Player-Centric Game Design: Adding UX Laddering to the Method Toolbox for Player Experience Measurement

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Abstract

In this paper, UX Laddering is introduced with its underlying theoretical perspective, Means-End Chain theory, and its methodological approach to measure game player experiences. Firstly, UX Laddering is positioned along the spectrum of game experience research methods. Then, a Means-End Chain theory inspired Game eXperience Model is presented. Next, the four-step approach of the UX Laddering methodology is briefly described, including
1) product interaction, 2) preference ranking, 3) Lenient Laddering and 4) a qualitative and quantitative analysis. This paper ends by explaining the applicability of the outcome of UX Laddering, the Hierarchical Value Map, as a communication tool towards game designers to support them in taking informed decisions during the game development process, from the analysis to game design and evaluation phase.

Introduction

A thorough understanding of game experiences requires insight into the complex interplay between three factors, including the 1) players, 2) characteristics of the game system, and the 3) game context [1]. Game experience can be measured on each of these dimensions. Studies that aim for an understanding of the game play *context* rely mostly on ethnographically inspired methods. The methods employed in studies on the assessment of the game *system* used to focus on bug testing, but recently also have incorporated more event-logging user data [e.g. gameplay metrics] [1]. The assessment methods of the idiosyncratic game experience of the *player* are most diverse. To illustrate, these cover amongst others objective, quantitative psychophysiological measurements [2], subjective surveys such as the Game Experience Questionnaire [3], as well as usability-oriented methods such as the RITE method [4] and more qualitative formative user testing methods like Deep Gameplay or the Initial Experience Playtest [5]. Many of the methods mentioned above have been introduced to support the design and development of games. Over the last years, game designers and researchers have been inspired by user-centered design practices in their search for appropriate methods to include players in a more player-centric game design process [5]. Typically, these measures are employed rather late in the game design cycle when most decisions that shape the gameplay have already been defined by the team of game designers. Yet, this is unfortunate because many design decisions can benefit from insights from user research from an early design stage onwards. Game design constitutes a second order design [6], meaning that a designer can only design the rules of the game and never the direct player experience. It is the challenge of finding the right theoretical perspective and methodological approach to account for the motivations and experiences of the players throughout the whole game design and development process. As an answer to this challenge, UX Laddering and its underlying theoretical framework – Means End Chain theory- are introduced to the game research community.

Games as a means to an end

Means-End Chain (MEC) theory has been developed in the domain of consumer research to provide an understanding of how people's needs and desires can be fulfilled through the interaction with products. In essence, Means-End Chain theory focuses on the linkages (*chains*) between product attributes (the *means*) on the one hand, and consequences of product use and personal values (the *ends*) on the other hand. The underlying premise is that people perceive certain product *attributes* as most likely to have certain desired *consequences*, which in turn seem beneficial to their individual *values* [7, 8]. Recently, it has been recognized that MEC theory can support research studies in other domains than consumer research because of its comprehensive perspective

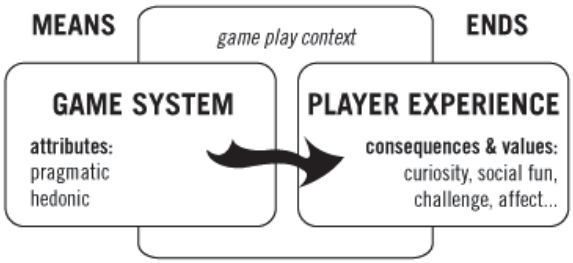

Figure 1. A Means-End Chain theory inspired Game eXperience Model.

on how to understand and analyse product experiences. More particularly, it has been argued that the user experience construct lends itself especially well to analysis in the context of MEC theory [9–11]. MEC theory's underlying premise points out that people prefer products, not because of the product's characteristics, but rather because of what these attributes can do for them in a particular context; the consequences of using a product unfold in the interaction between user, product attributes and context. This premise has also been agreed upon among user experience researchers. Moreover, it is also this premise that draws the parallels with game design as a second-order design problem. The design of a game system can never be a goal in itself, but rather that it is a means to provoking meaningful play as well as fulfilling player needs and values in a specific game play context.

Based on the insights from the game/user experience concept and the MEC theory we have summarized the potential of the MEC perspective for measuring player experiences, see Figure 1. In this MEC inspired Game eXperience Model, it is highlighted that in a particular game play context, both the pragmatic (e.g. usability-related) and hedonic (e.g. relating to aspects as flow or fantasy) game system attributes should be considered as a means to engage players in a meaningful game experience.

UX Laddering

The MEC theory provides us with several methods to reveal and understand product experiences and preferences. Laddering is one of these methods and foresees in a specific in-depth one-on-one interview protocol aimed at eliciting the respondents' attributes-consequences-values ladders with respect to a (limited set of) product(s). Laddering also refers to a particular data analysis protocol [12]. Recently, the potential of Laddering for Human-Computer Interaction (HCI) researchers has been put forward, which resulted in 2009 in the definition of UX Laddering [13]. UX Laddering is characterized by a four-step approach involving 1) product interaction, 2) preference ranking, 3) Lenient Laddering and 4) a qualitative and quantitative data analysis approach. UX Laddering always places the product under interest in a comparative, meaningful choice context, in which the experience with one or more alternative products or product classes is considered. As experiences unfold in the interaction between the individual and the system, and this in a particular context, people can only be questioned when they are able to reflect upon actual product interaction, and this preferably in a meaningful setting. Hence, UX Laddering's first step foresees in a short product interaction. Then, in the second step, the attribute elicitation phase follows by means of preference ranking. When the respondents are asked to rank two or more products, they will focus more on visible and concrete differences between the products than when the task is to elaborate freely on important product features [14]. The third step of UX Laddering consists in the actual interview in which the respondents *are ask*ed to reflect on those criteria that are important in distinguishing the products and in explaining what the experience with these products mean to them. The respondent is then repeatedly asked why-questions as many times as needed to reveal all relevant and salient criteria. It is this why-probing that typifies the Laddering interview approach during which the interviewer continuously asks for higher ordered, more abstract reasons and thus strives to climb up the ladder of attributes, consequences and (if possible and/or relevant) values [8, 15].

As for the fourth and last step, the UX Laddering data analysis, both a qualitative and a quantitative phase can be distinguished. It begins with the analysis of the interview transcripts according to the standards of qualitative

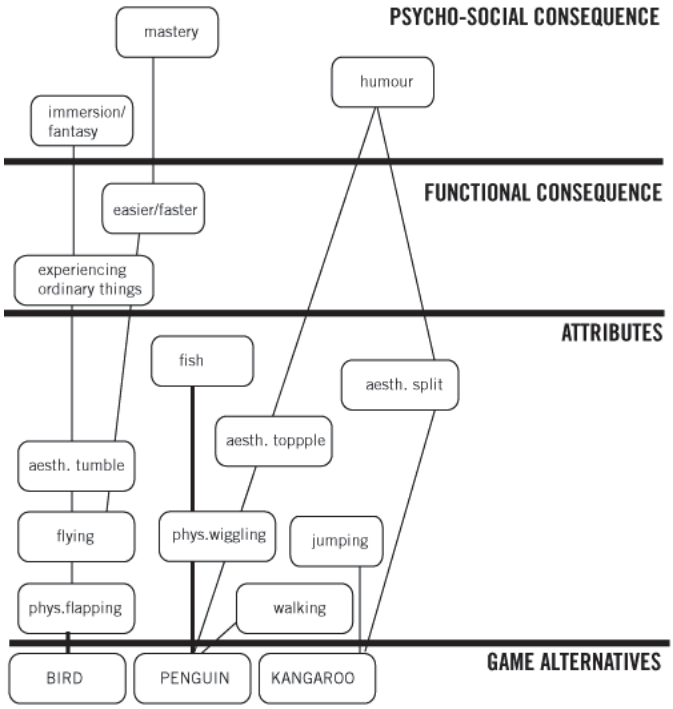

Figure 2. Example of a Hierarchical Value Map of a UX Laddering study in which children's dominant motivations of playing three types of cuddly toy interaction games are presented, to be read from bottom to top [16].

research and content analysis. The, the quantitative data analysis follows in order to reveal those dominant motivations that do no longer represent individual ladders but means-end chains at the aggregate level. This aggregation process results in the identification of the dominant relations at group level whereby marginal, individual links that are not repeatedly mentioned are ignored, and this all visually presented in a Hierarchical Value Map (HVM). Figure 2 shows an example of a HVM [16]. Such a HVM is the ultimate goal of UX Laddering as it provides an overview of dominant perceptions and motivations for using a certain product [15].

The Hierarchical Value Map as a communication and design support tool

The end result of UX Laddering foresees in a visual summary, the HVM, that highlights the most important results at a single glance, but at the same time includes sufficiently openness to account for the rich, qualitative insights that were gained during the in-depth interviews. Using the HVM as both a communication and design support tool is promising because the best communication strategy among researchers and designers, is one that enables both types of experts to talk in a similar jargon [17] and in which the results are concisely presented but at the same time do not lose all their richness [18]. The HVM accounts for these aspects and also facilitates a communication and decision strategy in which the right priorities are set based on the research conclusions while also leaving sufficient openness for design interpretation and discussion [18].

For instance, referring back to example in Figure 2, the HVM explains why certain children preferred one cuddly toy interaction game to the others. More particularly, it revealed that the bird prototype was preferred because of its physical interaction (flapping the wings) that led to the psycho-social consequence of immersion or mastery whereas the penguin (wiggling) and kangaroo (jumping) alternatives were preferred for benefits related to humour. The UX Laddering study showed the specific meanings these interactions had and the kind of experiences these could evoke among their players. Yet, these insights do not immediately prescribe new design aspects. Although there is still room for discussion, the design team will be able to take more informed decisions as they have insights into how and which concrete elements of their game relate to which player benefits [16].

Conclusion

This paper introduced UX Laddering and its underlying theoretical framework as a comprehensive approach to understand player experience whereby the results can be used to support the game design process. The UX Laddering approach reveals the link between players' motivations and game play benefits on the one hand and specific game design elements on the other hand. Its data gathering is based on interviews and the data analysis makes a transition from qualitative to quantitative analyses in order to reveal the dominant patters of player experiences. UX Laddering can be added to the game experience toolbox of methods that inform the design process of a game from the early development phases onwards. Its underlying theoretical framework, Means-End Chain theory, provides us with an array of concepts to describe the emerging game experience. When the interaction between the game system and the individual player is reflected upon, the UX Laddering method gives game researchers and designers the methodological support to understand it.

References

1. Nacke, L.E. (2009). *Affective Ludology: scientific measurement of user experience in interactive entertainment*, PhD thesis, Blekinge Institute of Technology, Karlskrona, Sweden.
2. Mandryk, R.L. (2008). Physiological Measures for Game Evaluation. In *Game Usability: Advice from the Experts for Advancing the Player Experience*. Isbister, K., and Shaffer, N., Eds., Morgan Kaufmann.
3. IJsselsteijn, W., Poels, K., de Kort, Y. (2008). The Game Experience Questionnaire: Development of a self-report measure to assess player experiences of digital games. *FUGA Deliverable D3.3*.
4. Medlock, M., Wixon, D., Terrano, M., Romero, R.L., Fulton, B. (2002). Using the rite method to improve products: a definition and a case study. In *UPA conference*, Orlando, Florida, USA, published online http://www.microsoft.com/download/en/details.aspx?id=20940, accessed 28 March 2012.
5. Pagulayan, R.J., Keeker, K., Wixon, D., Romero, R.L., Fuller, T. (2003). User-centered design in games. In *The Human-Computer Interaction Handbook. Fundamentals, Evolving Technologies and Emerging Applications*. Jacko, J. A., and Sears, A., Eds., 883–906, L. Erlbaum Associates Inc., Hillsdale, NJ, USA.
6. Salen, K., Zimmerman, E. (2003). *Rules of Play: Game Design Fundamentals*. Cambridge, MIT.
7. Kardes, F., Cronley, M., and Cline, T. (2010). *Consumer Behavior*. 1st ed., South-Western College Pub.
8. Olson, J. C., Reynolds, T. (2001). Understanding consumer Decision Making. In *Understanding Consumer Decision-Making: The Means-end Approach to Marketing and Advertising Strategy*. Reynolds, T. J., and Olson, J. C., Eds., 3–20, Lawrence Elbaum Associates, Mahwah N.J.; London.
9. Cockton, G. (2004). Value-centred HCI. In *NordiCHI '04*, 149–160, Tampere, Finland.
10. Friedman, B. (1996).Value-sensitive design. *Interactions **3***, 16-23.
11. Hassenzahl, M. (2004). The thing and I: understanding the relationship between user and product. In *Funology: from usability to enjoyment*. Blythe, M., Overbeeke, K., Monk, A., and Wright, P., Eds., 31–41, Kluwer Academic Publishers, Norwell, MA, USA.
12. Grunert, K., Bechlarsen, T. (2005). Explaining choice option attractiveness by beliefs elicited by the laddering method, *Journal of Economic Psychology **26***, 223-241.
13. Vanden Abeele, V., Zaman, B. (2009). Laddering the User Experience! In *UXEM09 workshop*, Published online http://soc.kuleuven.be/com/mediac/cuo/?p=publication&id=165, accessed 28 March 2012.
14. Costa, A.I., Dekker, M., Jongen, W.M. (2004). An overview of means-end theory: potential application in consumer-oriented food product design, *Trends in Food Science & Technology **15***, 403-415.

15. Reynolds, T.J., Gutman, J. (1988). Laddering theory, method, analysis, and interpretation, *Journal of Advertising Research* ***28***, 11-31.

16. Vanden Abeele, V., Zaman, B., and De Grooff, D. (2012). User eXperience Laddering with Preschoolers: Unveiling Attributes and Benefits of Cuddly Toy Interfaces, *Personal and Ubiquitous Computing,* ***16****(4):451-465*. Zaman, B., Vanden Abeele, V., Markopoulos, P., and Marshall, P., Eds.

17. Rogers, Y. (2004). New theoretical approaches for HCI, *Annual review of information science and technology* ***38***: 87–143.

18. Visser, F. S., Lugt, R. V. D., and Stappers, P. J. (2007). Sharing User Experiences in the Product Innovation Process: Participatory Design Needs Participatory Communication, *Creativity and Innovation Management* ***16***: 35–45.