Midgets: Exploring the Design Space for Truly Liquid Media

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Abstract

Traditionally, media objects have been restrained to specific media containers (e.g. media players, libraries, and technological platforms). In this paper we argue that this is due to a tradition of treating media as content separated from, but physically aligned to a certain form. However, due to the digital character of modern media, and due to current developments towards file sharing communities, media convergence and cross-media interaction design we argue that there are several good reasons now for exploring the design space beyond a container view of media. In our exploration of this design space we take a point of departure in media objects where form and content is integrated, instead of separated and we take contemporary theories of liquidity and an innovation-oriented focus group study as two sources of inspiration for exploring the design space of truly liquid media. The exploration is then summarized into a vision of midget design, i.e. design of small, lightweight, interactive and integrated media objects that can live across heterogeneous media platforms.

Keywords

Cross-media interaction design, Liquid media, Media convergence, Media platforms, Midgets.

Future mobile media

A few weeks ago I met the CEO for a company in the mobile media industry. He wanted to show me his mobile phone and their product, a software client for receiving Internet distributed TV on mobile phones. The TV-quality on the phone was quite good, and the CEO proudly said to me. -"This is the future of mobile media!". I wanted to challenge him on this statement, so I picked up my own mobile phone, pointed it in his direction, and replied, -"What a great TV-channel you have there! Can you give it to me?" The CEO looked back at me with confusion in his eyes. I had not offended him, but obviously I had to some degree redefined the design space for future mobile media.

In this paper we take this short anecdote as a point of departure for exploring the design space of future mobile media. Although this anecdote is in fact a true story, it is not this anecdote *per se* that motivate us to initiate this exploration. Rather, the anecdote is just an example that corresponds well to several more apparent trends right now including, e.g. the ability to distribute media over the Internet and across mobile devices using ad hoc networks, the trend towards file sharing communities via P2P networks, and finally, the current trend towards user-generated media content (see e.g. the popular media site www.youtube.com/ as a good example of a service driven by user-generated media).

Accordingly, we can now witness both a technical trend and a use-based trend towards a slogan like *"Media wants to be free!"* (similar to the popular Internet-slogan *"Information wants to be free!"* in 1994) since current development towards P2P-networks, mobile P2P applications, media streaming technologies, mobile media players, etc all point in the direction towards media that is circulated, shared, remixed and re-circulated between users instead of more traditional media consumption cycle that assume a one-way direction from media production, to media editing, to packaging, to distribution and finally media consumption. While the traditional media cycle assumes a container view of media in that a certain media content, e.g. a piece of music should be package in a certain container (e.g. a CD) which than correspond to a separated form, e.g. a CD-player, modern media might be more fluid in terms of its content and, a certain content might need to be able to correspond to several alternative forms as it is circulated on large-scale, complex and highly integrated cross-media platforms.

Given this general change in media consumption patterns, given the current development towards P2P file sharing networks, ad hoc networks, and cross-media interaction design, and given the digital character of modern media and the current trend towards media convergence we argue that there are several good reasons now for exploring the design space beyond a container view of media use. In this paper we therefore set out to explore the design space of truly liquid media. In our exploration of this design space we take a point of departure in media objects where form and content is integrated, instead of separated and we take contemporary theories of liquidity and an innovation-oriented focus group study as two sources of inspiration for exploring the design space of truly liquid media. The exploration is than summarized into a vision of midget design, i.e. design of small, lightweight and interactive media objects that can live across heterogeneous media platforms.

In the next section we describe the general method applied in our research on exploring the design space of future media in terms of liquid media in cross-media platforms. We

then present the background and concept case which we have target in our project followed by a presentation of the bearing concept “liquid media”. We then present a concept-driven & innovation-oriented focus group study that we have conducted and the results from this study in terms of implications for the design space for truly liquid media. We then introduce the concept design of *Midgets* as small, lightweight and interactive media objects that can live across heterogeneous media platforms, and relate this concept design to the existing body of research in this area before concluding the paper.

Method: Concept-driven Interaction Design & a Focus Group Study

From a methodological standpoint we have in our research project taken a point of departure in media objects where form and content is integrated, instead of separated, and we have taken contemporary theories of “liquidity” and an innovation-oriented focus group study as two different sources of inspiration for exploring the design space of truly liquid media.

The point of departure taken in concept-driven interaction design has enabled us to work in a well-structured and convergent thinking manner towards a better understanding of a core concept, i.e. the concept of “liquid media”, that could serve as a guiding tool to further explore the design space of future media.

On the contrary, the focus group study in this project followed a creative association technique as a method for exploring the design space of “free” media have guided us into more divergent thinking on the possibilities of future liquid media. Here, the concept of liquid media have served as a starting point for further associations in relation to four different object that the participants in the focus group were presented to during this study.

Background and concept case: Media as separated form and content

In the early 90´s the slogan “Information wants to be free” was a popular, and important phrase that described and guided much of the development of the Internet infrastructure. Similarly, the phrase “The media is the message” have had a great impact on how we think about media as a design material, i.e. we have had a tradition of looking at media as content separated from its form an dwe have thus made a distinction between media objects as content and media players as the form. Thus, an alternative interpretation of the famous slogan “The media is the message” mgiht be that media is only about content whereas its form is left out to a dedicated media player which typically only support a limited number of formats, or forms. Today, we can see this problem growing fast due to the development of new media formats and adoption of new media standards, and as a result of this people end up with media converters of various kinds for dealing with the current gap between media objects and media containers, e.g. media players.

While one might think that this is just a natural effect of technological development in the media industry in which we have moved from quite simple media formats to more advanced formats which have provided us with better quality, video- and audio compression, etc we argue that this design flawn is rather an effect of a non-relective transformational process from old (typically analouge) media to new (typically digital) media. Traditionally, media content (e.g. music, video and photos) were cheeper to reproduce in many copies than its associated media players,

i.e. it was cheeper to produce just one casette recorder and then produce the songs on different tapes than to produce a new player for each new song. As such, this divide that we have today between media form content and media form are due to this tradtion where traditional media had this restriction. Now, however, new media is digital in terms of both content and form, and thus we can e.g. reproduce the media players as easy as we can reproduce the media content. This leads us to further explore a more integrated view of media in which no separation is made between media content and media form.

Towards integrated media

The basic idea here of viewing content and form as one integrated structure is not completely new. The linguist Ferdinand de Saussure ones argued that in our languages form and content (or signifier' and 'signified' as he which to label them) is always integrated and he illustrated this in his semiotic 'dyadic', or two-part model of the sign as the following diagram illustrates:

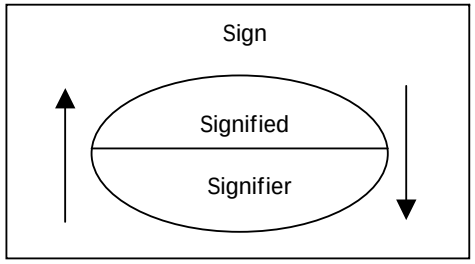

Figure 1. Saussure´s two-part model of the sign. (From http://www.aber.ac.uk/media/ Documents/S4B/sem02.html)

Saussure thus argued that a sign is being composed of: 1) a 'signifier' (signifiant) - the form which the sign takes; and 2) the 'signified' (signifié) - the concept it represents. The sign is then viewed as the whole that results from the association of the signifier with the signified (Saussure 1983, 67; Saussure 1974, 67) and the relationship between the signifier and the signified is referred to as 'signification', and this is represented in the Saussurean diagram by the arrows. The horizontal line marking the two elements of the sign is further on referred to as 'the bar'. (http://www.aber.ac.uk/media/Documents/S4B/sem02.html)

In parallel to this semiotic model, and by following the same structural layout, a more integrated view of media could be formulated as follows:

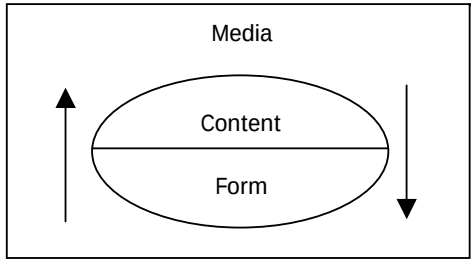

Figure 2. A two-part model of new integrated media

In this two-part model of a media object no separation exists between form and content, instead, form and content are fully integrated in the same container, i.e. the media object. The interface, or “the bar” is thus between a certain media content and its corresponding media form.

While this might seems like only a theoretical argumentation, it is easy to see the analogy to the history of media in terms of media form and media content.
If looking back at the history of media in terms of form and content we can see how it has always been a natural separation between e.g. cassette tapes and cassette recorders, between LP-discs and LP turntables, between

Figure 3. The "selfplaying" piano - PIANOLA Duo Art - from 1929 located in Gallery Thomasgaarden (home.no.net/leander/pianola_uk.htm)

Figure 4. The iTTCD10 - CD Player/USB Turntable (http://www.ion-audio.com/iTTCD10.php)

CDs and CD-players. The separation trend has been clear, but there are examples where a more tight integration between form and content has been explored. One such example is the self-playing piano, an invention popular in the late 20´s. Figure 3 show one example of one such device.

The self-playing piano illustrates the idea of integrated media objects where form and content are tightly integrated. However, as mentioned above, traditional media content (e.g. music, video and photos) were much cheeper to reproduce in many copies than its associated media players, and further on,traditional ”media players”, including e.g. selfplaying pianos, would occupy a lot of physical space if each song needed its own media player device. Finally, although the form and content was tightly integrated in the selfplaying piano, it did not enable easy distribution of these media objects in the same manner as modern file sharing networks do.

However, modern media do not share these characteristics. Modern media, including both content and form, is easy and cheap to produce in many copies. Modern media is also cheap and easy to distribute electronically. One good example of this is LimeWire (www.limewire.com) a P2P file sharing network client that distribute its installation file as part of the P2P application, and this installation file can then be shared on the P2P network as any other file.

So, we can now see a trend where we move slowly towards integrated media objects. This is a movement from traditional media (including stereo sets, turntables, CD-players, etc) via media converters (e.g. the iTTCD10 - CD Player/USB Turntable in figure 4) that enables digitalization of traditional analogue media into digital media, to truly liquid media that ca flow, travel and reshape seamlessly across P2P networks, home media networks, personal media networks, and so on.

As a manifestation of this trend, it is easy to see how the iTTCD10 illustrate several important steps in this movement towards new media, i.e. it supports: digitalization of traditional media (LP-discs) and re-digitalization of semi-modern media (CD-discs). It is also a good example of the current trend towards media convergence where several different media converge into one integrated format. Finally, this device illustrates the problem with separation of media form and media content as pinpointed above.

So, given that we now have the technology to move away from traditional separated media towards new digital and integrated media it is also important to stress the next step in this development, i.e. the fluid or liquid character of new media. In a nearby future we can assume that media will move freely across different technological platforms, across different media formats and across different networks. Media will in this sense appear more as a liquid than solids. In the next section we therefore take “liquid media” as in interesting point of departure for exploring the design space of future media.

Design concept: “Liquid media”

In order to explore the design space of future media we need to think about media metapohorically, beyond current media players on home media centers, beyond exchange of media files over the internet, and beyond mobile access to media servers. Instead we need to think about media in plastic terms that can move around seamlessly in tomorrows interaction landscapes built up around cross-media interaction design concepts. In this section we present “liquid media” as one such concept that illustrate this free moving, and easy re-shaping character of new media. So,

what could a concept like “liquidity” mean in the context of cross-media interaction design? To fuel our thinking about this concept of liquidity we have borrowed the reflection around the concept of fluids from Bauman’s book called “Liquid modernity”, and it reads as follows:

”Fluidity is the quality of liquid and gases [...] Fluids, so to speak, neither fix space nor bind time. While solids have clear spatial dimensions but neutralize the impact, and thus downgrade the significance, of time (effectively resist its flow or render it irrelevant), fluids do not keep to any shape for long and are constantly ready (and prone) to change it; and so for them it is the flow of time that counts, more than the space they happen to occupy. [Further on...] Fluids travel easily. They “flow”, “spill”, run out”, “splash”, “pour over”, “leak”, “flood”, “spray”, “drip”, “seep”, “ooze”; unlike solids, they are not easily stopped – they pass around some obstacles, dissolve some others and bore or soak their way through others still.” (Bauman, 2000, p. 1-2)

In comparison with this quote, new media needs to be volatile and free moving, almost like water or any other liquid substance. While one might think that this is only an issue for designers or media production companies, this is rather something that is highly important to media consumers. Today, we already have a “do it yourself”, and bottom-up trend around media in which YouTube (www.youtube.com) is a good example of user-generated, user-distributed and user-remixed media content. Modern users do not only consume media. They are themselves highly involved in the creation and constantly reconfiguration of the modern interaction landscape, i.e. they are doing interaction landscaping with new media and new media networks as their focal tools.

Figure 5. The participants in the focus group study

In traditional terms, the term *landscaping* refers to: *“any activity that modifies the visible features of an area of land, including but not limited to: 1.living elements, such as flora or fauna; 2.natural elements such as landforms, terrain shape and elevation, or bodies of water; 3.human elements such as structures, buildings, fences or other material objects created and/or installed by humans; and 4.abstract elements such as the weather and lighting conditions.” (Wikipedia.org on the term “landscaping”).*

Similarly, in this paper we suggest the term “interaction landscaping” as referring to the everyday use of interaction technologies which in turn contributes to the stabilization of the interaction landscape, and on the other hand, how everyday modifications and customizations of existing interaction technologies and new media, and how development of new interaction technologies at the same time challenge, and constantly redefine the texture of the interaction landscape. In the light of these processes we can see how a concept of “liquid media” naturally encompass this overall trend towards user generated, user-redefined, and user-circulated media. In the next section we present a concept-driven focus group study in which we have tried to further enroll these creative users in our exploration of the design space of future liquid media.

A concept-driven focus group study

In our ongoing research project we have conducted a concept-driven focus group study. The study design included 4 interaction design experts (see figure 5) and the focus group was organized into four phases (20 minutes/phase). The overall aim of the focus group study was to collect data on media associations in relation to four different objects (including media associations around: LEGO bricks, Soap

Figure 6. The material used in the focus group study included 1) LEGO bricks, 2) Soap bubbles, 3) CubeWorld devices, and 4) MobiBLU Cube 2 media players.

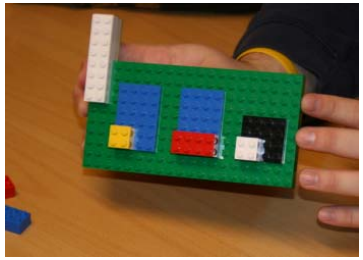

Figure 7. Physical mobile media container with LEGO-based UI and LEGO-antenna.

Figure 8. LEGO-based media services.

bubbles, CubeWorld devices (www.http://www.radicagames.com/cubeworld/index.php) and MobiBLU Cube 2 media players (http://www.mobiblu.com/), see figure 6). In follow-up questions during the focus group study a conceptual point of departure was taken in the "liquid media" concept for the purpose of validating the strength in this concept as well as to challenge it to further explore the design space of truly liquid media. Further on, another point of departure was taken in the idea of integrated instead of separated media in terms of form and content. Both of these two points of departure were explicitly stated in the introduction to the focus group study. Below we present each phase in detail followed by a presentation of the main results from this study.

Phase 1: LEGO bricks as media

In the fist phase of the focus group study the participants were instructed to build something together with the LEGO bricks available and, at the same time talk freely about what media associations they could come up with.

During this exercise the participants were mainly focused on LEGO-constructions as *physical containers* for media, e.g. a green big LEGO brick with a LEGO-user interface and a LEGO-antenna could represent a mobile media device (see figure 7, left). This might be due to the solids character of LEGO bricks in which its occupation of space, rather than time becomes a focal issue (compare the quote from Bauman above about fluids vs. solids in relation to time and space). There was however one attempt made to think about media as content and figure 8 illustrate how different media could be linked together and combined in a similar way as the Yahoo pipes idea (http://pipes.yahoo.com/). Another issue that was brought up in relation to this figure was the importance of "firewalls" between public and private media as to protect the individual integrity. To illustrate this, a LEGO-plate was mounted horizontally at the edge of the big green LEGO-plate (see the blue horizontally mounted LEGO brick in figure 8).

Phase 2: Soap bubbles as media

In the second phase the participants were equipped with soap bubbles. In this exercise they were instructed to blow soap bubbles and think about these bubbles in terms of media. During this exercise it was interesting to see how the creativity now were more directed towards media as content rather than focused on the form as in the LEGO case. Again, this might be possible to interpret in terms of the Bauman quote on liquids vs. solids. As the participants started their association game in this phase while blowing soap bubbles they started to talk about media in terms of e.g. "transparent media", "volatile media", exchangeable media" and "connectable media". As formulated by one of the participants: *"These media bubbles easily glue together... they connect to each other, unite, mixes and form something bigger".* One of the participants even suggested a similar concept as liquid media, i.e. "elastic media", and immediately they then started to explore this concept even further. As illustrated in figure 9 they connected their media bubbles, tried to glue them together, stretch them and hand them over to each other.

Figure 9. Collaborative elaboration with "media" soap bubbles around the concept of elastic media.

Figure 10. Two examples of collaboration around the CubeWorld devices.

Figure 11. Phase 4 in the focus group study in which the focus was on how to further develop the MobiBLU Cube 2 media players based on the creative associations made around media in phase 1-3.

As illustrated in figure 9, two participants tried to connect their “media bubbles” (left) and then give them to each other (figure 9, right). They also addressed that this seamless collaboration around media objects could lead to new forms of social interaction around digital material.

During this second phase it was obvious that they treated media as a fluid material rather than as content packed in media containers. Instead, they talked about how media should be able to changes its form, its mode of playing and its format, and how it must be possible with future media to seamlessly glue various media together, unite media, remix and blend media and then redistribute and share media in its new format.

Another aspect discussed was the fragile nature of soap bubbles and one participant said, in relation to media, that this could be though of in terms of “media strings”, almost like strings in string theory, that live just for a fraction of time in a certain form and in a certain location before it is transformed, deleted, passed forward or remixed.

Phase 3: CubeWorld devices and new media

In the third phase of the focus group session the participants were presented to CubeWorld devices (www.http://www.radicagames.com/cubeworld/index.php). These cubes are small physical cubes that contain a little display on which a little animated and interactive figure is shown. When two or more cubes are physically attached to each other these small figures can start to interact, go over to each other cubes on a visit, play together, etc. The instruction here was again to think about similar modes of interaction (e.g. connecting the cubes, shake them, place them on top of each other, etc) but in relation to media including media objects like photos, audio and video.

During this third exercise it did not take long before the participants were totally engaged in a collective exploration of these cubes. They first worked in pairs (see figure 10) and then started to combine all four cubes in different ways as to explore what the animated figures would do if connected to the other cubes.

One participant said that it would be nice to have a whole wall of these cubes and just sit back and watch how the animated figures would go across all the cubes and interact with each other. On the other hand however, this participant also pinpointed that quick access to a certain piece of media was critical and this person labelled this “20-minutes media” as a term for making a quick collection of media objects from all these sources and then enjoy it for 20-minutes, and then put together a new collection again. As such, the modern user do not have time to sit for hours and convert media into correct formats and transfer files slowly from one device to another. In relation to this idea of having a huge collection of cubes, even a whole wall of them, also generated the idea of “global shuffle”, i.e. to not only shuffle the songs on e.g. an iPod shuffle media player, but to be able to shuffle among all media accessible in the surrounding including both media walls consisting of Cube World-like media objects as well as others mobile media players.

Phase 4: MobiBlu Cube 2 devices and integrated media

In the forth phase of the focus group study the participants were instructed to think about how the MobiBLU Cube2 media player could be further developed if influenced by the associations made during phase 1-3 of this study. To ease their thinking all of the material used in the focus group study during phase 1-3 was ones again placed on the table in front of them together with four MobiBLU Cube 2 devices (see figure 11). The MobiBLU Cube 2 device is a tiny media

Figure 12. (left) Today's interaction landscape as a mixture of various media devices, media formats and networks, and (right) an illustration of the problem of integrating these different technologies seamlessly as to support fluid media use.

Figure 13. Illustration of an integration of two media platforms as a typical hard coded, cumbersome and non-flexible solution of today.

Figure 14. Illustration of the need for cross-media user interfaces

player capable of playing MP3, video and FM-broadcasts. It can also play video and show photos. To prepare the participants for this last phase they were all equipped with one Cube 2 player a couple of days before the focus group so they had the opportunity to get familiar with the device and its functionalities.

Immediately when this phase started one of the participants made the connection to the converting problem mentioned during phase 3. This participant said that he/she had transferred a movie from his/her stationary computer to the Cube 2 device. However, when attempting to open the movie file it turned out that it was in the wrong format and thus needed to be reformatted before transferred back again to the Cube 2 device. This was though of as being very cumbersome so this participant did not care to do it all over again.

Another reflection that was brought up was that all these media devices exist today, but the interconnections are really bad from both a networking perspective as well as from an interaction design perspective. Today, it is really hard to let any media move freely and easily between its containers due to cumbersome UIs, mismatching media formats, etc. One participant said that a common platform needed and maybe meta-data about media objects could be part of the solution. This lead to a wider discussion around the problem with the heterogeneous nature of today's interaction landscape, which can be summarized as a mixture of networks, media formats and applications as illustrated in figure 12 and which typically has lead to hard coded, cumbersome, and non-flexible solutions in attempts made to integrate different media platforms (see figure 13).

Further on, the concept of "elastic media" from phase 2 was ones again brought up. This time in relation to the structure of future media and the observation was made by one of the participants that: *"Elastic media has to do with both hardware and services or content".* This pinpoints to some extent the essence of integrated media objects, i.e. the inseparable character of truly liquid media.

Finally, cross-media design was brought up by one of the participant as a crucial aspect. Today there is little support for moving across different media containers and new interfaces or integrations are needed. Figure 14 illustrates this problem and the need for better integrations.

Introducing Midgets: Towards truly liquid media

Based on the conceptual exploration of integrated media objects and the "liquid media" concept, and based on the results from the focus group study we have formulated a vision of what we have labelled "midget" design, i.e. design of small, lightweight, interactive and integrated media objects that can live across heterogeneous media platforms.

Today, small widgets that integrate information (content) and form (executable application) have quickly risen in popularity and there are several sites that offer these small programs (see figure 15 for an example). In a similar way, midgets could be sought of as small self-contained, re-mixable and executable media objects that can move freely across heterogeneous interaction landscapes.

Inspired by the focus group results we can imagine several activities arising around midgets including e.g. social sharing of midgets, co-viewing of midgets, midget mixing, and midget post-productions. Following this idea we can see a new media ecology arising that adopts a new life cycle model of media. While the traditional media cycle has

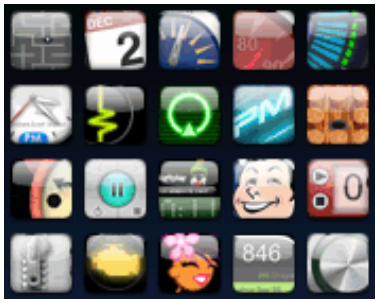

Figure 15. Examples of widgets from http://widgets.yahoo. com/

A “Midget” could be though of as a small, lightweight, interactive and integrated media object that can live across heterogeneous media platforms.

While Widgets can be sought of as small programs for accessing and visualizing small chunks of information, Midgets can on the other hand be sought of as small self-contained, re-mixable and executable media objects that can move freely across heterogeneous interaction landscapes.

consisted of a flow from media production, editing, and distribution to media consumption we can with free moving midgets start to imaging a cycle of media creation, sharing, re-production, re-mixing, re-distribution together with new forms of social interaction arising around these activities. As such, these midgets would incorporate the liquid or elastic aspects of digital media as explored in this paper.

Related work

There are some work related to exploring the design space of liquid media objects including e.g. the Media blocks (Ullmer, et al, 1998), the interaction modalities “Hook up ´n leave & come ´n play” (Wiberg, 2003), and the FolkMusic system (Wiberg, 2004). These three projects all explore how to seamlessly move media across the interaction landscape. However, none of these projects stress the focal need to integrated media in terms of form and content. Further on, we can on the commercial side find several initiatives taken towards more seamless access to digital media including e.g. Podcasts, RSS-feeds, SOAs, Yahoo pipes (http://pipes.yahoo.com/) and various media streaming devices (e.g. the Sling media device, (www.slingmedia.com) and the AppleTV (www.apple.com). However, although these technologies make it easier to access *remote* media, they do not simplify a more seamless flow of media objects across heterogeneous interaction landscapes as explored in this paper.

Conclusions

In this paper we have argued that due to the digital character of modern media, and due to current developments towards file sharing communities, media convergence and cross-media interaction design there are now several good reasons for exploring the design space beyond a container view of modern digital media. In our exploration of this design space we have taken a point of departure in media objects where form and content is integrated, instead of separated and we have take contemporary theories of liquidity and an innovation-oriented focus group study as two sources of inspiration for exploring the design space of truly liquid media. The exploration was then summarized into a vision of midget design, i.e. design of small, lightweight, interactive and integrated media objects that can live across heterogeneous media platforms that form today’s interaction landscape.

From our horizon we have just started to explore this design space of future liquid media so, in our future work we will continue to do concept development and further develop the underlying (metaphoric) concept of truly “liquid” media. We will also conduct a more large-scale focus group study together with teenagers, i.e. the forefront media people of today in order to further explore the design space, but also to validate the findings from this focus group study. Finally, we will also start to design and implement midget prototypes as to illustrate and test how these integrated media objects could work in today’s heterogeneous interaction landscapes.

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