Waiting as Part of the Fun: Interactive Gaming in Theme Park Queues

Chris Heger, Serge Offermans and Joep Frens
Eindhoven University of Technology, Department of Industrial Design
P.O. BOX 513, 5621MB, Eindhoven, the Netherlands
{ c.j.j.heger, s.a.m.offermans }@student.tue.nl, j.w.frens@tue.nl

Abstract
People visiting theme parks intend to have a day of fun. Yet a larger part of the time is spent queuing for rides rather than in the actual rides, which does not contribute to the intended fun experience. Current efforts therefore either make the queue as bearable as possible or try to get rid of it altogether.

In this paper we propose a vision in which we see the queue as an opportunity to become part of the fun experience of visiting a theme park. To realize this vision, we propose the use of interactive gaming platforms interwoven in queue, on which people in line can play a game that is based on several psychological principles to shorten the perceived waiting time. We present a design-case; 'the Dream Chamber' as an example of our vision. Evaluations of this system indicate potential for this class of systems and our proposed vision.

Introduction
In amusement- and theme parks, visitors buy a ticket to spend a fun day with their family or friends. However in today's crowded parks, a large part of the daytime is spent on queuing for the rides. Instead of the intended fun, this often results in annoyance and frustration.

General attempts have been made to overcome the problem of waiting in theme parks. Some projects aim to make the waiting as efficient as possible by the use of waiting management systems such as "Six Flags' Q-bot" and "Disney's Fast-Pass". Others aim to make the waiting more bearable by providing entertainment such as atmospheric environments, actors dressed as fantasy figures, videos, animatronics, etc. Some theme parks also use other entertainment to increase capacity and to take away pressure of the waiting lines, such as large theatre shows, restaurants and museums.
Disadvantages to these approaches include: (1) that waiting management systems only relocate the waiting but do not tackle the waiting itself, (2) that the current entertainment provided is fine in principle, but is very passive and usually does not entertain people for the duration of the wait.

Figure 1. Two photographs of the queue for the ride 'Droomvlucht' the theme park 'de Efteling'

The conclusion we drew is that the problem of waiting in theme parks has not yet been solved in a satisfying manner. Furthermore we believe waiting in theme parks is inevitable. Theme parks have under-capacity by default, which naturally results in people waiting for rides (in whatever form). From a business perspective queues are even considered desirable as they help theme parks to live up to their promise to provide visitors with a full day of fun. Finally, waiting in line contributes to increased anticipation for the rides, especially when you can have sneak previews of the ride while waiting for example a roller coaster passing by over your head.

Proposal

Vision
We propose a new vision on queuing. We see an opportunity to extend and amplify the fun experience of visiting a theme park by making the wait part of this experience. This opportunity is created by the nature of the queue which consists of: (1) a large number of people that (2) are waiting for the same entertainment and who have (3) time to engage in an activity. Creating a fun activity, tailored towards the ride, can exploit this rare opportunity to achieve the extended and amplified fun experience. Thereby the general visitor satisfaction of the park increases, resulting in better reviews of the park and more returning visitors.

Background theory
To realise our vision, we propose the implementation of several psychological principles in an interactive system in the queue area. We used three psychological principles described by David Maister in his paper 'The Psychology of Waiting Lines' [3], that either increase the tolerance for waiting time or reduce the perceived waiting time.
(1) Activity. When people have something to do, their perceived waiting time is shortened.
- We aim to provide people with an activity related to the service they are queuing for.
(2) Feeling of progress. When people feel they are progressing towards their goal, their tolerance for waiting time increases. When people feel the service has already started, this feeling of progress is further amplified.
- We aim to provide people with a game that becomes harder and harder when people move forward in the queue to create a feeling of progress. We aim to amplify this feeling by designing the game in close relation to the ride people are queuing for.
(3) Group feeling. Waiting on your own seems longer than waiting with a group of friends. When there is a feeling of 'group' the perceived waiting time is shortened.
- We aim to make people cooperate to create this feeling.

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'Flirting with the Future', Proceedings of SIDeR '09, April 15-17 2009, Eindhoven University of Technology, the Netherlands.

Design Case

Here we present a design for the queue area of ride in the dark called 'Droomvlucht' (Dream-flight) in theme park the 'Efteling' in the Netherlands. In this fairy-theme ride people are taken through several dream-worlds in 2-3 person carriages.

Dream Chamber concept

For the queue area of this ride we propose to implement a collaborative tabletop game, played on interactive tables that are interwoven in the queue structure. On these tables the people in line can play a game that matches the ride's theme of fairies and dream-worlds. We call this gaming-system 'Dream Chamber'.

Figure 2. The tables interwoven in the queues snake-structure

The goal of the game is to 'feed' the ride's dream-world with 'dreams' in order to keep it alive. The people in line have to work together to accomplish this task by guiding 'dreams' with their hands from one end of the table (where they emerge from the 'dream source') to the other end of the table where the 'dreams' are collected by an elf in a crystal ball. When the crystal ball is fully charged the elf sends the dreams from his ball towards a typical scenery that represents the dream-worlds of the ride. The more dreams that reach it, the more vivid and lively it becomes, making it a representation of how well people are playing. On a local level, the elf's crystal ball supplies this representation.

Figure 3. An illustration of the queuing area as proposed for 'Droomvlucht'

As people progress through the queue the game becomes more difficult. Each table presents them with increasingly challenging levels until they eventually reach the actual ride. When people enter the line, they start off with simple levels to explore the game. In later levels they have to avoid 'dreams' colliding with 'nightmares' that eliminate the dreams. To continue feeding the dream-world they will have to work together to guide the dreams safely across the tables.

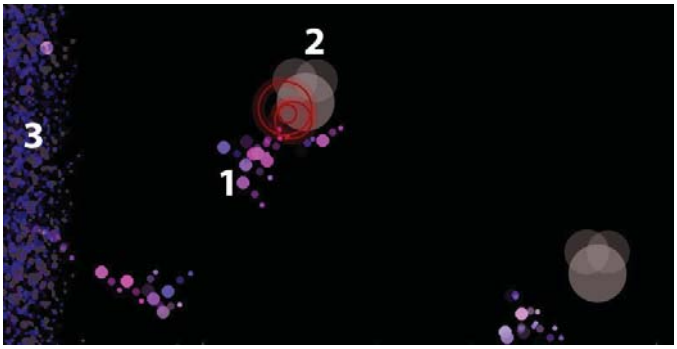

Figure 4. The game with the different elements; 1) Dreams; 2) Nightmares; 3) Dream source

Interaction

When entering the 'Dream Chamber' people receive a ring to put around their finger. This ring allows for recognition of the in- and outside of the hand by the system. Depending on the position of the visitor's hand above the table's surface, one of two types of interaction with the 'dreams' is used. With the palm of the hand facing up, the visitor can make an inviting gesture to attract the dreams. With the palm facing down, the visitor makes a blocking gesture to push the dreams away.

Each dream is in essence a particle which behaves according to the flocking principle [1]. This gives the dreams a natural emergent behaviour, similar to that of a flock of birds. When interacting with the dreams the people influence the 'dream particles' as a part of the flock but with a bigger force than the dreams have on each other. This gives people an influence on the dreams, but no control over the dreams. Cooperation with other people in line is therefore required to guide the dreams. The natural behaviour of the dreams and the two types of interaction create an intuitive way of playing the game and make it easily understandable for different users.

The wide variety of people in theme parks and their expectations requires the game to allow for a variable level of engagement in the game. The setup of the tables creates a continuous interaction platform which allows people to decide whether or not to interact with the game at each point in the queue. This means that children may play intensively for the duration of the wait, their parents may help out every now and then and they may take a break to have something to eat whenever they please.

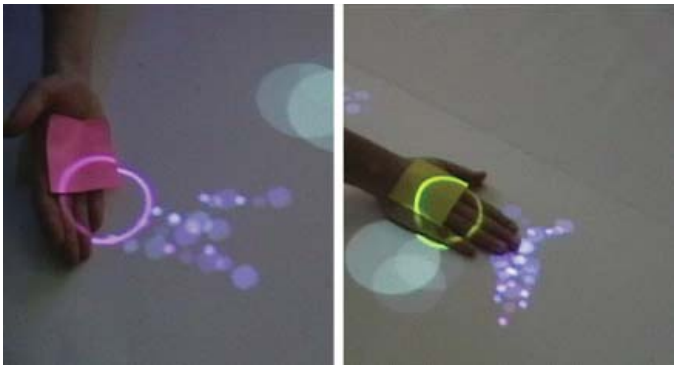

Figure 5. The Interaction possibilities with the game; pull (left) and push (right). In our prototype we used coloured stickers for hand-tracking instead of the proposed rings

Evaluation and Conclusions

Setup
To evaluate our proposal we created a prototype of the Dream Chamber concept. This prototype consists of a two meter long table that represents a small part of the larger interactive table system interwoven in the queue structure.

The prototype uses a video projector to project the game and a webcam to track people's hands. Instead of the infra-red ring described in the concept, we used coloured stickers to track hands.

Procedure
We evaluated the proposal in two qualitative user-tests at our department of Industrial Design at the Eindhoven University of Technology. One test was conducted with approximately 150 high school students (divided over groups of 15-25 people). They were asked to play the game. Afterwards they filled in a questionnaire in which they were asked about the use of such a system in a theme park context.

The second test was performed with an expert panel that consisted of eight staff-members and master students of our department. During this heuristic evaluation, the quality of more specific elements such as interaction, game-play, graphics and sound were discussed.

Figure 6 Photograph during the test with the expert panel

Findings
In general we can say that the concept triggered positive reactions in both testing groups. We can however not draw rigid conclusions concerning a successful implementation of the psychological principles (activity, progress, group feeling), as we were only able to evaluate the system outside the actual context. Nevertheless, from the observations of the tests, we got indications that we have succeeded in making these principles work.

We observed that most people were actively involved in the game for the duration of the experiment. This indicates that we have been able to create an 'activity' for the people in line.
We also observed that people who did not know each other cooperated and communicated strategies to guide the dreams in the right direction. This may be and indication of a basic 'group feeling'.

Creating a 'feeling of progress' was hardest to assess outside the real context. We have however been able to observe increasing skill of the participants over time as they reached the higher levels of the game. This increased skill may be felt as progress. People also indicated they saw a clear relation with the ride. This can make them feel the service has already started which also promotes the feeling of progress.

Considering the interactions, people were able to understand the interaction possibilities after a few moments of getting acquainted with the system. The capability to use the possibilities efficiently varied per person, but generally grew over time.

Discussion

Future work
In order to draw validated conclusions, an in-context longitudinal field study should be performed to learn about the actual implications of the proposed system on the queue and the people waiting in it. Only then can we answer relevant questions like: will waiting truly become part of the fun experience of visiting a theme park? Will the tolerance for waiting time be increased and the perceived waiting time be shortened? Will the same social rules still apply or does the design change the queuing ethics? [4] What will be the influence of people who interfere with the game's goals?

Also the possibility of developing different games for different rides needs to be investigated. This could be done both by exploring the implementation of the proposed interactive table platform for different rides and queues, as well as on other -yet to be developed- platforms.

Future of waiting in theme parks
It is likely that interactive entertainment will play an increasingly important role in theme parks over the years to come [2]. Interactivity in the rides is an opportunity which is hard to leave aside, as new technologies emerge and are available at relatively low costs. Visitors will become actively involved in the ride and help to shape their own, relatively unique experiences.

When the rides become increasingly interactive, interactivity in waiting areas is in our vision a logical next step. Actually, it is a step that may go prior to the shift in focus in the rides as the desire for a change is more urgent in this area. In our vision, a day in the theme park of the future is no longer one where a lot of time is spent waiting for pre-fab experiences; but rather one where a whole day is filled with fun activities.

Acknowledgements

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References

[1] Boids (Flocks, Herds, and Schools: a Distributed Behavioral Model). [online]. [s.l.: Craig Reynolds], [Cited: December 26th 2007]. Available from World Wide Web: <http://www.red3d.com/cwr/boids/>

[2] Jones, C.B.; Robinett, J. The future of Theme Parks in International Tourism, ERA issue paper, Economics Research Associates; 1995. p. 1.

[3] Maister, D.H. (1988), "The Psychology of Waiting Lines", in Lovelock, C.H. (Eds),Managing Services: Marketing, Operations, and Human Resources, Prentice-Hall, Englewood

Cliffs, NJ, pp.176-83.

[4] Rafaeli, A.; Barron, G;, Haber, K. The Effects of Queue Structure on Attitudes, Journal of Service Research 2002; vol. 5, p. 125