

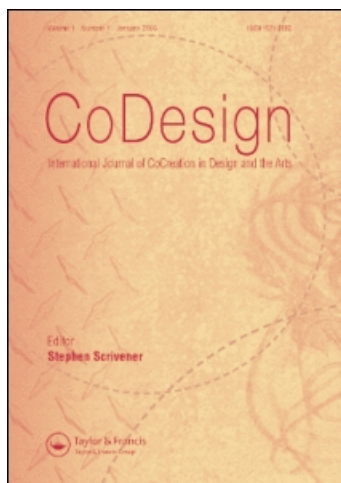
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The emergence of ideas: the interplay between sources of inspiration and emerging design concepts

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The emergence of ideas: the interplay between sources of inspiration and emerging design concepts

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The development of new ideas is an essential concern for many design projects. There are, however, few in-depth studies of how such ideas emerge within these contexts. In this article we offer an analysis of the emergence of ideas from specific sources of inspiration, as they arise through negotiation and transformation, and are mediated by design artefacts during an Inspiration Card Workshop, a collaborative event in which findings from domain studies are combined with technological sources of inspiration, in order to generate design concepts. We present a micro-analytic study of the interwoven social and artefact-mediated interactions in the workshop, and identify essential phenomena that structure and create momentum in the development of new design concepts, namely (1) the manifest properties of Inspiration Cards and Concept Posters as physical props for encouraging and supporting design moves, (2) the semantic dimensions of the cards and posters as catalysts for discussion, derivation and ideation, and (3) *ad hoc* external sources of inspiration as means of supplementing and developing design concepts. The analysed design situation is characterised as being socially distributed, artefactually mediated, adaptive and emergent.

Keywords: Design; Workshop; Innovation

1. Introduction and background¹

According to Schön (1983, 1988), design is a reflective interaction (or in his terminology, ‘conversation’) with materials, wherein the designer works with different media or

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¹The first part of the introduction and the description of the Inspiration Card Workshop technique in this article are based on Halskov and Dalsgård (2006).

materials, experimenting with various aspects of the design. In design processes involving multiple participants, such as many Participatory Design events, a diverse set of design materials is often employed, including video, paper documents, mock-ups, prototypes and posters. Moreover, small paper documents are commonly used as an integrated part of various design methods.

One category of small paper document is the Post-it[®], used, for instance, when making affinity diagrams (Beyer and Holtzblatt 1998). Another kind of small paper document is cards with pictures or text representing other types of design materials. In one instance of this category, Buur and Søndergaard (2000) have been using what they call 'video cards', with still images of video segments, and space for annotations, to be used as part of collaborative video analysis. In their approach, Buur and Søndergaard found inspiration in the work of Tuder *et al.* (1993), who have used cards to turn ideas into tangible objects. The video card game is a precursor for a similar use of cards, as part of a design workshop in which virtual video prototypes have been used (Bardram *et al.* 2002). Brandt and Messerter (2004) have been using various kinds of cards in four different types of workshops.

Additionally, according to Schön (1983), rather than seeking standard solutions, the designer sees the situation as something already present in his/her repertoire of paradigm cases or prototypes, despite which he/she manages to create new constructs by making experimental moves, the results of which may exceed his/her initial expectations.

In the area of information systems design, Madsen (1994) has explored how metaphors may shed new light on the way in which information technology might be used by seeing a domain of applications in a different light. In a later study based on three cases in which digital artists and designers worked together, Lervig and Madsen (2003) addressed the way in which design materials serve both as examples that pinpoint specific attributes, and as sources of inspiration that function as jumping-off points for work in a design project. Consciously looking for inspiration is part of the innovation strategy discussed by Kelly (2001, p. 280). Foster (1996) takes an even more radical stance, recommending, in his book on generating ideas, the deliberate pursuit of unaccustomed experiences.

In this article we offer an analysis of the emergence of ideas from sources of inspiration mediated by design artefacts during an *Inspiration Card Workshop* (Halskov and Dalsgaard 2006), a collaborative event in which findings from domain studies are combined with technological sources of inspiration to generate design concepts.

Sanders and William (2001), and Stappers and Sanders (2003) have identified the distinction between three ways of harnessing the creativity of end-users in the development process: (1) 'what people say' concerns what people say, for instance in focus groups; (2) 'what people do' concerns direct or indirect observation; (3) 'what people make' enables expression of creative ideas. Our approach relates to the third of these categories.

Moreover, our work is also related to other studies of the social dimension of the design processes, including the use of design artefacts. Perry and Sanderson (1998) have, in two ethnographically informed studies from the domains of mechanical and construction engineering, focused on the diversity of design artefacts, including their role in communication and the organisation of co-located group design processes. More related to our specific approach is the work of Mondada (2006), who, in the domain of architectural design, employs a *praxeological* perspective on the analysis of interaction 'which locates cognition not in the head of the lone subject but in the orderly production

and recognisability of actions as they are designed, dealt with, and, if necessary, repaired by participants' (Mondada 2006, p. 2). The paper provides a detailed interaction analysis which includes findings concerning the role of gaps in the conversation, gestures, and the spatial organisation of objects.

In contrast to Sanders and William (2001), Stappers and Sanders (2003), Perry and Sanderson (1998), and Mondada (2006), the research agenda driving the work reported here is based in the study and analysis of the specific role played by sources of inspiration—both those with a physical form and those in the form of *ad hoc* improvisations—in creative design sessions. Specifically, we study sources of inspiration, manifest and improvised, in an Inspiration Card Workshop conducted with our collaborating partner, a major Danish department store. The pragmatic agenda of the workshop in relation to the department store was to develop innovative ways of using digital technology in marketing.

The research contributions we present as a result of this work are twofold: first, the concrete findings of this paper offer an understanding of the artefact-mediated emergence of design ideas. Second, we believe that our micro-analytic method will encourage design researchers to carry out similar studies of design practices.

2. Inspiration Card Workshops

An Inspiration Card Workshop is a collaborative design event involving professional designers and participants with knowledge of the design domain in which domain and technology insight is combined to create design concepts. The event is similar to the Playful Collaborative Exploration approach (Johansson and Linde 2005).

Inspiration Card Workshops are primarily used in the early stages of a design process, during which professional designers and their collaborators narrow down potential future designs. The goal of the workshop is to develop design concepts starting from Technology Cards and Domain Cards.

A Technology Card represents either a specific technology (e.g. Motion Capture) or an application of one or more technologies (e.g. The I/O Brush; Ryokai *et al.* 2004). As an example, the card in figure 1 is a Technology Card representing a specific application of a thermal camera tracking technology.



Figure 1. A Technology Card. The text label translates as 'Dripping text'.

Domain Cards represent information about the domains for which we design. This information may pertain to situations, people, settings, themes, etc., from the domain. Figure 2 is an example of a Domain Card from the setting for which we designed in the specific case addressed in the subsequent part of this article.

The preparation for the workshop primarily involves selecting and generating the cards. Technology Cards, primarily generated by the designers, represent technologies that may directly or indirectly be part of the design concepts. Technology Cards can often be reused in various other projects, and the ones we produce are predominantly created from a pool of resources available at www.digitalexperience.dk. The Domain Cards may be generated by the designers based on studies of the domain, or by the participants from the design domain.

The workshop itself commences with a presentation of the Technology and Domain Cards selected. Each card is presented in turn, often with the help of images or video clips, to ensure a shared understanding.

The main phase of the workshop consists of the participants collaboratively combining the cards on posters, in order to capture design concepts (see figure 3). This phase is often initiated by a discussion in which the participants establish a shared understanding of the cards. There are no set rules for turn-taking, and cards may be combined in the way the participants deem most productive. Participants can start by selecting themes or situations from the domain that they wish to support, or transform and then select Technology Cards as a means to this end. Although a rarer occurrence, they may also select intriguing technologies as their starting points, then look for situations to which they may be applied.

Any number of cards may be combined to create a design concept. The cards are affixed to poster-sized pieces of cardboard. Participants are encouraged to write descriptions and brief scenarios on the posters, for further detail (figure 4).

After the combination and co-creation phase, the participants take a short break to step back and reflect on the resulting design concepts. In the case of a single group of participants, each poster is discussed *in plenum*. In the case of several groups concurrently combining and creating posters, each group presents its design concepts. The object of this phase is to ensure a common understanding of the concepts, rather than to evaluate



Figure 2. A Domain Card. The sign translates as 'Today's special offer'.



Figure 3. Combination and co-creation of design concepts using Inspiration Cards.

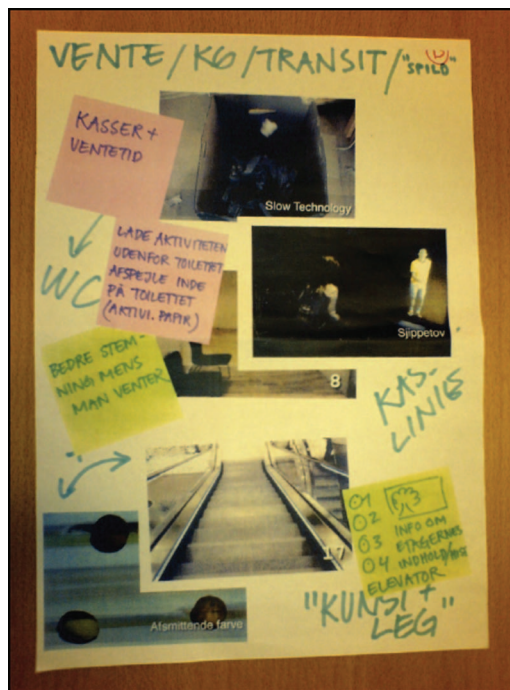


Figure 4. A poster with cards combined to generate and capture a design concept. The scribbled notes on the poster translate as (clockwise from the top): 'Waiting/Queue/Transit/Waste', 'Checkout line', 'Info about level content/elevator', 'Art + play', 'Better mood while waiting', 'Mirror activities outside of toilet inside the toilet' and 'Checkout + waiting time'.

them in terms of whether they are appropriate or realistic. Figure 5 gives an overview of the workshop phases.

3. Introduction to the department store workshop case

We currently use Inspiration Cards in the ongoing research project, ‘Experience-Oriented Applications of Digital Technology in Knowledge Dissemination and Marketing’ (www.cavi.dk/projects/experienceapplications.php).

The project explores the use of digital technologies in settings ranging from museums to the retail sector. As an integral part of the concept development phase, we have carried out one or more Inspiration Card Workshops with each of the collaborating partners (The Danish Electricity Museum, the 7th Heaven Centre for Children’s Literature, the chewing gum manufacturer, Gumlink[®], and the department store, Salling). We have extensive experience with carrying out this type of workshop, both in this project and in others, as reported in Halskov and Dalsgård (2006), and Dalsgård and Halskov (2006).

In this paper, we focus on one specific workshop, in order to analyse in detail the ways in which ideas emerge from sources of inspiration mediated by design materials, the way in which they are negotiated throughout the workshop, and combined into design concepts. The degree of detail in the selected analytical method does not leave room for direct comparative analyses of multiple workshops; however, we compare the general findings from the specific workshop reported in this paper, to our findings from other workshops carried out within the project. This extends the generalisability of the findings from this specific case, and indicates broader themes that relate to the emergence of ideas in this type of design event.

The Inspiration Card Workshop we present and analyse in detail was conducted with one of our collaborating partners, Salling, a major Danish Department Store. Salling is one of the oldest and most renowned stores in Denmark, and has just celebrated its 100th anniversary. The store has undergone a recent expansion, and as a part of the rethinking of the store layout, the authors collaborated with Salling in developing interactive ways of inviting potential customers to explore the store and its merchandise.

Prior to the Inspiration Card Workshop, we held a number of initial meetings to establish the scope of the project, discuss the intentions and values that were to guide the design process, and reach a general understanding of our respective competences and working methods. These meetings were supplemented by a number of field studies at Salling, in which we gathered empirical data about situations, interactions, people, and places in the department store. Simultaneously with the field studies, we researched innovative and experience-oriented uses of interactive systems. This research is partially available in a condensed form at <http://www.digitalexperience.dk>.

Based on the field studies and the technological research, 18 Domain Cards and 14 Technology Cards were selected (see Appendix). The Domain Cards represented locations in Salling that were either key places in the store, e.g. the store entrance



Figure 5. Overview of the workshop process.

(figure 6), or that left room for transformation and improvement, e.g. so-called ‘dead zones’ in the store (figure 7).

The Technology Cards were selected on the basis of two diverging criteria: (1) because they were conceptually related to the domain in a fairly direct way (so the workshop participants would easily relate them to Domain Cards), e.g. ‘Touch Light’, a touch display for use on window facades (figure 8), or (2) because they were conceptually quite different from the domain of product display (which could stimulate discussions and provide alternative views on the domain), e.g. *Drumhead*, a musical installation combining video projection on amorphous surfaces, touch sensors, and audio feedback for drummers (figure 9).

The workshop participants were four designers (including the authors) and two interior decorators from Salling. No shoppers participated in the process. The Technology Cards were selected by the designers, and the Domain Cards were selected collaboratively by the designers and the Salling interior decorators.



Figure 6. The *Salling Main Entrance* Domain Card.



Figure 7. The *Dead Zones* Domain Card.



Figure 8. The *Touchlight* Technology Card.

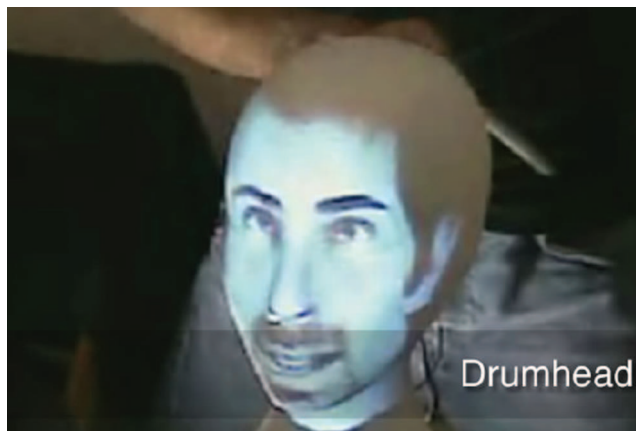


Figure 9. The *Drumhead* Technology Card.

4. The structure and progression of the design concept phases

The initial stage of the workshop consisted of explaining the purpose and structure of the event to the workshop participants. After that, the participants from Salling, and the designers presented the Domain Cards and the Technology Cards, respectively, explaining the content of each card, and the reasons for including it in the workshop.

Then followed the main part of the workshop, the combination and co-creation phase, in which design concepts were developed and discussed. This phase lasted approximately 70 minutes. During this period of time, eight posters with design concepts were created. In the following, we shall refer to these phases as design concept phases. The design concept phases were followed by a summary of the process and the posters created. The design concept phase took 55 minutes, the summary phase 15 minutes.

The posters varied greatly in level of detail and concreteness: Some posters described distinct interfaces and applications, whereas others suggested possible areas of interest for design, indicating specific domains and technologies on which the design process might focus. The number of Inspiration Cards used on each poster varied from two to six, and were not indicative of the level of concreteness, i.e. the most concrete design concept was a combination of three cards, whereas posters with two and five cards loosely pointed to areas of interest.

Figure 10 provides an overview of the structure and progression of the combination and co-creation phase of the workshop.

An analysis of the transcription and video of the workshop reveals a number of distinct *boundary markers* (Gumperz 1982), statements and/or actions that initiate or terminate discrete phases within the combination and co-creation phase. Two examples of boundary markers are the statements and actions that initiate and conclude the poster creation phase.

- P1 (Picks up the *Interactive Table Technology Card*) ‘I have to say, this thing is fantastic. I mean, for the 100 year anniversary, if we want to tell a story’.

The initiation boundary marker consists of an oral statement combined with a physical gesture, the act of picking up a specific card. These actions also serve as the initiation boundary marker for the first discrete poster phase, and frame this phase as relating to a certain technology and theme from the domain (the anniversary).

The termination boundary marker also consists of an oral statement and a physical gesture, that of putting aside the last poster:

- P3 (Has put aside poster no. 8) ‘Well, do you think that we have missed anything?’

These actions also serve as the initiation boundary marker for the summary phase. This double character of initiation and termination boundary markers was evident in a number statements and actions throughout the process, in that a participant’s statement of starting a new phase often implied that the previous process has run its course.

As is illustrated in figure 10, the phases overlapped in a number of cases. This happened when one design concept was being discussed, and a new and interesting idea not directly related to the concept was brought into the discussion. In some cases, these ideas would be integrated into the current design concept poster. In other cases, the idea

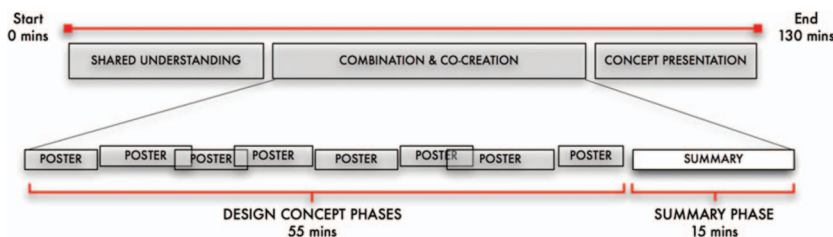


Figure 10. The structure and process of the combination and co-creation phases of the Inspiration Workshop.

did not fit into the current discussion, and two discussions would play out simultaneously. In these cases, the physical work of creating new posters was often initiated before work on the old posters had ended.

In a similar vein, participants would increasingly point to previously discussed concepts as the workshop progressed. Since the participants had not worked together before the workshop, these concepts formed a common ground, and were arguably the most stable points of reference in the discussion. The act of referring to previously formed design concepts also served to connect the concepts and establish coherence between them.

5. Analysis of the *Talking Heads* concept phase

In this section, we move to a micro-analytical level and focus on the creation of one of the design concepts created. The centre of attention in this analysis is the identification of how the participants in the Inspiration Card Workshop move from having a general goal and a number of sources of inspiration, towards forming a design concept; in other words, identifying which elements in the process created and maintained structure and momentum.

We were initially interested in the roles of physical design artefacts, i.e. *Inspiration Cards* and *Design Concept Posters*, in the process. However, initial analyses of the eight design concept phases revealed three additional key elements that structured and drove the process in conjunction with the physical design artefacts, namely *External Sources of Inspiration*, *General Workshop Themes and Values* and *Derived Ideas*.

In the following, we give an account of a single design concept phase, entitled *Talking Heads*, and in the subsequent section we discuss the general roles of the key elements in the workshop, which included two participants (P1 and P2) from the department store and three designers/researchers (P3, P4, and P5).

The *Talking Heads* concept was the fifth concept developed in the Inspiration Card workshop, and the chronological order of the key elements is illustrated in figure 11. For the sake of temporal overview, the numbers in the figure refer to specific incidents in the process, referred to in this section with numbers in square brackets, e.g. [1]. We present each of these incidents in this section. The categories of the incidents are identified in the horizontal rows, which signify Inspiration Cards, External Sources of Inspiration, General Themes, Derived Ideas, and Concept Posters.

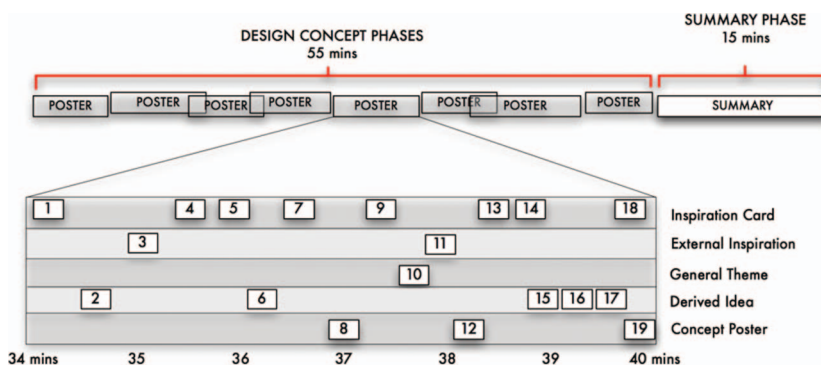


Figure 11. The structure of key elements in the development of the *Talking Heads* concept.

During the transition from the previous concept, people chatted and drank coffee. While referring to the *Drumhead* Technology Card [11] P1 starts out:

P1 'Speaking of heads, I can actually imagine that. I would actually like heads that you could swap and replace.'

Here, the *Drumhead* Technology Card (figure 9) acts as a boundary marker which indicates that a new subject is introduced, and which is followed by a brief exchange between P1 and P3, leading P2 to suggest an idea [2]:

P2 'I would prefer something like having someone telling the story.' [about the department store]

Next P1, P2, and P5 elaborate the idea with a focus on who that person could be.

By making a reference to museums as an external source of inspiration [3], and indicating *Drumhead* [4], P2 formulates a supportive statement:

P2 'Yes, I have seen it numerous times at museums, so where they use it [unclear], it works incredibly well. Because you walk right up to that person and it functions like someone talking to you.'

which makes P1, while seizing the *Drumhead* card [5], come up with an idea [6]:

P1 'But, but couldn't it be used so that Couldn't it be used in connection with the overview boards, to ask the way? You know then that it is simply someone talking to you?'

P1 'So you do not grab a ball, but a head?'

P1 'Yes, you can find your way with the head under your arm.'

Accompanied by a few brief exchanges, P5 seizes the *Drumhead* card [7] and pastes it to a blank piece of poster paper [8], affirming that a shared understanding has been reached. Here the generation of the idea reaches temporary closure.

The idea generated has its roots in the *Drumhead* Technology Card, and it is remarkable that certain attributes of *Drumhead* were active, for instance the physicality of the head, the idea of a specific person, and the use of audio, while the unconventional form of interaction and the use of projection on a curved surface did not seem to play a significant role. The mention of the museum as an external source of inspiration served as a supporting argument rather than actually contributing to the idea.

Next P3 takes up the *Floor Plan* Domain Card [12] (figure 12), opening a dialogue about the use of signs at the department store, but this is quickly turned into a humorous conversation elaborating the idea of using a *Talking Head* as a personal guide for customers.

P2 suggests that one of the heads could resemble the owner of the department store. This is a reference to a recurring, general theme [10] in the workshop, the tradition and the public image of the store:

P2 'We should have a head that addresses you as 'Sir' or 'Madam'. It could be Mr. Salling' [the founder of the department store].

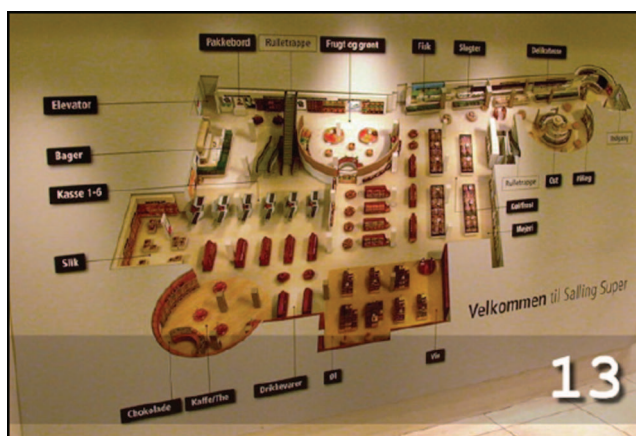


Figure 12. The *Floor Plan* Domain Card.

By making a reference to an external source of inspiration, *Krak* (the dominant Danish providers of online maps) [11], P3 raises a concern about digital guides and tour planning:

- P3 ‘The problem with getting directions, perhaps you know it from using *Krak*. You know, you sit at home and plan the route, and then if you go wrong just once...’
- P1 ‘Then it is just...’

During this part of the process, the *Floor Plan* Domain Card [12] is pasted to the poster, thereby connecting the idea emerging from the *Drumhead* Technology Card [13] to an issue of relevance for the domain, as represented by the *Floor Plan* Domain Card [14]. The *Floor Plan* Domain Card plays the role of connecting the idea to the department store, rather than contributing to the elaboration of the idea.

In the subsequent part of the process, another idea [15] emerges, apparently from the *Drumhead* discussion:

- P3 ‘One could also imagine having a much simpler variety, where you walk up to the board and say: “I would like to know where I can find jeans”, for instance, and then someone tells you.’

But the discussion returns to the elaboration of the idea of the head, and how to carry it around, including the need for an extra arm [16], which leads to the idea of having two heads [17]:

- P3 ‘Then there should be two, one sitting on one shoulder and telling you to save your money, and one that...’
- P2 ‘Yes, like a real devil...’
- P5 ‘Yes, or one that says that “we are going down to the candy section, come, we are going to the candy section”’
- P1 ‘And the other one says “No, no, go to the sports department”’.

To support the idea, the *Animatronics* Technology Card [18] (see figure 13) is pasted to the poster [19], and P1 paints wings and a halo on one animatronic doll, and horns, a tail and a trident on the other. In this way the card becomes more like a medium for illustrating an already developed idea, for instance the idea of having multiple heads, rather than playing a role in the creative process.

Finally, the poster is put aside and the concept is closed (see figure 14).

Having thus analysed the creation of one specific design concept, we now move to a higher level of abstraction, in order to analyse the role of key elements in the workshop.

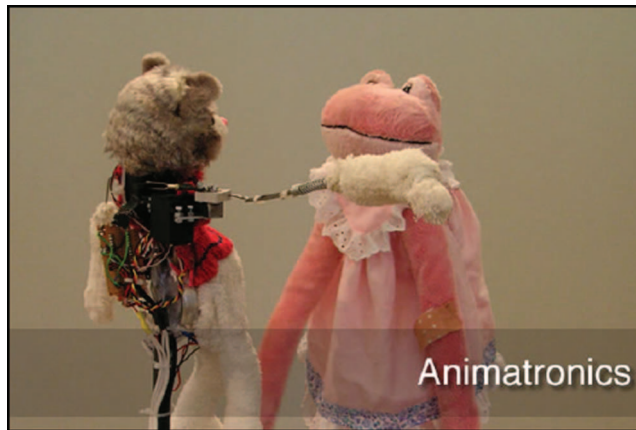


Figure 13. The *Animatronics* Technology Card. The animatronic dolls are from the Watschendiskurs art installation (Frank Fietzek and Uli Winters).



Figure 14. The finished *Talking Heads* concept poster. The text translates as: 'Head under the arm—Information—Various personalities'.

6. The role of key elements in the workshop

In this section, we describe and analyse the key elements in the eight design concept phases, and their interplay in the process of generating new design concepts.

6.1 *Inspiration Cards*

Inspiration Cards are physical instantiations of sources of inspiration, and as such they have a number of attributes that set them apart from oral arguments and gestures, in the discussion and creation of design concepts. First and foremost, they are concrete and fixed, in the sense that their appearance remains the same throughout the process, unless participants physically alter them by writing or painting on them, or cutting them to pieces. Due to this stability, they are fixed points or hubs for discussions. This can be observed in that they often serve as boundary markers in conjunction with oral arguments. An example of this is the initiation of the Talking Heads concept phase:

P1 (Picks up the *Drumhead* Technology Card) ‘I like the one you talked about, the one with the head. I’d like heads that you could swap and replace.’

The participant uses the card as a nexus for the following discussion, first by holding it in her hand, then by placing it in the centre of the table for all participants to see.

Participants imbue the cards with meaning throughout the workshop: they are presented and explained in the introductory phase, and in the concept development phase participants almost always use oral arguments to explain their choice and use of cards. When one or more participants attribute characteristics in this way, the cards become influential in structuring and driving discussions. The cards can thus serve as repositories for statements and arguments, and the meaning of a card may be disputed, and change in the course of a discussion.

This being said, analyses of the workshop did show a primacy of the material, in that the cards can be construed as lasting statements, whereas oral statements are temporary and may be overheard. This can be observed in the way that Inspiration Cards were often used by participants to concentrate the discussion, either by creating, maintaining or shifting the focus, much in the same way as the cards were used to form boundary markers.

In the analysis of the workshop we found that it was quite difficult to capture and analyse the oral statements as key elements in the discussions, even though the workshop was meticulously transcribed. It was much easier to observe how cards and posters structured the event, or in other words, the tangible elements of the workshop lend themselves well to video analysis. This can be a pitfall when analysing workshop data, and observers should beware of the tendency to focus overly on the visible and concrete elements. However, through careful examination of the data, it is clear that the emphasis on physical components is not merely ascribed in the post-workshop analysis, it was in fact clear throughout the workshop that the tangible design materials served as strong structuring elements.

6.2 *External sources of inspiration*

Whereas the Inspiration Cards are selected prior to the concept development phase, participants brought a number of external sources of inspiration into the discussion in

the course of the process. These sources of inspiration could be both closely related to the discussion, or point to entirely new directions for concept development. As an example of a closely related external source of inspiration, consider the aforementioned reference in the *Talking Heads* concept phase:

- P3 ‘The problem with getting directions, perhaps you know it from using Krak. You know, you sit at home and plan the route, and then if you go wrong just once...’

While discussing how to find one’s way around the department store, the participant describes how this problem is solved in a related domain. At the opposite end of the spectrum, external sources may be conceptually remote from the current discussion, as this example from another concept phase illustrates:

- P4 (Following a discussion of how to interact with items on display in shop windows) ‘We were at a public swimming bath this summer, where you could control a water cannon with your mobile phone, you could shoot water at the other guests by using the keys on the phone.’

Here, the participant draws upon personal experience to present possible modes of interaction that may be easily transferred to the current focal point of the discussion.

The introduction of external sources of inspiration was a recurring event in the workshop. We identified an average of three to four such instances in each distinct concept development phase. The effect of these sources of inspiration varied greatly. Some were overheard and dismissed or simply not responded to, whereas others resonated within the group of participants and came to influence the design concepts. Due to the setup and goals of the workshop, the external sources of inspiration that proved to be influential over the course of time were the ones that were set down on paper, either on new cards or as comments on Concept Posters. This was usually done when the participants agreed that a source of inspiration was valuable to furthering the process. The act of setting down in writing these sources of inspiration thus came to be an act of confirming common ground. On the other hand, sources of inspiration that were not written down did not endure.

6.3 General themes

During the workshop analysis, we identified a number of recurring, over-arching themes. These themes reflected shared values or conceptions of the use domain and the nature of the design process between the participants and the designers. When they were introduced or reiterated in the workshop, they served to guide the idea generation towards common goals. One example of these general themes was the designers’ acknowledgement of the department store’s particular tradition and image in the mind of the public, which they wanted to retain and enforce. Likewise, the participants from the department store knew and respected the designers’ interest in exploring innovative interfaces. As an example, the general theme of the long-standing history and status of the department store was often referred to by proxy of the founder of the store, a well-known character in the region:

- P2 (Following a discussion of having talking heads with various identities) ‘We should have a head that addresses you as “Sir” or “Madam”. It could be Mr. Salling’ [the founder of the department store].

The act of bringing this general theme into the discussion had a stabilising effect, and served to ground the creative phase: by hinting at the theme, the participants from the department store could take part in the creative process, and at the same time keep the designers from pressing ideas that would conflict with the store's image.

6.4 *Derived ideas*

A vital element in the concept development phase was, of course, the set of ideas that were derived from the discussions of Inspiration Cards and external sources of inspiration. These ideas sprang from, and in some way transcended, elements already present in the discussion. As with the external sources of inspiration, the derived ideas might live on in the design process, depending on whether or not they were set down on paper. Although the concept development phase was set up to be open, and encourage participants to bring forth as many ideas as possible, there was an implicit element of critique and evaluation of the derived ideas, in that the response from the group determined whether or not an idea was made manifest and written down.

The following is an example of a derived idea that came to influence the final Talking Heads design concept:

- P3 (Takes the *Animatronics* Technology Card, following a discussion of having talking heads with various character traits, to guide customers in the department store) 'Then there should be two, one sitting on one shoulder and telling you to save your money and one that ...'
- P2 'Yes, like a real devil ...'
- P5 'Yes, or one that says that "we are going down to the candy section, come, we are going too the candy section"'.
P1 'And the other one says: "No, no, go to the sports department"'.
P5 (Paints wings and a halo on one animatronic doll, and horns, a tail and a trident on the other)

In this sequence, a participant brought up the idea of having multiple guides. A second participant responded to this immediately, twisting the idea in the direction of devils (and, implicitly, angels), quickly followed by a third and fourth participant voicing their understanding and consent. This in turn led the second participant to manipulate the Inspiration Card to fit the idea so as to make it permanent. This interchange of ideas and manipulation of cards took less than 30 seconds.

6.5 *Concept Posters*

Concept Posters display many of the characteristics found in Inspiration Cards. They are physical artefacts, and large ones commanding the attention of participants when they are brought into play. On a semantic level, the over-arching goal of the Inspiration Workshop is to come up with design concepts, and articulate these concepts on the posters, which further emphasises the posters' dominant position in the process.

Whereas oral statements or the handling of Inspiration Cards may initiate distinct concept development phases, the posters often terminate them: When concepts are described on a poster, the work is done, and the participants move on to a new concept. This can be observed when a poster is physically moved to the edge of the table, and thus into the periphery of the participants' attention, when it is completed.

As with Inspiration Cards, posters are imbued with meaning through participants' statements. These statements may be oral, but may also consist of the act of affixing cards to the poster, or writing and drawing on it. Since participants regard the poster as a very important entity in the workshop, summing up an entire design concept, they usually hesitate to do this until concepts have been discussed and some sort of agreement has been reached; i.e. participants feel that there should be a consensus as to what is put on the posters, since it sums up the discussion.

The posters establish which concepts and ideas live on in the design phase, and which ones are discarded. For this reason, the summary phase of the combination and co-creation process was spent reviewing the posters, to ensure that the participants understood and agreed on the concepts.

6.6 Combination of key elements in Concept Posters

Since the design Concept Posters are instrumental in storing and transferring concepts to the continued design process, there is a great deal of relevance in an analysis of which elements of Inspiration Cards, external sources of inspiration, general themes and derived ideas are contained in the posters. The main components of Concept Posters are the Inspiration Cards affixed to them. These cards are supplemented by text and/or illustrations, often to indicate external sources of inspiration, general themes and derived ideas, and to underline relationships between these elements. To illustrate these points, figure 14 shows the poster that resulted from the Talking Heads design concept phase.

To this poster are affixed three Inspiration Cards: *Animatronics*, *Drumhead* and *Floor Plan*. Snippets of text are written, namely 'A head under the arm', 'Information', and 'Different personalities'. Furthermore, small drawings have been made on and above *Animatronics*, to symbolise angelic and demonic characters. To recap, the concept presented by the poster is that of supplying customers in the department store with talking heads that can guide them, and present relevant information about products. However, it is virtually impossible to decipher this concept if the context and process of the workshop are unknown; the poster has clearly been embedded in layers within layers of meaning and understanding in the process of making it. Thus, the Inspiration Cards are not used to directly represent the phenomena from which they originate, but instead each is used to illustrate minor points: *Drumhead*, originally an interactive and experimental musical instrument, is used to illustrate the idea of carrying around heads. *Floor Plan* is used to illustrate the fact that the heads are used to guide customers. *Animatronics*, which originally refers to a pair of mechanical dolls that are part of an art installation, is used to illustrate the idea of having heads with divergent personalities that may guide customers in specific directions. The ways in which the cards are employed are as much a question of participants' prior knowledge and emerging communication, as of what is actually represented on the card. Understanding the final poster is ultimately a matter of understanding the process that led to its fabrication.

Condensing these findings, we identify the key elements that structure and create momentum in the design situation as follows:

- the manifest properties of Inspiration Cards and Concept Posters, which enable them to function as props that encourage and support design moves in a manner visible to all participants and are open to ongoing reconfiguration, and furthermore support the construction of assemblages of ideas into concepts in physical form;

- the semantic dimensions of the cards and posters, as catalysts for deriving, communicating, discussing, and evolving design ideas and concepts; and
- the *ad hoc* improvised external sources of inspiration brought into the discussion by participants as means of supplementing and developing design concepts.

6.7 Further concepts developed in the workshop

Including *Talking Heads*, eight concepts were developed in the Inspiration Card Workshop. They fell into four categories.

Direction and guidance for customers in the department store—these were concepts that presented customers with forms of guidance and direction for finding specific products and special offers. The *Talking Heads* concept falls into this category.

Experience Zones—these concepts suggested ways of creating special interest zones, specifically one zone for entertaining children while their parents shop, and another zone for conveying the history of the Salling department store in relation to its 100th anniversary.

Recommendation—a set of concepts that suggested ways of implementing recommendations systems, known from web-based stores such as Amazon[®], but in this case integrated into the physical layout of the department store.

Interactive Façades—this group of concepts addressed the use of the façade. One of these concepts, *Dynamically Transparent Windows*, has been further developed, and is now in the final stages of product development. We expect to test the product at the department store in the autumn of 2007.

7. Results and findings from related Inspiration Card Workshops

As mentioned previously, we have conducted a number of workshops with the other partners in the course of the research project *Experience-oriented applications of digital technology in knowledge dissemination and marketing*—Gumlink[®], 7th Heaven, and The Danish Electricity Museum. Each of these workshops resulted in approximately ten concepts see (Halskov and Dalsgård 2006).

The workshop with Gumlink[®] was executed in order to create interactive elements for their booth at the world's largest annual sweets convention. Two of the concepts developed at the workshop have been implemented: a walk-up-and-use interactive console using tangible interaction; and a large motion-sensing interactive display at the front of the booth, intended to draw in passers-by (Dalsgaard and Halskov 2006, p. 4).

The concrete results of the Inspiration Card workshop with 7th Heaven are two installations at a children's literature centre focusing on Norse mythology: The first installation, *Balder's Funeral Pyre*, is an interactive corridor in which one of the sides features an immersive rear projection of fire (Dalsgaard and Halskov 2006, p. 5). The second Installation is *Mimer's Well*, a 3D stereo cinema that presents elements of Norse mythology.

The workshop held in collaboration with The Danish Electricity Museum resulted in a catalogue of concepts for further development. Due to limited resources for the project, these concepts have not yet been further developed. However, two of the most promising concepts, *The Energy Floor* and *The Energy Table* (Dalsgård and Halskov 2006, p. 6), have been developed as virtual video-prototypes (Halskov and Nielsen 2006).

With regard to the key elements identified in the Salling Inspiration Card Workshop, our findings from conducting related workshops with other partners in the research project can be summed up as follows.

7.1 *Inspiration Cards*

Our findings regarding the structuring role of Inspiration Cards are supported by the findings from the three other cases (see Halskov and Dalsgård 2006). In all the workshops, the Inspiration Cards served as physical markers around which many discussions and arguments were anchored, and they clearly guided the processes of ideation and negotiation. Typically, some Inspiration Cards presented in the initial stages of a workshop are never used. We have not been able to identify a clear pattern as to which types of cards are left unused; this may pertain to the limited amount of time in the idea generation phase, or it may have to do with the content or presentation of the cards themselves.

7.2 *External sources of inspiration*

In all cases, external sources of inspirations have played a prominent role. For example, the art of Bill Viola was brought into the discussion of atmosphere and style of the 7th Heaven literature centre, as documented in Halskov and Dalsgård (2006). As another example, Virgin Atlantic Airlines[®] was introduced and discussed at the Gumlink[®] workshop as an argument for the potential for doing ordinary things in an extraordinary way. In order to capture strong external sources of inspiration, we suggest that a number of Inspiration Cards be initially left blank, so that these sources of inspiration can be put onto them, and be preserved throughout the ideation phase.

7.3 *General themes*

In every workshop we have conducted, certain general themes have dominated the idea generation phase. In the case of the department store, these pertained to the store's renowned history. In other cases, we have worked directly at identifying and formulating such themes. Dalsgård and Halskov (2006) elaborate on this work, specifically with regard to incorporating over-all intentions and values into the design process in general, and Inspiration Card Workshops in particular. For instance, creating room for reflection and a solemn mood were recurring themes at the 7th Heaven workshop, in contrast to the Gumlink[®] workshops, in which promotion of Gumlink's[®] standing as hi-tech company driven by innovation and research was the focal point.

7.4 *Derived ideas and combinations of key elements in the Concept Posters*

In our experience from conducting a series of Inspiration Card Workshops, the ideas derived from combining cards and external sources of inspiration cover a broad spectrum, ranging from obvious concepts to surprising and unexpected proposals. In the case of the department store, concepts of interactive façades were created, which was to be expected, given the inclusion of both Domain and Technology cards that specifically addressed this aspect of retailing. However, as evidenced by the *Talking*

Heads segment analysed in detail in this paper, completely unexpected combinations and ideas can also spring from the process. In general, we have observed that this is often related to the experience that workshop participants have in working with creative processes and methods, e.g. the Salling participants were accustomed to working creatively with exhibitions and displays. With regard to preserving the ideas generated at Inspiration Card Workshops, it is worth noting that Concept Posters on their own are not adequate for documenting the design concepts. The posters are often hard to understand for those who have not participated in the workshops, and they need to be documented and elaborated if they are to be further used in the design process. Indeed, even workshop participants can have trouble identifying the concepts set down on posters a week or two after the workshop event. For this reason, it is highly advisable to capture the workshops on video, and generate textual descriptions of the developed concepts as soon as possible after the workshops.

8. Further discussion and conclusions

8.1 *Issues of participation—design moves and process structuring*

From a participatory perspective, the Inspiration Card workshop approach has proved to be a very productive way of involving domain experts in the early parts of the design process. As Brandt and Messerter (2004) observe, design props such as the Inspiration Cards ‘support different stakeholders in making design moves on a conceptual level’ (Brandt and Messerter 2004, p. 129). The cards are thus an integral part of the ongoing design dialogue, and a means of expressing or emphasising design moves. The politics of cards and posters has been particularly evident, for instance in the way that cards make it easy for participants to voice their ideas, and in the key role that posters play in bringing discussions to a close. At the same time, the choice of Technology Cards, which is made by the designers, has had a strong impact on directing the development of design concepts. What might appear at first glance to be a process with strong participation from stakeholders from the design domain was actually heavily influenced by the choice of Technology Cards. Traditionally, Participatory Design has made a high priority of taking the current (work) practice as the starting point for the design process, and in this respect has favoured tradition at the expense of innovation. In the workshop reported here, the balance shifts instead towards innovation, in the conflict between tradition and transcendence, identified by Ehn (1988) as one of the most important dilemmas in design. Thus, the design dialogue that unfolds in the concept development phase is highly participatory, while the framing of this process (in terms of the workshop setup and the sources of inspiration on the cards) is clearly directed by the designers, for better or worse.

8.2 *Micro-analytical studies of design processes*

Within the field of interaction design and human–computer interaction (HCI), there are precious few in-depth studies of the processes from which design ideas and concepts emerge. This seems paradoxical, given the ongoing interest in new and evolving technologies, systems, and artefacts. Following the lines of Mondada (2006), among others, we have employed a micro-analytical approach to one specific situation

from which a design concept emerged. The circumstances surrounding the situation allowed us to both participate in, and later reflect on this process. We chose this setup in order to gain an understanding of the many potential semantic layers of the design situation, e.g. the meaning ascribed to us by our collaborators and vice versa, the understandings of the use domain and workshop purpose, and, not least of all, the ongoing interpretations and reconfigurations of the Inspiration Cards and Concept Posters. Depending on the circumstances, roles other than those of participant-observer may be more appropriate in dissimilar design situations. In reviewing our method and findings, we feel encouraged to carry out similar micro-analytical studies in our future work. The approach has yielded insights into the intricate ways in which design props such as the Inspiration Cards structure the ideation process, make room for converging concepts, and function as boundary objects in discussing, resolving or transcending conflicts and misunderstandings. In future work, we will most likely develop our techniques of notation further, to more clearly visualise key elements and progression.

8.3 Innovation through an artefactually mediated, socially distributed, and adaptive design process

Since the Design Concept Posters from the Inspiration Workshop establish a potential future course of the design process, it is pertinent to explore the level of detail and completion of the posters. The aforementioned *Talking Heads* concept is clearly far from being a functional requirement or specification. It can instead be construed as emergent, in that it serves as a guide for the ongoing design process, but is still flexible and negotiable. Whether it will be realised, how, and in what form, is thus a question of continuous negotiation among the participants in the design process. The *Talking Heads* design concept is representative of the main parts of the design concepts that result from Inspiration Card Workshops: The elements that are combined to form the concepts are seldom directly transferred or copied (i.e. fixed and non-negotiable), but instead form negotiable, emergent designs. In this respect, the design concepts bear a close resemblance to boundary objects, as described by Star and Griesemer (1989): they are constructs that serve as common points of reference for people from different domains. They are flexible enough for people to interpret them in different ways and thus relate them to their practices, yet concrete enough to serve as means of translation and coordination across domains. In the Inspiration Card Workshop we can thus describe the collaborative efforts of practitioners from various domains to bring forth design concepts, as boundary objects in the making.

The specific Inspiration Card Workshop analysed in this paper can be characterised as a design situation that is socially distributed (in that multiple practitioners from various domains collaborate in bringing about ideas and concepts), artefactually mediated (in that the Inspiration Cards and Concept Posters help structure the process and mediate understandings) and adaptive and emergent in that ideas emerge, both those based on derivation from already presented concepts, and through ad hoc improvisation in continuous adaptation to the unfolding of the design situation.

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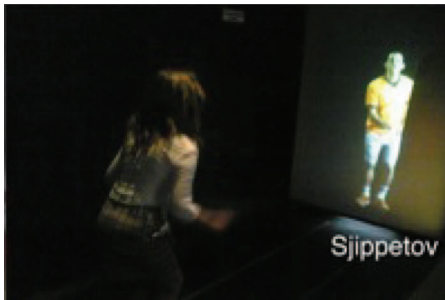
participated in the design workshops. We would also like to thank Martin Johansson Wetterstrand and Joan Greenbaum for fruitful comments and discussions of the paper.

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Appendix

The 14 Technology Cards



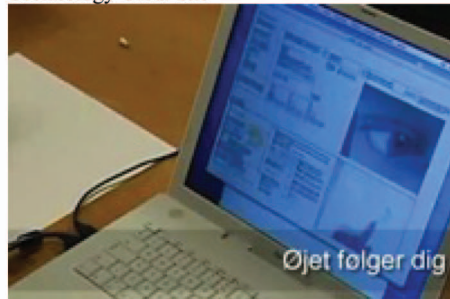
Technology Card: Jumping Rope



Technology Card: She



Technology Card: Blinkenlights



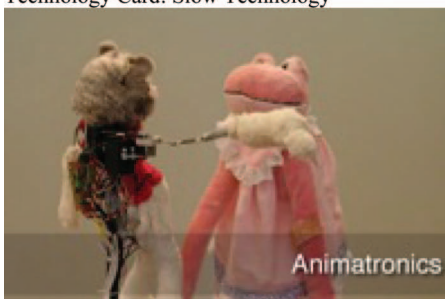
Technology Card: Eye follows movements



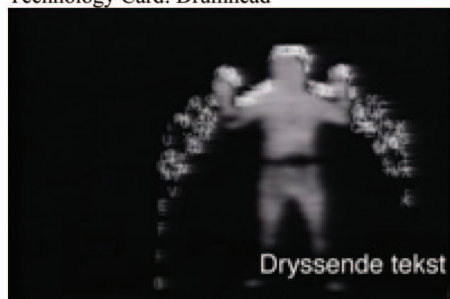
Technology Card: Slow Technology



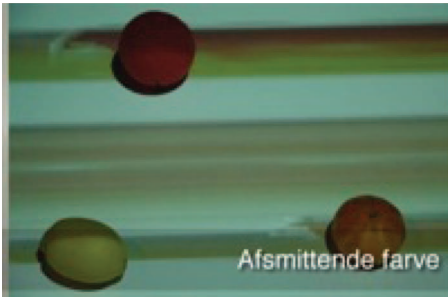
Technology Card: Drumhead



Technology Card: Animatronics



Technology Card: Dripping Text



Technology Card: Leaking Colour



Technology Card: Interactive Dressing Room



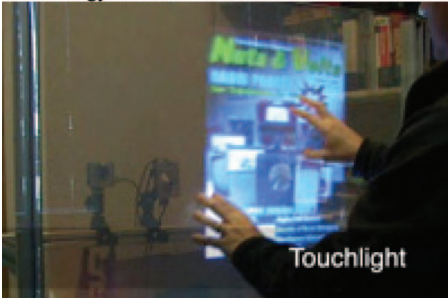
Technology Card: Information Table



Technology Card: Interactive Shopping Window



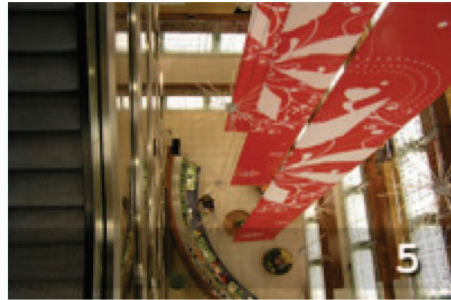
Technology Card: Recommendations



Technology Card: Touch Light

The 18 Domain Cards

Domain Card: Food Court



Domain Card: Drapes



Domain Card: Bistro



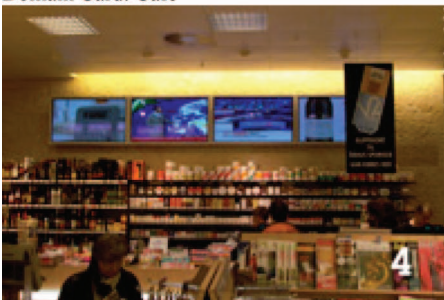
Domain Card: Children's Entertainment



Domain Card: Cafe



Domain Card: Large LCD TVs



Domain Card: Kiosk



Domain Card: Dead Zones



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Domain Card: Transitional Zones



Domain Card: Facade at Night