PROJECT PROPOSAL
THE DESIGN OF DIALOGIC INTERFACES

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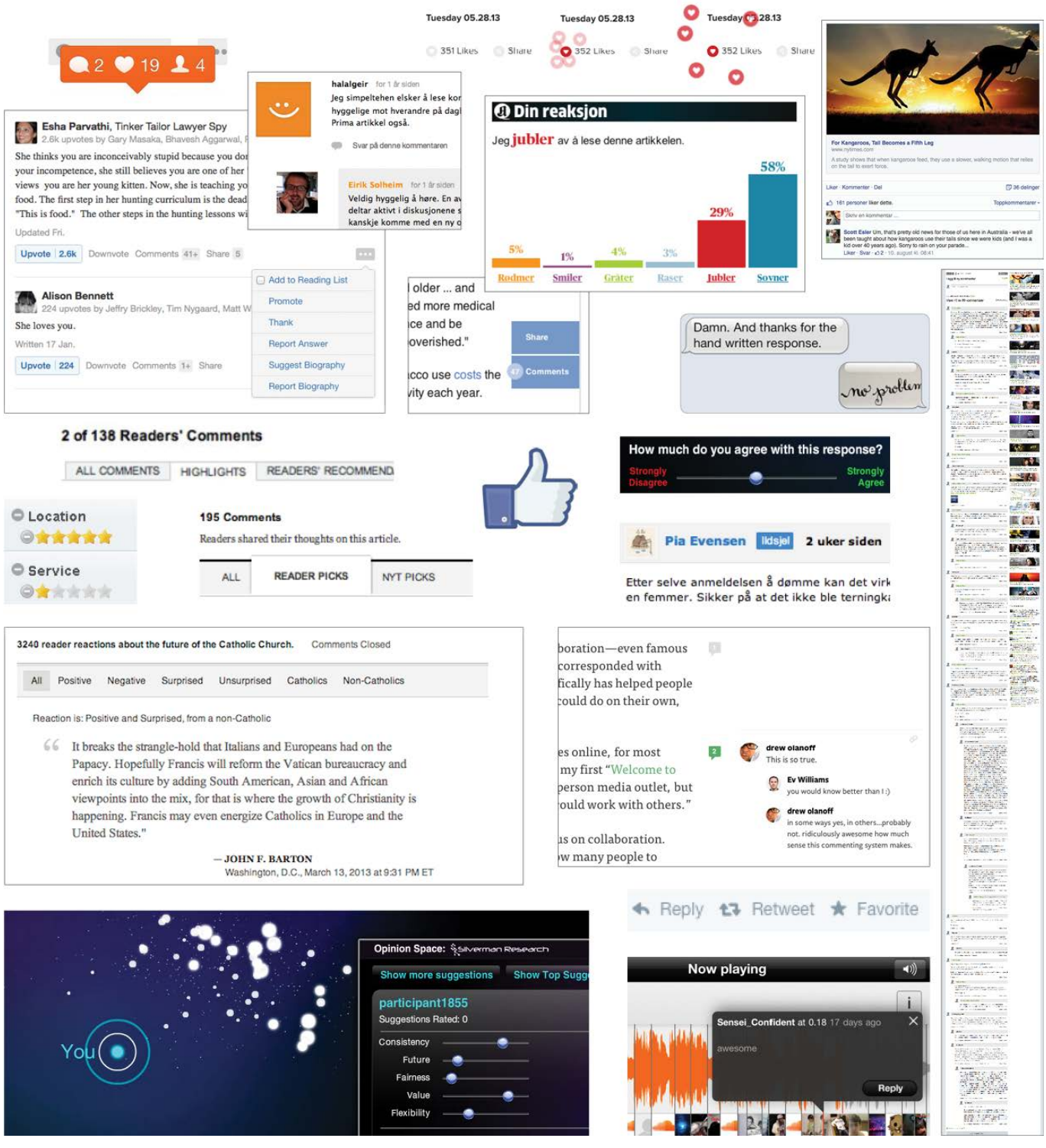
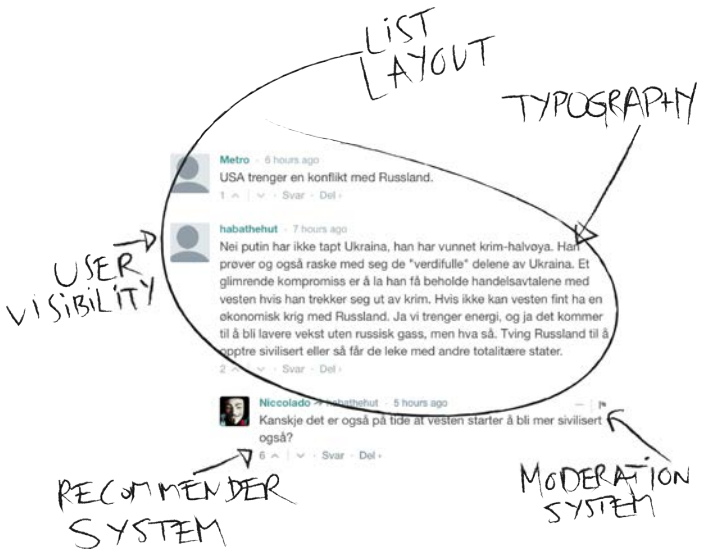
Various designs and features of dialogic interfaces.



Abstract

In this thesis, I will study the designs of commenting sections in online magazines and newspapers. These are interfaces consisting of a variety of designed choices, such as layout, typography, moderation system and a recommender system that helps us to decide which comments to read first. Within each of these choices there are many possibilities that affects our use experience, whereas few of them are explored in research. In my research, I seek to study and visualize concept designs for the holistic use experience of these choices, with emphasis on enhancing the expressive possibilities and engagement.



Picture 1: Traditional design of an online newspaper commenting space

The framing of the project is based on the idea of *designs and artefacts as producers of social and cultural meaning*. Existing research in this context is mainly focused on a functionalistic approach, as opposed to the discursive and semiotic approach I adopt. What does the design *mean* for us, and how does the designs of buttons, layout and typography effect our use experience?

As social media and technology has expanded our possibilities for expressing ourselves in the public sphere, rational arguments and emotional stories lives side by side, communicated in the same ways graphically; same fonts and few possibilities for communicating tone-of-voice. I will view the variety of these expressions as a *design material* for future concept designs.

I divide the process into three stages; 1) in the first stage I will gain knowledge and analyse existing commenting sections and the various features these consists of, 2) in the second stage the focus is on gaining knowledge on how to visualize and prototype alternative concept designs for a fictional magazine commenting section, and 3) in the third stage I will evaluate, analyse and further develop these concept designs in collaboration with experts in the field, editors and designers.

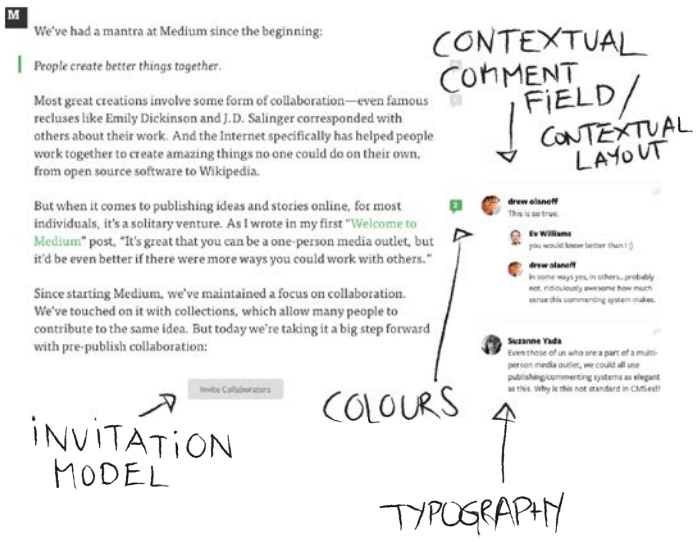
My thesis will be an article-based contribution, with three articles, based on these three stages. The project will be finished in the spring 2017.

Content

Introduction

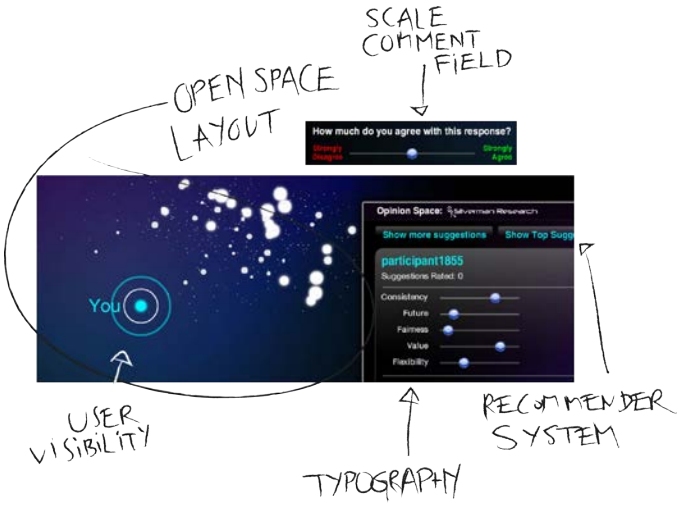
In my thesis, I will investigate the *design* of *dialogic interfaces*. By dialogic interfaces, I mean screen-based interfaces that permit and enables online interaction and conversations, such as commenting- and chat services. These interfaces can include several aspects of social media services and interfaces, such as the focus areas for my research; commenting sections in magazines and newspapers.

Dialogic interfaces are interfaces that promote conversation and dialogue; such as blog comment hosting services (e.g. *Disqus, LiveFyre* and *IntenseDebate*). These interfaces can also be found in applications such as Facebook Messenger, Instagram and Twitter. They are all digital environments that facilitates for discussions, argumentation, opinions, debating and personal stories.



Picture 3: Another way of structuring comments contextually, in the online magazine Medium.

My research will be about how these interfaces can be designed visually and interactive. How can designers, editors and others design dialogic interfaces in order to facilitate and arrange our opinions, discussions and personal expressions online? How can the design enhance the engagement of a debate? And can the design help facilitate for a diversity of expressive possibilities, such as video comments, body language and emotional expressions?



Picture 2: A different way of using layout and structuring comments visually in a large space, in OpinionSpace (Faridani et al. 2010)

In order to gain knowledge on how to design for dialogic interfaces, I will start by investigating and analysing existing dialogic interfaces. What do the interfaces consist of and what is the purpose behind the various elements such as the "like"-button, the layout and the typography? And how do these elements play together and form our experience of the holistic design?

Based on this knowledge, I will further in my research focus on *concept design*, by visualizing and prototyping commenting possibilities of a dialogic interface in a fictional online magazine.

I will finalize the research of my thesis by analysing and developing the concept designs, with the help from some of the experts and lead users in the field; editors and designers of online magazines and newspapers.

Background & challenges

CHAIRS, CURTAINS AND TABLES *VERSUS* LAYOUT, TYPOGRAPHY AND THUMBS UP

Today, much of the public debate takes place online, at web sites and apps such as Facebook, blogs and online newspapers. Chairs, curtains and tables are replaced with an interface of "like"-buttons, comment fields, long fields of textual input and typography. Whereas the formal board room might encourage formality and respect, the bar discussion might facilitate for a more personal and open conversation. These are all locations, props and people, all of whom can affect the quality of the discussion. A rococo chair and a mighty moderator can easily send signals that scare some people to consider their words more carefully.

One of the key signals that scare off or intrigue debate, is still the *content* of what people actually say–and as long as the possibility for expressing this is enabled in the design, then this is a factor the design can do nothing about.

However, my assumption is that the same signal as the chair and the room sends, can be sent by the various props of an online dialogic interface. The combination of for instance fonts, layout, colours, reward system, and the invitation model (*who* are invited to participate in the conversation and how do these people act in a conversation) can both silence people or encourage debate.

Picture 4: Different types of locations and props for debates and conversations in politics and business, amongst friends and kids, in addition to a dialogic interface.

Today, most designs of online commenting use the same fonts, colours and layout for all the content people write and publish in dialogic interfaces. Whereas handwriting might reveal something about you as a person, all of todays' online comments in Helvetica style treat diverse content and words in the exact same way.

Regardless of what people actually say or do, people also interpret others differently due to *who we are*; a case study from research in gender studies shows that regardless of what a person does or achieves, women are less likely to be liked than men in business *(McGinn and Tempest 2000)*. One way of interpreting this is that the body itself has roles and interpretations attached. Would people interpret online comments differently if they had different shapes or "voices"? What if we didn't know the gender of the debate participant?

In analogue debates, people are exposed to each others' bodily language response, they hear each others tone of voice, and even though some people don't express emotions obviously, it is often visible whether a person says something in anger, with joy or with sarcasm.

In dialogic interfaces, there is often a geographical and emotionally perceived distance between people. In some forums, this is an advantage and gives a possibility of being open about personal and emotional stories, and eliminating the types of risks associated with face-to-face interaction *(Klemmer, Hartmann, and Takayama 2006, Yee 2006)*, whereas in other

forums, distance might be a disadvantage, involving risk for diminishing the strength of a relation *(Kraut et al. 1998)*.

When designing in online spheres, designers are inclined to design by using these metaphors from real life *(Marcus 2002)* and biomimetic design *(Mak and Shu 2004; Sartori, Pal, and Chakrabarti 2010)*, and maybe forgetting the advantages in the medium itself.

Compared to real life discussions, one advantage is *time* to think about your arguments. Another advantage is that the content online is more likely to be facilitated online, in order to create "good" use experiences–though a good use experiences can mean many things**,** depending on the purpose for the discussion and the people who contribute. One reasoning for an online magazine or newspapers dialogic interface, might be to engage as many users as possible in order to get as many viewpoints and angles of opinions as possible. Another reasoning could be to engage those who contribute to discuss solutions and ideas for our society. A third goal for a good user experience could be to create a rational and informative culture, and a fourth goal might be to create an open, accepting, positive and personal conversation. Even to create a polarized and provoking debate, could be a goal related to the user experience. And perhaps it could be possible to integrate several of these into one interface.

With these examples and metaphors I argue that the design itself is essential to our experience of peoples comments in dialogic interfaces. Wright and Street claims that design plays a key role in discussion forums and the facilitation or thwarting deliberation. They also refer to research on the role of design regarding real locations for public debate;

> There is a longstanding view that the design of parliament buildings, council chambers and the like, not to mention the electoral system which fills those spaces with representatives, affects the quality of the discussion and the nature of the debate. *(Wright and Street 2007:853)*

The nature of public debates, however, has changed according to technological innovation and the increasing popularity of social media, introducing new aspects relevant to the design material of dialogic interfaces.

PUBLIC SPACE–NOW AND THEN

As society has changed, todays' public debate shows a different character than in Habermas' public sphere decades ago, where public debates were closely linked to the universities and people who were trained to debate. Habermas' writings on democracy was criticized for leaving out certain voices from the democracy; women's concerns in the private sphere and less educated people didn't have the public voices needed for rational and argumentative debates in the public sphere *(Deibert, Ratto, and Boler 2014; Habermas 1991)*.

Feminism, technology and social media has contributed making the private sphere a public concern, by expanding the kind of expressions we see in public sphere. Today, personal and emotional expressions are especially visible in fields such as family and health politics. A consequence of this evolution where everybody can have a say and the increasing openness in society, is *untrained public voices*, a challenge in our public debates *(Mainsah et al. 2014; Rheingold 2008)*. When untrained voices fail in their contributions, many experience that their comments are censured without even knowing why. This may affect the users trust in the system. In addition, the moderator of online debates is often invisible, hence becomes a force difficult to criticize.

Todays discussion forums does not only provide a framework that has radically increased the number of people and kinds of expressions in public debates, but they have also increased our

ability to see more of these discussions, than we could 20 years ago. How can we deal and design with the variety of these expressions today?

In the 50'ies, the philosopher Arne Næss pointed out the need for keeping debates on religious/emotional matters separate from scientific/rational debates, as they discuss on different terms *(Næss 1966)*. Whether Næss' "guidelines for debating" are translatable into todays online environment, remains a debate on its own *(Pedersen 2012)*.

The psychiatrist Finn Skårderud also touches upon this field when he writes about how social media is creating us, and how our identity and online presence effects our emotions and our way to present ourselves online *(Skårderud 2012)*. Skårderud discusses how a "like"-button is a symbol that influences our social identity, and might be a factor that turns our society into a more achievement-based culture, where people are only good enough depending on what we achieve, not who we are.

This changing public sphere has given us other expressive possibilities than what existed before, through the dialogic interfaces in online magazines or newspapers. Hence, this change influences the design material and design issues of my thesis.

Research questions

In my PhD research, I will investigate and explore the interactive and visual design of spaces online where users discuss, exchange opinions and personal stories. My focus areas are interfaces found in e.g. online magazine- and newspapers' commenting sections, often provided by online discussion and commenting services *(Shin et al. 2013)* (also called blog comment hosting services), such as *Disqus, Livefyre* and *IntenseDebate*. More specifically I will ask two main questions;

1) How may dialogic interfaces be designed to enhance engagement?

By *dialogic interfaces*, I mean screen-based interfaces that permit and enable online interaction and conversations, such as commenting- and chat services. These interfaces can include several aspects of social media services and interfaces, such as the focus areas for my research; commenting sections in magazines and newspapers. Dialogic interfaces are interfaces that promote conversation and dialogue; such as blog comment hosting services (e.g. *Disqus, Livefyre* and *IntenseDebate*). These interfaces can also be found in applications such as Facebook Messenger, Instagram and Twitter. The term *dialogic interfaces* is discussed in Eikenes' thesis on kinetic interfaces, and how these can be studied as a dialogue *(Eikenes 2010)*.

By *design*, I mean visual and interactive design, terms I will define in the next section, the *literature review*. The design cases I will conduct will be visualizing and protoyping possible concepts designs, meaning visualizations that show concept sketches for possible future scenarios.

By *engagement*, I mean the users involvement and interaction with the interface. It may be about increasing the attractiveness of the interface and enabling more people to contribute in various ways, but it can also mean engaging in other ways than previously possible. In Brandtzægs research on social media typologies, he refers to statistics showing that "over half of Internet and social networking sites users in Norway do not contribute or interact, indicating passive consumption and low-interest or low-skilled use" *(Brandtzæg 2012)*.

If introducing other concepts such as play, collective idea-generation or inclusiveness–how could these be used to create more engaging interfaces? One way of attracting users is the concept of *provocation*, one of the concepts that may contribute to challenges such as polarization of opinions, a challenge that is addressed as a design issues in the article "Opinion Space: A Scalable Tool for Browsing Online Comments" *(Faridani et al. 2010)*.

2) How can the expressive possibilities of these interfaces be enhanced through design?

By *expressive possibilities* I mean
1) that the design enables possibilities of communicating in a variety of *multimodal texts*– video, text or sound, or
2) how the design of the interface can make it possible to communicating *multivocally*, meaning communicating with different values, meanings or interpretations, such as various input choices, feedback mechanisms or tagging enabling e.g. argumentation by a person on video, or anonymous personal stories in words.

As I showed in the background section, emotional expressions have become increasingly part of the public sphere. Kriplean et al investigates design issues regarding the lack of concepts such as *active listening* in online discussions *(Kriplean et al. 2012)*. This topic is also related to the issues investigated in Opinion Space by Faridani and colleagues, where listening and respect for other debaters forms part of the recommender system; the system rewards insightful comments and participants who consider the opinions of those with whom they might normally disagree *(Faridani et al. 2010)*.

Wright and Street discusses the concept of *deliberation*, and claims that design plays a role in facilitating or thwarting deliberation, *"this evidence suggest that we should view deliberation as dependent on design and choice, rather than a predetermined product of the technology" (Wright and Street 2007)*. Morison & Newman also discusses the impact of the interface; *"It seems as the interface affects the way people write and deliberate online, from the immediacy of chat systems to the stilted but carefully considered essays submitted to structured bulletin boards" (Morison and Newman 2001)*.

Several researchers has pointed out the issues regarding *untrained public voices* that forms part of our increasingly diverse expressions in our public sphere *(Mainsah et al. 2014; Rheingold 2008)*. One of the design problems regarding this is *feedback mechanism*; can the design of the system help training or facilitate for learning to communicate in ways that serves our public sphere?

The object of my design research will be to investigate existing interfaces, and use this knowledge to visualize and propose concept designs for future commenting possibilities in the dialogic interface of a fictional online magazine. More specific research questions are outlined in the *Research production*-section for each article.

These research questions regarding the design of interfaces can be placed in interaction design research traditions, as I will define and position my research in the following section.

Literature review

HOW TO DESIGN FOR DIALOGIC INTERFACES TODAY

How researchers and professionals define interactive design, and functionalistic values' impact on the design process

Research on the design of dialogic interfaces has not been much concerned with gaining knowledge on the *cultural and social meaning* of the design. The reason for that might be

found in the definitions and history of interaction design research, and its inheritance and focus on functionalistic values.

The definitions of interaction design are diverse, and there is no agreed-upon definition on design itself. The definitions value different aspects of designs and the process, e.g. the *purpose* or *intention* of designing, the *action* and *creating* role of designing, or the goal of *changing* the existing or *envisioning* futures. Eames' definition, that design is *a plan for arranging elements in such a way as to best accomplish a particular purpose (Moggridge 2007)* relates to the first stage of my research; to investigate and gain an understanding for which elements and features a dialogic interface consists of and how these could be arranged in order to produce specific meanings and value–in order to have an effect on the use quality of the interface.

Cooper defines interaction design as *the practice of designing interactive digital products, environments, systems, and services (Cooper 1995)*, a definition well suited for my research. He also states that interaction design is concerned with *imagining things as they might be, more so than focusing on how things are*. In my research, I discuss the digital products and services of commenting systems and how the design of these create and effect an environment. My design approach is to imagining how these could be designed in the future.

Cooper also writes that in resemblance to other design fields, interaction design also has an interest in form, but its main focus is on behaviour. *Environment* and *behaviour* are both central concepts in my research, as they both relate to design as a producer of cultural and social meaning.

According to Löwgren, *interaction* could refer to the interaction between a user and a system–indirectly interaction design is also shaping the user. His definition is that *[…] interaction design refers to the shaping of interactive systems with particular emphasis on their use qualities*. Crampton Smith has similar views, and summarizes the design of interactions as being about *shaping our everyday lives through digital artefacts*.

Several of the definitions of interaction design today derive from research that was founded on a functionalistic approach to design. Hence, existing designs of dialogic interfaces is influenced by long-lived functionalistic terms and concepts–theories that has shaped the way we now look at and design social media.

Terms within the span of a century, such as *form follows function (Sullivan 1896)*, *invisible design (Norman 1998)*, *ubiquitous computing, calm computing (Weiser and Brown 1997; Weiser 1991)* has influenced what kind of values designers emphasize while designing online interfaces. Originally, *form follows function* became a mantra amongst the 1930'ies functionalists, and has ever since had an enormous impact on design fields that emphasizes functionalistic qualities in the design process. HCI-research, where most research on social media and commenting sections comes from, has traditionally been influenced by this functionalistic approach to design. The field is mostly concerned with users and context of use, and an analytical approach to design *(Horst and Miller 2013)*

Michl's research however, shows that the term *form follows function* itself imply and arguments for a specific aesthetic style; the unified and modern formal language, suited in the functionalistic era *(Michl 1995)*. The term *form follows function* is still trendsetting and debated today, and keep getting new interpretations by practitioners, both in favour of the functionalistic interpretation and HCI-direction *(Koch 2003)*, and in favour of Michls aesthetic interpretation *(Bradley 2010)*.

Where Sullivans term was related to architecture, Weiser's terms and Normans terms were related to a functionalistic view on computers, describing the computer as an *information*

appliance. Norman was criticized by Gromala and Bolter, researchers within visual communications, claiming that the computer felt more like "a book, a photograph album or a television set", hence a medium that stage experiences for us, more like films than practical appliances to solve tasks *(Bolter and Gromala 2006; Bolter and Gromala 2003)*.

Until now, research and practitioners who have designed and generated knowledge about dialogic interfaces, has come from a functionalistic approach, as opposed to an aesthetic and visual approach.

There are several reasons for a critical attitude to an emphasis on aesthetic values and visual communications in online interface designs. Today, however, the use *experience* has become a more valid value when designing, than previously, leading to more emphasis on visual communications. For one, there were previously more limitations in technology, meaning any redundant information had to be left out. This argument might not be as valid as it was, though still relevant. As shown above, several researchers from functionalistic traditions argue in favour of keeping the design "invisible", a viewpoint that could also be argued to be an aesthetic preference for the design–just as Sullivans functionalism; making design less intrusive is also about argumenting for one particular aesthetic style in digital interfaces.

Recent impact of aesthetic values and focus on *use experience* in the design process

In my research questions, I talk about "enhancing engagement" of dialogic interfaces, which brings me to discuss aesthetic values in relation to users preferences of an interface, discussed by *(De Angeli, Sutcliffe, and Hartmann 2006)*.

In real life, there is a variety of aesthetic styles and expressions in a room for conversations, such as a high-end boardroom or the neighbourhood bar. Most dialogic interfaces in online magazines and newspapers however, look very much like each other. According to some researchers, there are good reasons for why predecessors of dialogic interfaces are not explored in regards to aesthetic, communicative and graphical aspects *(Hemmeryckx-Deleersnijder et al. 2008);*

> Chat interfaces have not changed a great deal from their initial inception, and therefore most retain the traditional text-based interface. Even after the emergence of the graphically rich World Wide Web, chat users still continue to favour text-based interfaces such as Internet Relay Chat (IRC). There are three explanations for this. […] Second, graphically enhanced systems rarely provide users with enough advantages to offset their cost of switching to a new system. Third, new systems that are incompatible with existing chat systems have difficulty attaining the critical mass of users necessary to provide a consistently lively chat environment.

Since this article was written seven years ago, the communicative aspects of typography seems to be embraced by the world of technology, as Adobe Type Kit providing a large variety of fonts for web today. Some aspects of the reasons above, seems however to still be valid explanations today.

Löwgren states that emotions are a necessary part of understanding how designers can design good use quality in interaction design *(Löwgren 2001)*. Hence, knowledge on emotions is argued to be fundamental to our understanding for designing good use quality in interactive design. Norman discusses *emotional design*, and argues that "attractive things work better", as people perceive artefacts they consider as attractive, *more* useful and functional, than if they didn't consider it as attractive. *(Norman 2004)*. He seemingly embraced a new direction after his book on invisible design. Norman claims attractiveness and efficiency of a design must not necessarily be in conflict. He also critiques our tendency of separating cognition and emotions, as if cognition was pure rational, logical and cool, whereas emotions are seen as irrational, animalistic and out of place in a polite society.

Recent HCI-research however, seems to integrate aesthetic and visual communications as important values in designing *(Jung and Stolterman 2011)*:

> Far less consideration is paid to the notion and act of *decoration*, since it is considered useless or even harmful from a modern design perspective [32]. In this paper, considering form as a critical design aspect that can lead to functional as well as aesthetic qualities, we argue that a different perspective toward form—that goes beyond the notion of "form follows function"—is required to fully explore its functional and aesthetic potential in interaction design.

The aesthetic experience, usability and affective qualities in interaction design has become an increasingly interesting subject *(Lim et al. 2007; Tractinsky, Katz, and Ikar 2000; P. Zhang and Li 2005)*. On the other hand, Hassenzahl argues that usability and beauty has no relation, but what matters is the holistic perception, and the "goodness of an artefact" *(Hassenzahl 2004)*.

In a collection of texts regarding research on the relationship between emotions and communication technologies, *Electronic emotions (Vincent and Fortunati 2009)*, Baron reflects on *emoticons*, the evolution of them and how we attempt to create written expressions of emotions in computer-mediated communication *(Baron 2009)*. Baron states that we should promote–rather than hinder–unambiguous communication.

According to *Aesthetic Computing*, emotional design relates to aesthetic experiences *(Fishwick 2006)*, a book that seeks to expand and redefine aesthetics in terms of the intersection of art, design and computing.

One of few articles that investigates the design of a digital interface in relation to emotions and aesthetic experiences–and also storytelling and culture–is "We Feel Fine and Searching the Emotional Web" *(Kamvar and Harris 2011)*. The authors do not focus on aesthetics as a concept, but they discuss interfaces that are designed to *explore topics in a playful, aesthetically pleasing manner*. In the article, We Feel Fine is presented as an interface and *emotional search engine* that collects and visualizes emotions expressed around the world in blogs, microblogs and social networking sites. The tool is described as a *web-based artwork whose mission is to collect the world's emotions to help people better understands themselves and others*. The website both draws on a massive amount of other blogs, and gathers the information into a new interface. The research draws on the three fields Sentiment Analysis, Computational Social Psychology and Data Visualization.

Sentiment analysis is an emerging research field that is about identifying, extracting and analysing subjective information *(Kumar and Sebastian 2012)*. Other articles also discuss We Feel Fine in relation to sentiment analysis *(Kim et al. 2012)*. The field derived from *opinion mining (Dave, Lawrence, and Pennock 2003)*, both fields that draws on social media information. Though my research is about the designerly approach to sentiments and opinions, this field of text analysis and computational linguistic is relevant to understand the design material in dialogic interfaces.

Affective technology and *affective computing* are related fields, emerging from research environments at MiT. As emotions and personal expressions are entering our public sphere, they also become part of technology. Rosalind Picard, one of the main researchers behind this environment, writes that the word *usability* in a more general sense can be quite complex; for example improving a user's emotional state is also a valid *use (Picard 2000)*. Picard talks about emotions as fundamental to our experiences, communication and rational decision-making, but claims technology has disregarded emotions. Research in affective computing seeks to create balance between emotion and cognition in the design of technologies that are addressing human needs.

Another related and emerging field, though in the extreme ends of my research, is *Social and Community Intelligence* (SCI). The objective is about collecting and analysing the digital footprints we make everyday in cyberspace, to reveal human behaviour patterns community dynamics *(D. Zhang, Guo, and Yu 2011)*. As shown in previous texts, traditional commenting forums are text-heavy, and don't focus very much on designing, arranging or facilitating the totality of data from online discussion material. Today it is common to see word clouds now and then, but there are few visualizations of the social footprint of the shared opinions and expressions. The material is there, and the data gives us possibilities of visualizations that could improve our understanding of a debate, and enhance the user experience.

Inspirations to draw from We Feel Fine are how visualizations of the totality of data are designed to engage with the user and create a culture of self-reflection.

NEW *DESIGN MATERIAL* IN DIALOGIC INTERFACES

Social and technological impact on the design process

Emotions are not just relevant in the context of understanding what good use quality in interaction design *is*, they are also important in context of being *content* in dialogic interfaces and social media in general. As our public sphere is constantly changing parallel to the technological evolution, what we say in public also changes.

Social media technology is effecting our lives at an increasing rate, and media consumption happens more online *(Jenkins 2006; Shirky 2008)*. Social media and dialogic interfaces changes how we contribute in society, hence it creates new understandings of what a participatory democracy is *(Rancière 2004)*. Our democracy and public space is no longer limited to the Habermasian ideal *(Habermas 1991)* of rational-critical discourse. As emotional and personal contributions has increasingly become part of our public voice, the public sphere includes new voices that previously would not take part in society *(Fraser 1990)*. Social media is mainly investigated from social studies, where boyd and Ellison has provided a good theoretical foundation on definitions on Social Networking Sites *(Boyd and Ellison 2007)*.

As a consequence, peoples emotional and personal expressions in comments, becomes a new foundational *design material* when designing for dialogic interfaces. How we look at our material, also defines how we design *(Velden, Bratteteig, and Finken 2009)*.

MEDIATING INTERFACES

Trust, decision-making and allowing behaviour

A dialogic interface consists of a variety of elements that facilitates for our behaviour, and a lot of research has been done on the diverse features and elements that constitute this interface. Whereas my research discusses dialogic interfaces as mediating artefacts, Eikenes' research investigates the design of kinetic interfaces as mediating artefacts that produces cultural- and socially constructed meaning. *(Eikenes 2009)*.

In order to see what behaviour and expressive possibilities we allow for to happen, and which kinds of behaviour we don't enable through the design, it is essential to look at how research talks about the various features that enables or delimits this behaviour.

The different and isolated elements of online discussion spaces are often inspired by nature and culture; visualizations such as "like", "thumbs up" and star ratings makes us *trust* and *decide* in online environments that are overloaded by information. As Faridani and colleagues writes about Opinion Space, they chose a layout that is scalable for large amounts of information, hence helps their users to decide and find relevant information more easily than browsing a long list of comments *(Faridani et al. 2010)*.

Trust is facilitated and visualized through the design of *reputation systems (Jøsang, Ismail, and Boyd 2007; Resnick et al. 2000)*. In online spaces crowded by strangers, we try to imitate the trust we know from a long-term-relationship. Reputation could also be about a persons online identity, where the reputation is the information used to make a value judgement about an object or a person *(Farmer and Glass 2010)*.

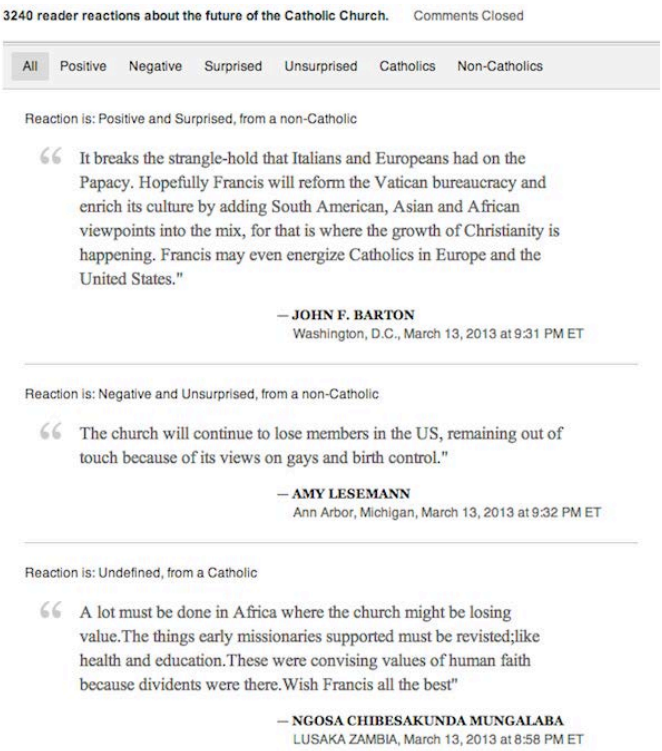
Recommender systems and *collaborative filtering* are related to reputation systems, and assists us in decision-making, rather than facilitating trust as reputation systems does *(Resnick and Varian 1997)*. Whereas recommender systems are software that makes recommendations to users, such as what online news to read *(Ricci, Rokach, and Shapira 2011)*, collaborative filtering is a way to make a recommender system *(O'Donovan and Smyth 2005)*, typically used in a users preference; "If several users selected the same books on Amazon, then you might like these books too." Recommendations and reputation systems are *incentives* of a culture, and go from algorithms to user experience, and can evaluate and measure the effectivity of the system *(Konstan and Riedl 2012)*. Resnick et al discusses the large implications recommendation systems may have on our society and culture, regarding "filter bubbles" and selective exposure to information of our own–or others'–choice *(Resnick et al. 2013)*.

However, as Shirky discusses our new collaborative designs for socializing, he writes that *tools don't completely determine behaviour; different mailing lists have different cultures, for example, and these cultures are a result of an often implicit bargain among the users. (Shirky 2008)*.

Shirky touches upon the large field of technological determinism, where argumentation is about technology as the driving force behind the development of society's social structure and values *(Smith and Marx 1994)*–though hacking of systems is one example where this theory fails. In an interview with Shirky, he discusses the extremity viewpoints of the theories on technological determinism;

> Both sides, Shirky says, are wrong. "Techies were making the syllogism, if you put new technology into an existing situation, and new behaviour happens, then that technology caused the behaviour. But I'm saying if the new technology creates a new behaviour, it's because it was allowing motivations that were previously locked out. These tools we now have allow for new behaviours – but they don't cause them." *(Aitkenhead 2010)*

Picture 5: Example of visual detail and categorizations of recommendations. From the recommender system of The New York Times



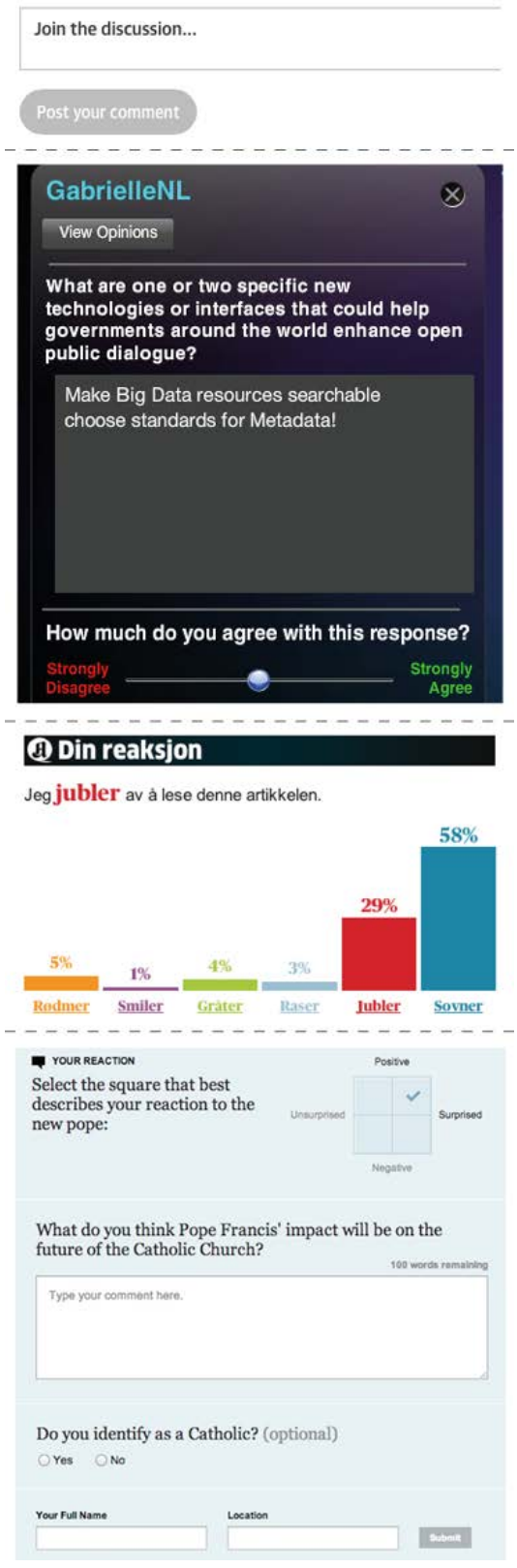
Picture 6: Example from a particular news story in The New York Times, on reactions on the election of the new pope. More categories as a part of the recommender system, as a result of more input choices (see next page, bottom picture).

Input fields are typical ways of allowing for behaviour, e.g. the traditional written comment fields, polls and scales, all with different use implications, see picture to the right. In most online newspapers there seems to be a guiding principle to use the traditional written-text-comment field (usually provided by the online discussion and commenting service), though some claim that it's a trending topic to completely remove comment fields in online newspaper articles *(Cillizza 2014; Reuters 2014)*, due to problems with the content users publish.

Research within journalism shows how the news content itself affects commenting and interactivity in commenting fields *(Weber 2013)*. Other researchers who studied the commenting of articles, has found that people who read negative comments, were more likely to judge the article as low quality and less truthful, regardless of the content *(Anderson et al. 2014)*.

It may also be a choice itself to not have commenting or input possibilities. In this project I will draw inspiration from other concepts and services than my sites of study, as can be tracked in the inspirational cards, described in the method section. One of these concepts, the PostSecret weblog–containing a large amount of postcards with personal secrets–chose to remove the commenting section completely *(Armfield 2013)*. For the purpose of emotional acceptance–as opposed to a comment field with judgemental opinions–this choice may have contributed to the community as the creator describes;

> "the postcards are inspirational to those who read them, have healing powers for those who write them, give hope to people who identify with a stranger's secret, and create an anonymous community of acceptance" *(Warren 2007)*



Picture 7: Four various input fields:
***Top**: The Guardians input field (1st of April 2015)*
***Middle 1**: The Opinion Space written comments and scale*
***Middle 2**: Aftenpostens visual polls on your emotional reaction to the article (blushing, smiling, crying, raging, jump for joy, dozing off)*
***Bottom**: Example from a particular case in The New York Times, on input of reactions on the election of the new pope.*

Significance & contribution

GAPS IN RESEARCH

What I presented in the previous section shows that most research of dialogic interfaces comes from a functionalistic stance, and does not address the *content* and expressions as a design material itself. The increasing use of social media, shows that our expressional possibilities are expanding–emotions has become part of our public sphere and debate, but is not recognized as material in this context. Research on emotions in technology, however, is an expanding field.

I have not found any cases of existing research in the context of magazine and newspaper commenting systems that presents future scenarios, visualizations, and possibilities. This is most likely due to most HCI-research's focus on specific features, or analytics and use perspectives of discussion forums and commenting systems. It is only fairly new research in interaction design that acknowledges aesthetic values and visual communications as important values that needs emphasis in order to attract and create good use quality of these interfaces.

CONTRIBUTION

In my research I seek to fill the gap described above. I also hope to bridge and produce knowledge on the intersection of interaction design and visual communication in this context. This could provide valuable knowledge on how to design for, facilitate and enable conversations online. Both for research, but also as inspiration for the industry; media houses, online magazines and newspapers and other facilitators of online debating, blog comment hosting services, and social media companies.

My topic is closely linked to how we communicate together in a democracy. As I wrote about in the background section; as the nature of public space changes, so does the design. My research may provide knowledge that can help making dialogic interfaces more *relevant* in todays society, and in best case scenario this research can even be a pebble in the road in order to enable groups in society that today don't have the public voice needed in order to in some way participate in society and in public debates. However, as addressed previously on technological determinism; I adopt Shirky's stance–that design can never enable motivations that doesn't exist *(Aitkenhead 2010)*, meaning we don't know whether these motivations exists until it is tried out in other contexts than in my research. Another factor is that there might always be ways of hacking future designs into scenarios not intentional by me.

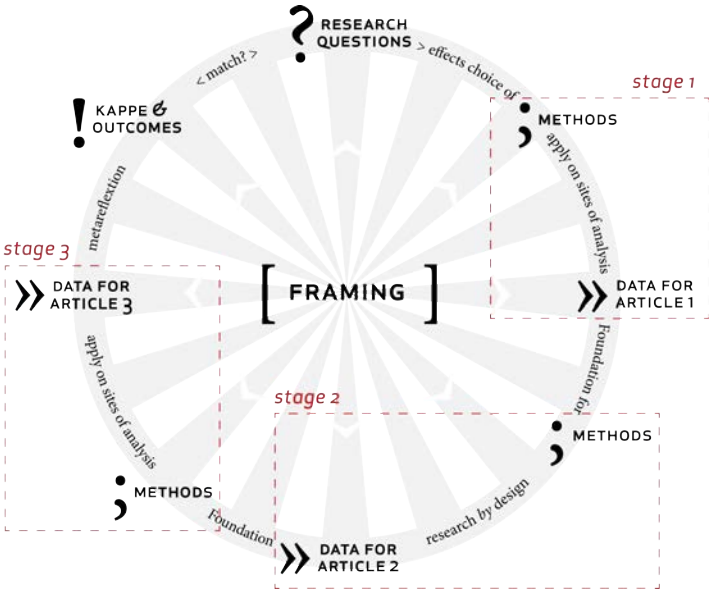
Research production

OUTLINE OF RESEARCH PROCESS

The research process will be guided by the description of this model.

The framing and research tradition I base my research on, affects the whole process–as described in the next section in this proposal; *Framing, methods and research activity*.

The research questions provided on page *7* forms the foundation for my choice of methods for the three stages in my research. More in depth on



Picture 8: A model that shows my research process.

choice of methods can be read below and in the following section. Stage 1 can give me an understanding of how to design *for* dialogic interfaces, by using systemic design methods and social semiotic-analysis–read more about these methods in the next section. Stage 2 is based on the data from stage 1, and takes on a research *by* design-approach, in order to learn how we can design for dialogic interfaces, by visualizing and prototyping possible ways of designing. In stage 3, I will analyse and develop the knowledge provided from my designs, by collaborating with experts in the field. These stages will lead to outcomes and metareflextions for the kappe–outcomes that aligns with the questions asked.

RESEARCH *BY* DESIGN

The research will be conducted within the frameworks of a *research by design*-approach *(Sevaldson 2010)*. In his article, Sevaldson describes research by design in the follow way;

> A special research mode where the explorative, generative and innovative aspects of design are engaged and aligned in a systematic research inquiry. […]

Sevaldson also refer to other research on various ways conducting design research, terms such as *research for design* and *research through design*–valid terms that is relevant for my research *(Archer 1995; Frayling 1993)*. In the following text on *Article 1*, my research will be conducted mainly as research *for* design–the research serves to inform me on how to design for the field of dialogic interfaces. Whereas in *Article 2*, the research goes in the category of research *by* design–where the design work itself *is* the investigation and knowledge production.

RESEARCH BY PUBLICATION

The PhD will be carried out as an article-based production, consisting of mainly three articles. The outline and questions of the articles will be within the following questions and subjects;

ARTICLE 1: WHAT DOES A DIALOGIC INTERFACE CONCIST OF? This article will be about understanding how to design *for* dialogic interfaces, as a way of finding my approach to this topic. What existing qualities and elements does a dialogic interface consist of, that may be important when designing? How does these elements effect our ways of using and our experience of the interface? By looking at the different elements, I'm investigating particular parts of dialogic interfaces that may serve as foundation for my future designs. How does these elements and the way we design them together as a holistic interface, produce meaning?

The article could be published in ACMs *Interactions, International Journal of Design* or *The Communications of the ACM*.

ARTICLE 2: DESIGNING ONLINE MAGAZINE COMMENTING: This article will be exploring how we can design for dialogic interfaces, by using the knowledge gained in the first article. In this article, I will work specifically on the designs of online newspaper/magazine commenting, designing a commenting concept for a fictional magazine. I will look at how we can facilitate and communicate the content and input possibilities, by seeing the comments itself as a design material.

How can we provide a design approach to addressing concrete challenges in todays online newspaper commenting? How may we conceptualise and visualize the interface with diverse elements such as typography, layout and reward system, according to knowledge on challenges such as polarization of opinions, untrained public voices and the mix of various expressions?

The article could be published in *International Journal of Design*.

ARTICLE 3: WHAT ROLE DOES DESIGN PLAY IN DIALOGIC INTERFACES: This article will be about what I learned from design experiments and expert collaborative workshops, and what

role design plays in the designs of dialogic interfaces. In order to understand the challenges and the design approach, this article will include the process from expert collaborative workshops with lead users and lead companies.

The article could be published in ACMs *Interactions, International Journal of Design* or *The Communications of the ACM*.

COMMUNICATION OF RESULTS

The PhD will be published as a book, containing the articles and the meta-reflections. The book may be structured in this way:

PREFACE: Abstract and acknowledgements.

1) INTRODUCTION: Background, research questions, framing, positioning of research, summary of publications.

2) APPROACH: Socio-cultural view, discursive design, research by design, social semiotics, the content of how people talk together as design material, methodology.

3) CONTEXT: Interface design, the complexity of dialogic interfaces, todays' challenges.

4) METHODS: Textual analysis of existing designs, design concepts, expert collaborative workshops, mapping, visualizations, inspirational cards.

5) DESIGNS: Criteria, experimentation, decision-making, iterations.

6) CONCLUSION: Reflections, main contributions and future possibilities.

PUBLICATIONS: Article 1, article 2 and article 3.

Framing, methods & research activity

DISCURSIVE DESIGN

In my research I will draw on perspectives from *discursive design (Dunne and Raby 2013)*, as opposed to an HCI-approach *(Horst and Miller 2013)* to interaction design research. HCI-research has been concerned with functionality, users and contexts of use. Discursive design, however, sees artefacts and designs as transmitters of ideas–meaning literally *how* we say something. Such as *how* we design dialogic interfaces today, and how we might design them in the future.

The related field of *critical design (Dunne and Raby 2013)*, is about the design itself as a way of providing an alternative way of communicating something, which may be a provocation or a way of debating the design and the power structures underneath. Whereas discursive design is more about the *how* and the meaning of an object, critical design is more about the *who,* and criticizing the power structures underneath the design itself. Both terms are debated and have implications heading in a direction of *anti-design*. My research however, will borrow aspects of discursive design, and not fully embrace the extremities and implications that has been assigned the term.

I am interested in what the different elements in a dialogic interfaces mean to us. E.g. what does a like-button do to us? How does it effect how we act, and how does it effect our experience when talking to people online?

If a commenting space is structured on a timeline like on Soundcloud, where you can tell your opinion on a specific minute in the sound clip, we seem to be debating on a more detailed level, whereas an open space layout might give a more holistic debate on the topic.

Discursive design provides me with a framework for studying what the design *mean* for people, within a *research by design*-approach. What interpersonal challenges arise as a consequence of the design? What is the relation between designed elements and the use experience?

The pictures on the right are several sources of inspiration covered in my *inspirational cards* (more information about these in the *methods* section on *mapping*). They show various illustrations from the Asterix comic volumes that somehow produce meaning by using layout, graphics and typography. Picture #1 shows a way of communicating sarcasm and tone of voice less ambiguous than it would have been with just a normal, white speech bubble. The four factors that makes us understand the sarcasm, is the context (by reading the whole story you will know that this man does not appreciate Asterix and Obelix), the wordily content ("Garedunord, it is us"), the evil facial expressions of Asterix and Obelix, and the speech bubble illustrations indicating waking the sleeping man up in an overly not-so-nice way.

The second illustration shows that emotions such as anger are visualized with green speech bubbles. The third illustration shows the use of various typographic styles, indicating that the people speak different language or dialects. The fourth illustration shows notes as a way of illustrating a happy tone of voice.

These are all ways of producing meaning and communicating less ambiguous through graphic elements, in addition to being useful inspiration from visual culture to draw on when designing for dialogic interfaces. They are also more complex culturally, meaning different cultures might interpret the green bubbles differently.

Picture 9: Illustrations from the comic Asterix, communicating tone of voice and emotions through the illustrations.

SOCIAL SEMIOTICS

For the parts of my research that deals with the analysis of visual designs, such as graphics, typography and layout, I will draw on *social semiotics*, a theory of communication that seeks to understand how people communicate by a variety of means, in particular social settings. Further down you can read more about textual analysis as method for my research in stage 1. These theories can also provide me an approach to addressing the content of dialogic interfaces as a design material for my research. Content can be expressed, designed and arranged in a variety of ways, and this is what social semiotics is about; the study of signs and their social significations; how we say something, and how we create meaning.

ACTION RESEARCH:

I will use action research as methodology to gain knowledge by doing design and intervening in the process. This means systematically investigating through practical action to test new ideas and concepts, in order to produce communicable knowledge *(Archer 1995)*. I will investigate by designing concepts for commenting at a fictional online magazine, and exploring the design possibilities in users interaction with the site.

RESEARCH STAGE 1: GATHERING INFORMATION AND BACKGROUND KNOWLEDGE

MAPPING: In order to understand the complexity of the designs of dialogic interfaces, I will draw on systemic design methods, such as the use various ways of mapping. Dialogic interfaces draw on an enormous amount of knowledge ranging from psychology, computer science, rhetoric, philosophy, communication, design and journalism. Systematic mapping of information can help me gathering complex knowledge along the way.

Picture 10: Inspirational cards

One way of mapping is the "inspirational cards", as a part of the meaning-making process throughout the PhD. I have developed this method to consist of a deck of cards where each card can be one of four different categories; 1) an idea, a design, a detail or a concept I've come across somewhere, that somehow is relevant for my process –indirectly or directly. 2) Other research discussing design concepts, 3) Personal reflections on process. 4) My own ideas for designs and features regarding dialogic interfaces. The cards function both as inspiration, visual diary, and a way of tracking of the knowledge-gaining process–all ways of informing me and my readers of how I landed on the knowledge, ideas, designs and conclusions that I did.

TEXTUAL ANALYSIS: By *texts* I draw on the visual communication interpretation of the word; meaning that e.g. video, sounds, words and pictures can all be seen as *texts*.

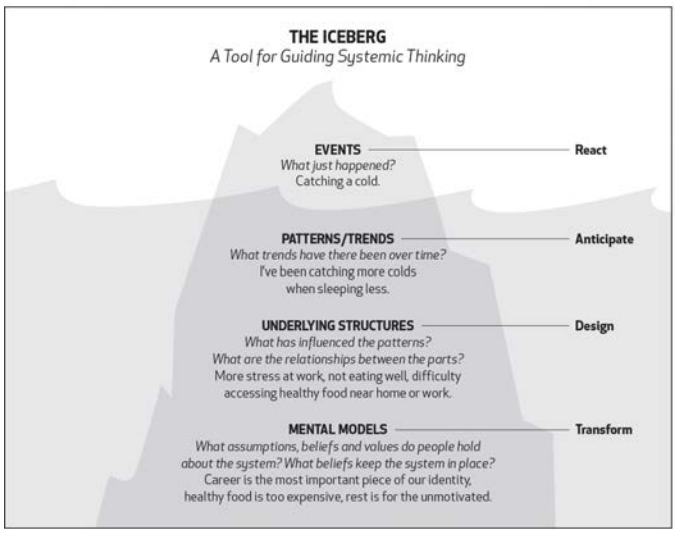
In order to understand how I may design for dialogic interfaces, it is essential to know the designs that already exist. How have people before me solved their problems regarding online communication with their users? What are the use experience consequences of a typical list layout for their dialogic interface? What does the different elements and designs of dialogic interfaces mean for the use experience? This method will be used to understand the diversity in

consequences of design choices made in dialogic interfaces. By consequences, I mean the use experience.

Semiotic analysis of existing designs of dialogic interfaces will provide the information I need in order to understand what the various designs of dialogic interfaces means for the users. This will be conducted as investigations for article I, in the early stages of my research process.

RESEARCH STAGE 2: VISUALIZATIONS & CONCEPTS

MAPPING: A type of mapping that could be valuable in my project is *mental models*, such as the *Iceberg model (Ponto and Coughlan 2012)*, that comes from a systemic design perspective. This method can help me look at specific problems related to the use experience (such as the challenge of untrained voices in dialogic interfaces, or why youth don't want to comment or share their stories), and then help me understand peoples motivation and the underlying structures and design of this problem. What lies behind these choices? How have designers designed for this behaviour and how can we design differently according to people's motivation? This will help me generate ideas and look at systemic transformation and design.



Picture 11: The Iceberg model

Another way of mapping that might provide useful insight is gigamapping, a method used in systemic design *(Sevaldson 2011)*. This mapping could make it easier to see connections and links, whereas the inspirational cards are a method where each card is very disconnected from the other. Gigamapping is mainly used as a process tool, but I also see a value in mappings and visualizations that can communicate externally.

I will continue using the "inspirational cards" from *Stage 1*, and mapping the design ideas that is revealed through the process, as these provide a good framework for discussing various ways of designing.

RESEARCH STAGE 3: EVALUATING & DEVELOPING CONCEPTS

EXPERT COLLABORATIVE WORKSHOP: I envision this method as a mix between a collaborative workshop and expert interviews. I find this mix interesting as it is essential to not only get information on how and why these expert do their designs of commenting- and recommender systems, but also to discuss possibilities with my concepts designs as background. How do they evaluate and hoe would they have further developed the concepts? Which challenges have they faced, and how do they try to solve these challenges through the design? As many companies use *Disqus* or other blog commenting host services, it might be essential to bring visualizations to free their thoughts from template systems.

Relevant experts are editors and designers at companies, institutions and media houses such as Medium.com, The New York Times, The Guardian, Disqus, Livefyre, IntenseDebate, NRKbeta, Underskog/Bengler, VG, Dagbladet and Aftenposten.

This method is based on *lead user innovation theories (Hippel 1986)*, and look at people, companies and institutions who are leaders in their field. How do they work with designs and the complexity of the field, related to the use experience? What do they think dialogic interfaces will look like in the future? How do they view my ideas and thoughts on the matter?

VISUALIZATIONS & PROTOTYPING: In order to present and communicate scenarios of how dialogic interfaces *could* be designed, concept visualizations will prove useful to provoke opinions as a concrete details to debate. Prototyping as pictures or video can materialize and communicate concepts much more efficient than words. Both as internal tool for my own process, but also as communication to people outside the project.

TEXTUAL ANALYSIS: Textual analysis of my own designs will provide knowledge and help decision-making in exploring the possibilities of the design of future dialogic interfaces.

SEMINARS, CONFERENCES AND SCIENTIFIC TRAVELS

Seminars and conferences that is interesting for my research, is the System Oriented Design conference, RSD, and the Design & emotions-conference, in order to provide two counterpoints in my research.

Possible research environments to visit, is the affective computing-environment at MiT, as this environment is studying the identification of emotions in digital designs, which could provide very interesting angles in the design for conversations.

In addition, I will do a journey to leading companies in the US and England, to do expert interviews with companies and institutions such as The New York Times, Medium.com, The Guardian.

Timeline & progression

2015:

March–June: Finishing article I. Writing, editing, send to publisher
July–September: Design experiments, mapping and expert collaborative workshops
October–December: Outlining and writing article II

2016:

January–February: Article II: Writing, editing, send to publisher
March–July: Design experiments and research for article III
August–October: Article III: Writing, editing, send to publisher
October–December: Kappe–structure & outline

2017:

January–April: Write first draft of kappe and send to reader
May–July: Kappe, write the final submission

Budget

EXPERT INTERVIEWS IN THE US

Two weeks hotel	13.000,-
Food	3.000,-
Flight	5.000,-
Total	**21.000,-**

Bibliography

Aitkenhead, Decca. 2010. "Clay Shirky: 'Paywall Will Underperform – the Numbers Don't Add up' | Technology | The Guardian." *The Guardian*. http://www.theguardian.com/technology/2010/jul/05/clay-shirky-internet-television-newspapers.

Anderson, Ashley A, Dominique Brossard, Dietram A Scheufele, Michael A Xenos, and Peter Ladwig. 2014. "The 'Nasty Effect:' Online Incivility and Risk Perceptions of Emerging Technologies." *Journal of Computer-Mediated Communication* 19 (3) (April 1): 373–387. doi:10.1111/jcc4.12009. http://dx.doi.org/10.1111/jcc4.12009.

Archer, Bruce. 1995. "The Nature of Research." *Co-Design Journal* 2 (11): 6–13.

Armfield, Dawn M. 2013. "From Traditional to Digital: Understanding Remediation of the Postcard through the Case of PostSecret. Com." University of Minnesota.

Baron, Naomi. 2009. "The Myth of the Impoverished Signal: Dispelling the Spoken Language Fallacy for Emoticons in Online Communication." In *Electronic Emotion: The Mediation of Emotion via Information and Communication Technologies*, edited by Jane Vincent and Leopoldina Fortunati.

Bolter, Jay David, and Diane Gromala. 2003. *Windows and Mirrors: Interaction Design, Digital Art, and the Myth of Transparency*. MIT press.

Bolter, Jay David, and Diane Gromala. 2006. "Transparency and Reflectivity: Digital Art and the Aesthetics of Interface Design." In *Aesthetic Computing*, edited by Paul Fishwick, 369. The MIT Press.

Boyd, danah m., and Nicole B. Ellison. 2007. "Social Network Sites: Definition, History, and Scholarship." *Journal of Computer-Mediated Communication* 13 (1) (October 17): 210–230.

Bradley, Steven. 2010. "Does Form Follow Function?" *Smashing Magazine*. http://www.smashingmagazine.com/2010/03/23/does-form-follow-function/.

Brandtzæg, Petter Bae. 2012. "Social Implications of the Internet and Social Networking Sites–a User Typology Approach." University of Oslo.

Cillizza, Chris. 2014. "RESOLVED: Comments Sections Need to Go - The Washington Post." *The Washington Post*. http://www.washingtonpost.com/blogs/the-fix/wp/2014/12/01/resolved-comments-sections-need-to-go/?wpisrc=nl-fix&wpmm=1.

Cooper, Alan. 1995. *About Face: The Essentials of User Interface Design*. New York, NY: Hungry Minds.

Dave, Kushal, Steve Lawrence, and David M Pennock. 2003. "Mining the Peanut Gallery: Opinion Extraction and Semantic Classification of Product Reviews." In *Proceedings of the 12th International Conference on World Wide Web*, 519–528. ACM.

De Angeli, Antonella, Alistair Sutcliffe, and Jan Hartmann. 2006. "Interaction, Usability and Aesthetics: What Influences Users' Preferences?" In *Proceedings of the 6th Conference on Designing Interactive Systems*, 271–280. ACM.

Deibert, Ronald, Matt Ratto, and Megan Boler. 2014. *DIY Citizenship: Critical Making and Social Media*. MIT Press.

Dunne, Anthony, and Fiona Raby. 2013. *Speculative Everything: Design, Fiction, and Social Dreaming*. MIT Press.

Eikenes, Jon Olav. 2009. "Social Navimation: Engaging Interfaces in Social Media." In *Nordes: Engaging Artefacts*.

Eikenes, Jon Olav. 2010. "Navimation: A Sociocultural Exploration of Kinetic Interface Design." Oslo School of Architecture and Design.

Faridani, Siamak, Ephrat Bitton, Kimiko Ryokai, and Ken Goldberg. 2010. "Opinion Space : A Scalable Tool for Browsing Online Comments." In *CHI: Understanding Comments*, 1175–1184. Atlanta, GA, USA, April 10-15.

Farmer, Randy, and Bryce Glass. 2010. *Building Web Reputation Systems*. O'Reilly Media, Inc.

Fishwick, Paul, ed. 2006. *Aesthetic Computing*. Cambridge, Massachusetts: MIT Press.

Fraser, Nancy. 1990. “Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy.” *Social Text*: 56–80.

Frayling, Christopher. 1993. *Research in Art and Design*. Royal College of Art London.

Habermas, Jürgen. 1991. *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*. MIT press.

Hassenzahl, Marc. 2004. “The Interplay of Beauty, Goodness, and Usability in Interactive Products.” *Human-Computer Interaction* 19 (4): 319–349.

Hemmeryckx-Deleersnijder, Bart, Jeremy M Thorne, Paul Burkhead, Juan Casares, and Lawrence Yau. 2008. “Awareness and Conversational Thread Organization in Synchronous Text-Based Communication.” *Computers in Entertainment (CIE)* 6 (1): 7.

Hippel, Eric von. 1986. “Lead Users: An Important Source of Novel Product Concepts.” *Management Science* 32 (7): 791–805.

Horst, Heather A, and Daniel Miller. 2013. *Digital Anthropology*. A&C Black.

Jenkins, Henry. 2006. *Convergence Culture: Where Old and New Media Collide*. NYU press.

Jøsang, Audun, Roslan Ismail, and Colin Boyd. 2007. “A Survey of Trust and Reputation Systems for Online Service Provision.” *Decision Support Systems* 43 (2): 618–644.

Jung, Heekyoung, and Erik Stolterman. 2011. “Form and Materiality in Interaction Design.” In *Proceedings of the 2011 Annual Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA ’11*, 399. New York, New York, USA: ACM Press. doi:10.1145/1979742.1979619. http://dl.acm.org/citation.cfm?id=1979742.1979619.

Kamvar, Sepandar D., and Jonathan Harris. 2011. “We Feel Fine and Searching the Emotional Web.” *Proceedings of the Fourth ACM International Conference on Web Search and Data Mining - WSDM ’11*: 117. doi:10.1145/1935826.1935854.

Kim, Seungyeon, Fuxin Li, Guy Lebanon, and Irfan Essa. 2012. “Beyond Sentiment: The Manifold of Human Emotions.” In *Proceedings of the 16 International Conference on Artificial Intelligence and Statistics (AISTATS) 2013*, Volume 31 of JMLR: W&CP 31. Scottsdale, AZ.

Klemmer, Scott R, Björn Hartmann, and Leila Takayama. 2006. “How Bodies Matter : Five Themes for Interaction Design.”

Koch, Peter-Paul. 2003. “Digital Web Magazine - Form Follows Function.” *Digital Web Magazine*. http://www.digital-web.com/articles/form_follows_function/.

Konstan, Joseph A, and John Riedl. 2012. “Recommender Systems: From Algorithms to User Experience.” *User Modeling and User-Adapted Interaction* 22 (1-2): 101–123.

Kraut, Robert, Michael Patterson, Vicki Lundmark, Sara Kiesler, Tridas Mukophadhyay, and William Scherlis. 1998. “Internet Paradox: A Social Technology That Reduces Social Involvement and Psychological Well-Being?” *American Psychologist* 53 (9): 1017.

Kriplean, Travis, Michael Toomim, Jonathan Morgan, Alan Borning, and Andrew J Ko. 2012. “Is This What You Meant ? Promoting Listening on the Web with Reflect.” In *CHI ’12 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems Pages 1559-1568, Austin, Texas, May 5-10 2012*.

Kumar, Akshi, and Teeja Mary Sebastian. 2012. “Sentiment Analysis: A Perspective on Its Past, Present and Future.” *International Journal of Intelligent Systems and Applications (IJISA)* 4 (10): 1.

Lim, Youn-kyung, Erik Stolterman, Heekyoung Jung, and Justin Donaldson. 2007. “Interaction Gestalt and the Design of Aesthetic Interactions.” In *Proceedings of the 2007 Conference on Designing Pleasurable Products and Interfaces - DPPI ’07*, 239. New York, New York, USA: ACM Press.

Löwgren, Jonas. 2001. “From HCI to Interaction Design.” In *Human Computer Interactions: Issues and Challenges*, edited by Qiyang Chen, 29–43. Hershey, PA: Idea Group Publishing.

Mainsah, Henry, Anders Sundnes Løvlie, Karoline Andrea Ihlebæk, Bernard Enjolras, Rune Karlsen, Kari Steen-Jonsen, and Dag Wollebæk. 2014. “Hverken Kloakk Eller Ekkokammer Støv Eller Slør over Grunnloven.” *Aftenposten*.

Mak, T W, and L H Shu. 2004. “Abstraction of Biological Analogies for Design.” *CIRP Annals-Manufacturing Technology* 53 (1): 117–120.

Marcus, Aaron. 2002. “Metaphors and User Interfaces in the 21st Century.” *Interactions* 9 (2): 7–10.

McGinn, Kathleen, and Nicole Tempest. 2000. *Heidi Roizen* Harvard Business School Case Study 8–9.

Michl, Jan. 1995. “Form Follows WHAT? History and Critique of the Form Follows Function Formula.” *1:50 - Magazine of the Faculty of Architecture & Town Planning* Winter (10): 31–20.

Moggridge. 2007. *Designing Interactions*. University Press Group Limited.

Morison, John, and David R Newman. 2001. "On-Line Citizenship: Consultation and Participation in New Labour's Britain and beyond." *International Review of Law, Computers & Technology* 15 (2): 171–194.

Næss, Arne. 1966. "Communication and Argument."

Norman, Donald A. 1998. *The Invisible Computer: Why Good Products Can Fail, the Personal Computer Is so Complex, and Information Appliances Are the Solution*. Cambridge, Massachusetts: MIT press.

Norman, Donald A. 2004. "Emotional Design." *Ubiquity* 2004 (January) (January 1): 1.

O'Donovan, John, and Barry Smyth. 2005. "Trust in Recommender Systems." In *Proceedings of the 10th International Conference on Intelligent User Interfaces - IUI '05*, 167. New York, New York, USA: ACM Press. http://dl.acm.org/citation.cfm?id=1040830.1040870.

Pedersen, Arild. 2012. "» Usakelig Nettdebatt." *Minerva*. http://www.minervanett.no/usakelig-nettdebatt/.

Picard, Rosalind W. 2000. *Affective Computing*. MIT press.

Ponto, Colleen, and Peter Coughlan. 2012. "Systems Thinking and Design Thinking: An Integrated Approach to Solving Tough Problems." In *Relating Systems Thinking and Design*.

Rancière, Jacques. 2004. *Disagreement: Politics and Philosophy*. U of Minnesota Press.

Resnick, Paul, R. Kelly Garrett, Travis Kriplean, Sean A. Munson, and Natalie Jomini Stroud. 2013. "Bursting Your (filter) Bubble." In *Proceedings of the 2013 Conference on Computer Supported Cooperative Work Companion - CSCW '13*, 95. New York, New York, USA: ACM Press.

Resnick, Paul, Ko Kuwabara, Richard Zeckhauser, and Eric Friedman. 2000. "Reputation Systems." *Communications of the ACM* 43 (12) (December 1): 45–48.

Resnick, Paul, and Hal R Varian. 1997. "Recommender Systems." *Communications of the ACM* 40 (3): 56–58.

Reuters. 2014. "Editor's Note: Reader Comments in the Age of Social Media." http://blogs.reuters.com/great-debate/2014/11/07/editors-note-reader-comments-in-the-age-of-social-media/.

Rheingold, Howard. 2008. "Using Participatory Media and Public Voice to Encourage Civic Engagement." In *Civic Life Online: Learning How Digital Media Can Engage Youth*, 97–118.

Ricci, Francesco, Lior Rokach, and Bracha Shapira. 2011. *Introduction to Recommender Systems Handbook*. Springer.

Sartori, Julian, Ujjwal Pal, and Amaresh Chakrabarti. 2010. "A Methodology for Supporting 'transfer' in Biomimetic Design." *Artificial Intelligence for Engineering Design, Analysis and Manufacturing* 24 (04): 483–506.

Sevaldson, Birger. 2010. "Discussions & Movements in Design Research." *FORMakademisk* 3 (1).

Sevaldson, Birger. 2011. "GIGA-Mapping: Visualisation for Complexity and Systems Thinking in Design." *Nordes*. http://www.nordes.org/opj/index.php/n13/article/view/104.

Shin, Sungho, Sangkeun Park, Jinseop Shin, Sa-Kwang Song, Sung-Pil Choi, and Hanmin Jung. 2013. "Analytics on Online Discussion and Commenting Services." In *Human Interface and the Management of Information. Information and Interaction Design*, 250–258. Springer.

Shirky, Clay. 2008. *Here Comes Everybody: The Power of Organizing Without Organizations*. Penguin Group US.

Skårderud, Finn. 2012. "Presentasjonsangsten." *Psykisk Helse*: 17–18.

Smith, Merritt Roe, and Leo Marx. 1994. *Does Technology Drive History?: The Dilemma of Technological Determinism*. MIT Press.

Sullivan, Louis H. 1896. "The Tall Office Building Artistically Considered." In *Kindergarten Chats (revised 1918) and Other Writings*. New York.

Tractinsky, Noam, A S Katz, and Dror Ikar. 2000. "What Is Beautiful Is Usable." *Interacting with Computers* 13 (2): 127–145.

Velden, Maja van der, Tone Bratteteig, and Sisse Finken. 2009. "Entagled Matter: Thinking Differently about Materials in Design." *Nordes*. http://www.nordes.org/opj/index.php/n13/article/view/34.

Vincent, Jane, and Leopoldina Fortunati. 2009. *Electronic Emotion: The Mediation of Emotion via Information and Communication Technologies*. Peter Lang.

Warren, Frank C. 2007. *The Secret Lives of Men and Women: A PostSecret Book*. Regan.

Weber, P. 2013. "Discussions in the Comments Section: Factors Influencing Participation and Interactivity in Online Newspapers' Reader Comments." *New Media & Society* 16 (6) (July 8): 941–957. doi:10.1177/1461444813495165. http://nms.sagepub.com/cgi/doi/10.1177/1461444813495165.

Weiser, Mark. 1991. "The Computer for the 21st Century." *Scientific American* 265 (3): 94–104.

Weiser, Mark, and John Seely Brown. 1997. "The Coming Age of Calm Technology." In *Beyond Calculation*, 75–85. Springer.

Wright, Scott, and John Street. 2007. "Democracy, Deliberation and Design: The Case of Online Discussion Forums." *New Media & Society* 9 (5): 849–869.

Yee, Nick. 2006. "The Psychology of Massively Multi-User Online Role-Playing Games: Motivations, Emotional Investment, Relationships and Problematic Usage." In *Avatars at Work and Play*, 187–207. Springer.

Zhang, Daqing, Bin Guo, and Zhiwen Yu. 2011. "The Emergence of Social and Community Intelligence." *Computer* 44 (7): 21–28.

Zhang, Ping, and Na Li. 2005. "The Importance of Affective Quality." *Communications of the ACM* 48 (9) (September 1): 105–108. doi:10.1145/1081992.1081997. http://dl.acm.org/ft_gateway.cfm?id=1081997&type=html.