"Psst"-ipatory Design: Involving artists, technologists, students and children in the design of narrative toys

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ABSTRACT

The aim of the Narrative Toys project is to develop new concepts for toys/play environments that support children in reformulating stories, through a combination of physical artifacts and digital media. The focus of the project is how toys act as a storytelling medium, and in particular the exchange between stories inscribed in toys by toy manufacturers and stories invented by children during play. The project is also characterized by its aim to accomplish "creative research"- using artistic means to create and convey knowledge. This paper describes two prototypes, Psst and the AudioTheatre, and how they relate to research aims and artistic creation.

Keywords

Interactive toys, play, narrative, design

THE NARRATIVE TOYS PROJECT: BACKGROUND

Play and narrative are closely connected in children's development. Bruner [2] and Schank [7] have described the importance of stories as carriers of patterns for behaviour, ethical and social values, and in general how shared stories are fundamental to communities. Children's play is nourished by all sorts of stories. Stories are tried out in play in a improvised manner between telling and enacting. The tight connection between toys and stories is also visible in any toy store. The shelves are filled with characters from other media: Harry Potter, X-files, Star Wars and so forth. Toys today are a mass medium, a channel where stories get published in parallel to film, comics or computer games.

Where an older generation of children sought inspiration for play in genre scenarios like pirates or cops and robbers , today's kids tend to base their play on "authored" stories from films or TV shows.

This dynamic between mass media, narrative, and play is the backdrop of the Narrative Toys project. We are exploring the cross-breeding between stories inscribed in toys and stories invented by children during play. How can toys deepen the understanding of narratives by giving children the tools to unfold them both in time and in physical space? Can we design new kinds of toys and play environments in which the combination of narrative information with physical artifacts supports children in staging, enacting, retelling and modifying stories?

The two prototypes we present both explore the interplay between authored stories and stories invented by children during play.

Method

Our working method was to stage a process of collaboration in two successive steps. In the first phase the collaboration includes project partners from different backgrounds: artists, designers, engineers, toy manufacturers, students and guest researchers. The process at this point is characterized by a large degree of creative freedom given to the participants. In this first phase we do not aim to include the users, i.e. children, in the process of design. Focus is on project participants' input, and the diverse systems of thought and work that they bring into the prototyping. Our prototypes are designed to be flexible and easily updated with new media or play formats.

But we do work together with children - making interviews, drawings, or through organized play around a theme related to the design. In this respect we draw on earlier work on participatory design with children by Druin [4] and others.

Related research

The StoryMat project by Cassell and Ryokai [3] supports children's storytelling through a computer system that records stories connected to a physical interface; a mat and soft animals. The EU FET I3 KidStory project [1] has dealt

with the development of storytelling technologies for children in a school setting using participatory design. The EU FET- I3 Pogo project [6] has similar aims to KidStory, but a decidedly design-driven approach. Earlier research at Interval resulted in the Zowie products: a combination of physical toys and cd-rom games. The physical toy represents the setting of the game (garden, pirate ship) and is also use as a tangible interface to navigation and gaming. The Zowie technology was bought by Lego and is not available on the market at present.

Figure 1. The Psstian characters: Max, Klump, Spuki, Memo, Spiri, Krax, Spak, Kilo and Mingo.

PSST! - THE PROGRAMMABLE SOUNDSCAPE TOY

With Psst [5] children can explore a set of characters: what they do, how they talk, where they are. It consists of nine dolls with ID tags and six play boxes. A sound database with talk and event sounds provide the feedback.

Children play with Psst by placing the characters on the contacts on top of the boxes. Depending on the play format running, placing a character on a contact yields different results: an utterance in the specific voice of the character, an event sound, an environmental sound describing the location. The characters are open-ended, inbetween human and animal, and they are designed to leave the question of age and gender open (with a few exceptions).

The play formats range from game-like to story-like activities. The Psst-Talk play format creates conversations between characters, the Ghost Hunt describes how a ghost is tracked down and captured in murky horror environments.
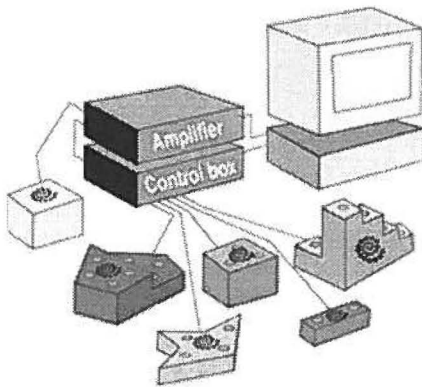

Figure 2. The Psst setup. The box to the left has no contacts. It contains the "narrator's voice".

The Platform

The Psst platform is designed to answer to the following requirements:

- It supports experiments with objects and sounds

- Children can play with it without much supervision or many instructions

- It is easily updated with new media, tagged objects or play formats

- It takes advantage of the physical space where it is standing

- It is robust and safe

The Creative Content of Psst

The work leading up to Psst started with a series of design sessions with children in a daycare center in Malmö. To each session we brought different materials (cardboard, colours, clay) and some low-tech prototypes in order to map out play opportunities around sound and physical artifacts.

We designed the characters through a series of rapid brainstorming workshops. The actor Niels Bender recorded utterances in nonsense language for the nine Psstian characters, according to a systematic grid where each character has a set of phrases expressing joy, fear, anger, sadness, questions etc. In defining the voice for each character Bender used aspects of the dolls as a starting point. Each voice is rich in gestural quality, and it matches the body posture suggested by the dolls.

Figure 3. Actor Niels Bender giving voice to Spak.

The sound database, which includes both event and environmental sounds, was designed by sound artist Hanna Hartman. She worked closely together with us, and the style of her sounds and her way to combine sound elements into stories had a large impact on the first generation of play formats.

Evaluation

The Psst platform has been tested in families and in child day-care centres in Malmö and Copenhagen. We have tested it with children age 4 to 6. Although children sometimes have had difficulty placing the characters on the contacts, the platform has been surprisingly resistant to heavy use. We have been able to add and modify play formats easily. The Psst platform has on the whole matched the initial requirements.

Figure 4. Children exploring PsstTalk.

With Psst, we started out with an idea of non-linear narrative, in the sense of creating a sphere of action for the user within the story. But play observations gave negative results in certain cases. What seemed to most interest the children was to understand the system. The rule-based scenarios in which the sound output is directly related to a single character and a fixed position worked better than scenarios relying on sequences of sounds.

These observations from Psst caused us to re-evaluate our initial idea of non-linear narrative in favour of simpler narrative structures.
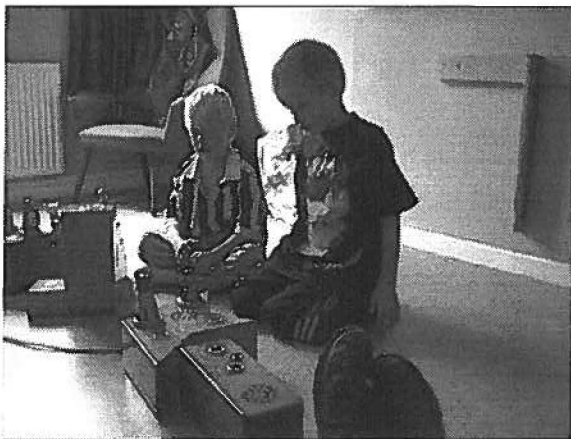

Figure 5. Listening to the narrator's voice.

THE AUDIO THEATRE

The AudioTheatre is a continuation of the ideas in Psst!, and it uses the same basic technology. Based on the observations in Psst we wanted to reduce the complexity, and create a more coherent system to be explored in the toy. We also wanted to strengthen the "do it yourself"-side of the toy. The concept was inspired both by the Lego Studio set, which lets children record and edit films, and by classic toy theatres in paper.
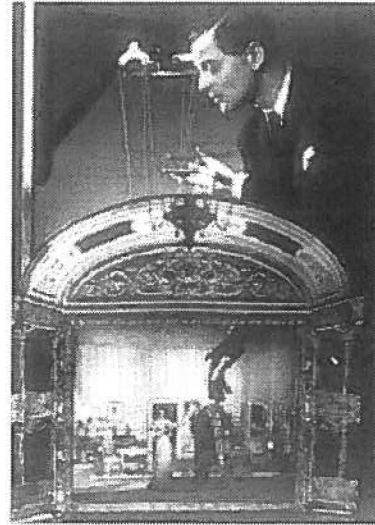

Figure 6. Toy theatre. The hand plays an important role as the most animated object on stage. *(Picture from postcard)*

The AudioTheatre is a tabletop toy theatre with paper doll actors that are placed on a stage in shape of a box with twelve contacts on top and a loudspeaker inside. It has two play modes: playback mode or record mode. In playback mode a pre-recorded theatre piece is performed. A booklet gives instructions about backdrops and how to place the actors on stage. The "actors" are paper dolls cut in foam, placed on a plastic plugs with a small switch. Both paper dolls and backdrops have ID tags that can be read by the computer. When you push a small button at the footpiece of the actor, it will say its line or tell you that it is not on the right place.
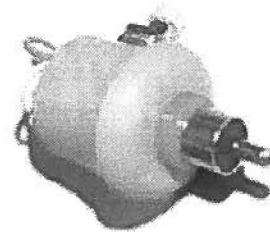

Figure 7. The actor footpiece with button and ID tag

In record mode new lines can be recorded to the actors directly on stage, and played back immediately. The utterance is linked to the character and the position on stage. The two modes can be combined. The playback mode is designed to take children through a relatively complex series of manipulations, and also teaches the user how to use the record mode.
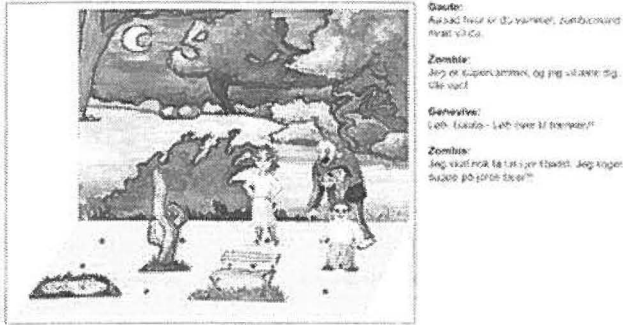
Tegning 6:

Figure 8. A booklet shows how to place the actors on stage.

The Design Process

The AudioTheatre started out with a clear concept, based on observations of the Psst platform in use. The content was then developed by playwright Martin Rauff-Nielsen and interaction designer Sanne Fraas. The theatre piece, Halloweek, is a slightly absurd story about a brother and a sister going out in the park on the Halloween evening, discovering a bunch of monsters instead of the ordinary environments. Sanne has made cartoon-like illustrations for the piece, which render environments and characters with lots of detail.

Figure 9. Playback of the pre-recorded piece Halloweek

Preliminary Evaluation

Small groups of children (one to three children, age 5 to 12) have tried out AudioTheatre. At first, we invited them to play through the prewritten piece. When they had played it through, we demonstrated how they could use the recorder actors.

All children that tested the AudioTheatre started to create stories of their own, involving a sequence of utterances and several characters. They had no problem identifying which actor was being recorded, and saying the lines for that

specific actor. This had been a problem in Psst.

Figure 10. Recording new lines to home-drawn actors.

The AudioTheatre comes closer to being a "narrative toy" than our earlier prototypes, in the sense that the narrative structures provided are visibly and audibly used by the children to build new stories for the platform. However, all children had difficulties remembering the position of the character relative to each utterance. Some of them resolved this by creating a chart showing characters and positions during the play. In future prototypes we would like to go further in exploring how the timeline can be represented spatially.

CONCLUSIONS

Although Psst and the AudioTheatre are closely related in content matter and technology, they represent different ways to combine artistic creation and research.

In retrospect, Psst is to a high extent a "piece", a creative production that carries significance on many levels. The AudioTheatre on the other hand is more useful as a prototype: it is designed to explore a specific dynamic, it is split up between concept and content - which makes the observations more easily generalisable.

In Psst, research considerations and artistic design were mixed up. This has made a prototype that is rich in ideas but hard to evaluate or test. On the positive side, there are new

and exciting ideas in the prototype - one of them is the combination of close-range sound recordings and small loudspeakers distributed in the room. On the negative side, the ongoing negotiation between different artistic temperaments - which does not come to a conclusion within the prototype - ends up as a system that lacks consistency, and thus less accessible for children users attempting to learn and use the system.

The AudioTheatre is in this sense easier to apprehend. The designers have been asked to create content to a preexisting context. They have had a large amount of freedom to write and illustrate, but within the limits set by the concept. The AudioTheatre is also better suited to explore the research issues in the project, since it stages the reformulation of stories.

The reason that I have chosen to make the comparison is that I think it tells something about the differences between the qualities necessary to an art piece and to a prototype in a research project. If a prototype is made to test a concept, it is almost an advantage from a research point of view that the prototype does not present too much interest in itself. On the other hand, as an inspirational tool, when it comes to raising questions instead of answering them, the art piece can be useful as a catalyst and battlefield for creative collaboration.

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