Heuristic Evaluation of "FarmVille"

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Resumo

A aval iação d e vid eojogos é uma etapa crucial no processo d e desenvolvimento de j ogos. A ava liação heurística é uma das opções para ava liar jog os, utilizada por p eritos n a id entificação de problemas d e usabilidade. Este artig o apresenta os resu ltados obtidos d a a plicação d e um a av aliação h eurística no conhecido jogo "FarmVille". 6 avaliadores analisaram 5 objectivos c om base em 35 h eurísticas únic as e identificaram v ários pr oblemas de usab ilidade no j ogo. Os resultados sugerem que o "FarmVille", embora seja um jogo interessante, pode ser melhorado.

Palavras-chave: usabilidade, videojogos, "FarmVille", avaliação heurística

Abstract

Video game evaluation is a crucial part of any game development process. Heuristic evaluation is one of options for evaluating games, used by experts in the identification of usability problems. This paper presents the acquired results of the application of a heuristic evaluation on the popular farm-sim "FarmVille". 6 evaluators analyzed 5 objectives using 35 unique heuristics and identified several usability problems in the game. Results suggest that "FarmVille", while an interesting game, has room for improvement.

Keywords: usability, video game, "FarmVille", heuristic evaluation

1. INTRODUCTION

One of the main reasons behind the failure of many products is the lack of testing and evaluation. This reasoning is also valid for video games. On occasion, and in a more specific context such as the web or video games, testers or evaluators will submit products to a usability evaluation. (Nielsen & Molich, 1990) define four ways to evaluate a user interface: i – formally, through an analysis technique; ii – automatically, by computer procedure; iii – empirically, through user experimentation; iv – heuristically, by analyzing the interface and passing judgment based on specialist opinion.

A heuristic evaluation, similar to the one carried out in the present study, involves looking at the product interface and making opinions about what is good and bad about the interface (Nielsen & Molich, 1990). As heuristic evaluation is a usability inspection method (Nielsen, 1992), other important components essential for the user are at times left out of the equation, namely accessibility. Accessibility in games is related to the possibility of the product being accessible to all people; people with visual, auditory, motor or cognitive disabilities.

This paper presents the acquired results obtained from the application of a heuristic evaluation, that took into consideration both usability and accessibility issues. The object of analysis of this study was "FarmVille[1]", a currently very popular online game associated to the also very popular social network, Facebook[2] (launched in September 2004 and with more than 400 million[3] active users). "FarmVille", categorized as an *application* in Facebook, is a real-time farm simulation game developed by Zynga[4]. "FarmVille" has strolled to success and is played by nearly 70 million users[5].

2.   CONCEPTUAL FRAMEWORK

2.1. HCI & Games

Although the fields of Human-Computer Interaction (HCI)/Usability and video games have existed for some time – and have in common the characteristic of trying to find, and provide, what the user/player wants – only recently have the number of interactions and exchanges between these areas grown, both on an academic and practical level (Jørgensen, 2004).

(Malone, 1982) published in 1982 one of the first exceptions to the existing condition between the fields, presenting ideas on how software – traditionally related to HCI and usability issues – could become more enjoyable by adopting ideas from video games. Since then, the amount of research in these contexts has grown (Fabricatore, Nussbaum, & Rosas, 2002; Pagulayan, Keeker, Wixon, Romero, & Fuller, 2003; Pinelle, Wong, & Stach, 2008).

While Malone was publishing his work (1982), Chris Crawford presented "The Art of Computer Game Design" (Crawford, 1982), a book that revolutionized ideas on game design. Crawford, along with others such as (Rollings & Adams, 2003) and (Rouse, 2001) have demonstrated interest in the "user" component in game development, using terminology such as "user interface", "usability" and "user friendliness" in their work (Jørgensen, 2004).

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[1] FarmVille: http://www.farmville.com/

[2] Facebook: http://www.facebook.com/

[3] Statistic retrieved from: http://www.facebook.com/press/info.php?statistics, June 30, 2010.

[4] Zynga: http://www.zynga.com/

[5] Information retrieved from: http://www.facebook.com/press/info.php?statistics, June 24, 2010.

One of the most accepted definitions of usability is that of ISO 9241-11: "(…) [usability] encloses three measures – efficiency, effectiveness and satisfaction – in a specific context of use (ISO, 2009). Melissa Federoff (Federoff, 2002) states in her research that video games are not a common product and therefore, their effectiveness, efficiency or even the satisfaction they produce have distinct evaluation parameters because of their unique nature.

Besides Malone (1980), previously mentioned, Chuck Clanton (Clanton, 1998) presented a division of what he considered to be the components of game usability, identifying game interface, game mechanics and gameplay. (Federoff, 2002) elaborated on (Clanton, 1998) work, describing the game interface as a sum of the elements that are used to control a video game (e.g. a keyboard, joystick) and the visual representation of a player's actions in the game. The game mechanics – divided into animation, programming and level design – are the ways the player is able to move in the video game (e.g. walking, running). Finally, game play refers to the challenges and problems a player must overcome to complete the game's objectives. (Pinelle, et al., 2008) state that video games are products that are subject to constant interaction and therefore, usability is an important factor in the industry. The authors define game usability as the "degree to which a player is able to learn, control and understand a game" (Pinelle, et al., 2008, p. 1453). Additionally, they believe that despite usability issues being common in video games and other products, video games present other usability questions not common in other products.

2.2. *Game evaluation*

Although the number of usability evaluation methods is vast, ranging from cognitive walkthroughs, interviews, and observation to questionnaires, one of the most common methods to evaluate usability is through heuristic evaluation. Some of the most known heuristics in the area of HCI are those of (Shneiderman, 1997), (Nielsen, 2005) and (Jordan, 1998). While useful, these heuristics are directed for product interface and design evaluation. Still, they can serve as a starting point for video game evaluation if molded to cover additional aspects of video game usability, as suggested by (Pinelle, et al., 2008). The authors mentioned in the previous section have not only reflected on game usability, but devised heuristics that can be used in game development and evaluation.

(Federoff, 2002) proposed a set of heuristics – grouped into game interface, mechanics and gameplay – based on a vast literature review and the collection of heuristics indicated

and formulated while working closely with a video game development group. (Desurvire, Caplan, & Toth, 2004) developed the HEP – Heuristic Evaluation for Playability – a set of heuristics collected through literature review. (Pinelle, et al., 2008) also proposed a set of heuristics to identify usability issues in video games. Contrasting with (Federoff, 2002) and (Desurvire, et al., 2004), these authors developed their heuristics after analyzing 108 different PC games. Based on the reviews received, 12 categories of usability problems were identified and a final list of 10 heuristics was defined. (Schaffer, 2007) proposed a set of heuristics for usability, focusing on general gameplay, graphics and controls. Schaffer alerts, however, that heuristics such as those of (Desurvire, et al., 2004; Federoff, 2002) are not always clear because of the lack of examples on how to apply each heuristic. (Korhonen & Koivisto, 2006) also developed a set of heuristics for game evaluation, having focused on the mobile context.

Other video game analysis approaches, namely through the use of eye tracking have also been considered as of late (Almeida, 2009; Almeida, Mealha, & Veloso, 2010). These studies presented some preliminary results regarding the value of player visual attention in video game evaluation.

3.   STUDY OBJECTIVES & METHOD

3.1. *Study Objectives & Heuristics used in analysis*

As mentioned, the present study consisted in a heuristic evaluation of the popular game "FarmVille". To limit the extent of the study, 5 objectives were defined on which the analysis would be based: i – *the game should have mechanisms that facilitate the player's learning process and general gameplay*; ii – *the game should be easy to play but have some complexity to engage the player;* iii – *the player should be able to identify his actions in the game and respective feedback*; iv – *the game should be graphically appealing without overriding game play and be customizable*; v – *game should be accessible to any person or player*. The 5th objective of the list is clearly directed towards accessibility questions, with the goal of understanding to what extent this game is accessible to all potential players. Based on these objectives, heuristics were defined to verify the implementation of the objectives in the game.

Because no single set of heuristics from the mentioned authors was felt to be sufficiently valid and complete to execute the study and analyze the defined objectives, heuristics from (Desurvire, et al., 2004; Federoff, 2002; Pinelle, et al., 2008) were extracted.

Additionally, heuristics specifically tailored for games as well as for usability in general were considered.

3.2. Study Method

A heuristic evaluation involves having a small group of evaluators analyze an interface and verify its conformity with a group of usability principles, the heuristics (Nielsen, n/y). Nielsen (Nielsen, n/y) defends that a heuristic evaluation may be carried out by a single evaluator (although only 35% of problems will be identified), but recommends between 3 and 5, depending on the extend of the evaluation. For the present study, 6 evaluators were selected. Of the 6 evaluators, 4 were female and 2 male; 3 had minimal or no experience with "FarmVille" and the remaining 3 were active players. To carry out the evaluation, new accounts were created for each evaluator to guarantee equal game conditions for each. Each evaluation session was accompanied by the lead researcher of the study. For each of the identified objectives, evaluators were presented with the heuristics used to assess their compliance. The evaluators were asked to answer either *Yes*, *No* or *Other*, if they had an opinion on the heuristic. Additionally, and as (Schaffer, 2007) indicated, written and oral examples were given to reduce the ambiguity of the heuristic and clarify its usage in the study. A total of 35 unique heuristics were used in the analysis, one of which was used for two of the objectives.

4.   RESULTS & DISCUSSION

Table 1 presents a summarized view of the heuristics and results acquired from the evaluators for objective 1. Not included in the table – or any other of the following tables – are the examples used to clarify each of the heuristics. Of all the heuristics used, 27 received the same answer (Y – Yes, No – No, O – Other opinion) from the evaluators, whereas the remaining 9 registered distinct answers.

OBJ. 1	The game should have mechanisms that facilitate the player's learning process and general gameplay																				
Heuristic	Tutorial provided at beginning of game			Tutorials are repeatable			Help is clear and informative			Other documents or support			Match between system & real world			Customizable controls			Errors are prevented with warnings & messages		
	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O
Ev. 1	x				x				x	x					x		x			x	
Ev. 2	x				x				x	x					x		x			x	
Ev. 3	x				x				x	x					x		x			x	
Ev. 4	x				x				x	x			x				x				x
Ev. 5	x				x				x	x			x				x				x
Ev. 6	x				x				x	x			x				x			x	

Heuristic	Player is involved quickly and easily			Game gives hints and suggestions			Context sensitive help			A game manual is required to play			Non-playable content can be skipped			Information is displayed in various forms			Player has full control over game		
	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O
Ev. 1	x				x			x		x				x		x				x	
Ev. 2	x				x			x		x				x		x				x	
Ev. 3	x				x			x		x				x		x				x	
Ev. 4	x				x			x		x					x	x					x
Ev. 5	x				x			x		x					x	x					x
Ev. 6	x				x			x		x				x		x					x

Table 1: Objective 1 heuristics and evaluator analysis

The first objective (analyzed with 14 heuristics) [Table 1], resulted in 5 heuristics being verified (line 1: column 1 & 4; line 2: column 1, 4 & 6) and 5 others not being verified (line 1: column 2 & 6; line 2: column 2 & 3). One verified heuristic was tutorial related. In fact, while a simple tutorial is presented at the beginning of the game; for a player who returns to play after a long period of absence and doesn't remember the basic controls, the tutorial can't be accessed a second time. Figure 1 represents a screenshot taken from "FarmVille" with the tutorial.

Figure 1: Screenshot from "FarmVille" presenting game's main interface

Figure 2: Screenshot from "FarmVille" with the market window activated

The remaining 4 heuristics received diverse responses from the evaluators. In terms of "match between system & real world", 3 evaluators (those with experience in the game) indicated that in fact there is a match. The other 3 evaluators stated that there is some match but, nonetheless, when at the "Market", it is unclear what they are buying (whether seeds to plant an entire lot or only a portion) and how many seeds the value indicated could buy. Figure 2 represents the "Market" area in "FarmVille". Another heuristic without a consensus was "errors are prevented with warnings & messages". Four evaluators indicated that there are no clear warnings that prevent players' errors. The remaining two evaluators indicated that when selecting the "delete" button (button with

recycle icon in Figure 1), and selecting an area to remove, the system asks if the player is certain he wants to delete the selected piece of land. A third heuristic that generated distinct answers is related to skipping non-playable content. Four evaluators indicated that it is not possible to skip this content. Nonetheless, two answered that while there is no button to effectively skip this type of content, by placing the avatar inside fences, avatar animations can be skipped. Finally, in terms of the "full control over game" heuristic, 3 evaluators indicated that there is no control, stating that what a player does is final and can't be undone. However, the 3 remaining evaluators referred to the delete and move button as a possible method of having some control over the game.

OBJ. 2	The game should be easy to play but have some complexity to engage the player																	
Heuristic	Game difficulty can be changed			There are multiple game goals			Game is balanced: no definite way to win			Game gives rewards			Game is replayable			Player doesn't rely on memory to play		
	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O
Ev. 1		x			x		x			x				x		x		
Ev. 2		x			x		x			x				x		x		
Ev. 3		x		x			x			x				x		x		
Ev. 4		x		x			x			x				x		x		
Ev. 5		x		x			x			x				x		x		
Ev. 6		x		x			x			x				x		x		

Table 2: Objective 2 heuristics and evaluator analysis

The second objective (analyzed with 6 heuristics) [Table 2] had three heuristics positively identified by all evaluators (column 3, 4 & 6) and 2 heuristics not verified by all evaluators (column 1 & 5). In fact, there is no method to select the game's difficulty; nor is there any option to reset the game and play it from the start. The only heuristic to generate different answers was "there are multiple game goals". Two evaluators answered that there are no multiple goals, although they refer that the possibility of having friends and trying to have more points than these can be considered as such. The remaining four evaluators mentioned the social aspect of the game as an evident game goal, while another evaluator indicated that completing the game goals – visible when activating the Ribbon button (bottom-left on game toolbox in Figure 1) – is a goal of "FarmVille".

OBJ. 3	The player should be able to identify his actions in the game and respective feedback											
Heuristic	Player score/status is identifiable			Feedback provided through sound			All feedback is immediate			There are multiple forms of feedback		
	Y	N	O	Y	N	O	Y	N	O	Y	N	O
Ev. 1			x	x					x	x		
Ev. 2			x	x			x			x		
Ev. 3			x	x			x			x		
Ev. 4	x			x			x			x		
Ev. 5	x			x			x			x		
Ev. 6	x			x			x			x		

Table 3: Objective 3 heuristics and evaluator analysis

The third objective (analyzed with 4 heuristics) [Table 3] is directly related to game feedback. 2 heuristics (column 2 & 4) were identified by the evaluators as conforming to the objective and the remaining two received diverse answers. For the "player score/status is identifiable" heuristic, 3 evaluators indicated the "Other opinion" option, stating that the XP (experience points) bar is unclear and that the scale is presented as relative to the level but contains absolute values. The remaining 3 evaluators approved the score/status interface elements. The "FarmVille" interface is visible in Figure 1.

OBJ. 4	The game should be graphically appealing without overriding game play and be customizable																				
Heuristic	Interface is consistent in color & typography			All relevant information is displayed			The interface is non-intrusive			Menu layers can be minimized			Game window can be expanded			Visual and audio effects arouse player interest			Audio, video & graphics settings are customizable		
	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O
Ev. 1	x				x		x				x		x			x				x	
Ev. 2	x				x		x				x		x			x				x	
Ev. 3	x				x		x				x		x				x			x	
Ev. 4	x			x			x				x		x			x				x	
Ev. 5	x			x			x				x		x			x				x	
Ev. 6	x			x			x				x		x			x				x	

Table 4: Objective 4 heuristics and evaluator analysis

The fourth objective (analyzed with 7 heuristics) [Table 4] received 3 globally positive evaluations (column 1, 3 & 5) but two negative evaluations (column 4 & 7) were also identified. The heuristic "all relevant information is displayed" received 3 positive indications and 3 negative. The evaluators that answered negatively indicated that the "help" is out of the game window and should be a visible option in the interface. Finally, the "visual and audio effects arouse player interest" heuristic had 5 positive evaluations and one negative. The evaluator that answered negatively indicated that the animations and audio effects are repetitive and irritating.

OBJ. 5	The game should be accessible to any person or player														
Heuristic	There are multiple forms of input			Pointer size is adjustable			There are multiple forms of feedback			Game has accessible language			G. actions' description can be turned on/off		
	Y	N	O	Y	N	O	Y	N	O	Y	N	O	Y	N	O
Ev. 1		x			x		x			x				x	
Ev. 2		x			x		x			x				x	
Ev. 3		x			x		x			x				x	
Ev. 4		x			x		x			x				x	
Ev. 5		x			x		x			x				x	
Ev. 6		x			x		x			x				x	

Table 5: Objective 5 heuristics and evaluator analysis

The fifth and final objective (analyzed with 5 heuristics) [Table 5] had three objectives which were indicated as conforming (column 3 & 4), and two as not being present in the game (column 1, 2 & 5). Evaluators agreed that "the game offers multiple forms of

feedback" and that it "has accessible language", making it slightly open to players with accessibility issues. However, evaluators additionally indicated that the "game doesn't offer multiple forms of feedback"; that "the pointer size isn't adjustable" and finally, that "game action descriptions can't be turned on/off". Therefore, in a general sense, the game is not accessible to players with motor difficulties. While it is acceptable that developing games for every type of player can be difficult, implementing keyboard interaction as a supplementary method of control could be considered and is easily achievable.

5.   CONCLUSIONS

The present study reports on a heuristic evaluation of the game "FarmVille". 35 unique heuristics (one heuristic was repeated for two objectives) were used to verify 5 defined game objectives. Evaluators' answers indicate that the game complied positively with 15 heuristics. However, the game did not comply with 11. The acquired results help understand that in general, "FarmVille" is a good and well developed game. Nonetheless, our research detected reasons for improvement in several game aspects. Specifically, while there is a help section and auxiliary documentation, these are out of the game window. Additionally, while there is a tutorial at the beginning of the game, it is not repeatable. For those who return to play after some period of absence, or for younger players, being able to repeat the tutorial would be important. Another visible flaw is related to game input which is limited to the mouse. It is felt that implementing keyboard controls could be a valuable addition and expand the game to those with motor difficulties. A final and significant flaw of "FarmVille" is that there is no significant control over the game. What a player does in the game is essentially final, as there is no possibility of *undoing* what a player does. The exception is moving the land or deleting it. Therefore, although "FarmVille" is extremely popular, and as can be said for any game, there is always room for improvement.

6.   ACKNOWLEDGEMENTS

References

Almeida, S. (2009   ). *Augmenting Video Game Development with Eye Movement Analysis.* Universidade de Aveiro, Aveiro.

Almeida, S., Mealha, Ó., & Veloso, A. (2 010). Vide o Ga me Usage a nd Gameplay: "Call o f Duty 4" Case Study. *PRISMA, 10 (Special Videogame Conference - VIDEOJOGOS2009)*(Accepted for Publication in 2010).

Clanton, C. (1998). *An interpreted demonstration of computer game design.* Paper present ed at the CHI 98 conference summary on Human factors in computing systems.

Crawford, C. (1982). *The Art of Computer Game Design: Reflections of a Master Game designer*: McGraw-Hill.

Desurvire, H., Caplan, M., & Toth, J . A. (2004). *Using heuristics to evaluate the playability of games.* Paper presented at the CHI '04 extende d abstracts on Human factors in computing systems. Retrieved from http://portal.acm.org/citation.cfm?id=985921.986102

Fabricatore, C., Nu ssbaum, M., & Ro sas, R. (2002). Playability in a ction vid eogames: a qualitative design model. *Hum.-Comput. Interact., 17*(4), 311-368.

Federoff, M. (2002). *Heuristics and Usability Guidelines for the Creation and Evaluation of Fun in Video Games.* Indiana University.

ISO. (2009). ISO 9241-11: 1998 - Ergonomic requirements for office work with visual display terminals (VDTs) - Part 11: Guidance on Usability: International Organization for Standardization.

Jordan, P. (1998). *An Introduction to Usability*: Taylor & Francis.

Jørgensen, A. H. (2004). *Marrying HCI/Usability and computer games: a preliminary look.* Pape r presented at the Proceedings of the third Nordic conference on Human-computer interaction.

Korhonen, H., & Koivisto, E. M. I. (2006). *Playability heuristics for mobile games.* Paper p resented at the Pro ceedings of the 8t h co nference on Human-computer inte raction with m obile d evices and services.

Malone, T. W. (1980). *What makes things fun to learn? heuristics for designing instructional computer games.* Paper presented at the Proceed ings of the 3rd ACM SIGSMALL symposium and the first SIGPC symposium on Small systems.

Malone, T. W. (1982). *Heuristics for designing enjoyable user interfaces: Lessons from computer games.* Pape r p resented at the Pro ceedings of the 1982 confe rence on Hu man fa ctors i n computing systems.

Nielsen, J. (1992). *Finding usability problems through heuristic evaluation.* Paper p resented at the Proceedings of the SIGCHI conference on Human factors in computing systems.

Nielsen, J. (2005). T en Usability Heuri stics. *Useit.com* Retrieved Ja nuary 27, 201 0, from http://www.useit.com/papers/heuristic/heuristic_list.html

Nielsen, J. (n/y). *How to Conduct a Heuristic Evaluation*: [Available at : http://www.useit.com/papers/heuristic/heuristic_evaluation.html].

Nielsen, J., & Molich, R. (1990). *Heuristic evaluation of user interfaces.* P aper p resented at the Proceedings of the SIGCHI conference on Human factors in computing systems: Empowering people.

Pagulayan, R. J., Keeker, K., Wixon, D., Romero, R. L., & Fuller, T. (2003). User-centered design in games *The human-computer interaction handbook: fundamentals, evolving technologies and emerging applications* (pp. 883-906): L. Erlbaum Associates Inc.

Pinelle, D., Wong, N., & Stach, T. (2 008). *Heuristic evaluation for games: usability principles for video game design.* Paper prese nted at the Pro ceeding of the twenty-sixth annu al SIGCHI conference on Human factors in computing systems.

Rollings, A., & Adams, E. (2003). *Andrew Rollings and Ernest Adams on Game Design*: New Riders Games.

Rouse, R. (2001). *Game Design: Theory and Practice*: Wordware Publishing.

Schaffer, N. (2007). *Heuristics for Usability in Games - White Paper*.

Shneiderman, B. (1997). *Designing the User Interface: Strategies for Effective Human-Computer Interaction*: Addison-Wesley.