important goals for game usability.

Regarding the RQ2, the results of this study indicate that the Northern European game companies perceived usability as a very important factor in game development. Furthermore, these game companies identified usability activities such as usability testing and evaluation as being useful and important.

This result is supported by studies where game usability and the quality of user interface of the game are very important for players as a deciding factor when they want to buy a game [4]. One reason for this opinion among players could be that players do not want to invest money and time on games with poor usability and user interface. Usability methods can help game developers to find issues that hinder players from having fun while playing the game and also to help to identify other problem in the game [25].

However, although usability was seen as a very important factor in games, not all companies conducted usability activities to test and improve the usability of their games. This was the case primarily in small companies (1-5 employees) which responded that they lacked the expertise and resources to conduct usability activities as part of their game development. Nevertheless, most of the surveyed companies were interested in conducting usability activities in the future if required expertise and resources would become available.

Regarding the RQ3, the game companies in this study used multiple usability methods (on average 5,1 different methods). These usability methods were tailored to fit the current need. Large game companies used more usability methods than the smaller ones; this fact is not surprising and reflects also the status of usability work in "traditional" software development companies. The game companies usually started testing game usability when they had a working prototype and the testing continued until the game was released. The most commonly used usability methods were playtesting and observation of gameplay, followed by a group of other methods that were almost equally popular and that were used in 41-55% of the companies. These methods were usability testing, focus groups, interviews, think-aloud, filmed play-sessions, questionnaires, and data logging. Among the least used usability methods were pluralistic and cognitive walkthroughs, empirical guidelines, eye tracking and heuristic evaluation. Pluralistic walkthrough is indeed more suitable for evaluating productivity software with "rich" user interface by employing paper prototypes, and this fact may explain the lack of use among game companies. However, the other results seem to somewhat disagree with the literature, which identifies think-aloud, Rapid Iterative Testing & Evaluation (RITE), heuristic evaluation, playtesting, and A/B testing as being the most common and effective methods for analyzing player experiences (see [17]).

The results of this study indicate that among the identified methods, only playtesting seems to be widely used in Northern European game companies. Gameplay and usability testing were used in over half of the companies, while heuristic evaluation was used only in six companies. Furthermore, only one company

responded that they used RITE as a method and none of the companies responded that they were using A/B testing. It seems that the Northern European game companies would need more information and expertise about different available usability, user experience, and playability methods. Three companies used cognitive walkthrough as one of their usability testing method and four companies were considering using it in the future, which is surprising when considering the relative lack of published research on using cognitive walkthrough as a method for evaluating game usability.

Regarding the RQ4, the results showed that only a few of the game companies in this study were using heuristic evaluation (6 respondents), although it is one of the most common and effective methods (c.f. [17]) and has been a popular research topic among human-computer interaction (HCI) researchers. It seems that heuristic evaluation as a method is not so well known among the companies, because in this study majority of respondents did not know about this method or how to utilize it. There were also responses saying that using heuristic evaluation would be too time consuming or that the company does not have enough people to do it. This result is surprising since heuristic evaluation is often considered the simplest and most cost-efficient usability method and it is widely used in the traditional software development [7,17,18].

One company reported as a reason of not employing heuristics that the existing game usability heuristic lists or generic usability heuristic lists did not suit their games. Indeed, game usability heuristics are quite new usability methods and they are based on definitions – such as playability – that do not yet have a commonly agreed definition even among HCI researchers, let alone among game developers.

Game companies that use heuristic evaluation have reported that the existing game usability heuristic lists were too general and that no single heuristic list was comprehensive enough while being easy to use. This has also come up in the literature, where it has been noted that some heuristic lists included rather ambiguous and broad heuristics [7,22] or that these lists are best suited for finding and evaluating usability issues on general level [5]. It has been noted that the game usability heuristic lists need improving before practitioners can utilize them [22]. It could be said rather ironically that the usability of the game usability heuristic lists themselves need to be improved so that the users of these heuristics – the game developers – are able to utilize them. This presents a challenge to the HCI researchers.

This gap between game usability research and game development practice may explain why company's own heuristic lists were mostly used among the responding game companies using heuristic evaluation. The idea of different game genres having their own specialized heuristic lists was also supported by the responding game companies. There are already existing genre-specific game usability heuristic lists for different genres like MMORPG, FPS, Action- Adventure and RTS (see [8,19,26]). Although some heuristic lists try to be comprehensive so that they can be used to evaluate a multitude of games across different genres [27], these lists have heuristics that are not equally relevant in all genres or that are even irrelevant in some cases [18], which might make these lists unnecessarily large and hard to use by the practitioners.

14   CONCLUSIONS

This paper reported the views of the Northern European game companies on the concept of game usability and their practices with respect to usability methods they use. Data from companies of different size in Finland, Sweden, Denmark, the Faroe Island, Latvia, Lithuania, and the British Isles were collected though survey to understand how companies perceive, define, and evaluate game usability.

Game usability is seen in companies as very important in game development, and is defined in a broad sense that includes the traditional view of interface and controls usability, as well as the more modern views of user experience and playability. This definition is in line with the trends in literature emphasizing the holistic approach to usability.

Game usability methods employed by game companies included gameplay testing, observation of gameplay, and usability testing. Usability activities were commonly conducted by medium- and large-sized companies. Game heuristics, despite its popularity among researchers, were rarely used in companies; when used, companies employed in-house heuristics. Overall, this indicated that the heuristic evaluation as a usability method has not permeated into modern game development practices and that the game development companies using heuristic evaluation have not found the existing game usability heuristics useful for their practical needs.

This paper contributes to the human-computer interaction and usability research with providing a snapshot of game usability understanding and practice in game companies in Northern Europe. The paper provides a contrasting view on how game usability is defined by researchers versus by professionals in game industry. The results of this paper support the "broader" definition of game usability (as defined by [2,3,12,14]) which includes aspects from "traditional" usability, user experience, and playability, as opposed to "narrower" definitions of game usability (as defined by [5, 6,10,11] following the traditional view on usability [28]). This finding highlights the importance of the development of a uniform terminology and language to bridge the gap between game developers, usability professionals, and usability researchers with respect to their understanding of usability. Furthermore, a clearer definition of game usability would make it easier to define which aspects of game (e.g., controls, interface, storyline) fall on the domain of game designers and which aspects fall on the domain of usability specialists.

This paper also contributes to the HCI field, in particular, the game usability research and practice, and game development industry with providing a better understanding of how well usability methods have permeated into modern game development practices. Furthermore, this paper provides the game development industry with knowledge on usability methods employed by game development companies so to increase their professional expertise and competitive positions and provide users with high-quality games. Additionally, this paper contributes to the HCI and game usability research with highlighting the need for developing suitable and easy to use usability methods that do not require lots of expertise or resources; especially small game development companies (1-5 employees) which lack the expertise and resources to use the traditional HCI methods would benefit from this development.

As a limitation of the study, it is not certain that respondents understood the different terms and meanings in correct and uniform way. The questionnaire was administered in English and also Federoff [3] pointed out that the language of usability researchers and professionals is not typically used within game industry. Another limitation is the sample and response rate; not all Northern European countries were covered and the sample size is relatively small but quite normal for this type of surveys.

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