

Context, emergent game play and the mobile gamer as producer

Stephan Wolff, Barbara Grüter

Zentrum für Informatik und Medientechnologien
Hochschule Bremen, Flughafenallee 10, 28199 Bremen
{stephan.wolff|barbara.grueter}@hs-bremen.de

Abstract: The emerging tensions between the mobile application logic and the unfolding dynamic context of use belong to the core challenges of ubiquitous computing today. Starting from and with reference to our experiences with mobile gaming in a game world, combining real world with virtual dimensions, we explore the mobile play activity as a source for the development of solutions. While the mobile gamer as producer of play possibilities before the game is pretty well understood, emergent game play and the mobile gamer as producer of novel play possibilities during the game rise conceptual and technological questions.

Introduction

The emerging tensions between the application logic and the unfolding dynamic context of use belong to the core challenges of ubiquitous computing. Context emerged as an issue in many areas of informatics in the early 1960s. The issue grew in significance with mobile computing indicating the advent of ubiquitous computing [LY02]. Today “ubiquitous computing is sometimes called ‘context-aware computing.’ The real world, and the activities of those who populate it, raises fundamental questions about the nature and role of context“ [Ch06]. Despite ongoing debates on definitions and uses the scientific community did not achieve a consensual definition [Co05]. The questions about, what context is, and how it has be taken into account by context-aware systems, are answered differently until today. Following Dey and Abowd [DA99] many computer scientists prefer to understand context as a predefined situation of an entity relevant for the same entity. Thus context-aware systems are built and function by means of anticipating potentially relevant situations. Other computer scientists particularly those who refer to the concept of situated action [Su87] and the phenomenological tradition in Computer Science [Ci06], understand context as something unforeseeable, emerging and becoming relevant within and by the interaction of an entity with conditions, persons, environments [Gr01, Do04]. While the former understand context as a predefined, static phenomenon, the latter understand context as an emerging, dynamic phenomenon. Both perspectives seem to be necessary, but are logical incompatible – at least directly. Furthermore it is unclear how to design and to facilitate interaction within an emergent context.

Starting from and referring to experiences with mobile gaming in a game world, combining real world with virtual dimensions, we focus in the next section on mobile play activity as foundation and source for understanding the issue at hand and for developing solutions. We fathom the concept mobile gamer as producer of play possibilities before and during the game and study the interplay of context and game logic in each format in the third section. In the fourth section we focus on emergent game play and the future of game design.

Mobile play activity – experiences, needs and possibilities

The mobile game prototype *On the Streets* has been played by meanwhile more than 500 players. From the beginning we have been interested in emergent game play and the mobile gamer as producer, compare [EGM05]. Now with regard to the context issue we see the necessity to deeper understand the mobile gamer as producer as one approach to deal with the dynamics of a mobile game play induced by changing contexts.

We start with the mentioned definitions of context and apply them to a small example of emergent game play: In a comparative play test of Eastern and Western game play we observed differences in the mode of fighting: While Western players fought in an offensive, expressive manner using virtual and real dimensions of the fight, Eastern players fought in a chary, distant manner focusing on the virtual level [GW08]. The fight mechanics, a component of the game system deployed by both player groups comprises a representation of context from the system perspective– the fight mode demonstrates context as a dynamic phenomenon. Our concept of mobile play activity allows the integration of the conflicting ideas of context. Mobile play activity in our view has a double character: structure and context. Each play activity is on the one hand structured by the game concept of the player and through that by the game system: in our example the fight mechanics. Each play activity is on the other hand unfolding within and as an emerging and changing context, in our example the mode of fighting emerging within the physical encounter of the players. Both characters of the mobile play activity, structure and context, are inseparably connected. Players and game objects, subjective and objective conditions of game play are an integrated part of the mechanics, and simultaneously an integrated part of the mode of interaction. The structure determines the play functions of players and objective conditions. From this perspective players and objective conditions are generalized, foreseeable and exchangeable function bearers. In difference to that the context encompasses the unforeseeable behavior of the *framing conditions of the game system in run-time*, emerging throughout game play, the uniqueness of the players, the conditions and their behavior.

Meanwhile concepts emerged to integrate both aspects of context for supporting interaction within emergent contexts, see aspect-computing [MRC07], adaptive systems, changing the configuration on the fly, for example [Co05], and the mediation concept, according to which the user supports the system in reducing ambiguity of context [DM05]. The integration of both perspectives by aspect-computing and adaptive systems happening from the system perspective is necessarily static in the end.

Within our research we aim for an integration of both perspectives from the gamers' point of view according to which the resources for adaptation and further development of the game logic emerge during game play. In the next section we focus on the mobile gamer as producer as one approach to deal with the tensions between the application logic and the emerging context.

The gamer as producer

Gamer as producer of play possibilities before the game: Players either modify content and logic of the existing game or create novel games. They produce items, characters, game mechanisms, levels and complete novel games. They use either separate tools or in-built editors and modifying tools, which assure to integrate the novel possibilities into the existing game logic. This well-known format arose, matured and became even a basis of a player economy [EGM05]. The time resources required to developing an item or a complete game range between one day to a year or even more. Often smaller groups of players with a strong motivation develop the skills and invest the time needed to produce play possibilities. One example in the ubiquitous area is the IPERG game creator [IP07]. Players modify or create location-based play possibilities, roles and rules for a mobile game. Regarding the issue of conflicting tensions between game logic and context, this format uses and circumvents the conflict. The gamers use the conflict, the experiences of game play, the impulses for other or even better play possibilities emerging during the game or during reflecting the game play after the game. Their experiences are the reference and starting point for the production of novel possibilities. The gamers circumvent the conflict: producing and playing are separated, sequentially ordered activities. The game logic emerges in the creation process and then defines and dominates the context.

Gamer as producer of content and particular play possibilities during the game: The impact of the player on the game logic within this format is enabled by the game logic. The first type we introduce is the gamer as producer of *valuable game content* that is connected to geospatial data and provides meaningful content to the participating gaming community. Players of CityExplorer compete for example for the maximum of collected tokens, photos of places and objects within a confined city area, which correspond to categories, they have defined before the game. The gaming community validates the uploaded content [Ma07]. Another example is Treasure, a game logic, by means of which the gamer playing implicitly collects information about the Wi-Fi network quality of the game area [Ba05]. In both examples the gamers produce content that adds meaningful data to the database of the game. The game could not exist without the creation of datasets that represent the games content, but the game logic remains untouched. A second type of examples is the gamer as producer of particular play possibilities. Those games deploy game mechanics *like the scavenger hunt*. The most prominent example is Geocaching: Players look for and hide caches. They announce the latitude and longitude coordinates of the hideout for other players via Internet.

Another example is the Gopher game [CKR07]. The players create location-based missions or mini games for other players to solve. As soon as the mission is fulfilled successfully, points are assigned to both players, the creator of the mission and the one, who solved it. See also Hitchers [Dr06]. In all these cases the players produce *location-based content plus instructions/rules for mobile play action* for other players, who are forced to go to a particular place to fulfill the task. The game logic, the scavenger hunt like principle, requires and enables gamer as producer of missions – and thus as co-producer of an organically growing game logic and/or producer of a changing sub-logic of the game. This directed openness not seldom leads to a reduction in quality of the produced content [CKR07], in that it requires to invest creative potential, which only very few are willing to or capable of. The content and the logic of the game are growing with the creativity of the players as the limiting factor. The issue game logic versus context plays out slightly different: The game logic is hierarchically organized. At the sub-level gamers fulfill a mission at the meta-level gamers fulfill the task of creating a mission. These game systems are to a certain degree open for the impact of the player, but the game logic rules the context in the end and thus the game rules the player.

Social gamer as producer: A novel type of mobile games is emerging currently deploying social technologies. At the first glance those games seem to fit in the previous format. But as they consist of, explicitly deploy and express social interaction, they enable a different gaming and producing experience. Social game mechanics „structure (players’) activity around a creative challenge that is matched to their skill level, with functionality that opens up over time, balancing the user experience between the emotional states of anxiety and boredom“ [Ki05]. The underlying principles of social technologies are: “Content sharing networks – Make it easy for players to create, share, rate and discuss content; Social game mechanics – Co-evolve your game in partnership with your players; Accessible technology – Leverage the most accessible, widespread technology – XML, SMS, voting etc.; Cross-platform – Make sure that your game data lives on the network; Syndication – open you API, enable widgets, encourage third party clients” [KK07]. Wikipedia may serve as an example how quality is maintained. These games enable a direct expression of social context.

Emergent game play

Despite the promise of social technologies – context is not only social context, and social context is more than social technologies enable. The small example from a single case study introduced in the second section would not fit into the social gamer as producer format. The fight of Western players and the fight of Eastern players have been identical from the perspective of the game logic. But from the perspective of the context they have been fundamentally different: offensively social interactions between Western players versus charily social interactions between Eastern players. In each case the emergent game play has been the result of both, the game logic and the unique context. According to Smith [Sm01] emergent game play is the “future of game design”. Future mobile games enable, express, and respond to the personal unique way of playing and develop together with the player.

With regard to the issue of game logic versus context we are interested if and how the context may have a direct impact on the development of the game logic, on the emergence of novel structures. We may understand the different fight mode as a first step of transforming the game logic. The fight mechanics designed by Western game designers anticipating a Western context changed the predefined function for just this moment within the context of Eastern players interaction. A mind game might help to understand possible directions of further research: If emergent game play within a group of players is repeated over time those players will develop operative rules [Wa05] within their direct encounter to adapt fluently the existing game logic to their context. They may even do this implicitly only by means of synchronizing mutually their body motion. Those rules will only become explicit if somebody behaving differently interrupts the flow. We may understand those emerging operative rules as a second step of transforming the game logic. The technological implemented game logic becomes modified and enhanced by means of a living game logic, the operative rules. A third step to imagine is the response of the computational game logic and the mediation of differences between this logic and context. A system developing together with the changing context, flexibly adapting and reconfiguring itself on the fly, see for example the proposal of Coutaz et al [Co05], might be able to recognize the change of goals and activities defined by operative rules. With regard to still remaining differences in the interpretation of context, the concept of mediation [DM05] might be useful, a dialogue between the user and the computer to resolve the ambiguity of context.

Summary

Within this paper we identified current possibilities of game design in dealing with the emerging tensions between game logic and context by means of the gamer as producer. We differentiated with regard to grasping context: before the game, previous context inspires the production of game logic, which dominates coming context; during the game, the channeled impact of context on game logic; the social game, enabling and expression social context. We then focused on emergent game play, its possible impact on the game logic and the possibility of a mutual development of both, context and logic.

References

- [Ba05] Barkhuus, M., Chalmers, M., Hall, M., Tennent, P., Bell, M., Sherwood, S. & B. Brown (2005). Picking Pockets on the Lawn: The Development of Tactics and Strategies in a Mobile Game. Proc. UbiComp 2005, Tokyo, Japan., Springer, LNCS 3660, pp. 358-374
- [BW08] Binder, D. & L. Wang.. Chinese and Germans playing On the Streets (Preliminary working title). Collaborative Master theses. Hochschule Bremen, 2008
- [Ch06] Chalmers, D., Chalmers, M., Crowcroft, J., Kwiatkowska, M., Milner, R., O'Neill, E., Rodden, T., Sassone, V., & M. Sloman (2006). Ubiquitous Computing: Experience, Design and Science Version 4 23/2/06, The UKCRC Grand Challenges
- [CKR07] Casey, S., Kirman, B. and Rowland, D. (2007). The gopher game: a social, mobile, locative game with user generated content and peer review. Proc. ACE '07, vol. 203. ACM, New York, NY, pp. 9-16

- [Ci06] Ciborra, C. (2006). The mind or the heart? It depends on the (definition of) situation. *Journal of Information Technology* (2006) 21, 129 – 139
- [Co05] Coutaz, J., Crowley, J.L., Dobson, S. & D. Garlan: Context is key. *Communications of the ACM*, Vol. 48 / No.3, March 2005.
- [DA99] Dey, A. K. & G. D. Abowd (1999). Towards a Better Understanding of Context and Context-Awareness. Georgia Tech GVU Technical Report GIT-GVU-98-01 <ftp://ftp.cc.gatech.edu/pub/gvu/tr/1999/99-22.pdf> See also Lecture Notes in Computer Sciences Proceedings of the First International Symposium on Handheld and Ubiquitous Computing, Karlsruhe, Germany September 27-29 pp. 304-307
- [DM05] Dey, A. K. & J. Mankoff (2005). Designing mediation for context-aware applications. *AMC Transactions on Computer-Human Interaction*, Vol. 12, No. 1, March 2005, pp. 53-80
- [Do04] Dourish, P. (2004). What We Talk About When We Talk About Context. *Personal and Ubiquitous Computing*, 8 (1). 19-30.
- [Do01] Dourish, P. (2001). *Where The Action Is: The Foundations of Embodied Interaction*. MIT Press October 2001
- [Dr06] Drozd, A., Benford, S., Tandavanitj, N., Wright, M. & A. Chamberlain (2006). Hitchers: Designing for Cellular Positioning, *Ubicomp*, Springer Lecture Notes in Computer Science, vol. 4206, pp. 279-296
- [EGM05] Eirund, H., Grüter, B. M., & A. Mielke (2005). Der Spieler macht das Spiel – Mechanismen der Autorenrolle in mobilen Spielen. In Dadam, P., Reichert, M. (Hrsg.): *Informatik 2004 - Informatik verbindet*. Bd. 1. 34. Jahrestagung der Gesellschaft für Informatik e.V. (GI) 20-24. September 2004 in Ulm. Bonn: Köllen Verlag, 184-188
- [Gr01] Greenberg, S. (2001). Context as a Dynamic Construct. *Human-Computer Interaction*, Volume 16 (2-4), p257-268, Lawrence Erlbaum Associates Inc.
- [GO07] Grüter, B. & M. Oks (2007). Situated Play and Mobile Gaming. In Baba, Akira (Ed.) *Situated Play*. Proc. DiGRA 2007, Sept. 24th – 28th, 2007, Tokyo, Japan, pp 103-112
- [Gu08] Guillemot, M. (2008). GDC Mobile 2008, <http://www.mobile-ent.biz/news/29915/GDC-Mobile-Mobile-games-market-hasnt-slowed-down-says-Guillemot>
- [IP07] IPERG (2007). On the Gamecreator see http://iperg.sics.se/iperg_gamessub12.html
- [Ki06] Kim, A. J. (2006) Putting the Fun in Functional - applying game mechanics to functional software. *Emerging Technology Conference 2006*. <http://www.shufflebrain.com/etech06.htm>
- [KK07] Kim, S. & A. J. Kim (2007). Power to the Players. Putting the fun in functional software II. *Game Developers Conference 2007*. <http://shufflebrain.com/GDC2007.htm>
- [LY02] Lyytinen, K. and Yoo, Y. (2002). Introduction. *Issues and Challenges in Ubiquitous Computing*. *Communications of the ACM*, 45 (12). 62-65.
- [Ma07a] Matyas, S. (2007a), Playful Geospatial Data Acquisition by Location-based Gaming Communities, *The International Journal of Virtual Realities (IJVR)* 6(3), 2007, www.ijvr.org, IPI Press, ISSN 1081-1451, pp. 1-10
- [MRC07] Mügge, H., Rho, T. & A.B. Cremers (2007). Integrating Aspect-orientation and structural annotations to support adaptive middleware. *ACM Int. Conf. Series*; Vol. 224 Proc. On middleware-application interaction, Lisbon, Portugal, pp. 9-14
- [Sm01] Smith, H. (2001). The Future of Game Design: Moving Beyond Deus Ex and Other Dated Paradigms. http://www.igda.org/articles/hsmith_future.php
- [Su87] Suchman, L. (1987). *Plans and Situated Actions. The Problem of Human-Machine Communication*. Cambridge Univ. Press, Cambridge
- [Wa05] Walther, B. K. (2005). Atomic actions -- molecular experience: theory of pervasive gaming. *ACM Computers in Entertainment*, Vol. 3, No. 2, July 2005. p. 1-13