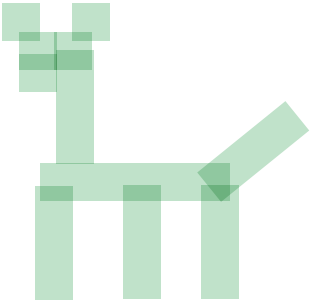
Smart Experience Actuator

Applied games in retail, heritage and tourism



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CONTENTS

FOREWORD

What you have in front of you is the final report completing the Smart Experience Actuator (SEA) project, a collaborative effort on applying games in the sectors of heritage, tourism and retail. Several partners were involved in this project, from the business world, knowledge institutes and the sectors themselves. Through this book we would like to share the insights and experiences that were gained developing the project's seven pilots.

Over the past few years we have seen a strong advancement in the application of games with other primary aims than amusement. SEA fits in perfectly with this 'applied' games trend. When the project was developed, the first healthcare games were on their way. The initiators, however, also saw opportunities for domains in which up to that point not much was going on. In heritage, tourism and retail as much as other sectors, was their principle, opportunities were there for the taking: innovating and reaching out to a younger target audience, for instance.

Since then, The Netherlands has seen a rise in the number of games companies, as for instance the 2012 Games Monitor shows, the study by the Task Force Innovation and partners into the state, size and rise of the games sector. Another one of the findings there was that more than half of the game companies focus on applied games. More and more organisations from various sectors are getting acquainted with game development and the press also increasingly reports on the subject.

But how can you make a game achieve the goals you have in mind? How do you pick the right game company or concept to match your question? In which ways can the collaboration between clients and game companies be structured? Does a game indeed bring about innovation and larger audiences? The SEA pilots led to many new insights in these areas and the partners are excited to share their experiences in the present document as well as through several events.

To you, our readers, I hope this book will not just be informative but also an inspiration to get involved with applied games yourselves. I would like to thank all that were part of this project for their input and inspiration.

Christel van Grinsven
Project manager
Task Force Innovation Utrecht region

ABOUT SEA

The core of SEA consists of a set of seven pilots, developed within the context of the heritage, tourism and retail domains. Next to these pilots a number of student projects were realised. The diagram opposite lists all of the projects and the 'stakeholders' and game companies involved.

ABOUT SEA	RETAIL **DesignerCafe**	HERITAGE **University Museum**	TOURISM **Utrecht Tourism**
Pilots	CROWDFUNDING APP *Elements Interactive*	ANIMAL MAYHEM *Hubbub*	U-SPY *Monobanda*
	LIVING DRESS (TECHNOLOGY) *Cooking Fox*	AGE OF MEDICINE (CLASSROOM) *Fourcelabs*	UTRECHT VS. THE WORLD *Vuurrood*
	LIVING DRESS (PROJECTION) *Mr. Beam*	AGE OF MEDICINE (MUSEUM) *Fourcelabs*	GUEST QUEST *Shapers*
	CLOSING EVENT GAMESCOPE *HKU*		
Student projects linked to the pilots	VIRTUAL CATWALK *Utrecht University*	BACKBONE *Utrecht University*	
	CROWD SIMULATION *Utrecht University*	MEDICINE NEEDS DISEASE *Utrecht University*	
	CUT OUT DESIGNOSAUR *HKU*	MENDEL'S MYSTERY *HKU*	
Student projects linked to the domains		MULTITOUCH TABLE *University of Twente*	
		PAPER ON THE USAGE OF INTERACTIVE MEDIA AT MUSEUM TWENTSEWELLE *University of Twente*	

SEA was made possible through funding from the *Pieken in de Delta* subsidy scheme issued by the Ministry of Economic Affairs and through co-financing from the province and municipality of Utrecht. Utrecht University, HKU University of the Arts Utrecht, University of Applied Sciences Utrecht, University of Twente and Reinwardt Academy were involved in the project as knowledge partners, each with their own expertise. The overall coordination of the project was handled by the Task Force Innovation (TFI) Utrecht region.

Primary school pupils playtesting

A SHARED LANGUAGE

The vocabulary of applied games

As a client or commissioning organisation in games it is important to get engaged in a conversation with the developer about the various aspects of the developing process. And, as is always the case when two parties want to discuss something together, they had better be speaking the same language. It makes sense, as such, to go into a number of terms that are widely used. In analysing the SEA pilots we use these terms to describe the insights that were gained.

Applied games or serious games

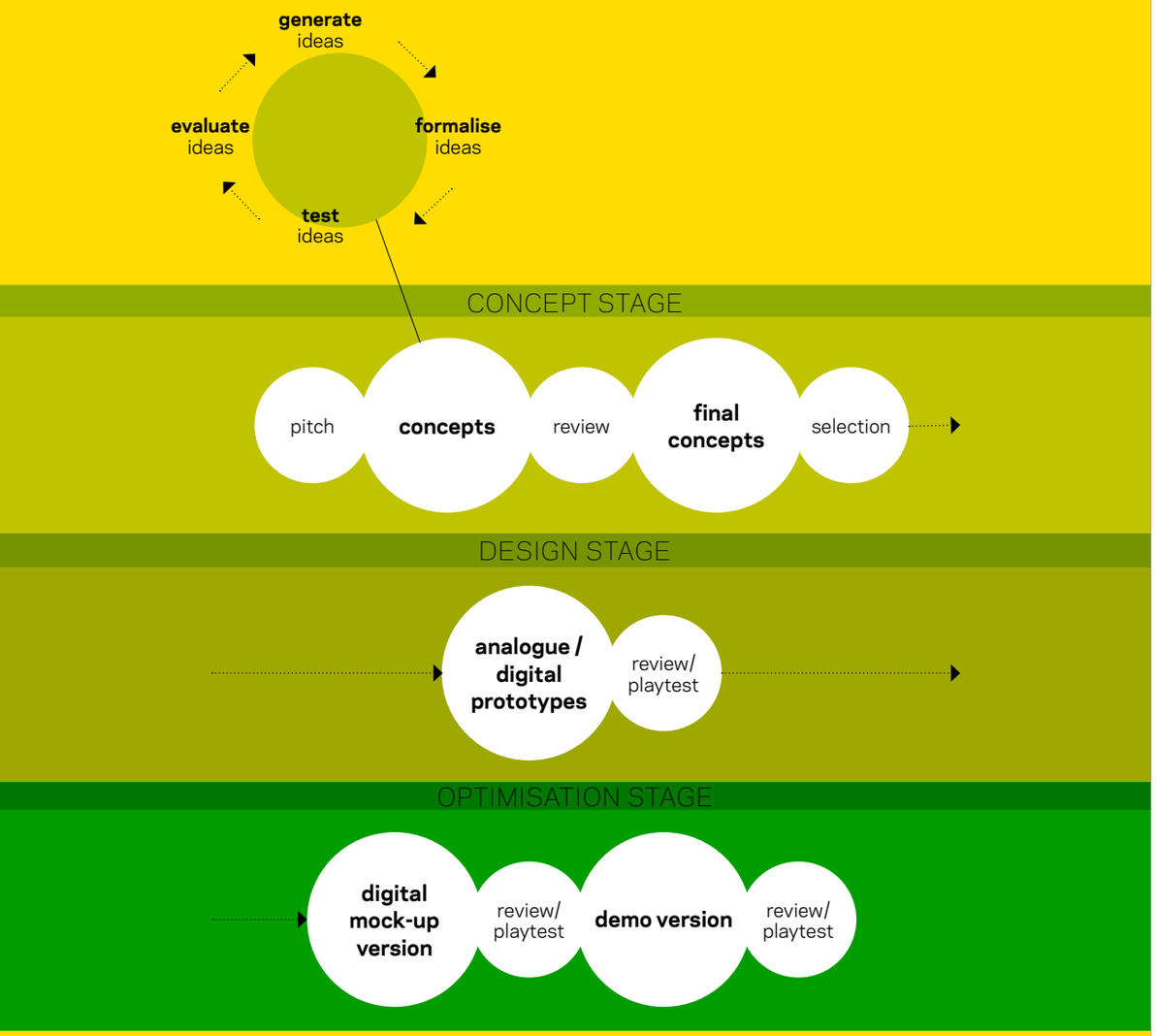
The term 'applied game' refers to games that are developed with aims in mind that are external to the game itself. Examples could be games that have educational purposes, are intended to be physically challenging or to train or develop certain skills. 'Application' in this sense refers to the use of skills and knowledge gained *in the game – outside of the game.*

SEA makes the assumption that every game has an effect on its user. Through a careful consideration of the design process, game principles are applied in such a way that this effect will closely resemble the desired employment outside of the context of the game. For the pilots developed for the University Museum, for example, the external purpose is to teach children something about the scientific process. The term 'serious games' is also often used when these kinds of games are concerned.
The term is commonly used for games with cognitive objectives (especially in education) while applied games can also have physical or social goals. We, in fact, prefer the term applied games for both categories, because 'serious' suggests the game is less 'fun' to play. While that definitely does not have to be the case.

The iterative development process

The process of developing applied games is iterative in nature, meaning every step of the design is worked on repeatedly.
In actuality, this means the game's appearance and content are not fixed beforehand, but only gradually take shape. This makes it possible to decide on aspects of the design, for instance the gameplay and look of the game, based on test results and experiences with prototypes.
Tests are also necessary because game design is all about developing behaviour, and you can never fully predict whether the gameplay will in fact make players display the right kind of behaviour. Testing to see the designers' assumptions were correct is, therefore, absolutely essential. A prototype by the way does not have to be digital, as a paper or otherwise physical prototype can also offer a wealth of information on how people respond to a certain kind of gameplay.

Playtesting as part of the iterative process



Schematic depiction of an applied game design process (adapted from Hrehovcsik, 2012)

Primary school pupils playtesting a prototype of *Age of Medicine*

Prototypes, it follows, are intermediate products that are very important in applied games, because they offer insight into the behaviour the game stimulates. The iterative process, then, is of a cyclical nature and there are cycles in every phase of the design process (as shown in the diagram opposite).

After each evaluation an improved version is implemented, and this pattern continues until the design meets the criteria determined beforehand. In applied games, iteration means the game is repeatedly tested with players, from the target audience where possible – the so-called *playtesting*. With it, a dialogue commences between designer, design and target audience and often discoveries can be made that the designer could not have predicted beforehand. Through this feedback the design is often reshaped quite radically.

The role of the client or commissioning party in the entire process is an important one. A game improves when he, she or it is actively involved in the development of the game, both content-wise and in determining objectives. As an expert in the field the client is, in fact, a very real part of the development team.

SEA makes use of and expands on knowledge acquired in previous projects. The words for this chapter were, to a significant extent, based upon a hand-out produced by the Expertise Centre for Games and Game Design, a joint project of HKU, TNO and TFI.

For more information:
www.expertisecentrumgames.nl

ANIMAL MAYHEM

Learning and entertainment in the Cabinet of Curiosities

Of the three sectors, perhaps heritage, represented in SEA by the University Museum Utrecht, is most directly suited for games. The museum already has visitors that are actively looking to explore new activities. Among those visitors are many children, who on average do not feel embarrassed about playing a game. And the organisation is already well adapted: employees continuously try to make the collection more accessible, plan expositions and, in a broader task description, make up new ways to bring the scientific content across to the audience.

Outside the box

"Back in in 2009 or 2010, SEA was already a discussion here," says Aniek Bax, project leader for exhibitions at the University Museum. "That was under the then head of department who was in touch with TFI. I was in a meeting once with at least ten people and I remember thinking: interesting, sure, but we'll just have to see! We had just started exploring the possibility of projects outside of the box."

The box: it's what they call the part of the museum that has climate control and contains the exhibitions. "We thought it was such a pity that in the corridors and hallways outside the box there was no connection with science." Bax explains. "We thought a game could add some meaning there."

Gertie Cuijpers and Aniek Bax of the University Museum Utrecht

Taking pictures as part of *Animal Mayhem*

We thought it was interesting because it was explicitly about new game applications and experimenting in that area.
– Hubbub

Initially the idea was big, too big. "There would be games on five locations, including in the garden" Bax recounts. The games together would represent all aspects of the scientific process and make the visitors see the collection the way scientists would. "Through them, we wanted to cater to different audiences, families and school groups among them." All the same, that was the idea used in the call for pitches, which led to Hubbub, among others, participating. "We chose them at the time, because they so clearly took our collection as a starting point and we thought that was very good."

What's the hubbub?
Hubbub is an Utrecht based design studio that since 2009 has been involved in research, design and development in the field of games and other playful initiatives, with a special interest in games that bring about social change. From the very onset of SEA, Hubbub was involved. "We thought it was interesting, because it was explicitly about new applications of games and experimenting in that area," founder and principal designer Kars Alfrink explains.

Because of his early involvement Alfrink was able to express a preference for one of the three sectors. "We chose heritage, because tourism and retail have much less of a cultural component" he says.

Only later, when it was time to pitch, the University Museum was revealed as the client. "We weren't immediately charmed by the idea of a museum," principal technologist Alper Çugun admits. "Or rather, we had few good experiences with games in museums. That actually made it a fun challenge for Hubbub. We started thinking about what museums meant to us and went looking for museum games that do work well. That wasn't easy, to be honest."

"It did help that I was very much charmed by the University Museum," Alfrink says. "We used what we saw there as a very direct source of inspiration." "We always do that," says Çugun. "Examining the local context is important if you want to get a sense of the playing field."

Focus
To be able to start on game design the assignment first had to be narrowed down. "We wanted to focus on one aspect of the scientific process" Alfrink says. "To start out with one of the rooms and create a concept from there. The Cabinet of Curiosities was going to be the one." "We actually went back into the box," says Bax. "Because one game turned out to be a lot of work already. This led to *Beestenbende*, or 'Animal Mayhem', with which we could target the family group. Later on, with the second pilot, we went on to address the school groups."

The Cabinet of Curiosities has a potential to excite and inspire and it could do with a game. "It was a place people found beautiful but that they walked in and out of", Bax says. "They were outside in no time." Afrink still stands with his decision. "It was the least interactive space. A blank sheet of paper, if you will, and few other installations were involved or connected."

Technological doubts
Animal Mayhem was going to run on smartphones and help visitors look at the mounted animals more consciously. But in the course of the process doubts arose about the set-up. Was it a good idea to have more than one player work with a single smartphone? Would that not lead to the more dominant children getting to have a go? Was a fixed installation not a better idea after all? "While the briefing specified we were not supposed to physically add anything to the area," Alfrink says. "This gave us the idea of having visitors use their own smartphone." Partially through the mediation the SEA consortium could offer, Hubbub's plan was continued anyway. "During that session we painted an alternative picture, in which touchscreens were installed at the museum," Alfrink says. "That didn't make it into a better game, you would have to go to and fro between the feedback screen and the environment you were meant to interact with."

"There were worries, of course, that people would just end up looking at a screen all the time," Bax says. "Which is why we asked for a game that would add something to the collection, rather than compete with it. We were happy Hubbub wanted the same thing."

Getting going
Hubbub set up a project team. Alfrink became project manager and creative director, Çugun was in charge of the technical execution. "This was our first smartphone app," Çugun says.

"I first looked into ways of involving web technology, but that worked out disastrously. Then we did use iOS in the end, which worked out well." Also, Claynote was brought in to do sound and two freelance professionals completed the team: Hanne Marckmann took care of game design and texts and Karel Millenaar game design and appearance.
The team first had another serious look at the families that were supposed to play the game together. "We noticed that parents often have little to do at expositions that are aimed at children," Alfrink says. "They can at most help out the children a little or explain how it works. Our research showed they would like to have more to do, because they were rather bored."

Museum games
Çugun tells us about a special issue of *De Groene Amsterdammer* that had just appeared at the time. "They compared museums and amusement parks. What was the difference in the end? We wanted to make that difference through a game that made it possible for families to really play together."

How was this incorporated into the game design? "The players share the smartphone with each other, that is a very important point," Alfrink says. "Also, we made sure the challenge is interesting to both children and adults.
The assignment is to point out the categories specific animals belong to, by collecting the characteristics of other animals in the Cabinet of Curiosities. But you quickly run out of the obvious characteristics. You've got feathers, so you're a bird, that's too easy!"
Then the game quickly gets more complicated. "Adults are accustomed to simply leaning on their existing knowledge, they think they already know everything" Alfrink says. "Children don't have that impulse, they just look at what is exhibited. In the playtests, people were surprised that their children saw so much more than they themselves did."



Visitors playing *Animal Mayhem* in the Cabinet of Curiosities

Game development
The University Museum has had some experience with digital installations, even with some game-like applications. "But we were never as closely involved in the different stages of game development," Bax says.

Hubbub started out with a paper prototype that through feedback from playtests was developed further and further, until the time came for a digital version, that was also improved on the go. The museum employees learned to appreciate the iterative process. "With an exhibition, it's more obvious to think: this is just going to be it," Bax says. "Because of the pilot approach there was now room to explore possibilities, and you get to see how much of a difference seemingly small changes can make. And you only really notice this when you do tests in the museum, with real visitors."
At the most recent big upgrade, the game was straightened out. "It's quicker," Çugun says. "In the previous version, you had ninety seconds to take a picture. That's a pretty long time when you're already done. Now, you can just take a picture and straight after it's the next team's turn."

Risen out of the pilot stage
In the meantime, *Animal Mayhem* has been put into use in the museum. "In that sense it has risen out of the pilot stage now," Bax says. For now, the app only runs on devices visitors have to lend from the reception desk, though the museum is working on getting it available in the App Store. "*Animal Mayhem*'s success now depends on how we present it at the reception desk," Bax says. "That is a challenge. For the latest version we are transferring to iPad Mini, which is something we have to get used to first." The iPad Mini is the ideal device for his creation, Alfrink thinks. "We thought the iPad was too large and unwieldy, and the iPhone was actually too small. The Mini is large enough for the whole family to get a view of the screen and small enough } to walk around with. What we created for smartphone was actually intended for iPad Mini – only at that point it didn't exist yet."

Fellow museums are observing the project with great interest

The development took longer than initially intended, but the University Museum looks back on the project with great satisfaction. "It took up a lot of time, but it was really worthwhile in the end," Bax says. "It was a very interesting project that got us very excited and involved, which may even have slowed things down. I wouldn't have missed it for the world."

Ahead of the rest

Fellow museums are observing the project with great interest. "They have visited to play the game," Bax' colleague Gertie Cuijpers says. "And we get positive comments at conferences. You can tell gaming has increased immensely over the four years we have been involved."
Hubbub, too, is satisfied. "We were able to create something that demonstrates our position on museum games," says Alfrink. Other museums have been in touch in the meantime, but a project of this size is usually seen as too expensive, still. "*Animal Mayhem* is a seemingly simple project, but a lot of time goes into polishing a game before the gameplay is actually successful and fun. That's a hidden cost laymen don't always consider. Many museums' frame of reference is limited to relatively simple content projects. A touchscreen browser with a timeline, a quiz. Linear things that they can also update themselves. The University Museum is well ahead of the rest here, they have very sophisticated knowledge of these matters now. Seeing where we started, that is noteworthy to say the least."

Bax also thinks the museum is ahead of the others, but she may even be more impressed by what games have taught her about, as she herself puts it, "the whole game concept." "With many of our exhibitions, the fun part is to go out exploring together," Bax says. "In *Animal Mayhem*, you actually have to compete against the others. So, things heat up through this game while at the same time people play together as well, with the whole family. I thought it was very interesting to see that competition in this kind of context can actually add something."

The game illusion
Of course it's not all positive, and there is some rather interesting commentary as well. "With game-like settings you see there is an underlying structure in place that sometimes doesn't really resemble reality," Bax says. "Our Natural History curator, Paul Lambers, uses an identification model that sometimes just leaves animals out of an animal class altogether, exceptional cases. But that's not how things work in a game. Everything has to fit into the structure."

Writer Nassim Taleb called it the *ludic fallacy*, the game illusion: the misconception that all of reality can be fit into clearly organised systems. "Simplification is inevitable, more so than what is normal within a scientific context," Cuijpers says. "There, everything's got a *yes, but*... or a *provided that*..."

"The question is whether or not this is a problem," Bax says. "Visitors aren't always interested in such a degree of detail. We used to solve these kinds of problems by adding an explanatory note, but that couldn't be very elaborate and wasn't necessarily of any use to the player. That kind of tension field we are familiar with, by the way, through every exhibition – you always have to strike a balance between realistic and attractive to visitors."

UNIVERSITY MUSEUM | HERITAGE

AGE OF MEDICINE

Healing trolls at school and at the museum

The University Museum was still in the middle of the iterative development of the time-consuming but successful *Animal Mayhem* pilot when it was time for a follow-up project. This time, another important target audience for the museum was to be the focus: children in the ages of ten to twelve in the final years of primary school.

The original plan was actually to organise three pilots. "But because the first one took longer than expected, the latter two were merged into one, cutting into both a classroom and a museum element," Gertie Cuijpers, project leader exhibitions at the University Museum explains. "Through the experience gained working on *Animal Mayhem* we got the idea we could create a similar app for other parts of the museum ourselves," Aniek Bax adds, who is also project leader exhibitions. "We wanted to use the second pilot for something completely new."

Tip of the veil
For the briefing, the museum sought the aid of the SEA consortium consisting of TFI and the connected knowledge centres. "Working on the

first pilot, we learned a lot from their input and we wanted to intensify the collaboration", Bax says. "So we did a brainstorming session with them, which led to many exciting ideas. Here, the thought came up to have the children start out at school. We wanted to lift a tip of the veil there before the visit. Once we had that, it all started to lift off. Though we did in the end have to get our feet back on the ground as well."
"It had to become a logical kind of process with a sense of urgency," Cuijpers says. "Like: this is fun, we have to go to the museum."
With the consortium's help they filled out the *Applied Game Design Canvas*; a briefing contained in one A4 sheet of paper, in which the client articulates the question and thinks ahead on the desired result.

Fourcelabs
Again, three parties were invited to pitch, and this time Fourcelabs, a local Utrecht studio involved in social and physical games since 2007, came out as the winner.
"We had already been asked to participate in the first pilot" says Fourcelabs' Karel Millenaar. "But back then we were working on another pitch and we couldn't take this one on as well."
Millenaar still ended up working on the first pilot when Hubbub asked him to participate in the game design and artwork for *Animal Mayhem* as a freelance member of the team.
"I really liked that game's approach," he says. "It makes great use of the museum's collection and it even makes it better in a way, it highlights the collection's assets."

The second pitch did come at the right time. "It was one of the best briefing documents I have ever seen," Millenaar says. "Very precise and well-articulated. With a lot of supporting information. They had clearly put in a lot of time and, of course, already had the experience of *Animal Mayhem*."


Pupils working as scientists

Developing medications
Why did the University Museum choose Fourcelabs? "Some companies understand better than others what it is we want to get across and what our museum is really about," Bax says. "They highlight the research aspect, and they took the time to look at the collection. Fourcelabs had come up with a kind of key, a metaphor, very conceptual. We felt they would be able to bring the research aspect to life."

The *Applied Game Design Canvas* already described some elements of the content. School groups would explore the scientific process through pharmacy and develop medications. Children would test the effects of substances, form a hypothesis and then test that again.
Cows were suffering from a disease is what a text box said, and the people from surrounding villages were already displaying similar symptoms. The cows later turned into trolls, but still, there was a start of a story.

Mapping the collection
The museum saw the pharmaceutical approach as a perfect motive to dive into the collection on the topic: preserved specimens, instruments, flower models, wall charts. It all hadn't been registered and there were no pictures yet. "In hindsight it may not have been such a clever idea, because it meant we didn't have anything to work with," says Millenaar.
"And we still don't. They said they would get it out of the way quickly, but there was no clear plan. It meant we lost quite some time waiting for each other at some point."
Bax softens Millenaars point somewhat: "When we started, the exact objects weren't there," she says. "But the main structure, with the plants, was already clear. There was some waiting involved, that's true, but that had more to do with the unclear process. And, in the meantime, two hundred objects have been documented.



Age of Medicine playtested in a classroom

Faith
Millenaar got to work. "But we had no clear idea of what he was going to do," Cuijpers says. "The concept story was far from completed: what will the game look like and how does it feature the collection? Fourcelabs involved all sorts of game types. Coins, cards, information. And then just try and try."

As the commissioning party, you need a strong sense of imagination to even get a bit of an idea of what's going on in such a process. "And faith," Bax says. According to Millenaar he had everything under control. Or well, sort of. "I said: here I've got a terrible paper prototype, because I don't know the first thing about this project yet. Please start playing and see if there's anything in it for you. I actually used the designing process as a communication tool. I was fed up with a client simply having to assume from my good intentions that a game was going to work. You can only tell through playtesting. When a client in a previous project finally realised this, I thought: hey, I should move this moment forward. Then there is no more need for those difficult meetings in which the client has plenty of time to discover it's not what they wanted and brings up ideas that make no sense at all, because they don't have a clue what it's about. Now, the client is at my side and knows what I'm doing. And the client knows they can contribute significantly to the quality of the game."

Safeguarding the content
All in all, the process still wasn't easy. "There was so much we had to think about," Cuijpers says. "So many principles that had to be translated into a simpler structure that fit the game. It led to many a prototype session, in which we worked side by side. It sometimes got us close to despair. There was so much to do and think about, it was so complicated. Everything had to come together into one single game and then even be fun on top of that. Our educator Ineke Puijk played an important part in safeguarding the content."
Thanks to SEA, the client was able to see the design process from a different point of view for once. "Designers always have to dive into the complicated content matter so they can translate it into simple steps," says Cuijpers. "Only normally we don't get to see this process from up close."
Not everything was new to the museum staff. "A lot of issues game developers encounter, we also deal with in museums," says Bax. "It's a different medium, but there is some overlap. Both require visual material and texts, for instance. We have opinions on those aspects as well, though in a game context texts often have to be even shorter. We had to 'undress' the information even further, which was quite instructive."

Infected trolls
We started focussing on the classroom element. "We use an online environment", Millenaar says. "That's practical for distribution purposes, but the game itself mostly takes place inside the classroom." "It's a true multimedia effort," Cuijpers says. "It's not just a game, it comes with an exercise book and information cards too."
The children have to develop medications for infected trolls. "To this end, they can use a library of sorts that contains non-verified knowledge," Millenaar says. "They've got information cards with plants on them, and four claims about their healing properties. In the digital part of the game, they can find out which of these claims are true by putting scientists to work. Then, the main objective is to develop a strategy for finding the right answer. There is a lot of information and there are limited means. Eventually, the children have to share their information with others to make it to the next stage."

Competition vs. cooperation
Do they actually do this? "Much depends on the way things are presented," Cuijpers says. "At one school, we had turned it into a kind of competition, and there no-one was willing to share information. Another group, where we didn't add this element, was a lot more open to sharing and, it turned out, had more fun as well. You'd also see more kids dividing up tasks. A couple in front of the screen, others working with the cards. And when they're really into it, they also swap places during the game. They get really involved."

"As a designer you try to emulate the tension field that exists in the real world," Millenaar says. "There is this tension between the pharmaceutical industry and the scientific world. The knowledge gained in the industry is mostly kept just there, because it is a way to make money. But does that help the discovery of actual remedies? There is a world of subtlety there. The trick is to disclose the information at the right time, after you've cashed in on it, something like that. That layer I would have wanted

Well, I've never seen children get so excited before about pictures of pots with brown gunk!
– Fourcelabs

to get in there, but it turned out that children didn't really pick up on it. This age group is too blunt in their thinking. And as soon as there is a competitive element, they get fiercely involved.

An experiment of sorts

The classroom part was tested extensively and works well by now. Then there was still the museum part to go. "We thought this would be easier, because we already had a basic game," Cuijpers says. "But the reality of the museum was more difficult than we thought."
"We were actually planning do something with an experiment of sorts," Millenaar says. "We studied how a substance that is used in medication actually comes to be. It involves taking an extract from something: you let plant material dissolve in a tincture with alcohol for instance. Unfortunately this turned out to be too difficult, it was too abstract."
Right now, the museum component is more or less a physical translation of the classroom part. "Instead of looking at a piece of paper or a picture, you get to work with the real objects," Millenaar says. "It makes everything more tangible. Funny enough, this actually seems to be enough to make it interesting. As a test, we had set up a table with some pictures of preserved specimens, a mock-up of what we call the reference room. Well, I've never seen children get so excited before about pictures of pots with brown gunk! That of course had everything to do with it being part of a game they already wanted to play because of their classroom experience. Even when the test fell apart because it was all improvised, some children kept on trying to play. They wanted so badly for it to work! Such enthusiasm... there is really nothing like it."

Innovation

At the time of writing, *Age of Medicine* – in its working title – is still being worked on. "It really is a pilot," Cuijpers says "and we'll also finish it off as a pilot. We are happy with the classroom part, but the museum part still needs some work. That process takes up a lot of time, still, so in that sense there is much to be done." Further ahead, the museum itself is also to be improved. "The plans have yet to be developed," Bax says, "but the experience gained here will definitely be brought into the equation."
"We now have a much better view of which means are best suited to get a certain story across," Cuijpers says.
"Gaming is certainly one of the tools we want to keep on using. Our museum has some special objects that visitors sometimes hardly notice. A game can make them stop and have a look, as well as provide context for the objects."

Follow-up plans

The University Museum is still considering what to do about continuing to work with *Age of Medicine* after SEA has ended. "We would like a continuation," Cuijpers says. "We are looking at how we could achieve this together, which is what Fourcelabs also wants." Millenaar sees *Age of Medicine* as a chance to innovate, not just in content but also with regards to the business model. "With a typical relationship between the commissioning and executive side it'll be too slow, it's too small a scale for the amount of money and time that is actually necessary," he says. "This is why you have to look at the possibilities of upscaling, work with more than one museum for instance. They also have a reason to develop interesting products. In the past, the money for cultural education was with institutes that developed programmes and sent them to schools, but now that money is in the hands of the schools themselves. This means museums have to get themselves noticed by those schools."
Still, as of yet there are no queues outside his office.
"It is still early for the museum world, or so it seems" Millenaar says. "We still have to actively spread the message to get it to people's attention. *Animal Mayhem* did help, that led to many positive responses."

Utopia

Fourcelabs thinks the game is relatively easily adaptable to other topics. "It's not only meant to stimulate interest in natural sciences," Millenaar says, "but it also stimulates children's social and emotional skills. Collaboration, communication and reading comprehension are all in there. It could work with so many different topics."
It's quite a lot to ask from a museum. "What I'm actually asking is, would you care to jump into a business venture with me and see whether we can turn this into something good? It is exciting, but a necessity as well. A project like this will eventually cost at least 100,000 euros. No-one has that lying around for these kinds of projects!
As long as the SEA pilot is still going, Millenaar tries to use it to the fullest. "Normally there is no time or money for a combination like this of research, development, testing and trying out business models," he says. "In that respect, SEA is a kind of Utopia. That's why I recorded everything in video reports." He also got the HKU involved in the project for 'some validation'. To see whether and how it would work out. "In the end we ran tests with four different school classes, one of which the HKU did a study of. This way, we now know for sure it has some effect."

APPLIED GAME DESIGN CANVAS

DEVELOPMENT OF A DESIGN TOOL

The SEA project consisted of two components. On the pilot side, innovative games and playful applications were developed for the three sectors. At the same time, however, the different knowledge partners were busy on a more abstract level, doing research into the development processes of applied games. To this end, they collected insights on how the design process could be optimised and they developed helpful tools. One of the results of this is the so-called *Applied Game Design Canvas*, an instrument that makes the interaction between commissioning party and game developer run more smoothly.

Actions and behaviour

From the years of experience that knowledge partner HKU has had with the development process of applied games, it appears that prospective clients or commissioning parties could often do with a bit of guidance. For instance, they often have little knowledge about games and are lacking a vocabulary through which they can express their question in a way that is relevant to game design.
An important bottleneck is the translation of the often widely available domain knowledge of the client into (active) verbs, important building blocks for game design. Games are all about action and behaviour, and because of this, the client's targets should be translated into those kinds of verbs before any development is started.

Imagine, for instance, that you would like to create a game that teaches players something about land reclamation in the Beemster polder area. A client might mention words like 'Leeghwater' and '1612' while a game designer will be looking for the likes of

'pumping out' (water) and 'building dikes'. They are, of course, easier to turn into the activities that are essential to any game. This might sound obvious. Still, this translation aspect is often not treated as obvious. Perhaps because prospective clients do not always have a clear idea beforehand of what a game's strong points are. Sometimes, the idea of developing a game just came up because the popularity of the medium didn't go unnoticed and the thought arose: "We have to do something with this." But games are not the right solution to every problem, they are no Holy Grail nor a last resort for when all else has been tried. The client's problem should be analysed to get to the core of the question. A critical and more informed look, before an often substantial amount of money is made available for a game's development.

The game developer, on the other hand, has a lot of knowledge on (applied) games, but does not always know how to get it across to the client in an understandable and relevant way. These are all arguments in favour of the *Applied Game Design Canvas*, a tool to ensure a common frame of thought. Meanwhile it's been shown that the canvas can indeed help to get dissimilar parties closer to one another.

Elementary traits

The canvas asks a number of important questions that help determine whether the problem the client has is transferable into a game or game principles. All core terms that are relevant in developing an applied game have been included. The HKU decided on these terms after an analysis of the elementary traits of applied games. The question they sought to answer was: which traits does every (good) applied game have? How do these traits relate to each other? And which things should at least be present and interacting successfully if the games is to reach its goal?

Articulate a question

The canvas among other things helps the client to articulate the question or correctly define the problem. This way, it also gets to answering that crucial question: is an applied game really an answer to the underlying question? Is a game truly a suitable means to address this problem with?
That is why ideally, the canvas is used even before the client has selected a game developer to work with. This way, it can first be determined whether a game is actually what is called for in this situation. If this does turn out to be the case, a briefing can be composed with care.

From this briefing, developers gather whether they want to try to win the project, usually by means of a pitch.
A request composed with the canvas in hand is elaborate and clear enough for a game developer to be able to make a proper estimate of whether it would be a suitable assignment for his company. Of course this also helps in preparing the pitch.

GAMES ARE NOT THE RIGHT SOLUTION TO EVERY PROBLEM, THEY ARE NO HOLY GRAIL NOR A LAST RESORT FOR WHEN ALL ELSE HAS BEEN TRIED.

Filling out the canvas

The Applied Game Design Canvas is, as the name already indicates, an empty structure with a number of boxes that can be filled out.
They have been divided over two sections. To the left there are the boxes the client fills out. They mostly concern the overall goal and the conditions. Filling these out is the first bit of practice for the client in clearly defining his problem.

On the right hand side you can find the boxes to do with the potential 'gamification' of the problem. These boxes can first be filled out by the client as practise, with a helping hand from experts in the field of applied games. At a later stage the game developer will fill out his share. When the canvas is completely full, it becomes a clear description of a game concept and it will quickly become apparent whether it could be a successful applied game or not.

On the canvas terms such as target audience, goal, context, desired behaviour, players' perspective, system feedback and learning variables are used. Because some of these terms are not self-explanatory there is a quick guide of terms attached. On page 32, you can see an example of how the first version of the canvas was filled out for the second pilot in the tourism sector, by Utrecht Tourism and the SEA consortium together.

SEA PILOT TOURISM 2

GOAL
Development of and learning from new, playful marketing technique in order to:
Get more people to visit the city of Utrecht, by:
- Creating a Point of Contact
- Moving past the Point of Entry in a playful way (show why Utrecht is worth visiting)

PLAYER PROFILE
In fitting with the target audience chosen for the Utrecht campaign
- Resident of province of Utrecht
- In fitting with SmartAgent concise description of target audience, see attachment. Additional information available.
- Decision stress. Target audience is already receiving many impulses, messages and having to make choices.
- Limited contact through short messages

KNOWN LIMITATIONS
Not just developing a one-time marketing activity, as:
- We should be able to apply said marketing technique again with different content or target audience
- A Smart target goal should be included
- The activity should fit in with existing products and means available in the city
- No new products or activities can be developed in the city itself
- Point of Contact is not in the city itself

SYSTEM INPUT
As little as possible

PLAYER PERSPECTIVE

RESPONSIBILITY

DESIRED BEHAVIOUR
- Getting involved with said activity (create awareness)
- Participating in the playful experience and, through it, learning about Utrecht (in-depth)
- To (want to) go to Utrecht

ACTIONS
- For example clicking, downloading information or existing game
- Eventually: visiting the city

MOTIVATORS

UNDESIRED BEHAVIOUR
- Not responding to contact
- Responding to contact, but not experiencing anything (action should create interest)

CONTEXT

LEARNING VARIABLES
- For *Utrecht Tourism*: learning which playful marketing techniques do/do not work
- For *players*: learning why Utrecht is an attractive city to visit

VISUALISATION
- Striking, draws attention

PLAY AIM

SYSTEM FEEDBACK

TEMPERATURE

Beta version *Applied Game Design Canvas* as filled out for second tourism pilot
HKU University of the Arts

The canvas was only partially filled out, which isn't strange. The right hand side could be filled out by the client, to see whether he is able to express his problem in gaming terms. Once a game developer starts to work with the information, the contents of this part will probably change. After all, the developer should have the creative freedom to come up with a fitting solution to the question himself.

Should the client, however, not be able to come up with a single potential game solution in the articulation stage, not even with the help of an expert, then this is probably a sign an applied game will not work for this question. Filling out the canvas will also prove to be problematic in such a case, as some boxes cannot be filled out or contradict each other.

Development within SEA

Within SEA, the HKU team used the Applied Game Design Canvas in different shapes and stages and kept on improving it at every occasion. The canvas was constantly assessed through interviews with those working with it.

One of the questions during that development was: how much help do clients need to be able to use the canvas themselves? To which extent do we want game experts to support them in filling out the canvas? Though attempts have been made to simplify the structure, it turned out that the canvas, in the end, just could not be used completely independently by people that came into contact with games for the very first time. An introductory presentation and the expertise from a process facilitator like the HKU was deemed essential for anyone to work with it properly.
Another conclusion was that the canvas mainly works as an analytical instrument, a kind of checklist that helps determine whether the question is suitable and whether the game principles are being put to full use. At first it was also intended as a kind of 'synthesis' tool for clients, enabling non-experts to come up with game concepts by themselves. The subject matter turned out to be too complex for this, however.

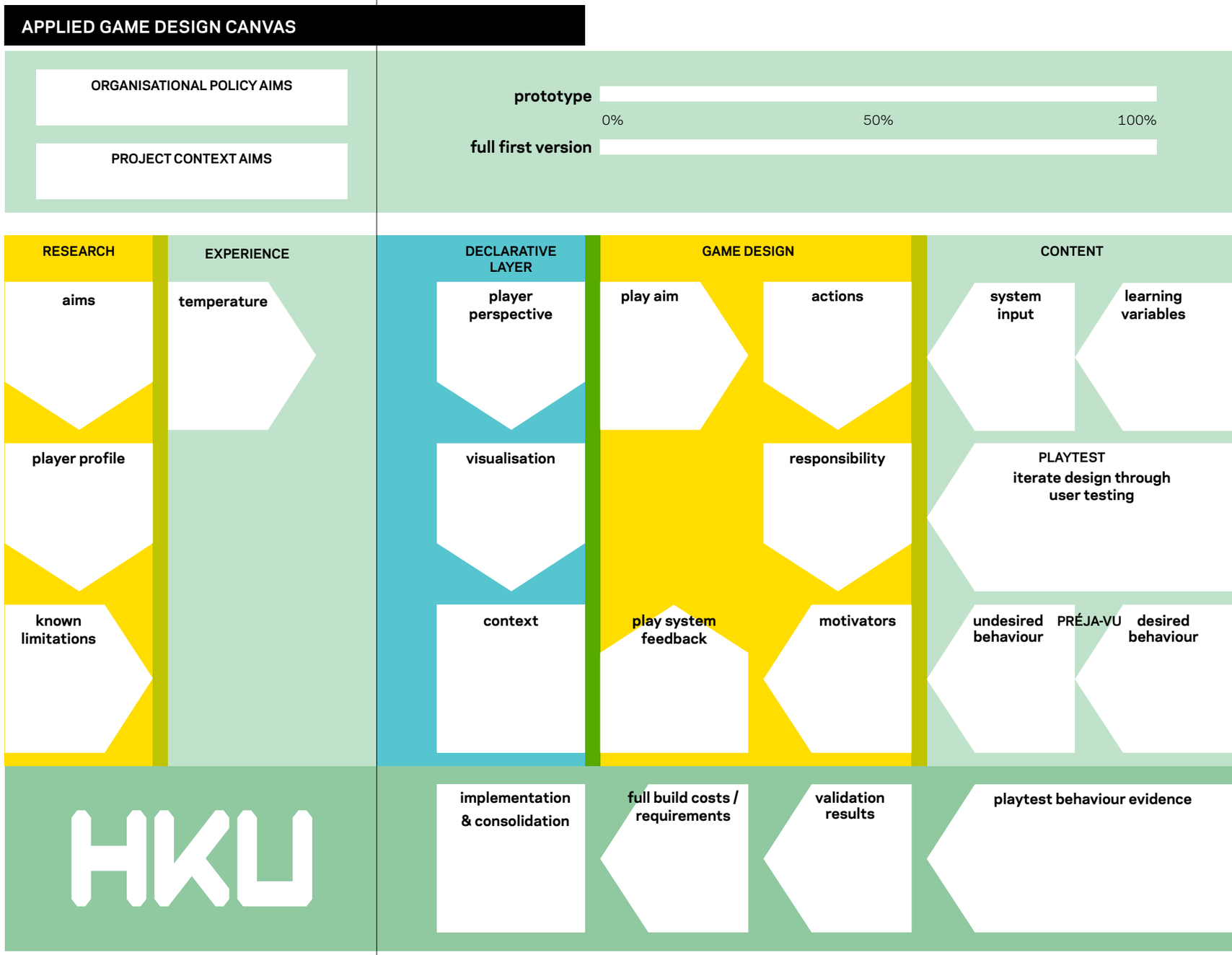
Those who really want to learn to design games need additional training. As was mentioned above: the client can try to already fill

THE CLIENT CAN USE IT TO EXPRESS HIS WISHES AND CONTENT GOALS IN A WAY THAT IS COMPREHENSIBLE TO GAME DESIGNERS.

out the right hand side, but this does not always lead to good concepts. A developer will still have to be involved in creating the actual concept.
The canvas is more directly of use in the dialogue between the client and the developer. The client can use it to express his wishes and content goals in a way that is comprehensible to game designers.
It is, as such, a starting point for conceptualisation, through which developers can get to work fully informed.

Interviews with game designers confirm this: they indicate that the requests and briefings that were prepared using the canvas were very clear. They had taken an important step forward in their thinking already, while this normally only happened after a developer had been chosen. This saved designers a lot of work and meant they could prepare a better pitch.

Interviews also showed that the cohesion between different parts of the canvas could be improved upon. The boxes had already been linked somewhat; for instance, 'goal' was next to 'desired behaviour' because they are closely related – the desired behaviour of players is after all strongly influenced by what the game's actual objectives are. But these connections were not made explicit. As a result, the canvas came across as an



Second version of the *Applied Game Design Canvas*

elaborate, but still somewhat random collection of terms and concepts that play a part in applied games, rather than a coherent whole. Aside from the clients, the SEA knowledge partners had a close look at the canvas, too. This meeting showed the canvas could offer more context information: not be limited to the game itself, but also discuss the surrounding factors. These findings were incorporated in the second version of the canvas (see previous page).

The second version

The second, present version of the canvas is sleeker and larger frames were added to make the order of and cohesion among boxes easier to see. Research for instance determines what the *temperature* (or user experience) should be, which then serves as input for the design.

The heart of the canvas, the box 'Game Design' is now a cycle. This shows that the so-called feedback loop should always be complete and at the core of every (applied) game, which had to be clearly visible on the canvas. This cycle roughly consists of:

- The player performing an action or task (a meaningful decision in the game);
- the game giving the player feedback on how the status of the game is influenced by this action;
- the player taking this feedback into account for his or her next decision.

If it cannot be made possible to complete this circle in a meaningful way, it will be very difficult to use the problem in a game setting.

As mentioned before, the evaluation meeting with the knowledge partners revealed a lack of context. The problem was hidden in the space between the so-called 'small game' and 'big game'. The small game is the game itself and how it functions as a closed game system. The big game is shaped by the context and conditions surrounding it, which are also of vital importance in making the game a success. Often, the client's question is related to an overall goal the organisation aims to achieve; especially in large organisations the underlying agenda can be quite a present factor. And when a game for instance is to be played inside a classroom, teachers have to be trained accordingly. If there is no such training, it could be that the game in principle does a good job at meeting the stated goals, but is still not being played and therefore not successful.

It's also possible that the professional who has to work with the game does not have enough faith in its qualities, for instance because there hasn't been any research that shows it really works. In that case there is a validation problem (see also the article on this from page (p.98) onwards). These factors are part of the big game and they strongly influence the small game's eventual effectiveness.

To make this context aspect visible, the uppermost and bottom panels were added to the canvas. The panel on top contains the policy goals of the organisation and the project's context. The panel below is all about the validation and implementation of the game. Here, from right to left, we see a phased plan, which runs from the first tests that indicate the players show the right behaviour, all the way down to an implementation plan. Adding these variables has made the canvas into a more complex structure, confirming that filling it out does require the help of an expert.

Conclusion

The Applied Game Design Canvas has been a great addition to the SEA project. With the help of game experts the clients were able to present clear questions and problem definitions and they could already get a sense of the direction in which the solution could be found. For game developers, this meant a clear briefing. This meant they could make a good estimate of whether the assignment would suit them, also more in advance. It saved them preparation time, too, because clients had taken some important steps forward in their thinking.

There was also a positive effect the other way around. By applying the canvas within the context of SEA and reflecting on it with clients and the other knowledge partners, HKU was able to further develop the canvas. Even though it is still a work in progress, the canvas is becoming an ever more useful and practical tool that brings clients and developers together.
The layout has improved and indispensible boxes were added, especially where the big game is concerned. In the future the HKU will definitely continue this process. Over the course of the SEA project, a derivative of the canvas called *Game Scope* was developed as well. This simplified version of the canvas cast into game form was used at the closing event (see page 106).

CROWD-FUNDING APP

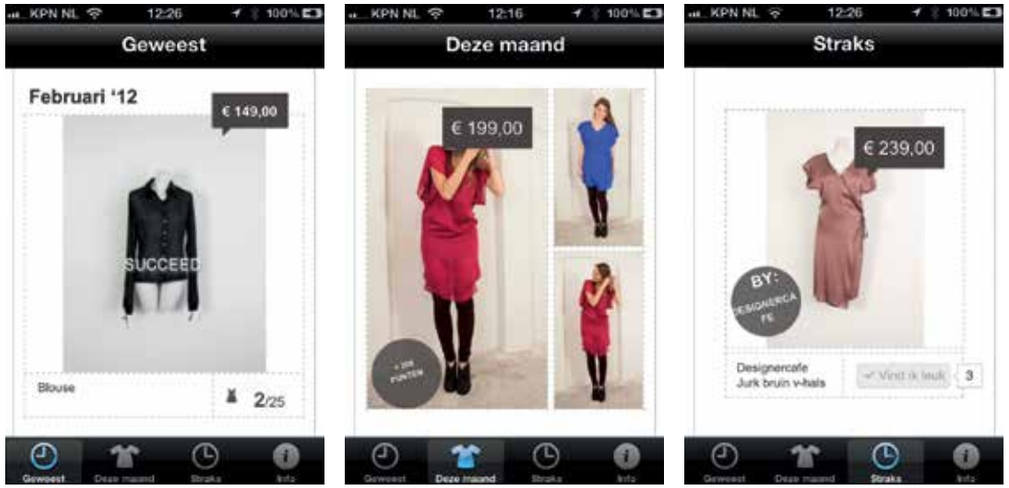
Voting for dresses

Do not confuse DesignerCafe on Utrecht's Oudkerkhof with your typical clothes shop that sells expensive dresses. The company set up by Cindy Dekkers and Stephan Aarts in 2010 calls itself a 'fashion platform'. On the one hand, DesignerCafe works directly with often young designers and it wants to highlight their story in order to improve their chances of name recognition and success. On the other hand, customers can put together clothes themselves while workshops and a myriad of other things are organised to build even more of a bridge between those who create and those who wear clothes.

Virtual reality

Dekkers and Aarts were already well-known in game circles, which made joining the SEA project not as big a step for them as it may seem. Their business ABSRD was located in the Dutch Game Garden (DGG), a building-sized conglomerate of innovative businesses on the Neude in Utrecht, a stone's throw away from the present Designer-Cafe. "We were creating a virtual reality with dressable avatars," Aarts tells us. "We did campaigns with them for L'Oreal, Holland's Next Top Model and Real Madrid among others. DesignerCafe originated from the desire to create actual dresses using those avatars."

Stephan Aarts and Cindy Dekkers of DesignerCafe



Screenshots from the crowdfunding app

In our business, you can influence your dress, instead of going somewhere else and hoping to find something more suited there.
– DesignerCafe

At one of the many DGG network meetings, Dekkers and Aarts got acquainted with TFI, after which they were asked to join the SEA project as representatives for the retail sector. "It had to be an innovative project that was somehow related to games," Aarts says. "From there, you were on your own and free to come up with whatever kind of idea you liked."

Realistic pitch

Together with the SEA consortium, consisting of TFI and the knowledge partners, they created a request for tender, a briefing outlining the client's question. "We explained ourselves," Aarts says. "In our business, you can influence your dress, instead of going somewhere else and hoping to find something more suited there. And we have many more ideas. We also have a production studio in our building, for instance. People can't see all of that at once." So, the problem as it was presented to pitching parties for the first pilot, was the ever-returning one: how do we get people to enter the shop? How do we show them what we do from the outside, both on the internet and on the actual street?

"They all pitched a similar kind of solution, which was a game or app for dressing up some figurine" Aarts says. "Some presentations got all kinds of things involved of which it was clear that it could never work in a real situation. Or that the inside of the shop would be much affected. When you're dressing a customer, you don't want to have to worry about all kinds of devices and cameras. You want a customer to be able to focus on a dress for a special occasion... or just something she thinks it is beautiful."

Elements Interactive

DesignerCafe eventually chose Elements Interactive from Almere. Why? "They had a lot of experience and more or less left the concept open-ended." Elements has been around since 1996 and specialises in interactive production, including websites and apps. Together with game studio Khaeon, the company founded Rough Cookie in 2008, focussing on games for smartphones, but that studio was sold in 2011 to American-Japanese publisher Ngmoco.

The pitch was won with what Elements owner Danny Hoffman calls "a couple of high-level ideas". These three concepts went overboard: an iPhone app with which you could take a picture of yourself against a green screen, then use it to try on clothes; a tour through Utrecht visiting several designers; and an idea with tagged labels attached to clothes that would be scannable for extra information. "Instead of just trying something on and buying it, you could get to know more about the designer," Hoffman says.

"Some ideas were less feasible," Aarts says. "Through our experience with virtual environments, we noticed the limitations more easily. Dressing an avatar takes up a lot of knowledge in your database. With a handful of clothes it's doable, but when it starts being about a thousand items it just gets out of hand. Especially if, in the long run, you want room for expansion."

Design exploration

An exploration stage was included, Hoffman explains. "Our people went to the DesignerCafe and checked out the shop, the people that visit and the feel of the place. We also did a competitor analysis. With that information we created personas of typical customers." These were used brainstorming with DesignerCafe.
"That happened in a brown paper session. Everyone wrote down their ideas on post-its that we stuck to a whiteboard and then we had a look which core elements we could continue with. They were divided into groups as a next step: what's important from the different perspectives?"

Aarts: "We simply looked at what really works."

The SEA assignment to look for playful solutions was partially ignored. Aarts: "A thirty-year-old woman busy thinking about her career will not just pick up a game. There has to be something in it for her. While games are a popular option nowadays, two years ago they were really just for children."

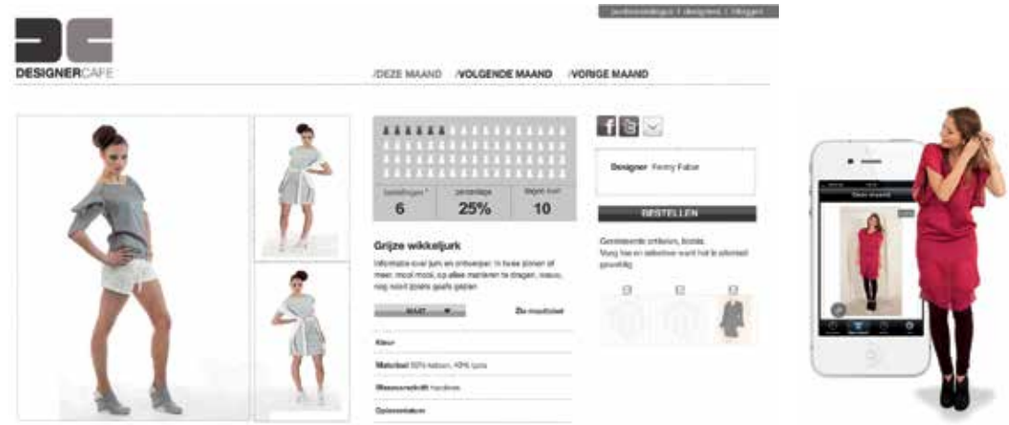
Instead, an app would be created with a few playful elements. "We wanted a kind of crowdfunding platform that displays a new dress every month," Aarts explains. "Designers would have to find a certain number of buyers

before the item would actually be produced."

The element of voting was only added after a presentation of the concept to the SEA consortium, where the playful element was seen as insufficient. "So we added the voting tool on top of the existing concept," Hoffman says.
"A selection before the crowdfunding part, which meant there were now two rounds, and the clothes got more limelight. Now we could display three categories on the app: with what had been created, what was dismissed and what was coming up."

Third party
Initially, Elements hired a third party for the job. "They mostly specialised in interaction design and concepting," Hoffman says. "Being technically skilled ourselves, we would then do the actual development. Of course we would also be part of the thinking process, but from a technical point of view." DesignerCafe was unhappy about the collaboration with the third party. "I think the process kept lingering on in the brainstorming, there wasn't enough concrete action," Hoffman says. "It may well be typical for designers; it's never good enough, you can keep on improving. But at a certain point you just have to go live. And maybe it had something to do with a personal 'click', or a lack thereof. Sometimes it's as simple as that."

Aarts gets more into detail: "They had worked on the user requirements, but they hadn't taken a number of our criteria into account. If you can only find 60-70% of your ideas in the summary, that's just sloppy. Someone else was then put on the job, who practically had to start all over. After two, three months of work I just thought that was too much. Then I asked TFI if we could work without the third party, as we were pretty clear on our ideas by then. Next, I set up the requirements together with Danny. With him it was different, he was more professional."



Screenshots from the crowdfunding app

Development
Then there was the question whether it was to become a *native app* (an app programmed for a specific device) or a mobile website. "Eventually, we chose to create one site that automatically adapts to the device it is displayed and used on, to keep the developing costs within bounds," Hoffman says. "When you start building native apps, you at least want to get iPhone and Android, and the iPad was also a definitive contender for that list. That just wasn't feasible. But we did add a hybrid mobile application to the responsive site, actually little more than a simple shell with some push notifications."
Then there were several stages of development. Hoffman: "We made a sitemap and starting from there we created a visual design. There were a number of user tests. And then, eventually, the copywriting, the images. Filling the platform, pretty much."

Not the expected success
Once the app was finished, it worked perfectly, but did not have the expected success. "People would vote, but not go on to purchasing anything," Aarts says. "And we had no marketing budget at all, so it more or less came down to showing people the app inside the shop. That was a shame. Still, the people that started using the app would continue to. The app was the most popular part of our website. But the visitors didn't continue to the webshop."
Aarts had also hoped other shops would be able to take over the concept. "But it's clear you lose retailers' attention once you bring up technical things in a conversation. They have a difficult time getting into it." Aarts himself has no such trouble, at least, most of the time. "Sometimes you do wonder what good it actually does. Developing an app is expensive and very time-consuming. But a bit of hassle is normal with projects like this and I still have faith in it. It can work, but then you do have to put people on it fulltime. An app is not something static, it has to be developed and promoted continuously." For now, the app lies dormant. "We recently updated our webshop, which meant the link to the app didn't work

anymore. We should update it, too, but that's going to cost five thousand euros and we don't have that available.
So then there isn't much of a choice." The project was shelved, though Aarts would love to get it up and running again. "For a concept like this to work, we would have to be bigger," he says. "Not just one shop, but four. Then you've also got the budget to do maintenance on an app like that. We would love to expand, with innovative projects, preferably with the online-offline combination."

A pretty pragmatic approach

The crowdfunding app brings up the question whether a playful approach is in fact suitable for every project. "Not everything necessarily gets better with playfulness and gamification," Hoffman says. "It was, in any case, quite difficult to come up with a good concept that worked in this assignment. There's the added problem that people are spoiled with free games, even for their smartphones. You really have to stand out for a concept to catch on.
In the end we just got started with DesignerCafe and created something that was first commercial and practical.
For DesignerCafe it had to be down-to-earth, which is something that suited us as well. We were well suited to each other in the sense that we both have a pretty pragmatic approach to things."

LIVING DRESS

Playing with light, sound and fabric

DesignerCafe: the shop that looks like an exclusive fashion boutique, but is more than meets the eye. A true fashion platform, where designers present themselves, customers can create their own Construct dress, workshops and expositions take place. How can you present such a concept to the outside world? In the first SEA pilot for the retail sector, an app was developed through which potential clients were able to get a first glimpse of the concept, voting for clothes and crowdfunding them before they would actually be produced.Though the app functioned well enough, it had not succeeded in getting new audiences to frequent the shop. Time for a second request and a second pitching round.

Second pitch

"The SEA consortium really wanted there to be a game element in this one, they thought it was not present enough in the app," DesignerCafe's Stephan Aarts says. It wouldn't have been necessary on his account. "Some elements are not playful, but they are effective. We were much more interested in how we could get our passers-by excited. Now it had to physically take place inside the shop." Like the first time, the three pitching parties left Aarts unimpressed.

"Their solutions were impractical, they took up too much space or didn't suit our customers' wishes. It was disappointing enough to make us think we had to make up something ourselves. With a

concept we believe in and partners that do too."

Installation inside the shop
DesignerCafe went with what they thought to be the most capable party, Cooking Fox from 's-Hertogenbosch. Founded by interaction designers Femke van Drooge en Joep Slenter, two HKU alumni, this studio has been creating applications, games and physical installations since 2011. Their pitch was an installation with iPads and revolving pedestals. Visitors could take a seat on a stool, assemble their own dress and view it as a 3D model in a kind of augmented reality. There was also a member system with RFID chips involved. DesignerCafe did not see much potential in the idea. "We already have an iPad in our shop, but it's not being used," Aarts says. "It is fine as a display, but our customers don't use devices in here."

"When you're asked to create something inside a shop that customers can get involved in, the idea of an interactive installation of course quickly pops up," says Cooking Fox's Slenter. "We spent a week working on ideas and building a cool presentation." A lot of work for an unpaid pitch with an insecure future, but Slenter and Van Drooge still think it was worthwhile.

Something completely different
"Two weeks after the pitch we received a phone call," Slenter says. "Good news and bad news, they said. We would like to work with you, but we want something completely different. It turned out they were actually not too certain about the initial requirements."
The project had to take up less space and better suit DesignerCafe's target group. What is more, they had also already got a third party involved for the visuals, Mr. Beam from Utrecht that had refrained from pitching before.
"They didn't want the whole surrounding shebang," Aarts says. "A pity, because they make beautiful things that stand out, entice and inspire."

Mr. Beam specialises in projection mapping, which is more or less folding projections around objects using modern beamers, a very precise measuring process and clever software. "DesignerCafe had seen one of our creations, a projection onto a bag," Mr. Beam's Mo Assem says. "They thought it was interesting. Their Construct dress was also a product with many possible designs. They were curious what we could come up with for them."

Interactive shop window
"That Mr. Beam was involved made things a lot clearer," Van Drooge of Cooking Fox says. "As did the request to not do anything *inside* the shop, but rather *close to* the shop. That doesn't leave much beside the shop window." An interactive shop window, to be precise, with a projection onto a dress that passers-by would be able to influence in some way.
"The tasks were clearly divided," Slenter says. "Mr. Beam took care of projections and sound, Cooking Fox would handle interaction and the technical layout."

The shape of a dress
It's not easy to 'projection map' a dress. "You have to really understand the feminine shape of the dress," Mr. Beam's Assem says. "You have to understand what the light does with it, as pixels turn into beams of light when you project them. We did a lot of research to get a grip on this technique. It's almost like unwrapping a shape, a kind of 3D texturing."
It wasn't just about the dress. "We wanted a spatial experience for people passing the window," Assem says. "The challenge was to pull the shop out of that dark Oudkerkhof, as it actually pretty much blends in with the shops around it."

The spectacle was to take place mostly at night. "It's strange actually that shops here pay such high rents, while they are only open a third of the time, Assem says. "So much for the 24-hour economy. This is why we wanted the shop to live on virtually or part-virtually. To make sure that after closing time there would still be something going on.
I thought people might be really intrigued by such a thing."

A practical solution
Cooking Fox started looking for a practical solution. "For us it was fun and challenging that Mr. Beam's visual style was the leading principle this time," Van Drooge says. "Usually, we start out with user behaviour."

There was much meeting and deliberating. Who could do what, how would everything interact? Cooking Fox studied interactive options: which input technology would be suitable for passers-by? "There are plenty of affordable techniques nowadays, including Leap Motion, Kinect, cameras and sensors," Slenter says. "Each has its own pros and cons."
Kinect was dropped because for it to work, people would have to pretty much stand in the shop window. Putting touch foil on the glass wasn't a very desirable option either, because of the fingerprints.
"At some point we realised the best idea was to oversee the situation from above," Slenter says. "From five, six metres above street level you can see the direction in which people are headed quite clearly."

Living dress in the shop window of the DesignerCafe

We actually created a combination of a surprise and very subtle interaction.
– Cooking Fox

Building a camera
But first, Slenter took apart an HD webcam. "I went so far as to actually take the lens off the chip. Then I removed the infrared filters, so we had a camera that could see infrared. Next, add a few other filters and you've got a camera that can see negatives so you can see things in the dark."

The camera was fitted with an elegant exterior with a stainless steel shackle, blackened to make it stand out less, keeping it firmly in the right angle. It was mounted to the front of the building. But then there was condensation. "Even with the watertight exterior and the heating device I installed, there were suddenly drops on the lens," Slenter says. "We were astonished, we thought it had rained into the equipment. But it turned out the vertical position was what was wrong; the heating element was trying to heat the glass but failing, because the heat only went up."
He took the module off the shop front again and thought deeply about this. "Air circulation was the way to go. Proper circulation makes the air dryer and prevents condensation. I drilled many holes into the camera cover. With simple parts from the DIY shop, in this case a ventilator and gutter end caps, I made sure the air circulated from top to bottom." Problem solved. "It's still a prototype, but I think it's a high-quality prototype at least."

Blob tracking
The camera registered images and those images were analysed according to the rules of blob tracking. The different images captured by the camera are compared to each other: deviations are identified as being objects and the system keeps track of their movement. This is the information that changes the projection onto the dress.
That isn't always without problems. "The camera is very sensitive," Stephan Aarts of DesignerCafe says. "When someone drops something or parks a car, the system does not register someone who passes by. Luckily, Cooking Fox are very diligently making things better all the time."
For instance, a recent software update made the system calibrate more often.

Playful interaction
In the meantime, the SEA consortium's wish to turn it into a playful experience was stressed yet again. "In a brainstorming session, all sort of ideas were contributed," Van Drooge says. "Picking things up, scoring points. You would see frowns on the DesignerCafe-side of the table, because things like that didn't fit in with their exclusive target audience at all. They were right, of course, but it took us some time to find the right balance."
"Now we developed a kind of imaginary zones on the pavement, a bit like a foot crossing," Slenter says. "When people walk by and go from one zone to the other, something happens. The content skips into a next phase and sounds are being played."
"The system deliberately follows just one person," Van Drooge says. "Otherwise you'd get strobe lighting on that dress."

Nightly spectacle
In the dark you can easily observe how people walk by and are made aware of the projection with the space sounds. How they see the colours change next. How the shop lights up more with ambient lighting when they come even closer to the dress. Some people play around with it: they walk back and pass by again. And again. They try to figure out how it works: that their walking speed affects the transitions on the dress. That the projection comes from two discreetly placed beamers. Every once in a while a cyclist will get off his bike. Or cars stand still.

"We actually created a combination of a surprise and very subtle interaction," Van Drooge says. The audio element is an important aspect.
"It's a hangdrum, a kind of Jamaican steel drum-turned-inside-out," Mo Assem of Mr. Beam explains. "It's a warm and woolly, yet ploinky sound. Roel Slootman, our steady audio guy, went on to edit it further into a generative design, meaning tone sequences are triggered in a different order every time. The result sounds a bit like the wind chime people have in their gardens. I think they turn the volume down a bit more every evening, there's almost nothing left. A shame, because the audio was designed in such a way that it blends in with its surroundings."

Eye catcher
Important: the client sounds excited, more so than with the crowdfunding app. "We've got something that stands out, something no-one else has got," Aarts says. "When you walk in the shop's direction, you can't miss it. It's an eye catcher."

I'm happy we could collaborate with people open to a more artistic approach.
– Mr. Beam

Of course there are some less successful aspects. "We can only project onto one dress that doesn't look very interesting during the day and that we can't sell anyway, because it was created specifically for the projection, with the right material that best brings out the light. We are now looking at whether we can put another dress in front during the day." It is still a pity it's not possible to have projections during the day. "Especially when the days start getting longer," Aarts says. "Or well, we would have to buy very expensive, strong projectors for that." At night the practical problem is that the people surprised by the shop window cannot directly do something about it. "They have to look us up on the internet with a smart code or come back some other time. I don't have much faith in that. But people do talk about "that shop window on Oudkerkhof". They understand there's more going on here, that it's a completely new approach. That conversation, in the end, does lead them to you."

More subtle effects

As always, there are things that could be better. "We would like more animation in the projection part," Aarts says. "Now you can only see new dresses, more or less like slides. We would like to be able to add a subtle belt, for instance, some detailing and variety."
Mr. Beam's Mo Assem agrees. "Now it's still a bit choppy, the technical part is too visible. We would like to have more control over how the images transfer, morph into the next. The colours you see. So you get sucked into the experience."
The workflow also has room for improvement. "DesignerCafe would for instance take pictures of a new collection and we'd simply work it into the projection," Assem says. "This way, it would never stay the same and dresses could be added constantly, or maybe some more daring alternatives in between."
Still, most of all he is satisfied with what was achieved with the available means. "In this project everyone wanted to be subtle," he says.

Customer loyalty program: earn credits after activating Living Dress

"When other shops try to stand out, many are happy to get LED-walls involved – cheap and straightforward. There we'd be asked to come up with Sinterklaas-themed projections by now. I am happy we could collaborate with people open to a more artistic approach."

Lower rent for the shop

Aarts abounds with ideas for the future. "Many shop windows are empty," he says. "We could use them, showing our same DesignerCafe projection in four or five different cities." This could be done nationwide, but also internationally. "We had negotiations in several European cities where we'd like to set up exchanges with local designers."
Cooking Fox would like to continue developing this idea of an interactive shop window. "There are other options too, besides projection," Joep Slenter says. "Physical objects responding to you; mannequins looking at you when you walk past. That's all already possible: the data are available. In that respect, they can give us a call right now and we'll get to it." Speaking of data, by the way: there is one unexpected side effect of a camera keeping track of who walks by. Aarts: "When we moved into this building we got a report from the real estate manager with the amounts of people passing through this street, arranged by day of the week and part of the day. But those numbers were ten years old already and turn out to be completely off. Because of the crisis, but also because of the internet. People often go online to buy things, they just don't go into town as often. We can now attest to this." So, this way an innovative dress projection could eventually lead to a lower rent for the shop.

RESEARCH AND DESIGN

In the context of SEA, the knowledge institutes involved completed several research projects. In the next few pages we will give you an overview of these projects.

THE PHYSICAL AND THE VIRTUAL WORLD COMING TOGETHER

University of Twente

The department of Human Media Interaction (HMI) at the University of Twente is involved in research on virtual environments and interaction technology. This research takes place in the context of Dutch and European projects and in so-called networks of excellence. An important topic for HMI is translating research results into practical applications. This has led to the creation of interactive entertainment and cultural heritage environments that are open to a large audience. SEA has given HMI the opportunity to increase its activity in the areas of recreation, games and cultural heritage, in the concrete shape of two research projects within the heritage theme. The projects are part of a broader vision that sees interactive technology, through increasing use of sensors, more so than now as part of a level playing field where the physical and virtual worlds are able to be equal.

Individual and joint personalisation

A multi-touch table in a science museum

Students and members of the Human Media Interaction department at the University of Twente studied how the experience of a museum visit for children could be changed for the better. They used a multi-touch table in combination with game and storytelling techniques.

When the system gives access in a playful way to information about the exhibition at the museum, it turns out children don't just interact with the table but also continue the verbal and non-verbal interaction amongst each other, discussing and negotiating with other players as they go along. The interaction with the system and the museum content, and the interaction with other children becomes one integrated whole. This way, a small group of children can combine their interest in the objects on display in a common interaction with the table.
A system has been experimented with in which the children, following this discussion, receive 'a common personalised' route through the museum, the 'quest'. The system has been evaluated on aspects like pleasure and collaboration during the interaction with the table, and on the way it influences the experience of the museum visit when they follow the suggested route and answer questions about museum objects on the way. It seems to be a promising concept for a new way to have children experience a museum.
What did show is that going into such evaluation sessions with children 'out in the wild' (as opposed to research within a controlled environment) is not just inspiring, but also rather challenging. Childrens' experiences are not easy to fit into systematic questionnaires. Also, children rarely do what the designer of a system came up with, which means the methods for observation and analysis that were thought up in advance often do not lead to clear results. Systematic evaluations, therefore, should be interchanged regularly with anecdotal analyses of specific interactions between children.

Interactive installations

Regional identity in a historical museum

In the context of an internship for her Human Media Interaction MSc degree, Kimberly Snoyl looked at how interactive media can be employed to highlight *regional identity* in a museum exhibition at Museum TwentseWelle. To this aim, she did research into the important elements of designing a museum exhibition.

Exhibitions should be both educational and amusing. Interesting insights in this area can be found, amongst other publications, in *Researching Learning in Museums and Galleries* by Hooper-Greenhill and Moussouri. For designers of interactive systems in a museum context there is much to be learned from the design theories in What makes learning fun (D. Perry) and *Designing with multiple interactives: Five common pitfalls* (Allen & Gutwill).

It shows people remember a lot more when they can actively participate and can interact with the social environment.

Snoyl also looked at how another museum in The Netherlands approached regional identity, and at previous use of interactive media in museums in general. Through her research she found a suitable medium and developed two concepts that Twentse-Welle could implement in the future, and evaluated them in conversations with experts.
The most important lessons from the evaluation were that interactive media in these kinds of settings should stay 'light', have to be set up in such a way that visitors are tempted to do something themselves and should give visitors the chance to 'get into contact' with other visitors, for instance by leaving comments. This is especially fitting in the context of an installation on identity.

In research of this kind on serious applications of game concepts it turns out there is a fragile balance between the serious aspects of the game that is to be developed and its playful elements. On the one hand what should be achieved or learned is an important question, and on the other hand the fun aspects of the games should not be left out of the equation. What's crucial is the observation that something is not automatically fun, interesting or stimulating once you call it a game and attach a score board to it. This issue appears both in the design stage and in the evaluation of the result. Guarding the balance seems very possible, but only when both game developers and domain experts pay close attention.

WHAT'IS CRUCIAL IS THE OBSERVATION THAT SOMETHING IS NOT AUTOMATICALLY FUN, INTERESTING OR STIMULATING ONCE YOU CALL IT A GAME AND ATTACH A SCORE BOARD TO IT.

WITNESSING TWO HERITAGE PILOTS

Reinwardt Academy

Since its establishment in 1976, the Reinwardt Academy has ever developed itself; now it is a knowledge centre with a key position in the museum and heritage related knowledge infrastructure. In its programmes the academy seeks to be on par with the latest developments in the field, and if possible play an active role in the development of new ideas and practices. With this background, lecturer of exhibition communication Mario Jellema participated in the heritage pilots *Animal Mayhem* and *Age of Medicine*, and joined in thinking about project layout, observing playtests and most of all in how games are similar to the common approaches and work methods at museums.

With *Animal Mayhem* it soon became apparent that there is a difference between the development strategies of games and the usual museum approach. When museums choose their focus points, they are used to building their reasoning around content and knowledge transfer. That is unsurprising seeing the strong educational identity museums have. Game designers would sooner start the development with a focus on the actions and interaction of the participants and are therefore more process oriented. It's not that the content does not matter, but it only comes second in line.

In relation to this, the first pilot has shown museums are used to thinking from a clearly defined end product. This makes it a bit strange for a museum if a game developer in a pitch does not immediately come up with a clear image of the end result. Instead both parties start a developing process together in which a number of playtests is completed. There, the game is constantly edited until it meets the requirements and takes its eventual shape.
The second pilot, *Age of Medicine* was more complex in setup. This educational project tried to connect the school and museum situation with each other through a game. The appearance of the game was not stable: it consisted of cards, notebooks, an online environment and the actual environment of the museum itself.
In the playtests, it turned out children had little trouble adjusting between the one form and the other. So it is possible to offer these as a whole.

The project has also shown that there is a meaningful connection possible between a game inside the classroom and a follow-up experience in a museum. This does call for a careful approach.
To still be playable, a game in principle has to be a simplification of the subject matter, while inside the museum it's often about the broad approach and factual details of the subject. When there is a good connection between the two, the museum part of the game can be interpreted as a next level after the school element while also making active use of the collections and the rooms of the museum. Following the observations and thinking along with their development, Jellema gives a couple of recommendations for both museums and game studios that could improve the coordination, collaboration and communication between the two.

Recommendations for museums:

1. Begin with the thought that an applied game is an effective way to organise an interesting interaction between visitors around a certain topic. Also, redirect your focus to what you want people to do inside your museum.
2. Get people to instruct you on the design process, design criteria and costs of a game.
3. Start the project with a broad museum team and choose a game company that fits with the project and that the team clicks with.

Recommendations for game studios:

1. Realise that common terms in gaming are often not known to museum employees or they might have a different meaning within a museum context.
2. For museums it is very important that the content and facts in the game are in order. Show how this is taken into account and assured in the development process.
3. Strive for as much integration as possible of the game with the unique museum location and the story the museum stands for.

THE COMPUTER SCIENTIST'S VIEW ON GAMES

Utrecht University

Utrecht University, and especially the Computer Science department, is a great source of knowledge in the field of games and game technology, both on the bachelor and master level. It can also offer insights into the games sector from numerous projects ventured into for and with the creative industry. Utrecht University delivered three student projects for SEA connected with the pilots.

Data 'backbone' to the University Museum

Data exchange between applications

Interactive games and activities can make a museum visit into a more amusing and educational experience. The software used in this project makes interactivity possible through simple data exchange between applications. The goal was to create a backbone through which different games inside and around the University Museum would be able to communicate with each other. The intention was to make the games more interactive this way and better adapted to the interests of one person. The system will not actually be used anytime soon and is – for that reason – quite broad in its scope and has room for future expansion. A SDK (Software Development Kit) for game developers was also created, an analysis tool for museum directors and a system that gives suggestions to users.

Created by the students Peter ter Haar, Rutger Kerkhoff, Ali Khahim, Marinus Oosters, Guido Passage, Ruben Peters, Jorn van Wijk and Tom van der Zanden

A seventeenth-century pharmacy

Medicine needs disease; medicine through the ages

Applied game about the pharmacy business

For this project an applied game was developed with the title *Geneesmiddel zoekt ziekte*, or 'Medicine needs disease', covering a great transition through the ages. The goal of this game was to get the institutionalised knowledge about the pharmacy business across to the user in a playful way and create awareness with the audience.
Because self-care medication can nowadays be bought in normal shops and in online pharmacies, what a pharmacist actually does has become a lot less clear to many people. The pharmacist is seen as superfluous or unimportant on the path of diagnosis to medicine use.
This game is meant to show the player the opposite is true, and as such helps to improve the image pharmacists have.

The game has two settings. The first is a historical pharmacy in the sixteenth or seventeenth century. In that day and age, the body was viewed from a holistic perspective. The learn of humours, based upon the four bodily juices blood, slime, black bile and yellow bile was central and any medical complaints were interpreted as the result of an imbalance of the juices. Against this backdrop the player has to perform the tasks of a pharmacist: treat clients (receive and read prescriptions, look up prescriptions in the *Pharmacopoeia*, follow steps from the *Pharmacopoeia*), collect the necessary ingredients (from several shops and your own garden), manage a steady stock of preparations and keep up with the knowledge of the trade necessary to pass the exam.
The second setting is a historical pharmacy from the nineteenth century.
In those days, the body was no longer seen holistically but they tried to locate medical complaints and also treat them locally. Through the development of toxicology, the idea of dosage started to get more attention. In this setting, too, the player has to perform the pharmacist's tasks.

The game isn't just available on the website of the Dutch National Pharmaceutical Museum, but there is also a touchscreen demo version of the seventeenth-century pharmacy that can be played at the Boerhaave Museum in Leiden. Those who manage to finish the demo receive a link to the website that has the entire game.

Created by the students Abdelkarim Abou, Justin Arensman, Stephan van den Brand, Bram Brink, Jochem Eek, Vazgen Gasparian, Jacco Krijnen, Eva Timmer, Lucas Weideveld and Dirk van Wijk

Virtual catwalk for DesignerCafe

See the dress you designed yourself in Cafe Runway

DesignerCafe sells, produces and promotes collections of about twenty up-and-coming designers, both autonomous designers and those exclusively involved with designing and creating clothes. An important part of the collection is the Construct clothing line, which allows customers to pick a basic dress and then enhance it themselves using the available means. The Construct collection was a focal point for the application that was developed on behalf of DesignerCafe.

Students were given the assignment to create a virtual catwalk for a rather specific target audience that is already involved with DesignerCafe. Users are able to construct their own dress, though this is an optional element as ready-made designer dresses are also available for selection. Next up, the chosen outfit is shown in a virtual simulation of a runway fashion show, from which customers can tell what the dress would look like in real life.
The Cafe Runway application runs from a website and is available in most browsers. The fashion shows are live streams that are shown from a server, meaning computer speed isn't much of a factor, only the internet connection is. Users are also able to create an account, through which they are able to save, re-use and edit their shows and outfits. Using the application also earns the customer credit points and achievements, and users are able to share their creations with others as well as view already shared results.

Created by the students Mickey Botterweg, Joey Deiman, Fedor Finkenflugel, Hugo Heemskerk, Minghai Jiang, Dennis de Jong, Joran Minjon, Nilton Ramos Monteiro, Martijn Petersen, Maarten van Saane and Merijn van Tooren

Characters navigating around the Domplein

Realistically simulated crowds

A crowd simulation plug-in for Unity 3D

In the context of the SEA Living Dress pilot the presence of passers-by became an issue of interest. Part of the research for this pilot was therefore dedicated to the walking behaviour of people in public spaces. Utrecht University (UU) students in contact with the creators of the pilot started working on a crowd simulation solution for software often used in games. Representing the UU, Roland Geraerts was to be the student team's client. Geraerts himself is part of the research group for Games and Virtual Worlds of the Computer Science department, where he conducts research on simulating crowds realistically.

The students developed algorithms that can get large groups of virtual characters to navigate around an area realistically. The findings were incorporated into a crowd simulation engine. The client wanted to make the engine widely available to game developers and, because of that, asked them to integrate it into popular package Unity 3D as a plug-in. The plug-in should make it possible to add crowds to a game in an easy way.

A number of components were necessary in creating this plug-in. For starters, Unity 3D has to be able to send information about the characters and their surroundings to the crowd simulation engine. This, in turn, simulates the movements of a crowd and sends information back to Unity 3D. This part is called the simulator.

The end user should also be able to create characters and groups of characters (crowds) in Unity 3D for himself. The settings for these crowds and characters have to be editable too. It's what the crowd editor is there for. Before a simulation can take place, the crowd simulation engine needs information about the surrounding area. To make the simulation work accurately and quickly, calculations create a representation of the areas the characters are walking through. For this calculation all objects inside the level have to be taken into account. This work is done using the mesh filter inside the level converter. The mesh editor enables the user to adapt all results manually.

Aside from the plug-in itself, there are a number of other demands that have to be met. All software has to be well-documented, using the Doxygen format. Adding comments in this format to the programming code switches on the automatically generated documentation option. There was also a demand for a product website with more information on the plug-in and its uses. The website was made to also act as a manual; it for instance has a wiki page with elaborate tutorials aimed at teaching game developers with a background in Unity 3D to work with the plug-in.

Then finally, there was a demand for two levels demonstrating the plug-in. For this element illustrators were recruited from Grafisch Lyceum Utrecht (Creative college for media, design and technology). The first level had to contain a well-known and recognisable part of Utrecht – for which the Domplein was chosen. The second level mostly shows off the advanced possibilities the engine can offer, through which it proves the plug-in is very suitable for game design.

Created by the students Jonathan van den Berg, Chris Boer, Jordy Boot, Tigran Gasparian, Kevin van Nieuwenhuizen, Frank Nijmeier, Simon Prins, Mark Raasveldt, Steven van Rossen, Johnny Schaap and Edwin Westerhoud

PARALLEL TO THE PILOTS

HKU University of the Arts Utrecht

Also at HKU student projects were linked to SEA. The intentions behind these projects were different than those of other knowledge centres. The student teams were given the assignment to operate as a game company themselves, and as such, the background information for the pitches of the *Age of Medicine* and *Living Dress* projects was also presented to these teams. The challenge for the students was to come up with different solutions from the ones the selected game companies presented. They sometimes did ask the game companies questions, but performed the assignment autonomously and developed prototypes of their own concepts. The students – who themselves styled their teams Cutout, Designosaur and Bluebird – have backgrounds in the various HKU programmes (Game Art, Game design & Development, Interaction Design, Digital Video Design, Art & Economy and Music & Technology) and/or Utrecht University's Game & Media Technology department.

Interactive table and playful shop window

Designosaur for DesignerCafe

This project is made up of two parts. It all starts with an interactive table on which customers can design and combine clothes themselves. The resulting outfits are displayed in the shop window, using an interactive model that responds to passers-by and walks along with them. It is like a kind of interactive catwalk, made possible through blue screen technology, a camera hanging from a rail on the ceiling and a bit of diffuse foil on the window. At the end of the catwalk the passers-by, if all goes according to plan, enter the shop.

Created by the students Ibrahim Attallihi, Esmé Berach, Martijn Horbach, Bob Jacobs, Angelos Kremyzas, Evita Lammes, Marloes Reijnders, Thomas Reinink and Joeri van de Velde

Digital blocks in a shop window

Cutout for DesignerCafe

Turning Blocks is a playful interactive shop window consisting of 180 digitally turning blocks that respond to every movement. A life-sized model changes outfits and, through various enticing texts, encourages passers-by to get to know more about the workshops and the option of creating your own clothes, all available inside the shop.

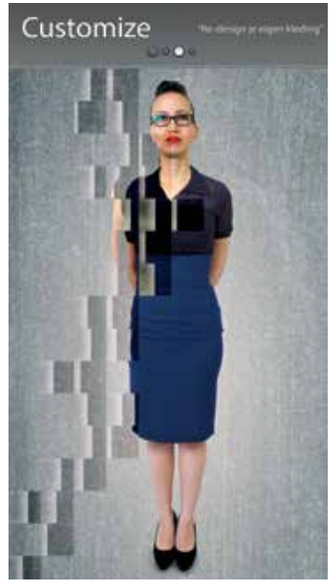
Created by the students Merlijn Berdenis van Berlekom, Ingmar uit de Bos, Ron Duffree, Kevin Nederkoorn, Kenrick Ouwehand, Richie te Wierik and Ollie Wijermars

Scanning and combining plants

Bluebird for University Museum Utrecht

Mendel's Masterpiece is an interactive experience in the botanical gardens of the museum, assigning children between the ages of eight and twelve the task of collecting plants. The players receive a mysterious device through which they can bring the portrait of a girl to life, and later on also scan and collect plants. Meike, the girl from the portrait, gives them the task to take existing plants and create something new with them. On the Mendel Machine tablet the children can combine the attributes of the plants they collected. In the end, Meike evaluates the results.

Created the students Yasen Atanasov, Denise Blauwkamer, Robin Bosma, Michelle Kusters, Krien Linnenbank, Lin Setzekorn and Nick Witsel



From top to bottom:
Interactive design table,
a playful interactive shop window,
screenshot of the interactive shop window

U-SPY

A cross-medial treasure hunt through the city

The city of Utrecht is essentially divided into two halves, separated by Hoog Catharijne, the indoor shopping area that also houses the Central Station. Many business 'tourists' only see the Jaarbeurs side of the city, which is after all where the conferences they attend are being organised. The other side they rarely see: the historical city centre with its characteristic canals and wharfs, where the lion's share of hospitality and other tourist attractions are. Even if business visitors go into the city centre, they often don't leave their meeting venue.

That's a shame, think those responsible for city marketing. And so the assignment for the first SEA pilot in the tourism sector became: find a way to get these business visitors to cross the threshold.

"People literally don't know where the city centre is," says Carlijn Leenders, marketeer for Utrecht Tourism, which became the client for the tourism pilot after the department of city promotion for the Utrecht municipality had been closed down. "This is one of the reasons why Hoog Catharijne is being renovated, the station area is being opened up into the city centre. The same idea that was behind the pilot – we wanted to make sure the business visitor would go into the city centre after his or her meeting."

Carlijn Leenders, Utrecht Tourism

A spy on a mission

I first wanted to figure out what ages the people in the target group were, what was on their minds. If you don't know that and you've got a whole concept all the same, it's probably an old idea you've reshaped.
– Monobanda

Monobanda
It was a tough assignment and a difficult decision to make at the pitch, say those involved. Eventually chosen to be the winner was Monobanda, an Utrecht designer studio that has been developing interactive experiences, often with a playful element, since 2008.

Like Hubbub, that created *Animal Mayhem*, Monobanda was involved with SEA from day one. "We were made aware of it via the Dutch Game Garden," co-founder Sjoerd Wennekes says. "The intention of SEA was to apply games and playable solutions in the real world and that really appealed to us. Especially since it was to be about bigger parties and larger budgets. Through this we would be able to create bigger, more exciting things." When the project actually lifted off, Monobanda was asked to pitch. "Unfortunately, we were not chosen to pitch for retail, while we had more ideas for that project," Wennekes says. "Eventually we were happy to pitch for tourism and we got the assignment."

Target audience analysis
Though the briefing had been clear enough, Monobanda did not have a clear view of the target group and its size. "Students at the University of Applied Science Utrecht (HU) would perform a study, but the results only came in after the pitch,"
Wennekes says. "That's why we had a very simple pitch: we are Monobanda, we do such and such, and if we get the assignment we will work together with you and use the results. I don't have an idea yet, no game, no story, I just know that I'll work together with you." The other parties did present specific ideas. "It just didn't seem sensible," Wennekes says. "I first wanted to figure out what ages the people in the target group were, what was on their minds. If you don't know that and you've got a whole concept all the same, it's probably an old idea you've reshaped. Or you didn't pay enough attention to the assignment and you're trying to get your own way."

The study turned out to be disappointing in the end. "There wasn't anything substantive to work with and the scope had been very limited," Wennekes says. "Then we did a bit of research ourselves by e-mailing all the people we know that work in a different city from the one they live in. We got more results than the HU group had had. The combined research projects we used as a foundation for our game."

Spy game
Monobanda got to work. "We made a few assumptions," Wennekes says. "With those as a starting point we developed and presented a number of concepts, one of which was chosen in the end: U-Spy, a spy game in the city."
In an early stage meeting locations La Vie and Seats-2meet were also involved in the project, plus a third meeting location that eventually dropped out of the project. "We first considered a game that would take place between the station, car parks and those meeting locations," Wennekes says. "Something with apps and smartphones. But that wasn't exactly what we were looking for, you still wouldn't have a clear enough encounter with the city itself. Then the game was moved more to the city centre."
With the location, the original target group was also dropped. "We started focussing more at what the city centre has to offer," says Wennekes. "We started going on walks through the city centre, looking for places we thought were fun to include in the game. It got us excited and TFI and Utrecht Tourism as well. A story arose from those places."

Mysterious
The story starts to unfold on a large white arcade machine at one of the meeting locations. "There you can play a game that's almost too simple to play" Wennekes says. "It shows the Oudegracht, as drawn by us, in the dark with all the nice old houses on the canal. Every once in a while a light goes on and you see a silhouette. You have to shoot it with a click of a mouse to score points. Amusing, but there is something else behind it."

The player had to report to the front desk next and mention he wants to play U-Spy. "Then you're given a mysterious card. With an instruction manual. The arcade machine turns out to have a small card slot, and if you enter your card, the game disappears and a website takes its place. You're shown a video that has an old man addressing you. He got U-Spy involved to help him solve a family mystery; as it turns out he belongs to one of Utrecht's oldest families. Then you have to start completing assignments around the city."

Monobanda put serious effort into it. "Our writer learned all there is to know about the history of Utrecht. Everything that happens in the game is historically correct and that makes it even more fun," Wennekes says. "For the video we had transformed our office into an old attic room. We arranged a proper camera, lighting and make-up. It turned out very well."

Missions

On their first missions, the players were sent to the Oudegracht. "While you're walking in that direction, you suddenly receive a text message on your phone. "Go to such-and-such address, find out which year is on the building's façade. A little later you receive another text message: "Add this number to the year and you've got the phone number you have to call." When you call, you reach an answering machine with instructions for the direction you have to walk in. This gets you to Café Olivier, which has a large wooden sculpture of a Biblical event, containing a puzzle."

The game also passes lesser-known locations. "Close to Mariaplaats there is an area with new apartments that are pretty hidden," Wennekes says. "When they started building this, they discovered the floors of a medieval monastery. The tiling has been preserved. The new apartments are on top of it, but you can see the floor from the outside through a glass pane. Halfway through the third mission the players are led to this location. The flooring consists of nine different types of tiles in a mosaic-like pattern. We connected those tiles with a letter from the alphabet and the players have to figure this out."

There were four similar missions, which even included a bit of intrigue. The game ended with an exciting message in a locker at the Tourist Office. That was also one of the game's main bottlenecks. "Human factors come in to some extent," Wennekes says. "We automated everything we could, like the text messages. The staff at cafés had been informed and that usually worked out. Oddly enough, things most often went wrong at the Tourist

Screenshots of U-Spy

Office, where sometimes people at the counter would say: "I don't know what you're talking about." Then the game is over... while we gave them clear instructions. 'Oh come on!' was my response. But of course it will always be a complex product for parties that don't produce games themselves."

Not used very often

Halfway through 2012 the pilot came to an end. "Everyone who had played it filled out a survey with their experiences and how it affected how they thought of Utrecht. It was very positive," Wennekes says. "We created something that we can proudly add to our portfolio and that is really a fun addition to the city as well. I think the client was also excited. When we presented our plans, we sent them out to play the first mission. They all came back with big smiles on their faces."

Utrecht Tourism confirms this, but does have a few remarks to add. "The game is a lot of fun, but more suited for instance for teambuilding activities and bachelor parties," Leenders says. "In its present shape it just hasn't been used very often. One wonders anyway whether something like this could work for business visitors at all, won't they at most want to get a bite to eat? I think the format and the target audience didn't match very well. That's not a huge problem, it's SEA's intention that we're working with pilots to try something new. But then the outcome can also be that it doesn't work and that we won't continue to use it."

Follow-up plans

Monobanda wanted to continue working on U-Spy. "We wrote a plan with points for improvement and new ideas," says Wennekes. "We wanted to also set it up in Amsterdam, Rotterdam and The Hague. City marketing for every sizeable, self-respecting city. It would be a lot of work, the treasure hunt has to be completely different with a customised storyline for every city." But the strict funding rules stood in the way. "At the start of the SEA project you sign away all rights, everything you create belongs to TFI," Wennekes says. "When we started we thought that was fine, but when we wanted to continue independently we had a problem." TFI was very supportive of a relaunch, but the funding bodies did not agree. "In the end we were allowed to take the concept

with us, but only starting January 2014, after the project had finished. That just takes all the momentum out of it."

It probably won't lead to anything. "We would have to do everything ourselves. Utrecht Tourism doesn't have the funds to do it. I don't mean to sound bitter about it, it's just the reality we have to deal with."

Utrecht Tourism confirms this. "Were Monobanda to come to me now, I wouldn't put any money on it," Leenders says. "The game does not contribute enough to our targets, the investment is not justified by the gains. Also, our budgets are very limited, which means we have to be very careful about our decisions."

Under the radar

A fun game it is, but not a hit. It also didn't get much attention from the press. "We worked very hard to bring it to the media's attention, also locally," Wennekes says. "It's a game you play in Utrecht, and it's free – that's great, right? But all we got was a few words in the Utrecht online newspaper. We didn't understand it at all, normally we're very good at making waves." Indeed, with previous projects Monobanda had been noticed internationally.

The project also didn't lead to any follow-up assignments. "U-Spy stayed completely under the radar for everyone, you see," Wennekes' colleague Niki Smit says. You could say that for a spy network, that's extremely successful.

UTRECHT VS. THE WORLD

Facebook battle of the city ambassadors

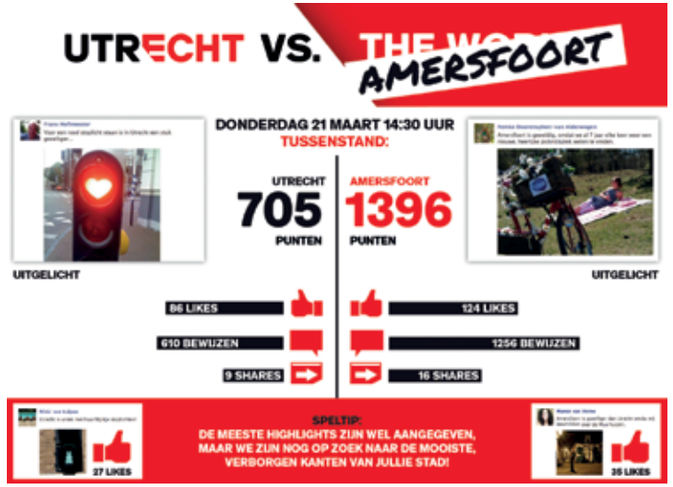
With U-Spy, Utrecht Tourism had an amusing treasure hunt through the city in hand, a free game that still didn't get many users. And in any case failed to reach the desired target audience of business tourists. But had the assignment actually been good enough? Those business customers by definition would have work to keep them occupied; wouldn't they be the last ones to take the time to play a game? Be that as it may, for the next stage a completely different angle was explored. The assignment became simpler: generate publicity for the city of Utrecht. Not geared towards tourists that were there anyway, but the people that hopefully would become them in the future. Through an accessible game they would simply play from home.

Vuurrood

After the pitching round, Vuurrood, a communication design agency operating from Rotterdam since 2004, was chosen as the partner for this next project. Founder Hans Foks teamed up with freelance game designer and copywriter Hanne Marckmann, who also happens to be his wife. The pitch was impressive, especially because Vuurrood had already performed a playtest to show how effective their concept was. Simple it was too: challenging a city on Facebook on behalf of Utrecht, after which players had to prove why their city was the better one.

Test group

"The test had been set up in a heartbeat," Foks says. "We added two people from Utrecht to a closed group on Facebook



Screenshots from the playtest against Amersfoort

When a butcher from Utrecht is liked five times, you know it's a good place to go to.
– Vuurrood

and started coming up with arguments and proof. This shows the power of the concept: you can get started straight away, you don't need much in the line of technology. Also, the test proved there was a real urge to play once you had started. Five days on and still new posts were being added."

The test was informative for setting up the rest of the project. "With four people, we had already collected way more data than expected," Marckmann says. "If the group hadn't been a closed one, we would have influenced our network, everyone would have picked up on it. We could make a rough estimate. Now we also knew the kinds of arguments we could expect. Not just the Erasmus bridge and the Dom, but also an artisanal butcher. And fake claims, like cable cars that turned out not to exist at all."
"This way you find out you do have to set up some rules," Foks says. "With every post you have to offer some proof, for instance a picture."

Challenges
In the briefing, two target audiences had been singled out: a young target audience consisting of families and an older one. "The younger group was clearly more active on Facebook than the older one," Foks says. "Then we started looking at whether there was something we could do with the results of a battle, for instance generate PR. When a butcher from Utrecht is liked five times, you know it's a good place to go to. A local newspaper might think it's a good subject to write something about. A newspaper article is still a great way to reach the older target group."
But Utrecht Tourism decided to focus on the younger target group, which meant we didn't put much more thought into this.

The matter of how it was all to be judged was a tougher issue. Because who was going to keep score? "For our test we asked someone from Amsterdam, an independent party," Marckmann says laughingly. "Would he want to have a look at who had won, according to him. He could have just added everything up at that point, but he actually came up with a system of his own." Not just the amount of proof was important, but also the amount of likes and shares.

'Utrechtenaren'
The new insights on Utrecht that the developers from Rotterdam gathered they literally worked into their proposal. "Initially, we had used the word 'Utrechtenaren' everywhere to indicate people from Utrecht," Marckmann says. "We didn't have a clue that it's not what you're supposed to call them. We actually kept it in the final presentation, but with a strikethrough and 'Utrechters' next to it. We were the living proof that the concept can work, that one playtest had taught us many things about Utrecht." A change in personnel at Utrecht Tourism meant the second pilot had been initiated by Sander Geleedst, but when he went on a trip around the world Carlijn Leenders took over his position – when the concept was already there and the development had just started.

Vuurrood got to work with two large tests that each took up three full days. Firstly: Utrecht vs. Amersfoort. Which one of the two was most 'gezellig' as the Dutch so famously say, or had the nicest atmosphere? "We used existing techniques for the most part," Marckmann says. "We did not build anything complicated, didn't spend money on technical developments."

Promotion
Leenders had her work cut out for her right from the start. "I put so much effort into promoting it," she says. "People really liked the messages and pictures that were being posted on the app, there was much *liking* and *sharing*. There was a noticeable threshold when it came to people adding messages themselves, though. We kept on spurring people on to join in, with some success. Still a lot less people joined in than we would have hoped."
It wasn't all easy for Vuurrood either. "I kept on adding up the numbers," Foks says. "We did that every day to check intermediate scores. But posts from the first and second day would still get replies later on, so you kept on having to start over and count from scratch."

Taking on Amersfoort
Then there was the shocking apotheosis. "Amersfoort really won by an awful lot," Marckmann says. "Utrecht didn't like this, but well, when you play sometimes you lose."

How was that possible? "Amersfoort had a much tighter online community, and they

Screenshots of the second pilot

People from Utrecht are proud of their city, of course, but they didn't display as much of an urge to parade it around.
– Utrecht Tourism

really got each other excited about joining the game," Leenders says. "When you're being challenged by a larger city, this kind of underdog position can actually be appealing. People from Utrecht are proud of their city, of course, but they didn't display as much of an urge to parade it around."

The accursed score system had also played a part, and this was addressed before the second big test – Groningen was to be challenged during the students' introductory week in both cities. Which of the two was the best city for students? "For that test we did develop specific technology," Marckmann says. "We wanted to get an automated system in place for keeping score and also change the balance a bit."

Technical development
There was a discussion with the SEA consortium whether a full Facebook app should be developed. "We decided not to," Marckmann says. "It would have created too big a threshold. Players would have to perform a number of steps before getting access." An iPhone app was created, though, and players could take pictures with it and post those.

For keeping score, we wrote an independent web module that read the results off of Facebook, though there were a few problems there. So when Groningen was complaining about the scores, it was not just because they were so fanatical about the game.

Taking on Groningen
"Groningen was a pit bull," Foks says. "They literally did a recount of all the points." "They took it very seriously," Leenders says. "They said: you are already ahead, why does that one tiny point mean so much anyway?" "It was also because we had told them we would be testing the technical workings," Marckmann says. "Then people pay extra attention." It turned out shares were only visible on Facebook if they had been from friends. "The privacy settings on Facebook can't all be overruled," Foks says. "They change them constantly, too; sometimes one thing is opened up, then something else is closed. With a closed app we wouldn't have had all of this trouble."

Social media
Friends. They would have liked to have had a few more of those in Utrecht. The Vuurrood pitch had appealed to Utrecht Tourism among other things because Facebook was mentioned; experiences with the game showed there was still a long way to go.
"The Utrecht Tourism page now has a thousand likes," Foks says. "While Groningen has over ten thousand already. Once they put one message on their page, it spreads immediately. There was a similar kind of difference between the team captains: the one in Groningen had at least 500 Facebook friends, while the one in Utrecht had no more than 150."
Leenders puts it all into perspective. "In Groningen it didn't go very well either," she says. "There, mostly the stay-at-home mums and people working for Marketing Groningen took part. The students there also didn't show a collective urge to win." "You need a few strong ambassadors," Foks counters. "People who get the fire started. So far they came from the publicity offices themselves. Still, there were quite a few external participants as well, even if they were a bit less involved. Groningen actually managed to get a message onto a screen on the big city square, reading: show Utrecht we are the best! Then, results start flooding in."

Student introduction week
"The timing, during the intro-

In an experimental setting like this you're not afraid to mention the lesser successes without having to come up with a solution right away
– Vuurrood

duction week, seemed perfect," Leenders says. "That week is when the connection with the city is essentially created. We didn't take into account, however, that students hardly check their computers at all that week. The first-years are out on the town, the rest is still on holiday. This would have worked out better during a normal week of classes."
All in all, Utrecht also lost against Groningen. "We were a bit worried the press might catch on, that wouldn't have been very nice," Leenders says. "It wasn't too bad in the end, but we cannot afford losing a third time."

Regardless of the different topics ('city with the nicest atmosphere' and 'best city for students'), both test showed the same arguments and proofs kept on coming back. "In Amersfoort an image of a bull statue at a roundabout came up," Leenders says. "I know that roundabout, it's nice, but would you really call that 'gezellig'? In Groningen a picture of a tractor was popular. Well, that's a lot of fun for students, right? People only see 'Utrecht vs. Groningen' and don't really notice all the rest." One suggestion from the evaluation with Groningen: categories. They could give players a sense of direction, once they are forced to pick one before they can post something.

Collaborative efforts
Despite all the losing, Leenders can still look on the bright side and see some merits. "There were really people who got excited about Utrecht and they are still on our Facebook page," she says. "When you scroll down the page you see spots you might not yet be familiar with. At the same time, I discovered places in Groningen that I might want to visit one day. That part of the story is important in convincing other cities to participate. It's not just for Utrecht, there are benefits for both parties."
In Utrecht itself the game led to collaborative efforts. "Apart from our own Facebook page, it's been exported to the pages of Hoog Catharijne and the museums of Utrecht, and to Utrecht University's website," Leenders says. "That had never happened before and is a great start."

What should it look like?
All in all, Utrecht Tourism is cautiously optimistic about a follow-up. But what should it look like? Vuurrood brought up three scenarios. Option one: back to taking score by hand. "We would put an intern on it and we could get rid of all the technical stuff," Marckmann says. "Then you've got a not completely watertight but accessible, easy score system."

Option two: improve the current approach. "You could hire some technical experts that are on the ready during the run," Marckmann says. "But as soon as it gets out that there's something wrong, players would of course start complaining."

Option three: create an app after all. "It won't be possible anymore within the pilot," Marckmann says. "Personally this is my favourite option, because then you'd have proper reference material. It can also become more of a real game. Now it's like the gamification of posting messages."

Follow-up plans
For Utrecht Tourism, that wouldn't be an option. "Then I would have to invest €10,000 in it," Leenders says. "If I had that kind of budget, I would use it for something else that gives me more direct results. Option two makes the most sense to us. Vuurrood is on that now, and with the results we'll do a final playtest next year."
Eventually she does want to use the game as a yearly campaign tool. "The process could be made a bit shorter then," Leenders says. "First boost it for a week, then play it for two days. By that time I'd want to make sure we have more followers and put some serious thought into the subject and the city that we'd be competing against."

Experiment
Leenders also apologises for the communication issues. "I am incredibly busy and this is the kind of project that can usually wait for a while," she says. "So sometimes it would take me a month to get back to Vuurrood. That was probably difficult for them to work with. I thought: we'll finish that off when I'm in Rotterdam again. The trouble with working with someone in a different city." Proof also that the development and promotion of a game can take up quite a lot of time.

Vuurrood has some praise for the SEA project's structure. "You get a completely different dynamic to what you would normally have with a client," Marckmann says. "And in an experimental setting like this you're also not afraid to mention the lesser successes without having to come up with a solution right away. You can also share it with the SEA consortium group and ask: does anyone have an idea for this situation? Everyone at the table tries to expand the limits of their subject area and that is noticeable. While customers still often think in terms of gamification, or games that to us in the game world were last interesting four or five years ago. I learned an awful lot for future projects."

GUEST QUEST

A game of hospitality

In contrast to the retail and heritage teams, the tourism section of SEA did make it to a third independent pilot. There is an interesting pattern underlining the three games developed on behalf of Utrecht Tourism. From the amusing but not very 'applied' city game *U-Spy* and the practical but laborious Utrecht vs. The World to a very specific educational game for the hospitality industry: *Guest Quest*.

Hitch on to existing projects
"I am swamped with phone calls from app builders who would like to create all sorts of amazing apps for me," says Carlijn Leenders, marketeer for Utrecht Tourism. "Well, as the city of Utrecht we have one official app, a city guide containing all tourist information, and that's enough. I didn't want to think up yet another app."

A brainstorm session was set up with the SEA consortium. "I indicated I wanted a connection with topics that were already relevant in the city," Leenders says. "Take the Domplein, an underground museum is being developed there as we speak. Entire treasure troves are being dug out. One of the ideas was to include it somewhere."

A city is an incredibly complex product, everyone can influence it greatly.
– Utrecht Tourism

"City marketing is not just about promotion, but also product development," Leenders says. "A city is an incredibly complex product, everyone can influence it greatly. We try to direct things by working together with all sorts of parties, for instance in the field of hospitality. If a taxi driver drives past Hoog Catharijne, the station area that has been one big construction site for years now, and the customer asks: what's that? You don't want him to say: that's one bloody mess. You want him to say that something beautiful is being built there. A taxi driver, in a way, is also an ambassador for the city."

Hospitality

In an existing hospitality project the need for a training scheme was expressed. "For a broad target audience," Leenders says. "Not just taxi drivers, but also hotel and catering staff, for instance, and employees at the Tourist Office. But training programmes were often seen as dull. We didn't want there to be a trainer necessary either, yet e-learning was quite boring still. Then we came to games as a medium. We wanted to use the SEA investment to explore whether an educational game could work in practice."

For the briefing to the executing parties, Leenders together with TFI filled out the *Applied Game Design Canvas*, a tool with the aim of getting the question out in much better shape. "The question was a lot more specific than 'something for business visitors' or 'something people can do from home to get acquainted with Utrecht', she says. Three parties put in a pitch and the design agency Shapers from Utrecht got the assignment. While having been around since 2000, over the last seven years, under the leadership of Niels Floor, the company has been dedicating itself fully to learning experiences.

Shapers

"This assignment matched perfectly with what we do, we really wanted to get it," Floor says. "It gave us the possiblity to develop our own training scheme, we could even experiment. We always begin by focussing on the learning goals we want to achieve and the target audience we are working with, so we can find an optimal solution. It sounds quite generic, but with an applied game you'll for instance have to figure out how to translate learning goals into the rules of the game. Sometimes a game setting works, sometimes it doesn't. Every time it's like a puzzle we have to solve."

Shapers had put a lot of work into the pitch. "The concept was pretty much done," Floor says. "And we went away and finished our target audience study as well." "It was still anyone's guess whether we could create a game generic enough for both taxi drivers and catering staff to use," Leenders says. "Basically the answer to that was: no, that's not possible." "Our opinion was that the concept could be applied broadly, but for the pilot we wanted to pick one subgroup anyhow," Floor says. "The waiting staff at café-restaurants was our group of choice. Not too big, but not too small either."

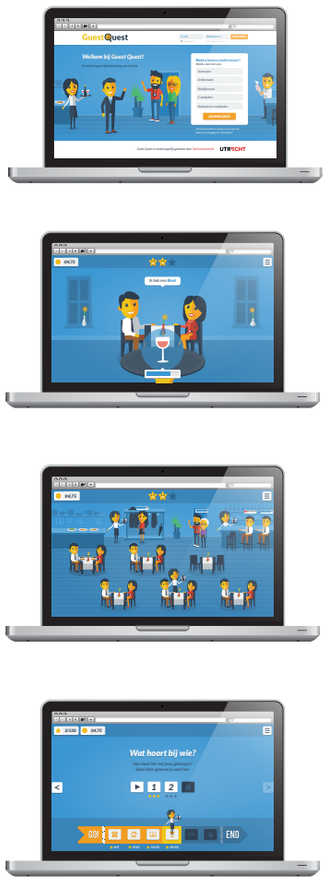
"We've got a lot of those in Utrecht, like Winkel van Sinkel and Café Olivier," Leenders says. "Establishments where you can get a beer, but also have dinner. In restaurants and hotels the staff have often had the kind of training that went into the principles of hospitality, but these 'grand café's' just employ students mostly."

The guest journey

Leenders was excited about the pitch. "The game followed the *guest journey* along several steps. The hostess could have been absolutely incredible, but if afterwards the doorman spits on the ground in front of you the good feeling is gone. Shapers showed very well that everything is connected this way. We also thought it was great that they went out on the streets. It meant that they, out of all parties, could tell us the most about how hospitality works."
There were also practical considerations in choosing Shapers. "I wanted a candidate from Utrecht" Leenders says. "To keep the money here, but also because in the last pilot I lost half a day whenever I had to visit Vuurrood in Rotterdam. Now, I simply get on my bike and pop by Shapers." Niels Floor and his team could get started straight away. "That really helped, because the schedule was tight," he says. "Otherwise we wouldn't have made it by a long shot."

Experiential learning

The learning goals determined the design's direction, as is always the case with Shapers. "You learn through experience," Floor says. "But what exactly makes an experience educational? We reshaped the models that already exist on the topic into something you can explain and apply well, but that still is profound as well. This way, we identify four types of learning goals: cognition, experience, perception and behaviour. They were based upon the idea of experiential learning and the work of Kolb among others. We also use the *be, see, know, do* model. Being and doing are part of behaviour, but being and doing also require an understanding. Seeing and knowing go with cognition and knowing and



Screenshots from *Guest Quest*

doing require significant skill." There is a logical order to those things. "You first have to realise why something is important for you, then you have to learn to understand it and once you understand it you need to acquire the skill to be able to apply it," Floor says. "Then you have to apply it and keep on applying it. If you don't, it will stagnate, because new applications lead to new insights. Eventually your behaviour does start to change. That behaviour isn't part of *Guest Quest* very much yet, but it is something we carry in the back of our minds."

DIY-game

Shapers' initial idea was to let every organisation shape the game for itself. "If you set out a path together there is already a discussion on that point," Floor says. "You start on the game with a different understanding. It's also your playing field." "The guest journey starts out with someone making a reservation, entering, ordering something. "We thought it wouldn't be necessary to do this with the whole team, because everyone knows how this works. It's quite obvious." "In its present pilot shape for just one target audience, it wouldn't add much," Floor admits. "But I'd like to have a look at this later on."

What comes with it

Shapers really dived into what hospitality means. "We went looking for theories and systems," Floor says. "Then you get to issues like the continuity with the service you offer, the feeling you give to people and the way the organisation functions around it. Does it give you the chance to be hospitable, or do you have to wait on the entire, jam-packed outdoor seating area on your own?" He who creates an educational game, also learns what he wants to teach the target audience. "In a television show like the Dutch 'Ik vertrek', you see people who move to the south of France to start a business – and often completely miss the point," Floor says. "I always think: it can't be that difficult, right? Now I know that it's not necessarily difficult, but that there are many different things you have to take into account all at once. Hospitality is more than just a friendly smile, welcoming people and making sure the food is hot. There is a whole spectrum of possibilities that could be applied quite subtly."

Van Spronsen

Already in the pitching stage a hospitality expert was involved in the project who would prove to be an invaluable source. Hans van Spronsen has been training people in this field for twenty years. "He is just as involved in this as I am," Leenders says. "I am a bit more into telling people what to do and when, he is the content expert."

"Together with Van Spronsen we had a look at the steps of the guest journey," Floor says. "Some things were dropped at that point, we were left with the ideas that we had most to gain from. Everything was developed further up to a certain point and presented again. With a prototype you have to be very flexible." The present game consists of six mini games, which is a lot considering the tight schedule. "It's a matter of managing very well that all separate elements are being produced at the right time," Floor says. "You have to make sure no one in the team has to wait for someone else."

Playtesting

On the day Niels Floor became a father, the first playtest was held as well. "When things were easing down at the hospital I got a message the test had gone really well," he says. "Then I thought: great! We've tested two mini games, they worked well within the larger concept. We got very helpful, supporting feedback on it." "We tried them on the employees at Café Olivier," Leenders says. "The man in charge there pays a lot of attention to hospitality. They already have training schemes, which you can tell from the staff. We had four people at the table who had already been working there for a longer period of time and four who had just joined the staff. You couldn't tell them apart."

The first mini game was about reservations. "You would also get a real audio recording," Leenders says. "It felt like a game, with nicely dressed up little characters. The question was: which answer will you give to customers? It was funny, those testing were laughing out loud while playing. But once you reached the higher levels, the situations did become more difficult."

The second mini game was about ordering. "Characters would be sitting at the tables and order things," Leenders says. "Your assignment would then be to drag the glasses to the right characters. I was wondering whether that wasn't a bit too easy."

Evaluation

"People were very motivated to try all the games," she says. "They also received tips for it, and stars. Eventually, they could create a ranking of sorts showing how well you are performing compared to your colleagues. This shouldn't go too far of course, with a boss saying: I see you've only got two stars, we need to talk. The employees at Café Olivier indicated they wouldn't mind the idea of competing against other businesses, to see which one is the most hospitable. That's great!"

Screenshots from *Guest Quest*

It got everyone thinking out loud about the question how you are supposed to show hospitality. All those involved learned from the experience and became more aware of their behaviour.
– Utrecht Tourism

As is often the case with applied games, much of the momentum was in the evaluation round. "When someone complained that something in the game wasn't right, a discussion got going," Leenders says.
"It turned out, among other things, that everyone has different tricks for memorising who ordered what. That got everyone thinking out loud about the question how you are supposed to show hospitality. All those involved learned from the experience and became more aware of their behaviour."

Behaviour and understanding
It was an indication that the game should be part of a broader training scheme. "*Guest Quest* on its own is not enough to make people more hospitable," Floor says. "That wasn't the intention either. The idea was to open people's eyes. If that is successful, I think the client is already more or less satisfied." Leenders confirms this. "Shapers is quite into influencing behaviour, the last step in the learning cycle, but I don't think we need that kind of ambition just yet. Let's leave it at creating awareness for now, then people can apply things later for themselves."
Floor doesn't think that's enough. "We would like to see players build up an understanding, top it up with the right knowledge and then also learn to apply all this. That is why it's a great thing this is a pilot: we get to be gutsy and to see how far we can get this to go."

Scepsis overcome
Utrecht Tourism is excited. "Beforehand, I was wondering whether people would like it, whether they would actually learn something from it," Leenders says. "But the playtesters' message was that they had really been made more aware. We can use this to make Utrecht more hospitable."
Van Spronsen, too, was a sceptic at first, but has by now warmed up to *Guest Quest*. "Now he even wants to invite a group of colleagues from the trade to come and try it sometime," Floor says. The pilot has to be finished by the end of 2013, before the end of the SEA project. There is much work to be done. "The project ends at a point where we still have quite a lot of questions left,' Floor says. "Hopefully, it will continue as a regular assignment, then we can still add to it where necessary and catch up with the target audience."

Follow-up plans
Even though the original funding conditions made this difficult at first, in the meantime Utrecht Tourism has made clear it will be the game's new owner and it is going to have *Guest Quest* developed further. "We look forward to working with it in real situations," Leenders says.
The game as it is right now runs on web-based technology. "It's broadly accessible, so in principle you could also play it on your phone," Floor says. "This is the quickest way to reach as many people as possible with it. Once you get involved with apps there are the different platforms to consider, like iOS and Android. For the follow-up we have to ask ourselves anew whether it should really be an app after all."
The direction, for now at least, depends on the available budgets. "I would like to make the game available to a second target audience, taxi drivers or museum staff for instance," Leenders says. "For that, I'd have to find a budget. "

Educational
The pilots have at the very least been educational. "They showed me that games can definitely work," Leenders says. "It is possible to aim it at your target. But a lot more thought goes into it than you might imagine. It's no magical solution, which many people do seem to think it is. In the leisure sector people are looking for innovative ideas. You'll hear them say: people play games, they use social media, that's the kind of thing we have to do. Such a thought comes from higher up in the organisation, a global kind of idea a city councillor or director might have. Employees copy the idea, but it usually ends up just being a bit off."

She does have more faith in *Guest Quest* than in the previous projects. "In this case a manager or boss will say: you have to do this, plain and simple. Of course the developer still has to make sure it's fun and educational. But with many other games the target audience is very large and people decide for themselves: yes, I want to go play this.
In many organisations the awareness is missing of how many games actually exist.
I get so many invitations on Facebook that I sometimes think: oh please, enough with those games! I think that goes for many people. It has to be really a lot of fun if you're ever going to try and play it."

RESEARCH

HOW DO YOU OPTIMISE COLLABO-RATION?

Developers and clients

The collaboration between game developers and clients is crucial to the development of an applied game. This is why, within the context of SEA, there was a study into the question how this kind of collaboration can be optimised. Even though there is increasing knowledge on the subject, many aspects still haven't been fully crystallised. It is important to get a clearer image, as proper interaction between developer and client is an essential requirement to ensuring the applied game can meet the client's demands.

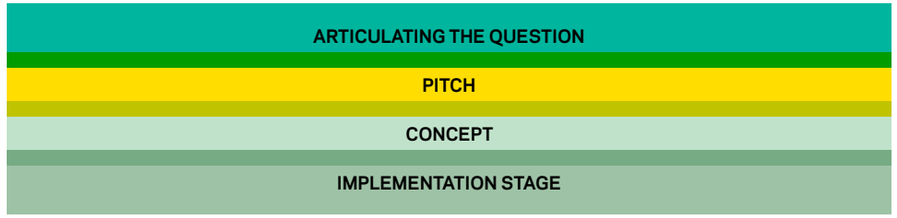
The HKU already has wide experience and expertise in escorting applied game development (see for instance GATE[1] and EGG[2]),which is why it took on this part of the research. This study makes use of interviews and evaluation rounds that were held with the SEA clients (University Museum, Designer-Cafe and Utrecht Tourism) and the developers they worked with. The results in this article mostly came out of the first pilot round, which consisted of *U-Spy, Animal Mayhem* and the DesignerCafe crowdfunding app. We will go into some general lessons learned, as well as those specific to the client or the developer.

Previous research

Previous HKU research already brought up some important points. Van Roessel and Van Mastrigt-Ide (2011) named the three essential elements for collaboration and creating teams when designing an applied game. Firstly, a *subject matter expert* (SME) has to be involved in the development. Secondly, this SME is often the client or someone

1 gate.gameresearch.nl

2 expertisecentrumgames.nl



The different stages of the SEA pilots

working for the client, which can lead to an unbalanced game. Thirdly, there is usually no transfer expert present to safeguard the applied game's learning goals.[3]

Falstein and Fox (1997) wrote about collaboration processes in the development of entertainment games. They identified five factors that improved the chances of a successful collaboration, being clearly identified roles, mutual respect, a shared vision, complementary skills and a well-running process.[4] Entertainment games in general require a different construction than applied games, seeing as most of the time there is no direct client that is also a content expert. But because the findings of Falstein and Fox are broad enough they can also be taken into account when discussing applied games.

The SEA structure

In designing the structure of the SEA pilots, some of the factors mentioned above were taken into account. The SEA consortium, for instance, brings complementary skills together; the members, though no part of the development team itself, were available for additional knowledge and expertise. They could be 'flown in' where necessary. Though it was not always clear how and when exactly they could offer support. In concurrence with the findings of Van Roessel and Van Mastrigt-Ide, clients in most SEA pilots also took on the role of SME or domain expert. Clients were also involved in the distribution of the applied games.

The pilots each went through the stages mentioned above, though we will not go into the implementation stage in the following. These stages were subjected to scrutiny in the evaluation round, as well as the frequency and nature of the collaboration between client and developer. As will become clear, not every client felt himself, as domain expert, a part of the development team.[5]

Articulating the question

When articulating the question, the developers had not yet been chosen. They, of course, only came into the picture when they delivered their pitches. There was no collaboration between developer and client possible up to that point. The SEA consortium did do some work in advance that was important for later collaborations. The HKU team for instance delivered a presentation to the clients about what applied games are and what you can use them for. This way they could get a first glimpse of how games and play could work in their field of expertise. It helped the clients to better articulate their requests for tender (the question companies can attempt to answer and pitch to).

The clients' experiences with articulating their question were mostly positive. They were of the opinion that because of the consortium they were better prepared for their tasks. This gave them a stronger position later on in their collaboration with developers. It would, however, take up quite a bit of time to get all knowledge partners together, which slowed down the process. It also turned out the question articulation could have been more directive. This is why in the second and third rounds the Applied Game Design Canvas was used.

"The organisations at the table created a very nourishing environment."
– DesignerCafe

"First we had to find out by doing what such a question would look like... but we later used it again creating the briefing."
– University Museum

"It was quite a lengthy process to get to a good question. It would be quicker now, because the parties now know each other."
– Utrecht council

3 Van Roessel, L. & Van Mastrigt, J. (2011). *Collaboration and team composition in applied game creation processes.* Proceedings of DiGRA 2011 Conference: Think Design Play.
4 Falstein. N. & Fox, D. (1997). *Collaborating in game design.*
5 The last Tourism pilot was an exception to this rule: the hospitality expert involved here was an external party.

Lesson

For the client:

- Make sure, already in the articulation of the question, that the necessary (independent) game expertise is present. This allows you to write a better request and make a well-founded decision as to which developer would best suit the assignment.

Pitch

From responses to the requests for tender, each time three companies were invited by TFI to deliver their pitch. The domain-specific client and the SEA consortium were always present.

A form had been drafted up to give these clients something to base their decisions on. The checklist contained several aspects that are important in developing and implementing concepts. There were questions such as: how well does the concept content match the question? How well does the atmosphere and style suit the assignment? Did the party paint the right picture of the target audience? Those present gave out score points per subsection, on a scale of one to five. Later on, it turned out these factors were not all equally important in choosing the creating party.

What the evaluation for instance showed is that trust, showing interest and respect regarding the content are decisive factors in choosing a developer. The client after all has to feel good about the collaboration. Feasibility was also an important factor.

"Having faith in the other parties is the most important thing."
"Kars (Hubbub) showed a real interest in the museum. That kind of curiosity is a good feeling. He didn't take the content for granted, but understood it's an important aspect."
– University Museum

"We got to work with the party with the least fixed idea. Openness and it being appreciated works best for us."
– Utrecht council

"In the end, feasibility is conclusive."
"Gut feeling also plays a part, though."
– DesignerCafe

A completely finished concept is not necessarily an advantage either, it figures. It's also connected to the fact the client is often the content expert and he or she will later on influence the design greatly.Whenever a developer clarified to the client that its intention was to study the integration of content and gameplay it gave off a more positive image than if the developer had already presented a concept in which all content was incorporated.

Lessons

For developers:

- In a pitch, don't (just) show what the final product is going to be. Show them you can handle the future client in a co-creation kind of setting.
- Be genuinely interested in the subject matter and the knowledge of the content expert: content expertise will be an essential part of the game in any case and this knowledge is best acquired through positive collaboration with this SME.
- Do not create a game concept based upon (personal) assumptions: check the client's specific wishes.

Playtesting *Animal Mayhem*

For clients:

- Consider whether you could see yourself working with this developer, seeing and talking to each other on a regular and also informal basis.
- Consider whether the developer is still up for an open approach and is open to your input. If the concept seems fully fixed you could be dealing with a concept the developer had lying around, had wanted to develop for a while already or had even 'shelved'.

Concept stage

Once developer and client are matched up, the concept stage is on. In many cases, a concept (or several) will already have been presented during the pitch. As is explained above, it is possible to deviate from this concept at any time. This has to do with, among other things, game design being about designing and developing behaviour. Only by testing a concept (by means of a prototype) is it even possible to know what kind of behaviour the game engenders. It is not unheard of that a test leads to unexpected and undesired behaviour and the

concept is completely turned over.
In the first round of pilots the concepts, in retail especially (the DesignerCafe crowdfunding app), were only forged after the pitch. In heritage, (*Animal Mayhem*) the blueprint for the game was already present in the pitch, even though both concepts were still radically changed through iterations.

In the iterative design process a successful collaboration between client and developer is of the essence. The developer can benefit from a lot of input from the client, both on content and the product context.
A positive example can be seen in the collaboration between developer Hubbub and the University Museum. The museum was very much involved in indicating which animals and attributes could be put in the game. Museum employees validated all the information that was used in the game and gave feedback.

They also played an important part in how the game was fitted into its context. Because the game was linked to a museum exhibition (the Cabinet of Curiosities), the museum's input was of vital importance in this area as well. In the concept stage there was weekly contact between Hubbub and the University Museum. This frequent meeting was seen as positive by both parties. Already early on in the process a paper prototype was tested on location, which also could not have happened without close collaboration.

The importance of investing in close collaboration between game developer and client was also apparent when the museum had a sudden change of personnel.
A newcomer had to temporarily take the place of main directive force behind the project, meaning the common language between developer and client had to be redeveloped. Partially because not everything had been clearly documented, decisions that had been made before needed to be re-evaluated and defended. A change in personnel therefore means re-investing in a common vision; proper documentation can help to make this process easier.

In the first pilot for the tourism sector the contact was less frequent. There was actually only one real meeting after the pitch in this project and it was informal in nature. The next encounter was to deliver the final result. Because of this approach, the client (Utrecht Tourism) and developer hardly had the chance to get to know each other – and real co-creation was of course out of the question. The client expressed a strong desire to try a different approach for the second round. The client would have liked to have had a clearer picture beforehand of the development process and its role and responsibilities in it. Now, it had for instance been unclear who was really responsible for staying in (frequent) contact.

Lessons

For all involved:

- Paint all parties the same picture of what a design and development process looks like.
- Exchange intermediate products like mock-ups and proofs of concept.
- Make sure there are both formal and informal opportunities to discuss progression.

These lessons were brought into practice in the second round of pilots, in which there was more intensive contact between clients and game developers. Developer Fourcelabs for instance planned a weekly play and playtesting of prototypes with the University Museum, after which there was an informal evaluation each time. Developer Vuurrood and Utrecht Tourism also had regular contact. Because of the distance between both parties, however, this was mostly through e-mail and by phone.

Evaluation first round

The evaluation of the first round of pilots showed all parties involved were happy with the possibilities SEA offered for launching concepts they normally were not able to and grateful to gain experience with projects of this kind. The pilots offered many a learning opportunity. The clients were also happy to stay in place as commissioning parties within their domains for the second and third rounds. This meant they could take their gained knowledge about collaborating with game developers along with them. They were starting to speak the right language and already better able to judge the quality of a design pitch, in part through the *Applied Game Design Canvas*.

An important point taken away from this stage, is that it is not a problem if at the pitch a large part of the concept is still undetermined. What is more important, in fact, is that a developer can show to be open to the content matter. This was also briefed to all potential developers in the other SEA pilot rounds.

Children participating in a playtest

TESTING TO SEE IF IT WORKS

Validation by playtesting

In the world of applied gaming there is an increasing call for validation. Do the games really have the intended effect? Applied games need a strong, research-based foundation of their effectiveness, to safeguard the practical and financial viability of the industry.

After the development of an applied game an elaborate validation study is, however, often left out, because there aren't enough means. An alternative is to validate the intermediate products (prototypes) during the process of development, for instance through playtesting – playing the game with the target audience. This is always more or less a part of the development process; were the playtests to be systematically planned and evaluated, however, they could also provide us with important validation data.

The responsibility for this issue lies primarily with the game developers: they are supposed to promote the applied game in all its effectiveness. Ideally, tests are performed during the entire process, with every iteration. With enough money and time, a game developer could also hire a playtesting expert as part of their team. He or she could then concentrate fully on setting up, executing and interpreting the specifically targeted playtests, and take measurements with validated equipment for evaluation and user feedback.

This article is about the way in which playtesting and validation were applied in the SEA pilots *Utrecht vs. The World* and *Age of Medicine*. It reviews the pros and cons of the pilots critically, after which some of the learning points are highlighted. These learning points are practical starting points for setting up validation through playtesting in future applied game projects.

Cyclical process

Applied games are most often designed following an iterative, cyclical design process in which fixed steps are repeated a number of times. Using the feedback from previous iterations, the design is continually improved.
Ideally, every iteration contains a playtest, preferably with the target audience. This way, the effectiveness can already be measured during the design process. The tests then indicate for instance whether the gameplay leads to the right kinds of behaviour or whether the graphics fit the style

preferences of the target audience.
If you do this in a proper way, the game can already be validated during the design process. This saves time and money at the end of the line, because it makes independent validation research redundant. Also, when validation research is only tackled at the end, there is no room for improvement anymore. If it turns out the game doesn't work at that point, nothing can be done about it.

Not all that easy

Sometimes it's hard to even get enough testing done during the design process or to get the target audience sufficiently involved. This could be because the target audience is hard to reach or because the tests weren't planned far enough in advance. As opposed to the cyclical design process, preparing and setting up a playtest is actually a linear business. It takes time to get the version that is being worked on to a playable standard and to get a test crowd together or prepare interview questions.
Generally speaking: the further the target audience is removed of developers, the more difficult setting up a test becomes. If the target audience for instance consists of men of between twenty and thirty years old that spend a lot of time on the internet, they will most likely be easier to reach than council members or children with brain damage. Sometimes it's also necessary to get permission from parents or a test committee. The larger the trial group, the more reliable the test will be. Finding a large group can also take up more time, however.

Depending on the demands the playtest is subjected to, it could therefore slow down the design process. Sometimes the start of the next iteration has to wait until the results from the test have arrived. As such it is essential that a test is set up well, so the right results can be collected quickly.

Utrecht vs. The World

The second pilot in the tourism domain had the target to "increase the number of visitors for the city of Utrecht and lead to higher spending per visitor, improve the image of Utrecht as a destination with global stature and be an excellent way to receive and inform guests", and all of that through a playful application. It aimed at visits to Utrecht by people from outside of the city, and not just as a location for events like festivals and concerts. Participants should become convinced, through this playful experience, that any effort put into discovering Utrecht is worthwhile. After pitches from three parties, Utrecht Tourism consulted with the SEA consortium and chose the studio Vuurrood from Rotterdam as their developer; and the studio went on to create the game *Utrecht vs. The World* for use on Facebook. In this game, the city of Utrecht competes against another city to prove Utrecht is for instance the most fun, has the best atmosphere, is prettiest or most hospitable. People take part by 'campaigning' for their own city on Facebook. They post so-called 'proofs' in the shape of pictures with captions. The number of proofs, but also the shares and likes determines which city wins in the end. This way, players really turn into ambassadors for their own cities.

Playtest in the botanical garden of the University Museum

The playtests

During the design process Vuurrood performed two large playtests. The first test was Utrecht vs. Amersfoort: which city has the best atmosphere, is most 'gezellig'? In the second test Utrecht took on Groningen: which of the two is the best city for students? The playtests became important reference points in the designing process of *Utrecht vs. The World*. With this concept, reaching a (large) audience was a crucial element of the task. This is why the playtests had to be performed in the public domain straight away. This had a number of advantages, but also brought with it some challenges.

A big advantage came from the possibilities Facebook offered of gathering a heap of information on how the game was used and who its players were. All activity was logged and data on both players and their networks that came into contact with the game could be retrieved. The scope of the first playtest turned out to be quite large, a positive result. The game had the potential of reaching significant groups of people. The group that was reached turned out to consist mostly of people between the ages of 18 and 44.

A playtest for U-Spy

THE ADVANTAGE OF PLAYTESTING IN THE PUBLIC DOMAIN IS NOT JUST THAT THE PLAYER GROUP CAN GIVE DIRECT FEEDBACK, BUT THAT THE SURROUNDINGS CAN RESPOND ALSO.

Evaluation sheets were created for a more profound assessment of the game experience, consisting mostly of quantitative questions with the option of added qualitative questions. This gave insights into player motivation, game use, game experience and distribution of range.

Redesign

The results seem to have mostly influenced the redesign of the game after the first large test, where the information used the most seemed to be parts of explanations the participants gave with their choices. The individual values of the quantitative questions also seem somewhat unbalanced. The questions didn't have very uniform answer choices either, which made it difficult to compare questions. Creating a list of questions is, it turned out, quite a special skill, that calls not only for a strong theoretical background but perhaps also support from a specialist. Questions should be clearly connected to targets. Nonetheless, the evaluation results from the first test still offered useful information for a redesign.

The advantage of playtesting in the public domain is not just that the player group can give direct feedback, but that the surroundings can respond also. A possible disadvantage is that negative publicity could be spread even before the game is finished or ready to be officially presented. It turned out for instance that after the first test some negative publicity got out. A blogger thought the battle between two cities was too hostile. This was resolved in the second test by, firstly, clearly mentioning that this was a test and, secondly, mentioning explicitly that the end result was intended to be playful in character. In short, it's important to clearly announce to the participants what intentions you have with a playtest, so as to avoid undesired behaviour or a focus on the wrong aspects.

Age of Medicine

For the second heritage pilot, the University Museum's target was: "To teach pupils in a playful way and through collaboration how the scientific process works." The target group consisted of pupils of the last years of primary school. With this assignment game developer Fourcelabs got to work.

The resulting game concept, *Age of Medicine*, uses a combination of physical and digital material. The class is divided into groups, that through the game, are taken off to a fictional island where they are meant to heal trolls. The trolls become ill and display certain symptoms. The children try to find the active ingredients to counter these symptoms through testing in a laboratory. They go on to produce these ingredients so they can be used to make medicine.

For *Age of Medicine*, Fourcelabs performed playtests in collaboration with HKU game researchers. They set up detailed test plans including planning, test goals, test specifications (like the number of participants), role division and a script. The test plan does not just offer support in keeping the test on track, but it also creates a clear overview of the activities that can be used afterwards to identify where things went well and what could have been better. This adds to playtest evaluation and helps in creating and executing future tests, whether adaptations were made since or not. In short: use an elaborate test plan for each and every playtest. Through it, you achieve the kind of scope which benefits quality and consistency.

Fourcelabs and the researchers with HKU painstakingly collected playtest results. A pre- and post-test were part of the method, as were assessment through a survey, interviews and a video registration. Based upon the resulting information they wrote a comprehensive analysis. Taking a step back with a clear scope, again, improves test consistency and the right implementation of changes to the design. By collecting information in different

ways they learned a lot about experiences with the game that could have been missed, but were not. So, playtest results should be recorded independently and in different ways, perhaps making blind spots in registration methods a thing of the past.

Knowledge of the process

One of the assessment methods was a pre- and post-test concerning the knowledge of the participants on the scientific process. The intention here was to make it an addition to the self-report studies (survey and interview) and ascertain afterwards in a more objective way whether the participants had actually learned something from the game. In the self-reports the participants had all written down they learned so much about creating medicine and the plants they used to this end. The claim, however, wasn't supported by the pre- and post-tests.

This could also be seen as a kind of play-test registration through which a blind spot could be avoided. The difference in results between all these registration methods seems to show much socially desirable answering and people getting tired of tests. A socially desirable answer is one more answer in the self-report book that is less in touch with reality and more with what you think you should be answering. This could affect results. It's also possible participants (usually about 11 years old) had more problems concentrating after three hours of playtesting and that made them get lower scores on the post-test than they would have gotten otherwise. Test-weariness can be avoided somewhat by performing the same test again at some other time, for instance a week later.

The playtests for *Age of Medicine* in their elaborate preparations and scope were partially made possible through the collaboration between the game developer and HKU. The HKU team was able to take on the playtests and, this way, take some of the workload off the developer. For other creators it might also be advisable to have team members or partners purely focussed on playtesting and validation. Possible delays in the design process are minimised this way and the amount of collected information is maximised.

Playtest results

An elaborate analysis of the test results was written by HKU. At the time of writing Fourcelabs, however, is still in the midst of developing and has not yet been able to incorporate the test results in the design.

A tentative conclusion could be that the tested version of the game has not yet achieved the learning effect that was aimed at. Participants indicated that they both enjoyed the game and learned a lot from it. But this does not match the results found in the pre- and post-test. A question about the order of the scientific process for instance did not receive more correct answers. The clarity and comprehensiveness of the information received through the tests does, however, make this a valuable addition to the further development of the game.

During the tests it also became clear the participation goal was shared by the players themselves: they were way more intent on winning. Interviews and observations also showed participants did not always understand the rules and occasionally missed steps in the process because of this. They went looking for answers with supervisors (teacher, museum guide) but they were not always able to offer useful guidance. The supervisors in this game play an important role in the contextual support of the game and as such should be well-informed. This way, any confusion of the rules of the game is minimised and unnecessary frustration and distortion of the experience can be avoided.

CLOSING EVENT

WRAPPING UP SEA WITH A BOW

An account of the closing event

Though a number of pilots were still in full swing, notably *Age of Medicine* and *Guest Quest*, the SEA project was closed on 10 December 2013 in a closing event of all parties. As was said often that day and evening, the SEA project was closed "and a big bow wrapped around it".

At the HKU (University of the Arts) location in Hilversum, the different parties involved gathered to exchange experiences of a project that had, all in all, taken the best of three years: game developers, knowledge institutes, organisations from the retail, heritage and tourism sectors and of course Taskforce Innovation Utrecht region itself. Together they had worked on new applications and taken on exciting experiments, through the use of new technology and insights in game design. It had been a 'free zone' in which there was room to play, with even very concrete pilots as a result.

Willem-Jan Renger of HKU placed the three sectors on a continuum: tourism is aimed at the entire city and as such operates on a 'macro scale', heritage is aimed at groups of visitors and in that sense operates on a 'meso scale', while retail is aimed at individual clients' purchases and as such operates on a 'micro scale'. Every level demands different exceptional skills, you might say, if any meaningful solutions are to be reached.

When working on your own pilot requires your full attention, as it turned out, there isn't always time to observe what's going on at the other end of the project – meaning the results of the other groups were, without exception, observed with great interest. Some parties even talked about future ambitions together: wouldn't Utrecht Tourism for instance want to get involved in the upscaling ideas for the University Museum?

Game Scope

One very exciting part of that final gathering was testing the *Game Scope*, a new tool that HKU developed. It's a continuance of the *Applied Game Design Canvas* that is still being developed as we speak.
Renger explained that the canvas had already been meant to fix the 'broken dialogue' between client and commissionee. It had also turned out to be quite a challenge to let non-experts fill out the array of elements that are relevant to game design and arrive at a proper request for tender. This is why in *Game Scope* the order of things was pretty much reversed: here, the participants start with a pitch and dissect it using a number of well-aimed questions. This way they learn to analyse and view the pitched games critically.

Test session

The participants were divided up across three classrooms and there they heard a condensed pitch of one of the SEA pilots, and from that were told, in groups of two to four players, to submit the answers to 17 questions on a playing board of about a metre long, to be finished in half an hour. For example: "Can a player quickly start playing (without much instruction)?" This was done by putting markers in areas for 'Yes', 'Doubtful' and 'No'.
They were able to get extra advice by turning a maximum of eight 'expert cards', in this case filled out by HKU employees, and aimed to stimulate participants. They could adapt their answer after this or it confirmed their initial presumptions.

At the end participants could put three of the questions aside of which they doubted the answer and wanted to ask more questions about. The playing board made this very easy, because the placement of the markers made it clear in one look where the differences of opinion and doubts were.
Were the participants going to offer the assignment to the executing party they could, as a kind of finale, also fill out a mock cheque – with on it among other things an estimate of the budget.

Collecting feedback

As could perhaps be expected from a group of game developers, game researchers and organisations that have by now been involved with games for years, Game Scope too was analysed and criticised. More than once the suggestion was made to also have the *Game Scope* go 'through' the *Game Scope*.
One realisation was that the tool most of all tested a pitch and not a game. Willem-Jan Renger added that the Game Scope didn't necessarily have to be used in this formal way; the question card can

The audience listening intently at the closing event

come in useful in different stages of the creation process to investigate a game design in a critical way. This was reassuring to those who didn't necessarily see playing a game to evaluate a pitch as a useful way to spend your time. There was also some discussion on the terminology used in the game: what exactly did 'gameplay' encompass? What was the difference between a game achieving its goals and players engaging in the desired behaviour? Renger explained this ambiguity was at least partially a good thing, and once participants discuss this and have deep meaningful conversations about game design this way, a lot has improved already.

Participants were also thinking out loud about questions that could still be added to Game Scope: about the cost/benefit-analysis, about how it would bear playing again and maybe about 'game temperature', the memorable element from the *Applied Game Design Canvas* that indicates how heated the debate about it can get.
This way, at least the designers of Game Scope went home afterwards with a head full of inspiration, challenges, simple starting points and bright ideas for the future.


INSTRUCTIE
GAME SCOPE

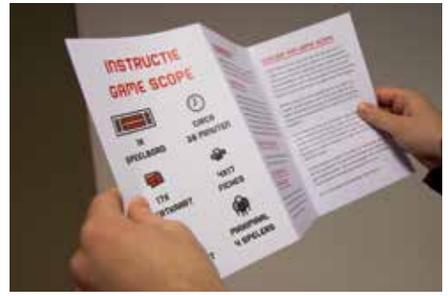
Game Scope in action at the closing event

Why Game Scope?

Game Scope originated from the progressive insight that filling out the Applied Game Design Canvas would only be possible with some help from game experts; there was still a desire to have clients also examine applied games independently. The canvas was a bit too static as well. It could be a bit more playful, it was supposed to be about games anyway. Practice what you preach!

This question led to a dynamic card system with which participants without much knowledge of games could analyse or judge a game or game concept. The cards have structured questions on them as inspired by the canvas – treated elaborately elsewhere in this publication. The important thing is, there are no empty, intimidating boxes anymore, just direct questions that can be asked. The tool is also more dynamic, because the questions are on separate cards and not part of a static structure anymore.

By now, several iterations of Game Scope have come and gone. The tests showed players did indeed start asking each other the most important questions about applied games, critical questions that they normally would have needed experts to mention to them. The test crowd did engage in productive, head-to-head debate on content with each other, a promising result. For the final SEA gathering a special version of Game Scope was prepared.



Using Game Scope

This tool is not limited to the SEA final event. Roughly three applications for Game Scope can be identified:

1. Use the three SEA test cases to educate an organisation on analysing and judging applied games. Expert opinions have been captured on a few cards, ready to be turned around and used, just like at the SEA meeting.

2. Use the questions independently to judge real-life pitches and to choose a partner for your project. The questions on the cards can be used straight away, which makes this system more accessible than the Applied Game Design Canvas. The main difference is that at a real pitch there will be no expert opinions to-go. However, the questions themselves are already a great starting point for approaching the pitched concept more critically.

3. Analyse an existing game that fits your organisation in some way, for instance because of a relevant target audience, domain or game principle. In this case, experts could be involved to express the expert opinions.

At the end of this publication, the entire game and instructions are waiting. Cut out the cards and get started!

GETTING STARTED WITH APPLIED GAMES

In this publication we have taken you along on a tour of the SEA project pilots. You have read all about our learning experiences in the articles about validation and playtesting for instance, but as a final recapture we will look back at the most important lessons learned and other matters that you as a potential client might want to take into account.

Because applied games are still relatively new, part of these recommendations were aimed at executing parties. They are also interesting to potential clients, a quick look into the problems game developers may encounter. It could help bridge the existing knowledge gap between client and commissionee.

Your client role

You made the decision to have a game developed. What's next? At the onset of such a path it is very important to become aware of what it is you want to achieve. Maybe you will discover your issue is not suitable for a game solution. The path of learning to express your question and the desired goals for the game we call 'articulating the question'.

The SEA consortium played a considerable role in articulating the questions for the pilots. That was useful because for new clients, it's often difficult to estimate what they can and cannot hope to achieve through a game. They are also often unaccustomed to the language used in game development. In the process of articulating the question, the *Applied Game Design Canvas*, developed in the context of SEA, can be a useful tool. There, the desired actions and goals of a game are expressed in verbs, which best matches the language used in game design. However, the canvas has been found quite difficult to use without previous knowledge on game design, meaning getting some help from experts is still the recommended course of action.

It does help if you realise a few things beforehand. Games are preferably developed in a cycle of thinking up concepts, creating and testing – the so-called iterative process (see chapter 'A shared language'). As such, the exact end result is therefore often unclear at the onset; it becomes what it is precisely through the continuous collaboration between client and game company and continually testing what does and does not work with the envisioned target audience. This is why you as a client should reserve enough time to be involved in the development yourself. It's not at all the kind of assignment you just throw over the wall.

Choose a commissionee

Once you have decided on a goal and the most important conditions for your game it's time you start talking to designers and developers. Through the Dutch Game Garden and the website www.applied-gamedesign.org, for example, you can get a quick overview of game companies in The Netherlands. A popular approach for the selection process is inviting several parties to come deliver a pitch.

In the course of SEA project it turned out a number of issues is important in choosing a game company:

- Game development is a collaborative process. A personal connection and faith in a game company are therefore essential;
- A pitched concept should not be too polished yet, you as a client should be able to influence the end result through the collaborative process;
- A game company should be able to show you it can do its research, but still show you, as a content expert, respect;
- It is important for a game company to show you some of its work methods and approach.

When game companies come pitch their ideas to you, you as a client are able to ask questions; definitely make use of this opportunity. Examples of questions can be found in the playful tool *Game Scope* (see the chapter 'Wrapping up SEA with a bow', the box 'Why *Game Scope*?' and the 'DIY *Game Scope*' attached). A game company will not be able to answer all questions immediately, as several topics should still be developed together with you. This makes it very much possible that the pitched concept doesn't even resemble the final result much at all.

Collaboration between client and game company

You decided on a game company and together you start envisioning the development of the game. After the pitch you and your chosen partner continue the conversation. Apart from a number of work agreements you will go through part of the question articulation process again. It is important to go through approaches and the results you want together. Also pay attention to the limitations and behaviour you definitely don't want. For example: the game should not lead to children running around the museum. This does not slim down your chances for creating a game – it is a serious design task for the game company.

A vague assignment means there weren't enough follow-up questions from both parties; the first stage of the development is expressly suitable for improving the pitched concept with the wealth of information through insight into the client's wishes and context.

Also, make agreements on bringing in domain expertise. Developing a game by definition calls for a multidisciplinary team; the game company does not just bring in programmers and game artists, but also game designers that are responsible for the functional design of the game. Apart from that there is the essential external content-related knowledge you yourself, someone from your organisation or an independent expert could deliver.

Arrange beforehand how the project's progress is going to be shared. Avoid having team members work too much on their own and losing track of the rest of the development. Do stay focussed on your own field of expertise, though, don't take the designers seat or allow the opposite to happen. By getting into this project together and identifying the relevant issues, the knowledge gap between client and game company can be bridged (see chapter 'Research').

Do not hesitate in this process to keep asking for the meaning of certain terms and keep in mind that there may be different interpretations for the same terms. Validating a game, for instance, doesn't mean the same thing to a researcher as it does to a game designer: the scientist want to make sure the process is scientifically valid, while the game designer means he wants to test whether the game works in practise.

Finances and time

Developing applied games is a relatively young trade, and because of that relatively few key figures for lead time and the costs of a game exist. Of course a simple browser game is cheaper than an elaborate concept based on a simulation model; your level of ambition should match the available budget. For more information we direct you to: www.seriousgameblog. com/?p=2426&lang=en

If budget and time limits were not decided on already as strict conditions, lead time and the use of the available budget should be decided on together at the start of any development scheme. Even with a fixed budget and timeframe, it's important to identify the stages of development and intermediate results together. Make sure there is enough time and money available for testing and evaluation. Depending on the type of game and the communication channels of your organisation it is also important to save enough of the budget for reaching the desired target audience. A game by itself is not enough to attract new audiences – and it doesn't necessarily take up the majority of the budget either.

It's not necessary to give out a large assignment straight away. In the context of SEA we worked with pilots that had relatively short lead times. The first stage gives

the client the opportunity to discover what is possible with a game and to try out together whether a concept has potential or not. Taking smaller steps in aiming towards a final result is also easier. It is important to stay in touch with the bigger picture here: which follow-up steps and investments are necessary. The concepts and test results you as a client can use to try and find additional financial means, internally or externally, and to increase support for a follow-up initiative.

You should also consider issues related to the eventual ownership of the game. Can you as a client have the game to your full disposal and manage all content yourself? Or do you need the original game company for every change or addition? Avoid only getting involved at the last moment in a discussion about ownership. Through the common process of developing a product, you yourself also put in knowledge and time. Maybe it's possible to come up with a model in which the game company can offer the game through a license to other parties that are interested. The arrangements come in all shapes and sizes. For more on intellectual property, see: Olivier Oosterbaan: Games: recht en business (2011; unfortunately no translation available).

Game content

The SEA project had a strong focus on the process of developing games, but we do not want to pass by content altogether.

Many applied games are developed by a specific organisation in a specific physical setting. This creates opportunities to use this space and involve it in the game's design. The added value of an applied game is also in its use of the context in which it is played. All too often, game developers are too focussed on and used to on-screen development. Do not let the unfamiliarity of technical aspects get in the way of game design either though. A link between physical space and the design can add excellent opportunities to for instance make sure players don't just stare at a device all the time. Games are expertly suited to organising behaviour.

A game developer should aim to strike a balance between content and playability when making his design. Something doesn't automatically become fun, interesting or addictive because you call it a game and attach a scoreboard. The knowledge transfer in games also doesn't have to be direct either, and coming up with different ways to get information across opens up interesting new possibilities. Learning by experience is often more effective than factual knowledge transfer. A game that for instance has a training objective can also be aimed at awareness. So, a game in which things go hilariously wrong all the time can turn out to be just as effective as a game that shows you how you are supposed to do things.

Games can also be combined with (interactive) storytelling techniques. With input opportunities, players can make the story 'their own', which is the best motivation to get involved with any kind of content.

Game validation

Testing continually in all stages of the development is important. Already in the first stages of design you should put thought into validation and evaluation. By making sure tests will take place in a uniform fashion over the course of the entire process, results can always be compared to each other. Every iteration would ideally contain a playtest as well, preferably with the target audience.

This way, the effectiveness can already be measured and validated during the design process. This saves time and money at the end of the line, because no standalone validation research was necessary. Appointing someone to be responsible just for the validation aspect is a practical thing to do. Having someone be not directly involved with the design has the added advantage of that person being the one who can observe the process with some much needed distance.

DIY GAME SCOPE

Game Scope - What's that? Game Scope is a tool that helps you look critically at an existing game or existing game concept. From a number of questions you are able to analyse and judge a game or game concept. Game Scope was inspired by the canvas as discussed in detail elsewhere in this publication. With this concise variety, participants can get going straight away without needing much (advance) knowledge on games.

01

Do other players or adversaries influence the gameplay?

02

Does the player have a clear responsibility in the game?

03

Is the player instructed to take on a fictional role (for instance the role of warrior, healer, magician etc.)?

04

Can the player start playing quickly (without too much instruction)?

05

Can the player influence the course of the game?

06

Are the required actions easy to carry out for the player (by gradually increasing difficulty or by providing hints)?

07

Is the chosen game world motivating for the player?

08

Is the objective of the game clear to the target group?

09

Does the game (design) take the physical location of the player into account?

10

Does the player receive feedback during the game so he/she can adapt his/her behaviour?

QUESTION 02

QUESTION 01

QUESTION 04

QUESTION 03

QUESTION 06

QUESTION 05

QUESTION 08

QUESTION 07

QUESTION 10

QUESTION 09

11

Does the game design allow for possible negative (player) behaviour?

12

Is the game suitable for various players within the target group?

13

Is the game designed in such a way that players show the behaviour desired by the commissioning party?

14

Are the digital devices and tools (phone/virtual reality etc.) really neccessary for the game experience?

15

Are there any other stimuli to motivate the player (like competition, tension, risk factor, role playing)?

16

Is the objective of the commissioning party achieved by playing the game?

17

Is the concept easily expandable or upscalable?

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Add your own question here

QUESTION 12

QUESTION 11

QUESTION 14

QUESTION 13

QUESTION 16

QUESTION 15

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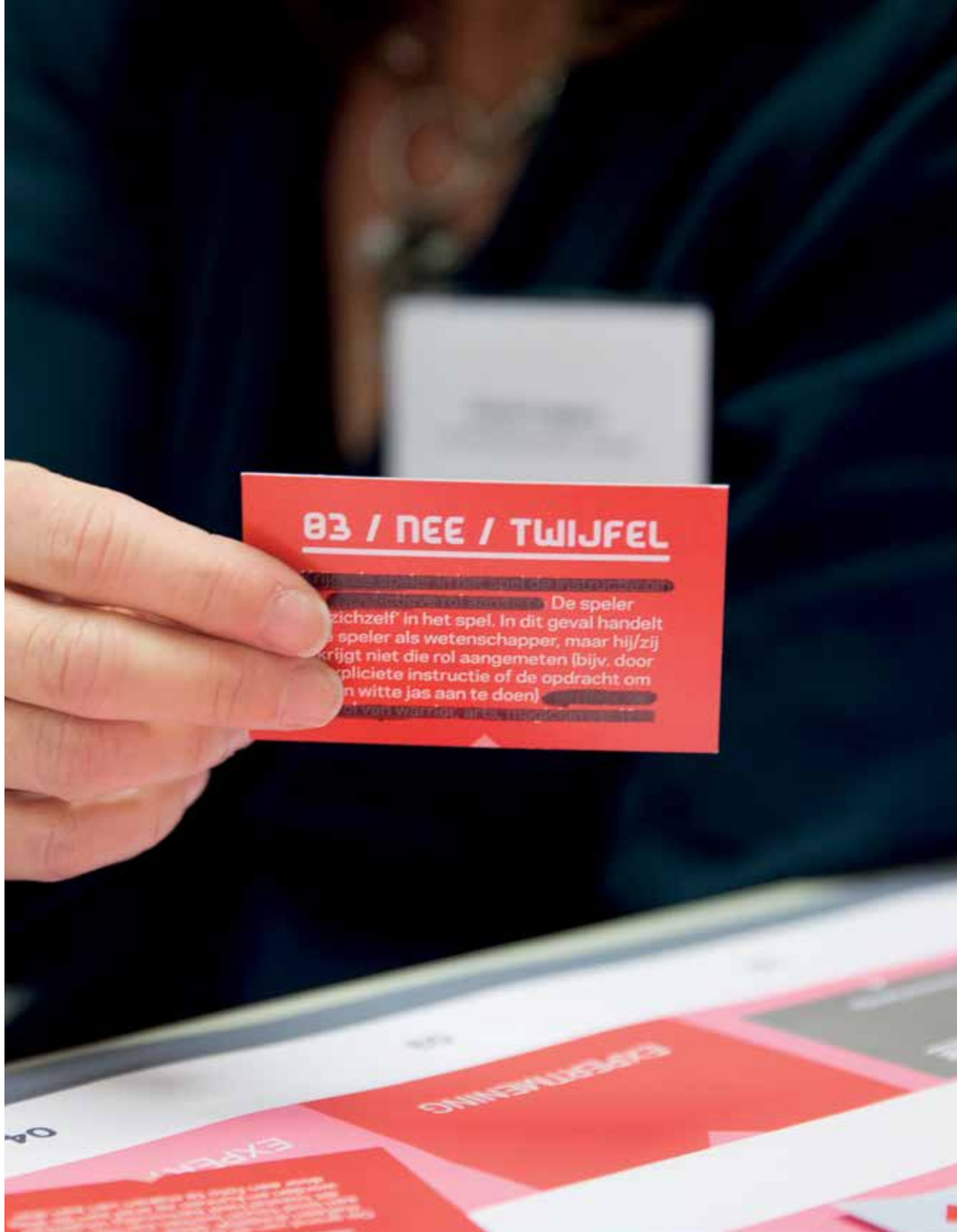
QUESTION 17



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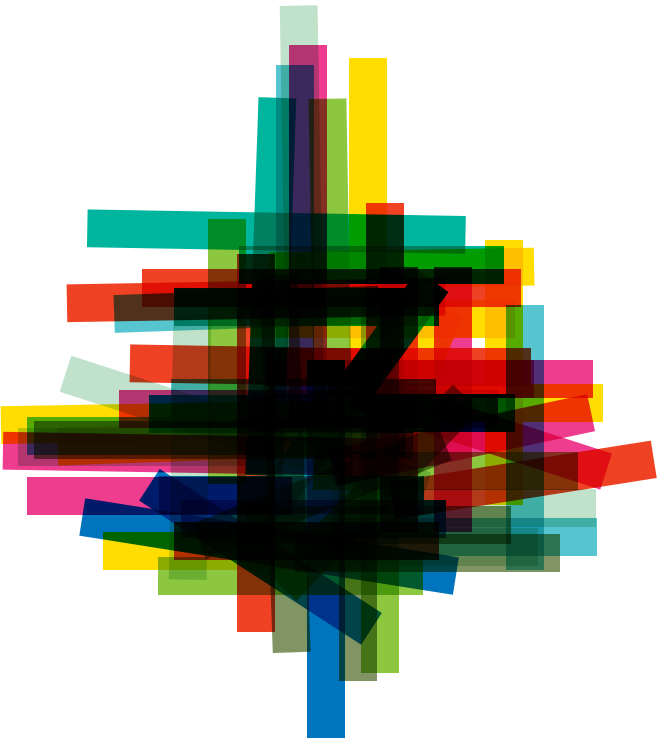

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