# A game experience in every travel web site? Game technology is next.

Tjostheim, Ingvar
Lous, Joachim

Norwegian Computing Center
ingvar.tjosheim@nr.no

## Abstract

The paper addresses the theme of the conference – what's next? Gaming computing is big and a growing industry. In this paper results from a study of an application in a non-travel setting is presented. The purpose is to put a focus on gaming computing, and ask if it is relevant for travel and tourism marketing? It is argued that from a users perspective, a travel application will have similarities with the VR-store, a retail application. It is documented that non-users of computer games didn't find it difficult to use the VR store. Moreover, it created a feeling of presence. This is important since tourism is in its nature experiential. For the travel industry it is relevant to ask if attractions and travel services are promoted and presented in an effective and engaging manner. Gaming technology has much to offer in this regard and it is likely that gaming technology will have an impact on travel and tourism marketing in the future.

**Keywords:** computer gaming, human computer interaction, travel web sites, tourism marketing

## 1 Introduction

The theme of the conference focuses on the future – what is next? In travel and tourism the use of IT started early compared to a number of other industries. A well-known example is the first computer reservations system developed by Sabre in the 1960s. The last few years it has been common to put the letter "e" before other words such as business. As the use of computer and electronic tools, electronic communication, Internet as a distribution channel etc. is being integrated in most business activities it is likely that this "e" will disappear in most cases. Computers and the Internet are becoming a fact of life, and just being online does not make you stand out any more. There are many ways of categorizing technologies and fields within IT. Computer gaming is one of these sub-fields or categories. Moreover, the computer gaming industry is big business and has become very important in IT-development, or as David Reid in BBC's program *Click Online* (Reid, 2003) phrases it; *"In the computing world, few things have become as popular as computer games, and it's easy to forget just what a huge amount of time and money goes into producing new*

*titles."* How relevant is it for the travel industry? Some will argue that, at least parts of, the travel and tourism industry is in the entertainment business. Tourism products and services are in their nature experiential (Vogt and Fesenmaier 1998, Gretzel and Fesenmaier 2003) and it is not always easy to communicate the experiential or non-functional aspects in travel and tourism marketing. The travel and tourism industry is highly influenced by the technological development and travellers' increasing use of technology. The popularity of the Internet for information search and booking purposes is well known and well documented, also in ENTER conference-proceedings. When searching the web many travellers have not made all their decisions and are looking for alternatives, for instance what to do at a destination. Hence, it is important to communicate non-functional aspects of a travel experience in order to attract visitors to a destination.

This paper addresses the question of whether the travel and tourism industry will adopt computer gaming for marketing purposes in the near future. The paper is organized as follows: literature and cases from other industries, a case study – a test of an application developed with computer gaming technology, technological aspects with particular relevance for computer gaming and concluding remarks. The application tested is from the retail sector. However, at the conference an application targeted at tourists will be also presented.

## 2 The game experience – some examples of applications

*"A game experience in every (computer) application"* (Rosenbloom, 2003) is the title of a special issue of Communication of the ACM, an influential magazine in computer science. It is well known that kids, young adults and even some adults are spending a lot of time playing games. (Rosenbloom, 2003, p.31) There are a number of reasons for this. The author in the introductory article documents that (even) game-playing children realize that the driving force in these immersive environments is the users' experience. "*Computer games are engaging because they provide increasingly realistic and lifelike 3D visual environments, thus driving demand for home 3D entertainment."* (Rosenbloom, 2003: 30) According to the Entertainment & Leisure Software Publishers Association (www.elspa.com) computer games are a $18.5 billion business worldwide. One of the most recent issues of the same magazine has several papers under the title, the special session "*Interactive Immersion in 3D Computer Graphics*." (Rosenbloom, 2004: 31). Museums are mentioned among the examples - "*visitors can explore the museum (Centre Pompidou) in real time at www.readymade.fr.*"

The term virtual reality has been used since the 1980s and it was coined by Jaron Lanier, the founder of VPL research. In a recent article, Pan et. al. (2004) discuss product presentation in e-commerce and virtual shopping malls. They write "*Virtual Reality (VR) is a new and attractive human-computer interactive technology, which is becoming one of the hottest research and development areas in the computer industry today.*" (Pan et. al. 2004: 1) In addition to referring to several other e-commerce examples with VR, the authors also present their own concept or system named "*EasyMall*." This is one of several examples from the retail industry in which VR or 3D is used for the purpose of creating realistic shopping environments. A second example is an Internet store for clothes described by Nantel (2004). In this Internet store the user, or shopper, can create his or her model/avatar in virtual 3D, and try clothes on this avatar. This is done in *My Virtual Model™ Dressing Room* and the *My Virtual Model™ Fit.* The examples above are from the computer gaming industry, e-commerce and the retail industry. The next example is from a museum context. The paper by Kenderdine and Hart (2003) describes the Virtual Room in Melbourne Australia. It is, according to the authors, a revolutionary visualisation laboratory and it represents the latest in scientific visualisation technology and gives the public access to a cutting-edge research project in stereoscopic visualisation. Moreover, the paper contains information about historical examples of 3D visualisation from as far back as the mid 1800. This is an advanced example of what is possible in a physical museums context. Very few will have the resources to develop something similar. However, it indicates what we will see in the future. The purpose is to create engaging and realistic exhibitions from the visitors' point of view. There are (other) examples from travel and tourism, but they are few. The *Microsoft* research group at Cambridge presented some examples and demos in a paper at ICCV2001 (Szeliski et. al. 2001).

In a tourism context, monuments and historical or well known buildings are often important attractions for a destination. A paper by El-Hakim et. al. (2002) describes how 3D can be used in documenting heritage sites. The authors list six important motivations for such "3D reconstructions" and one of them is virtual tourism and virtual museums. A third paper by Letellier (1999) focuses on how virtual reality could be used to present a city like Luang Prabang in Laos. The purpose is to "*give virtual access to endangered heritage sites and to regulate visitation to an acceptable level, and still satisfy tourists and tourism needs.*" (Letellier, 1999: 2.). It is a small step from using a simulation (good enough to function) as a substitute for a real visit, to using it precisely to promote the destination and attract visitors. GeoSim, a maker of 3D city models is one of relatively few examples specifically targeting tourism applications - more information can be found on http:// www.geosimcities.com/ sol_tourism.htm. Still, the most impressive VR experiences available on consumer

hardware are seen in computer games. Some prime examples of recent games that illustrate convincing and responsive content relevant to the tourism industry are: *The Getaway*, a PlayStation 2 game. In this game London is modelled and the user can drive around almost 50km of its streets. The city environment is faithfully replicated and the user can recognise all the well-known buildings of London. It is not difficult to understand that such a game could be used for other purposes than driving as fast as possible in the streets of London. Another impressive game is *HalfLife 2*. It is not yet in the shops, but the PC version is scheduled to be launched by the end of 2004. When this game was first previewed at the game exhibition E3, the BBC interviewed John Davison, (Davison 2003) who described it as "*mind-blowing. It's going to be one of those things that everybody wants to upgrade to a new graphics card for*." In this game city environments are presented in a smaller scale but in a very lifelike manner, illustrating the quality that can be attained when modelling a more localized attraction. Another example is *Far Cry*. In this game the player can move freely around an entire tropical island The location is fictional, but the impressively detailed mountains, lagoons and forests represent the state of the art in simulating large-scale natural landscapes on desktop hardware.

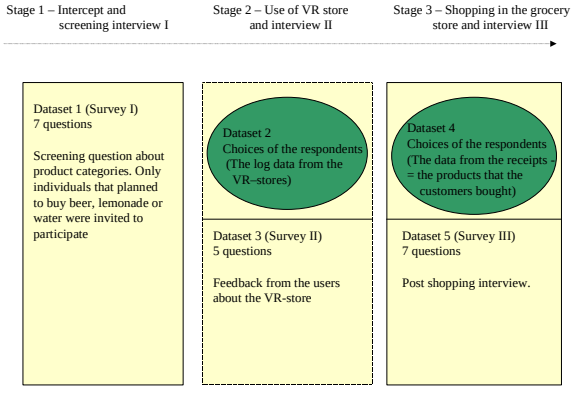
## 3 A test of an application built on computer gaming technology – the user's point of view

In this section results from a study on a VR store, an application in the retail sector, are presented. This is not a travel or tourism application, but the authors of this paper are cooperating with the Kon-Tiki Museum in Oslo and are developing a Kon-Tiki presentation based on the same computer gaming technology. The results from a test of a VR-store cannot directly replace a study of for instance a VR-museum, but if user studies from applications based on computer gaming technologies in other industries than travel and tourism indicate that such applications are perceived as convincing and easy to use it might influence travel researchers and developers to start focusing on travel application based on this technology.

"*Walkthrough interfaces, used in first-person shooter-style games, are useful for understanding and navigating an environment's interior spaces*" (Houston et. al. 2004 : 56). This application, the VR store named Top-shelf, was developed by using the same kind of computer game technology, derived from a first-person shooter-style game. The store is presented on a PC and the user does not need gloves or similar equipment. Still, a 3-D like feeling or experience is created. Two key questions are: a) Are virtual environments on a PC screen perceived as convincing and realistic?

b) Do individuals not used to playing computer games adapt easily to game-like applications on a PC or is the learning curve perceived as steep? To test the public appeal of a computer game based application, a virtual grocery store was developed. Photos from two stores were used in order to replicate the stores. It is not difficult to find grocery shoppers, but that does not mean that they are all willing to take part in a test of a VR-store. Hence, the respondents got an incentive of approximately 20 euros to ensure a relevant number of test participants. The participants were customers of the two replicated stores. The two stores belonged to a national chain and they were typical local stores with approximately 2500 different products. The respondents were not recruited in advance, but invited at the entrance of the store. Hence, the test-participants were already in a shopping mode when they were asked to shop on the PC. They were asked to choose products in the VR-store, and then do their normal shopping in the physical store. The respondents could choose among all the products in the beverage category in addition to the most common other products in the store, 450 all in all. The activity was task-oriented and not presented as entertainment. The interviewers reported that a number of the test-participants commented that this is an interesting Internet grocery store. Before shopping on the PC, a short demonstration of how to navigate in the VR-store was given by the interviewer. The test participant could also try the program (how to navigate) before the real test started. The test was set up in Oslo, Norway in a four-week period June and July 2003. Professional interviewers from a market research firm recruited respondents and did the interviewing of the test-participants. One year earlier a pre-test with a prototype of the VR-store was tested with 52 grocery shoppers. Figure 1 presents the number of surveys used in the test.

Figure 1



### 3.1 Results

First it should be noticed that the majority of the participants were at least 30 years old (57%) and two out of three were not experienced users of computer games. The test was aimed at individuals that were not the frequent user of computer games. To ask individuals that use computer games frequently about navigation issues, ease of use etc. is relevant. However, it is even more important to target the non-users if the majority of the users of PC do not use computer games frequently. Table 1 supports the notion that computer games are more frequently used by young people. The national bureau of statistics in Norway only asks children and teenagers about computer games in the yearly survey of media use in the population. This does not mean that older people are not using computer games.

Table 1 – Age profile vs. games usage

| *Age profile* | All respondents | Are using computer games monthly or more frequently | Are using computer games less frequently than monthly or not at all | Are using computers less frequently that monthly or not at all |
|---|---|---|---|---|
| 18 - 19 years old | 7% (42) | **14%** (27) | 4% (15) | - |
| 20 – 29 years old | 36% (218) | **50%** (99) | 30% (119) | 29% (15) |
| 30 – 39 years old | 23% (139) | 24% (47) | 23% (92) | 18% (9) |
| 40 – 49 years old | 17% (100) | 10% (20) | 20% (80) | 22% (11) |
| 50 – 59 years old | 12% (71) | 3% (5) | 16% (66) | 12% (6) |
| 60 + | 5% (33) | 1% (2) | 8% (31) | 20% (10) |
| N= | 603 | 200 | 403 | 51 |

The individuals using computer games less frequently than monthly are the largest group - 403 of 603 equaling 67% (table 1). In the following the focus will be on this segment, the less frequent users of computer games, and a sub-segment consisting of 51 individuals. The members of this sub-segment answered that they use computers less frequently than monthly or not at all. Why focus on these two segments? For the travel industry, the individuals that are users of computer games are a smaller market than the non-users. Moreover, they already know how to use a game or a game like application. But for the less frequent user this might not be the case. If it can be documented that it is appealing, easy to use etc. also for them, there is more reason to start looking at the possibilities: what computer gaming has to offer in a marketing context. As expected, the age profile between the segments is different – the less frequent users of computer games are older than the frequent users of computer games. The age profile of the sub-segment, the individuals not using PCs or using PCs very seldom, differs from the others. For instance 1 out of 5 belong to 60+ group. The findings in the tables 2 to 5 are from dataset 3 (Survey II), see figure 1. Even though a computer game, a VR-store, a VR-museum etc might be impressive from a

graphical point of view, it does not mean that it will attract a lot of users. For instance, if it is difficult to use it less likely that it will be recommended, the number of potential users will decrease etc. If the purpose is to replicate for instance a building it is also relevant to ask how if the user recognises this particular building.

Table 2– Recognizing the store?

| *To what extent did you recognize the grocery store?* | All respondents | Are using computer games less frequently than monthly or not at all | Are using computers less frequently than monthly or not at all |
|---|---|---|---|
| To a low extent | 4% (23) | 4% (15) | 6% (3) |
| To a medium extent | 14% (84) | 13% (54) | 14% (7) |
| To a high extent | 82% (492) | 82% (330) | 80% (41) |
| Has not shopped in this grocery-store before | 1% (4) | 1% (4) | - |
| N= | 603 | 403 | 51 |

The replicated grocery store on the PC was recognized as the actual physical store by more than 80 per cent of the test-participants (table 2). There are no differences between the segments.

Table 3 - Navigation in the VR-store (I)

| *In your opinion, how easy or difficult was it to move around in the VR-store?* | All respondents | Are using computer games less frequently than monthly or not.. | Are using computers less frequently than monthly or not at all |
|---|---|---|---|
| Very difficult | 3% (19) | 4% (16) | 10% (5) |
| Somewhat difficult | 18% (107) | 22% (90) | 24% (12) |
| Somewhat easy | 37% (223) | 40% (162) | 53% (27) |
| Very easy | 42% (254) | 34% (135) | 14% (7) |
| N= | 603 | 403 | 51 |

The more experienced user (of computer games and PCs) the better the feedback (table 3). However, even the majority (2 out of 3) of those that are using a PC very seldom were able to navigate in the virtual store.

Table 4 - Navigation in the VR-store (II)

| *To what extent was it difficult or easy to find exactly the product you looked for* | All respondents | Are using computer games less frequently than monthly or not at all | Are using computers less frequently than monthly or not at all |
|---|---|---|---|
| Very difficult | 3% (19) | 3% (14) | 2% (1) |
| Somewhat difficult | 13% (78) | 14% (55) | 20% (10) |
| Somewhat easy | 38% (226) | 39% (159) | 43% (22) |
| Very easy | 46% (280) | 43% (175) | 35% (18) |
| N= | 603 | 403 | 51 |

Table four is also about navigation in the virtual store, but also relies on the visualization – the images, the shelf with grocery products. Improvements can be made, but in general most of the shoppers gave a positive feedback on this question.

Table 5 - A feeling of presence?

| *To what extent did you get the feeling of being in the grocery store?* | All respondents | Are using computer games less frequently than monthly or not at all | Are using computers less frequent than monthly or not at all |
|---|---|---|---|
| Yes, I got the a feeling of presence | 80% (484) | 80% (322) | 80% (41) |
| No, I did not get feeling of presence | 7% (43) | 7% (29) | 2% (1) |
| No, I did concentrate on how to navigate and pick products into the shopping basket | 7% (44) | 7% (28) | 6% (3) |
| It is difficult to answer this question since I have not used this program before – I need some practice | 4% (22) | 4% (18) | 8% (4) |
| Other | 2% (10) | 1% (6) | 4% (2) |
| N= | 603 | 403 | 51 |

Feeling of presence is important for a number of reasons. A feeling of presence might indicate that the user (or grocery shopper in this case) behaves in a way that correlated to his or her behaviour in the physical world. It might have the effect that the user spends more time in the game (or application) exploring more of its possibilities. Internet is a pull medium. Hence it is important that the user spends time at a particular web site. All in all, the feedback was positive – these test results document that most people can use a game-like application. It also document that a feeling of presence can be created.

It seems that there is not much research on game experience in a non-entertainment setting. But an example is Jeandrain (2001) who did an explorative study on consumers' reactions to two kind virtual shopping environments, a traditional 2D or a 3D/quasi 3D environment. A group of 20 students were interviewed in order to generate some preliminary results and to develop a set of research hypotheses. In our study we have focused on the feeling of presence and potential navigation problems.

Our empirical findings show that individuals without much computer gaming experience are able to navigate in a VR-store. Moreover, most users also got a feeling of being in the store.

### 3.2 Computer performance issues - technological development

In travel and tourism, new and better marketing tools customized for the Internet are warranted in order to communicate experiences better than text-and-images web pages. Computer games have recently reached a level of graphical realism, even on typical home systems, that is suitable as a credible marketing tool in tourism. Going beyond just the novelty value of using 3D graphics and interactive presentations, common home technology can now support highly usable and attractive presentations of even large-scale or outdoor locations (see examples mentioned earlier). Hence, the timing for developing new presentations based on computer gaming technology should be good.

### 3.3 Technical aspect – the programming of the application.

The simulation software used was based on the Quake 2 game engine from iD software, with some modifications to improve the graphics and adapt the "game rules" to the new application. The platform was chosen mainly because the source code could be licensed free of charge, good editing tools were readily available, and although slightly dated, with some graphical improvements it still delivers industrial-level performance in the areas we needed. In the commercial sector there are much more advanced systems available that could be used, especially when it comes to lighting and other effects. Writing our own engine was also a realistic option, requiring probably only slightly more development work to deliver the limited feature set needed in our application. But it would require an initial development round before other work could commence, which did not fit our schedule.

The model consists of photographic textures from the real shops wrapped onto quite simple geometric models. The result is highly dependent on the resolution of the texture images, but already we are achieving very good realism, and the capacity of graphics cards to handle high-resolution textures is moving fast. The user interface was modelled on that of typical action games (look around with the mouse, move forward/backward with keys, using both hands at once), rather than themouse-only point-and-click interface of typical desktop applications, which many other non-game desktop VR have chosen. We felt that the more immediate and direct control this offers contributes significantly to the sense of immersion that such games produce

and depend on for their effect, even if it is initially unfamiliar to people without games experience. We hypothesised that the reasons that games have settled on this control scheme apply to other experience-oriented applications too. Before the main test, the details of the interface were refined through two fairly small-scale rounds of usability testing.

## 4 Discussion

One of the purposes of this paper has been to emphasise that gaming technology and computer games are important in the field of IT development. Does this mean that it will have an impact on travel and tourism marketing? Not necessarily. However, based on our research in another non-gaming area (e.g. an application for the retail sector), we would like to draw the readers' attention to what gaming technology has to offer. A good application based on computer gaming technology can be a powerful marketing tool due to the fact that it is engaging, interactive, life-like (if this is needed), and that it can communicate non-functional aspects of an attraction.

A grocery store is different from a museum or a theme park. To what extent are the findings in the study presented in this paper relevant for visitors to a museum or a theme park? They are not directly applicable, the task is different – to buy grocery products is different from looking at what is in a museum. However, if the user finds it difficult to navigate and use the application it is likely that he or she will leave and not use the application – look at the content etc. We feel that our results go some way in allaying fears that the general public would not respond well to game-like content. The computer gaming industry has a good track record in creating both games that are easy to use and advanced games that requires better skills.

What kind of skills is/are needed at the publishing end in order to use computer gaming technology? For the purpose of creating a web-site there are tools that are relatively easy to use, and they are inexpensive. On the other hand, if the goal is to develop a web site of higher quality, a graphically well-designed site, a more effective site, more resources and professional design services are already needed. This is also the case for computer games: high-profile games are very expensive to produce. On the other hand, games are typically much larger in scope and have a stronger need to be state-of-the-art than the promotional applications we envisage. With good tools and professional designers, it should be possible to attain professional results at a cost comparable to quality promotional material of other types.

Is it a game just because it is 3D? The scope of this paper has been firmly on the basic technology and techniques used in games, and how people respond to it. As for

how to exploit this, the options are many. At one extreme, one could forge licensing deals and use high-profile games to promote a location, as is already done for major films. More typically, we expect some attractions will want to include more modest gameplay elements (related to the attraction or not) in a free web based simulation, in order to maximise enjoyment of the site and simply prolong exposure. But even a static 3D preview to just interactively "walk" through in an easy-to-use way has the potential of providing a more compelling presentation of an attraction or location than current web sites offer, and supersede the now-common 360-degree panoramas. In all these cases, games should be taken seriously as the industry that has been driving VR technology for the last decade, and which has the most extensive experience in what works well for creating engaging and inviting virtual experiences for non-expert and enjoyment-seeking users.

## 5 Concluding remarks

For destinations attractions are very important. This is documented by for instance Richards (2002: n) who writes; "*tourists are pushed towards attractions …..… .Visitation is shown to be strongly related to motivation, attractions markers, use of different media, and touristic characteristics.*" (Richards 2002: 1048). A marker is (a piece of) information about a sight. Hence, for the travel industry it is relevant to ask if attractions as well as other travel services are promoted and presented in an effective and engaging manner. We argue that gaming technology has much to offer in this regard.

The travel researchers Snepenger and Snepenger (1993: 830) argue that "*gathering, processing, and evaluating information can be seen as an integral part of the travel experience.*" Already we see examples of 3D technology and VR used in travel web sites. In order to utilise this technology to the maximum effect, both concerning technical solutions and inspired execution, it is important to also look to the game industry. This is a successful industry whose whole existence revolves around delivering experiences to non-technical users, and has honed this craft over many years in a very competitive market. Learning from this in future web sites, the travel experience and user involvement can start already at the information search stage. If used professionally it can create new opportunities for the travel and tourism industry.

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