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Interpreting Online Discussions: Connecting Artifacts and Experiences in User Studies

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Abstract

This paper presents a methodological effort to connect the specifics of technologies to the details of social practices, in an attempt to deepen our understanding of evolving sociotechnical cultures. More specifically, this paper describes a methodological framework that makes use of online discussions as a vital source of data. The reason the paper focuses on online discussion is that the Internet has become a natural habitat for discussions of high-end technologies, be they physical products or online services. The framework combines interpretative research and attribute-consequence-value (ACV) chain theory – a theory commonly applied to market and consumer research – to conceptualize and explore evolving prosumer cultures through online discussions. The benefit of using ACV chain theory is that it explicitly connects products and services to practices and values. The proposed methodological framework identifies three central techniques to elicit and analyse ACV chains from online prosumer discussions: (1) attribute analysis (2) Internet forum data collection and (3) thematic analysis. The paper goes on to exemplify the application of this framework by examining the sociotechnical co-evolution of the friend list – a backbone feature of many social networking services. In summary, this paper shows how ACV chains can be fruitfully applied to explore evolving prosumer cultures and make the vital connection between technical features and emerging cultures.

Keywords

Means-End Chain Theory, ACVChains, Online Discussion, User Experience, Prosumption, Qualitative Research

Interpreting Online Discussions:
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This paper presents a methodological effort to connect the specifics of technologies to the details of social practices, in an attempt to deepen our understanding of evolving sociotechnical cultures. More specifically, this paper describes a methodological framework that makes use of online discussions as a vital source of data. The reason the paper focuses on online discussion is that the Internet has become a natural habitat for discussions of high-end technologies, be they physical products or online services. The framework combines interpretative research and attribute-consequence-value (ACV) chain theory – a theory commonly applied to market and consumer research – to conceptualize and explore evolving prosumer cultures through online discussions. The benefit of using ACV chain theory is that it explicitly connects products and services to practices and values. The proposed methodological framework identifies three central techniques to elicit and analyse ACV chains from online prosumer discussions: (1) attribute analysis (2) Internet forum data collection and (3) thematic analysis. The paper goes on to exemplify the application of this framework by examining the sociotechnical co-evolution of the friend list – a backbone feature of many social networking services. In summary, this paper shows how ACV chains can be fruitfully applied to explore evolving prosumer cultures and make the vital connection between technical features and emerging cultures. Keywords: Means-End Chain Theory, ACV-Chains, Online Discussion, User Experience, Prosumption, Qualitative Research

Our relationship to the everyday technologies of our lives is constantly evolving. This is perhaps especially true today, where rapidly evolving media technologies and online services support a mediation of a growing number of (social) activities. The emerging social practices connected to modern media technologies are often the target for scholarly analysis. However, such analyses many times leave the artefacts – products and services – used as mediating technologies as vague complexes without any deeper specification. This paper presents a methodological effort to connect the specifics of technologies to the details of social practices, in an attempt to deepen our understanding of these evolving sociotechnical cultures. A significant recent change in the relationship to our everyday technologies, according to many scholars, is that the demarcation between consumers and producers has begun to blur. Indeed, information and communication technologies (ICT) provide ability for previously passive consumers to become engaged as prosumers in a communicative sharing of opinions and ideas about technologies and their own relation to it (Fornäs, Becker, Bjurström, & Ganetz, 2007; Tapscott & Williams, 2006). To give an indication of the amount of discussion generated via online services, Boardtracker, a specialized internet forum search engine, reports to have indexed approximately 68 million discussion threads at the time of writing (BoardTracker, 2013). BoardReader, another search service dedicated to forums and discussion boards provides data indicating a weekly prosumption of around 250,000 new threads, and up to 800,000 new posts on the most popular forum sites (Top Forum Sites, 2014). Not all of these

threads relate to uses of technology, but Internet forums have become a natural arena for, amongst other topics, discussions on digital media artefacts, services, technologies and phenomena. The pragmatic function of technology discussions is often to provide feedback on prosumer problems, creating not only a valuable source of information for users, but also a compelling data source for researchers. Indeed, forum data is often rich and in-depth as it includes detailed descriptions of prosumers' problems and solutions; stories and experiences; concerns and intentions; and likes and dislikes. In fact, this paper will argue that the analysis of user discussions offers fantastic opportunities in connecting artefacts and experiences in user studies.

> Instead of measuring individual consumers' preferences, expectations, satisfaction and loyalty, marketers should systematically track the readily available public information on review sites, user forums and other social media. (Simonson & Rosen, 2014)

In an attempt to provide a coherent methodological framework addressing this request, this paper starts by providing a theoretical background, which helps to conceptualize and motivate the choice of methods and the various types of data collected. It then moves on to giving an overview of the proposed methodological framework. Next, the reader is taken through each of the various methods of the framework, explaining them in more detail. This is followed by a case briefly highlighting the social-technical co-evolution of a specific technical feature – the *friend list* – over three different online services at three points in time. The framework is then discussed in terms of benefits and limitations after which a presentation of the final conclusions ends the paper.

Theoretical Framework: Attribute-Consequence-Value Chains

This paper argues that the detailed analysis of specific artefacts has been missing from much Internet research. It has certainly been present in neighbouring disciplines such as human-computer interaction or design studies, but Internet studies often leave it as a somewhat vague technological complex (e.g., a digital enabled social network). As such, this paper emphasizes the examination of the evolving technical specifics that mediate the individual Internet experience. The proposed methodological framework is one step in that direction.

Table 1. The three levels in attribute-consequence-value chains

Attributes	Features or aspects of artefacts, services or systems (e.g., colour, chat functionality, build quality)
Consequences	Outcomes that arise from product use (e.g., save time, feel young, help others, share memories)
Values	Enduring beliefs of preferable modes of conduct or being (e.g., happiness, being independent)

The combination of methods proposed in this paper is grounded in a fairly uncomplicated theory of how people create chains of associations, the so called attribute-consequence-value chain theory, sometimes referred to as the means-end chain theory (Gutman, 1982). As mentioned, this theory aims to arrange perceptions of product and perceptions of oneself into a hierarchical network of attributes, consequences, and personal values (so called ACV-chains).

The roots of the ACV chain theory can be found in personal construct psychology (Hinkle, 1965). From there, clinical psychologists were early to apply the concepts of links and hierarchies that form between personal values in order to understand how humans organize their perceived world (Neimeyer, 1993). ACV chains, as applied today, have focused more on products/artefacts and how these relate to personal values (Chiu, 2005; Hassenzahl & Tractinsky, 2006; Hawley, 2009; Wong, 2002). In more detail, ACV chains aim to explore humans' cognitive structures through the identification of associations between features (attributes), the personal consequences that the attributes coordinate and the high-level personal values that the consequences in turn support (Lin, 2002).

Figure 1. ACV-chain conceptualization (adopted from Botschen, Thelen, & Pieters, 1999)
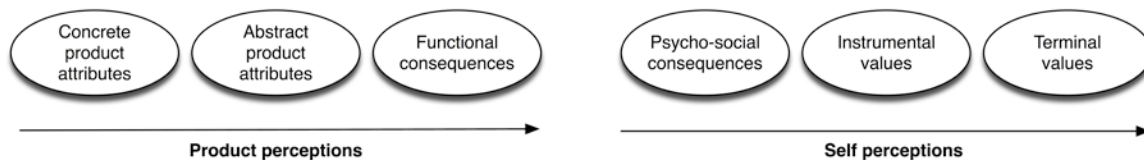
Attributes are features that characterize or are contained by a product or service. However, reducing products to *bundles of attributes* may be risky. Firstly, the examination of prosumer practices may well discover innovative combinations of features or more subtle attributes not identified in an initial attribute analysis. Secondly, in a context of information goods, the concept of a product does not always refer to physical media technologies, but also combinations of services and applications. Furthermore, to acknowledge that attributes are not necessarily tangible, scholars often distinguish between concrete and abstract attributes. Concrete attributes are the most obvious characteristics of a product or service (e.g., colour, weight, GPS support). Abstract attributes are usually intangible and may be a result of a concrete attribute (or set of concrete attributes). Examples of abstract attributes are *style*, *value for money* or *brand*.

Consequences are the feelings, intentions or concerns that arise after usage. These may also be further categorized into functional or psychosocial consequences. The functional consequences are those that can be directly attributed to certain attributes (e.g., a faster computer processor provides a quickened start-up time). Psychosocial consequences are more related to the user's perception of an attribute and its benefits (or hazards). It is, again, more intangible (e.g., good build quality can make the user feel reassured the product will not break easily). Consequences, whether functional or psychosocial, are usually positive or negative in some sense, but can also be neutral. A neutral sentiment does not necessarily mean that the user is indifferent, just that the outcome is not a clear positive or negative consequence.

Values are defined as high-level enduring beliefs of preferable modes of conduct or being. There is often a strong emotional aspect connected to these values. Instrumental values are values that relate to a person him- or herself (i.e., character traits). Terminal values are more related to long-term goals that make life and the activities in it fulfilling. Typical instrumental values are independence, honesty, helpfulness, politeness; and typical terminal values are

social recognition, self-respect, true friendship, justice, health and freedom (Rokeach, 1979). In many ways, instrumental values serve to reach terminal values.

While ACV chains have been effectively adopted by consumer and marketing research (Gutman, 1998; Walker & Olson, 1991), the model has so far been exclusively concerned with *consumption of (physical) products*. In the context of new media, it becomes imperative to lift the perspective to include not only services and applications, but also to include forms of *concurrent production and consumption* (i.e., prosumption). To the author's knowledge, the connection between prosumer cultures, ACV chains and online discussions has not been explored previously.

Prosumer cultures and attribute-consequence-value chains

The acknowledgement that new media helps to blur the boundaries between producers and consumers is nothing new. Indeed, the view that the dichotomy between consumption and production is a sociocultural construction and not inherent in new media technologies was effectively expressed already in the year 1970:

> It is wrong to regard media equipment as mere means of consumption. It is always, in principle, also means of production and indeed, since it is in the hands of the masses, socialized means of production. The contradiction between producers and consumers is not inherent in the electronic media; on the contrary, it has to be artificially reinforced by economic and administrative measures. (Enzensberger, 1970)

In many ways, prosumer culture research has continued to ask the same questions regarding technologies, practices, social structures and divisions of labour, and how these affect or are affected by new media. Even so, it is clear that it is not until recently that new media have begun to fulfil the vision of prosumption on a larger scale. Likewise, it is not until recently that theory has begun framing the more subtle nuances of prosumption (Bruns, 2007). Online discourse holds a central part of prosumption because it supports users in the meaning-making process regarding products and services:

> Consumption involves a complex encounter between textual products and individual subjects in distinct social settings or contexts leading to the creation of meaning, identity and shared life worlds. (Fornäs et al., 2007, p. 44)

Prosumers actively engage in the collaborative shaping of perceptions regarding products and services by sharing their experiences in online discussion forums. Another way to express this is by saying that products and services are prosumed for their perceived and continuous meaningfulness in the lives of prosumers. As such, analyses of online discussion have the capability to enrich our understanding of prosumption practices. The online experience of sharing differs from other types of interaction mainly due to its reliance on technology. The various technologies used to share and interact all have different affordances, qualities and specific functionality. Thus, it is important to remember that mediating technologies are capable of both increasing agency as well as limit it – or direct it, rather. The *design* of gadgets, applications and services hides as well as makes visible certain paths of interaction. This further emphasizes the need to connect artefacts and experiences in user studies (as suggested in this paper) and study how prosumers may circumvent prescribed agency, but also, in a more general sense, try to understand how subjectivity and technology are co-shaped.

This paper also suggests that ACV chains can help to develop prosumer cultures research by describing the way users act and understand artefacts, services or phenomena on levels ranging from artefact/service features to life values. In addition, they also assist in conceptualizing the specific *connections* between attributes, behaviours and fundamental human values. The aim of the framework (and corresponding methods) is consequently to assess users' cognitive structures via the connections they make between the ACV chain levels. A map of such connections helps researchers to get an idea of how prosumer culture is distributed from a sociotechnological perspective. For example, it is possible to assume that attributes that generate negative consequences are not likely to support any fundamental or desirable values, and thus not contribute to continuous prosumption. This theoretical conclusion is important since it acknowledges how ACV chains can be broken before completing the chain and reaching the value level.

Overview of the Proposed Methodological Framework

This overview is provided in order for the reader to get a comprehensive picture of the full process before being presented with the details. The reader can then recall or return to the overview in order to understand how the different parts are framed.

Table 2. Framework overview

Method	Description	Outcome	Level of ACV-chain
Attribute analysis	An artefact or service is analyzed with regard to its functionality/features	Initial categories and tentative coding scheme	Attribute
Online forum data collection	Relevant prosumer discussions are elicited	Qualitative discussion data	Attribute, consequence, value
Thematic analysis	Qualitative analysis based on recurring themes aiming to connect attributes of artefacts to consequential actions, and in turn to overall life values	Qualitative themes, descriptions & quotes.	Consequence, value

The framework is presented in an order that corresponds to a research process starting in attributes and moving towards values. However, while the overall direction is likely to take such a course, the day-to-day research may well take on a more iterative character. This depends on the fact that each step of the procedure is capable of generating new insights that may impact on results from previous steps (e.g., categorisation schemes, chosen online venues, emergent themes). Notably, it is also possible to imagine research projects that begin in an examination of consequences, or even values, and then aim to connect these to attributes in an everyday range of available media technologies. The details of such an approach, however, are the topic of a different paper. We will now move on to explicate the theoretical foundations used to frame the specific methods.

Attribute analysis

What are the key technical features of a specific technology used by a specific group of people? The examination of attributes is an important first step to acknowledge that new media and new interactive systems generally support a variety of purposes. The attribute analysis is consequently necessary to understand how the full user experience can be allocated over diverse attributes (and indeed diverse media technologies). This is important in order to generate an initial coding scheme. If possible, personal use of the product or system (i.e., by the researcher/analyst) can add significant improvements to the theoretical sensibility of the researcher.

The attribute analysis should be kept fairly straightforward (i.e., not a *formal inspection* as proposed by for example, Loer & Harrison, 2001). The rationale behind the attribute analysis is to get an understanding of what features that are available to prosumers and what specific terms that are used to identify them. This repertoire of features serves as potential dimensions by which to initially categorize data. As described in the theoretical background, the notion of an attribute is not necessarily limited to obvious or marketed features. Attributes exist on a scale ranging from the concrete (e.g., battery life, colour, editing possibilities) to the more abstract (e.g., brand, perceived style factor; Lin, 2002). The practical result of the attribute analysis is a range of attributes relevant to the research question.

Forum data collection

While a variety of data can be collected from social media, this paper focuses on discussions carried by Internet forums. The use of online discussions as sources of data is not new (Correll, 1995), but as these arenas of communication become more accessible, they also become an integral social space interweaved with the everyday life for a lot of people (Hine, 2008). Before presenting the practical details of forum data collection, some definitions are appropriate.

Forum. An Internet forum is an online website for carrying discussion. It allows users to post messages (or *posts*) that become visible to other users of the same site. Forums are many times public, but can also require registration or be limited to a specific group. The main purpose of the Internet forum is to function as a web-based application for managing user-generated content (mostly text, but other media can be included). The structure is usually made up of subforums, threads and posts. Subforums are topic labels under which discussion threads are categorized. For smaller forums, subforums may be superfluous.

Thread. A thread (sometimes referred to as a *topic*) is a chronologically ordered sequence of posts under a thematic heading.

Post. A post is a message added to a thread from one specific user, usually containing, a part from the actual message, some details about the user and a timestamp. It may be a first post or a subsequent reply. Methodologically, a single post may contain several relevant data items (i.e., several relevant accounts of prosumption).

The collected data is usually made up of textual material. However, a note should be made to acknowledge that with the increasing multimediated social interaction, audio and video are to an increasing extent included as data sources (Dicks & Mason, 2008). The general richness of social media is also recognized by Murthy (2008) who ascertains: "when conducted alongside other data (e.g., interviews), the sites can provide unique in-depth autobiographical

accounts of scenes and respondents" (p. 846). In particular, relating to prosumer experiences, the methodological utilization of emergent communication technologies and new media, is regarded as highly relevant (Mulder & Kort, 2008).

The selection and amount of data collected is usually at the discretion of the researcher and should, naturally, be guided by the research question. Since a lot of forums are highly social arenas with its benefits and drawbacks, data can be cluttered with off-topic material. In a general sense, forum data collection can be concerned with all types of forum activities, but depending on the research question a preliminary sorting can be resource-saving. A risk is that it can be hard to predict what to save and pursue and what to discard and ignore, even with a narrow topic of research. On the one hand, this depends on the relevance of answering the research question and is up to the skills of the researcher. On the other hand, the technical cost of saving additional material from forum studies is usually low, so while a preliminary sorting can save time and effort, there is always a possibility to re-include material previously disregarded.

Forum data collection is typically one of two types: (1) targeted or (2) distributed. Targeted collection means that one specific forum is selected because of its specific relevance to answering the research question (e.g., topical or demographical relevance). In this case, the actual collection boils down to identifying relevant discussion threads or posts and saving these. If the research question is limited in scope in relation to the overall topic of the forum, this paper suggests to make use of search options included for the specific studied forum, but also that a final relevance judgement must be made at human discretion. In the case of distributed forum data collection, several forums (or blogs), are searched for relevant discussion. It might be that these are general discussion forums containing a wide variety of discussions, not only pertaining to the specific research question. This approach is largely made possible by the continuously refined search options and techniques offered by both general (e.g., Google) or specialized (e.g., Boardreader, Omgili, Blogpulse) search engines. As such there is a larger reliance on language and technology, but also a potential to widen both the reach and variety of the data. There is much to be said about forum research, including entry-making, ethics and presentation of results. This paper has little room to elaborate on all such issues, but refer to the comprehensive work of dedicated scholars (Garcia, Standlee, Bechkoff, & Cui, 2009; Markham, 2004; Skågeby, 2011).

For each data item (i.e., relevant verbalized experience or expressed opinion)[1] a judgement call needs to be made on whether the general reaction of the data item is positive, neutral or negative (Kuisma, Laukkanen, & Hiltunen, 2007). This is done in order to capture a polarity of what the user feels after usage (i.e., a consequence; Lin, 2002). In discussion forums, users often explicitly express such sentiments, making them easy to identify. In instances where no clear positive or negative consequence can be assigned, neutral provides a way to assign a middle-of-the-road sentiment. Each data item is finally assigned to the appropriate attribute category/subcategory. For the sake of illustration, we shall now consider a prototypical prosumer quote and how consequences and values can be elicited from it:

> I just love that my new phone now plays MP3's. Not having to carry both my phone and my (rather bulky) mp3-player saves a lot of room in my coat pockets! Also, if I'm listening to music it pauses it if I get a call and then starts again when I hang up– pretty cool! Too bad it is sucha hassle getting them [the music files] on to the phone.

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[1] Nota bene: one post may include several relevant data items

Although appearing a bit dated in this age of constant technological updates, this quote indicates how the MP3 feature is appreciated for making other products redundant and in consequence adding to a sense of freedom. This freedom however seems obstructed by the perception that transfer is a problem. Interestingly, when looking deeper into such issues it is not rare to find that prosumers have overcome such issues by developing programs that address specific compatibility and transfer issues.

Let us now consider another prototypical quote:

> This is bad! The battery gives me like 2hrs of uptime when listening to music, snapping pictures, making video calls and sharing playlists…what if I'm left at an airport with no juice [battery power] because I was trying to alleviate my boredom with some music or movies…that's no good!

This, in relation to the previous quote, show how there is often a complex of attributes, consequences and values that form the prosumer experience. Of course, these quotes represent condensed data and a completed data set would likely consist of many more similar, and nuanced, prosumer quotes. Thus, the end-result after forum data collection should be a workable data matrix of qualitative data (i.e., copied discussion text and sentiment judgement) connected to identified attributes. With a starting point in this data matrix the paper will now describe an adaptable analysis procedure.

Thematic analysis

The thematic analysis is used to create abstractions (i.e., themes) from the collected discussion data. Even though the attribute analysis makes it possible to connect consequences and values to product features, it is often also interesting to move beyond the focus on attributes and identify more general patterns of prosumer cultures.

Analysis of textual data can follow many different frameworks (e.g., rhetorical analysis, discourse analysis, feminist analysis). However, for the purposes of this paper we propose the more general approach of thematic analysis (Braun & Clarke, 2006; Freeday & Muir-Cochrane, 2006). Put simply, thematic analysis refers to a careful reading and re-reading of the data in order to find recurrent themes across the data. Thematic analysis is a general and flexible method that has been used in many different methodological and theoretical traditions, although under different monikers. As such thematic analysis is open to, and acknowledges, the potential influence of application theories (i.e., initial theories and research efforts that colour the preliminary categorization of the studied area). Leaning on Braun and Clarke (2006), the generic steps of the thematic analysis procedure are:

1. Continuously (re-)familiarizing yourself with the data. This step entails an initial reading and reflecting over the data set as well as a continuous re-reading bearing in mind the emergent themes and their relation to the text in whole.
2. Creating additional codes. While reading through the data, it is necessary to pick up on potential codes that appear, or that describe the appearance, in the text. Some initial categorization has been completed through the attribute analysis and application theory survey. However, the thematic analysis is meant to add qualitative insights to the attribute categories, creating a deeper understanding of the consequences and values that are connected to the attributes. Attribute categories are thus complemented by emergent themes relating to overall use.

3. Identifying and examining themes. This is where coded text segments are grouped into larger themes that envelop their character. This step also includes defining and naming themes.

It is important to note that the thematic analysis procedure is usually not progressive in a linear sense. Rather, the steps are often interwoven in a parallel or iterative procedure. As described previously, the forum data collection generated a matrix of attributes, consequences and values. By conducting a thematic analysis on this data matrix, we gain higher levels insights about the thematic connections between attributes, consequences and values.

Empirical Example: The Evolution of *The Friend List*

To emphasize how the proposed framework can capture sociotechnical evolution, we shall now consider a brief and summarized example where the development of a particular feature of media sharing services co-evolves with social practices and prosumer culture. The feature in question is *the friend list* – arguably the backbone feature of many social network sites. Three cases where the friend list was a central socio-technical feature will be reviewed and analyzed: Soulseek (a music-sharing P2P network); flickr (an online photo-sharing service) and Facebook (a general purpose social networking site). The studies on these three cases were conducted in 2004, 2006 and 2008. As such, it is interesting to observe how the friend list feature actually co-evolved with the emerging social practices. Due to restrictions of space, this paper will not represent the full attribute analysis of the three systems, but rather illustrate how a focus on one single attribute can actually open up an array of interesting insights.

Soulseek is a music file-sharing service that emerged from the ruins of Napster. Up until 2004, Soulseek was an open P2P system (although, technically it relied on a central server) where users had access to all other online users material. However, in 2004, the introduction of 'the buddy list' (the attribute) came to divide the user community into two large groups. The buddy list was basically a list of selected friends, but the big cause of the stir was that users could choose to share their music with users on the buddy list exclusively (the consequence). To the users who regarded open sharing as the ideal practice, this was an outrage. The creation of these small networks that could benefit from the overall pool of resources, but not give anything back went against their ethics of sharing (their values). These users were what we may call instrumental in their use of Soulseek. They did not want to socialize or have chats about the weather each time someone wanted to download one of their files. In short, they wanted the biggest possible pool of resources. To the other group, whom we may call communicators, the buddy list was an improvement because it allowed them to make social connections as well as provide material directly to others whom they knew would enjoy it. Communicators also saw the buddy list as a way to ensure that others shared as much as them – somewhat counter-intuitively, only if you shared enough could you be on their buddy list. In all, the attribute (the buddy list) gave rise to feelings of both injustice and increased sociability, which in turn forced users to reflect on their intentions behind sharing, and its relation to the tension between the public and the private, at large.

If Soulseek was mainly concerned with the sharing of music, a relatively impersonal form of media, flickr – a photo-sharing service – became an arena for more intimate and sensitive issues. In 2006, flickr supported four friend list options to coordinate different types of relationships. These options were: public (photos visible to any and all); private (photos visible to oneself only); contacts (photos visible to personal list of contacts only); friends and family (photos visible to a select subset of the contact list). Perhaps needless to say this distinction was not enough for users who complained significantly when they discovered that for example their moms would access the same photos as their everyday peers. Consequently,

the lists included in flickr did not represent the variety or complexity of relationships out of flickr. Perhaps even more interesting, there were also users who were concerned that the added metadata that they themselves, or other users, attached to photos would compromise their social status. This could be for instance tags or comments that put the photo in a new light. That is to say that users were perhaps not concerned with a photo being public, but once "social metadata," for example in the form of comments was attached, it was no longer clear that the photo should be public. So, when sharing digital media objects in a socially networked environment, the socially important metadata becomes part of the picture as well. In summary, the restricted friend list options caused frustrations, which in turn caused concerns about personal privacy at large.

In Facebook, multimedial sharing is taken to a new level – photo-sharing, locations, instant messaging, status updates, personal profiles, social gaming, friends of friends are examples of features of this *mash-up* service. The key thing, when it comes to end-user distinctions between different relationship types, is that the information provided to others is controlled by a *configurable set of lists*. As such, it is interesting to note that this very attribute requires users to consider what they mean by friendship and what different types of friendships there are. To further this argument, an interesting question is, once we have configured our social relationships (via friend lists) in Facebook, will we, when meeting people face-to-face, also begin to consider them in terms of lists? If we after meeting face-to-face, also decide to connect on Facebook, we certainly have to.

The evolution of the friend list clearly illustrates how a specific attribute (feature) can generate different consequences and different values. This is not rarely the case – a specific feature is introduced which divides the user base into those who prefer the old ways and those who welcome the new. ACV-chain analysis helps us not only to understand those two prototypical groups of prosumers, but also the interesting middle ground of prosumers who move between the two poles.

Discussion

The procedure presented in this paper is a unique combination of theory and method applied to a specific source of data in order to explore a specific activity. While the utilization of online discussion is nothing new in itself, the theoretical foundation of prosumption and ACV chains provides a frame for a distinctive combination of methods. As such, online discussion becomes a valuable source for studies of prosumer engagement with new media artefacts and services, but also for studies on wider social phenomena (e.g., Kendall, 2000; Kummervold et al., 2002; Tzaliki, 2002). This paper has attempted to provide enough detail to be applicable to contemporary research. As such there has been little room left for critical comparisons with other methods. Instead, the paper has relied on solid theoretical ground to provide arguments for the application of specific methods to a limited area of study. Also, the paper will now discuss the potential benefits and drawbacks of the proposed framework.

Methodological Benefits

The use of online discussions, or other forms of collaborative technologies, as sources of data has several benefits (Mulder & Kort, 2008):

- It supports in situ measures
- Over longer periods of time
- Unobtrusive measurement
- Data collection can potentially be automated

- Performs research over multiple users
- Captures qualitative as well as quantitative data

In relation to these benefits, it is perhaps particularly interesting to note that because forum discussions archives often contain data spanning over long periods of time, it becomes possible to make longitudinal studies of prosumption, as it develops over media and technology development, on the basis of far-reaching archival data.

In addition to the general benefits outlined above, this paper argues that the connections between attributes, consequences and values are conceptually important because prosumption can be distributed over several devices or services. In the context of new media and information and communication technologies, it is clear that one specific technology (or technical feature) has the potential to meet many various user intentions. Reversely, one user intention can be acted out through a combination of many technologies (or technical features; Ihde, 1993). The comprehensive method presented in this paper gives researchers and designers the opportunity to explore such conceptual connections between features, consequences and values – connections that may indeed be distributed over several different media technologies.

Further the theoretical conclusion that use depends on completed ACV chains is an actionable insight. As mentioned previously, it is possible to deduct that attributes that generate negative consequences will not support any fundamental or desirable values, and thus not contribute to continuous prosumption. Using the concept of engagement: "Failing to engage users equates with no sale on an electronic commerce site and no transmission of information from a Web site; people go elsewhere to perform their tasks and communicate with colleagues and friends" (O'Brien & Toms, 2008, p. 938) As such, researchers and designers can analyze attribute-consequence chains that were terminated before reaching the value level (often easily identifiable via negative consequence sentiments) in order to explore prosumption failures and specifically direct action and attention towards those chains.

There are other interesting benefits that come from using online forums as data sources. The data is spontaneously there without researchers having to prompt respondents, recruit subjects, arrange workshops or set up focus groups, As such the method is quick without necessarily sacrificing any detail of insights. Forum discussion data also has the benefit of being quick in another sense, namely that forums provide rapid response to new, or even only rumoured products and services. Yet another benefit is that the data itself offers some structure right from the start (by being organized in threads for example), helping researchers to make sense of the pragmatic organization of the topic.

Methodological Limitations

While it is possible to cast the net wider, this paper has limited itself to so called new media and ICT-related discussions. This was necessary to bring focus to the paper, but also as a natural first step since Internet is such an integral part of prosumption cultures. The meta-discussion of information and communication seems almost native to Internet discussion forums.

Further, the use of online discussion data is to be seen as one of a range of available methods. The methods described in this paper are suitable for eliciting user engagement with existing products, services or phenomena, but if the research topic is complex or relates to prototypes only, other methods may be more relevant to offer a full and rich picture of the lived human experience. Also, a thematic analysis requires a skilled researcher with interpretative proficiency. However, utilizing several coders and/or interpreters reduces, or rather distributes, subjectivity.

From an epistemological perspective, it is also important to acknowledge that data from discussion archives is open to both quantitative and qualitative analysis techniques (Hewson, 2008). Indeed, a small, but growing body of work is combining qualitative and quantitative methods to good effect (Kendall, 1999; Sotillo & Wang-Gempp, 2004). A key conclusion emerging from these studies is that qualitative analysis can shed light on the underlying reasons for frequency distributions resulting from quantitative analysis. For example, a fairly recent paper (Lin, 2002) presents a quantitative approach to ACV chain analysis: "The traditional MEC [means-end-chain] analysis is a qualitative analysis; the new integrated analysis is a quantitative analysis" (p. 348). Yet another paper suggests that qualitative analysis in itself is made stronger by the application of mathematical models (Chin-Feng, Hsien-Tang, & Chen-Su, 2006). Nevertheless, subjective analyst skills and judgements many times precede quantitative efforts by, for example, defining central concepts.

There are several issues relating to validity that can be elaborated upon in this paper. However, there is one particularly pressing issue regarding the definition of attributes and what forum posts that are categorized under each attribute. In many ways, this is a fundamental problem of all research, but here it is perhaps particularly apparent as it is so clearly at the hands of the researcher.

A small note on quoting may be necessary. Quoting online material as a part of the results is particular and thus requires a dedicated methodological discussion. It is clear that for the presentation of results from the thematic analysis, word-for-word user quotes can add a lot of insight to the reader. They back up analysis and give readers a chance to experience users' actual expressions. However, with the growing effectiveness of specialized forum search engines, there is reason to consider not quoting to the letter as users may be searched out, tracked and potentially identified based on the exact phrasing used. Instead, one may consider a careful rewording that communicates a comparable message (i.e., paraphrases to the same effect). There are of course other ethical concerns that also come into play. However, this paper has little room to expand on such issues and refer to the more detailed works of other scholars (Sharf, 1999; Svenningsson, 2004).

Conclusions

This paper has proposed a coherent methodological approach to connecting artefacts and user experiences in online discussions. By focusing on specific features of artefacts and how these connect to larger concerns, intentions, experiences, practices and values, this paper illustrates that there are fruitful methodological combinations to be made by looking at neighbouring disciplines. By combining theories and methods from clinical psychology, consumer research, social informatics and Internet research, this paper provides a trimmed approach for exploring prosumer technology-oriented cultures. The importance of gathering solid requirements and foundations, in the shape of user concerns, intentions and perceived system errors, for re-engineering and re-design of information systems cannot be understated. Online discussion is a vital, but many times underused, source for data to elicit such requirements and foundations. This paper has described a coherent and systematic process to access these data sources as well as analyze, interpret and, to some extent, present the gathered data.

The analysis of the three cases indicate how it is important to understand both changes in technical attributes of mediating technologies as well as the social practices that emerge and co-shape their use. The friend list is a central feature of many social mediating technologies. The fact that friend lists have to be actively configured requires prosumers to reflect over what a particular type of relationship actually means and how the people s/he connects with are related to one another. Nevertheless, this might very well be a necessary practice, which is

beneficial for prosumers - at least if the alternative is to have automated inference mechanisms relating to relationships, levels of sharing and privacy settings.

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