User Perceptions of Wow Experiences and Design Implications for Cloud Services

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ABSTRACT

Wow! as outstandingly positive user experience has often been cited as an important design target in industrial product development contexts. Wow is assumed to be more than acceptable user experience, it is something that exceeds users' expectations. There is relatively little research on the specific concept of Wow and how it can be achieved. In our multi-year Cloud software project with over 20 industrial partners we have found a strong interest in establishing basic understanding of this concept and further, design implications for bringing Wow to Cloud services. To this end, we first conducted two small online surveys to understand the general user perceptions of Wow. We then explored two specific Cloud application domains – personal contact management and information security services – in more detail by conducting two rounds of user interviews on how Wow is perceived in these domains. In this paper we present the results of these user studies and draw design implications for Wow in Cloud services. The main design implications include providing positive surprises to the users by pushing dynamic service features through the Cloud, supporting automated data integration of and universal access to user's personal data, and moderating the level and types of Wow for "serious" application domains.

Categories and Subject Descriptors

H.5.2: User interfaces, User-centered design

General Terms

Design, Human Factors.

Keywords

Wow, user experience, Cloud services, design implications

1. INTRODUCTION

As technology markets get saturated by a broad variety of products and services, there is an increasing need to differentiate by positive user experience (UX). UX extends the concept of product usability by setting additional goals such as emotional fulfillment, enjoyability, aesthetic pleasure, entertainment, and fun [17][11]. UX has been noted to entail both pragmatic

characteristics such as usability and effectiveness, and hedonic characteristics such as stimulation, identification and social relatedness [8]. Wow can be seen as an outstandingly positive UX which strengthens the bond between the user and the product.

We are working in a large Cloud software research project [20] where in addition to seven research institutes there are over 20 industrial partners. In this project, Cloud software development is investigated from the perspectives of technologies, methods and business. Cloud computing refers to "both the applications delivered as services over the Internet and the hardware and systems software in the datacenters that provide those services" [2]. Cloud can be seen as a new paradigm for service design and delivery in which the services are offered and data shared transparently among users through heterogeneous computer networks, the Cloud [15][22]. From the user's point of view, the Cloud is a personal information storage following them wherever they go. The user can access all their data from any device and also the applications and services come from the Cloud. Examples of existing Cloud services can be found in enterprise systems and in wide variety of consumer services, e.g. for communication and social media (Gmail, Facebook), content management and media sharing (Flickr, YouTube) and financial services (e,g, Mint).

In our Cloud project, "superior UX" has been set as one of the main targets or strategic research themes, and it is linked to all of the main Cloud development perspectives i.e. how to create new Cloud technologies with good UX; how to link UX to Cloud development methods, in specific agile development of Cloud services, and how to support business development with excellent UX of the services. Central issues of Cloud UX are, for example, dynamic service offerings through the Cloud, user's data storage and access "anytime, anywhere", feeling of security and trust in service providers, social interaction with other users and seamless multi-device access to the services [21].In this context, the need to design for ways to differentiate Cloud services in ways which make them "stand out" in the large service offerings.

A quest for evoking *Wow experiences* with future services has become strong. In the Cloud project the industrial partners have realized that services need to match to the end-users' increasing requirements. The developed services need to be not only useful and easy to use, but also visually attractive, inspiring and they should give some kind of "adventures" to the users. Besides the industrial and user interface design, users need to be fascinated by interacting with the service. When the user sees and uses the service for the first time, they should be able to exclaim: "WOW! This is something that I want." Furthermore, they should remain engaged also in long-term interaction with the service.

Wow has been addresses under that label in some earlier research (see Related Work). Still, in the context of our Cloud project, one of our research goals was to establish a more thorough understanding of Wow as a design target. To this end, we conducted user studies of the concept of wow; in specific users' perceptions of what causes Wow and how does it appear. We investigated two Cloud service domains, contact management and security, in more detail. In this paper, we present these studies and draw initial design implications for Cloud service UX.

2. RELATED WORK

In this section we describe concepts from earlier research which are related to Wow. We then cite papers which have addressed Wow as a design concept.

Maslow [14] defines "peak experience" to include experiences of unitedness, total attention, richer perception of objects, disappearing ego, and even love or mystic experiences that may come only two or three times in a lifetime. Furthermore, Maslow describes peak experience as subjectively being out of time and space, always good and desirable and finally, momentarily experiencing loss of fear and anxiety. Maslow states that *"the emotional peak experience has a special flavor of wonder, of awe, of humility before the experience"* [14]. Maslow reports that in peak experiences, people use following attributes of reality [12][14]: goodness (desirability; justice); beauty; wholeness; aliveness; uniqueness; perfection; completion; order (symmetry; structure); simplicity; richness; effortlessness; playfulness (fun; joy; humor) and self-sufficiency (autonomy; independence). While Maslow's peak experience refers to experiences that are typically related to art, nature or other people and often have even a religious or mystic nature, we are more interested in how people perceive and describe their Wow experiences related to objects, particularly products and services.

More recent studies particularly by Csikszentmihalyi [4] define the Flow experience which contains several properties reported by Maslow. In his studies, Csikszentmihalyi has found that when people experience what he calls "flow" or "optimal experience", they report one or more of the following eight factors: 1) a task that is possible to finish, 2) a chance to concentrate, 3) clear goals, 4) immediate feedback, 5) deep, effortless concentration that leads to forgetting one's worries, 6) feeling that actions are in one's own control, 7) worry of the self disappears, yet after the experience the consciousness of the self returns stronger and 8) altered perception of time. In other words, flow experience can be described as *a result of voluntary action that is goal-oriented, occupies full attention and is at the optimum (high) level of one's capabilities.* The flow experience is strongly connected to quality of life, even happiness, and can therefore be seen worth pursuing also in design of products and services.

The concept of user experience (UX) was developed in late 1990s and early 2000s to extend the concept of usability with design goals such as emotional fulfillment, enjoyability, aesthetic pleasure, entertainment, and fun [11][17]. UX depends on various aspects of the user's internal state (expectations, needs, motivation, mood, etc.), the product characteristics, and the context of use [8]. UX has been noted to entail both *pragmatic* characteristics such as usability and effectiveness, and *hedonic* characteristics such as stimulation, self-expression and social connections [8][7]. UX is temporal and thus changes over time [12], hedonic product characteristics being more important in prolonged use. Hassenzahl [7] has conducted experiments

establishing that basic user needs such as autonomy, relatedness, stimulation, competence and security form a basis for design of positive user experience. Even though user experience as a term does not necessarily mean a Wow experience, similar, or at least a subset of the basic human needs can be assumed to lie behind Wow experiences.

Desmet et.al. explain Wow being a "*combination of pleasant surprise, fascination and desire*" [5]. In their design study [6], Desmet et al start designing a wow product by first eliciting 'product concerns', falling in of three categories: goals, standards (beliefs, norms) and attitudes towards objects. A design was based on the elicited product concerns and showed that the design evoked high ratings in surprise, desire and fascination. In their design, they concentrated on the product concept, and not on the product features. If a designer wants to aim at a Wow product, they should design a product that is appraised as *unexpected*, *unfamiliar*, *promising* and *fit for personal possession*. They name these four terms as "wow-appraisal". They also claim that Wow can be more than just a superficial verbal exclamation, having experiential, physical and behavioral impact.

Steen et al. define Wow as a "*strong, positive emotional experience, surpassing basic experience*" [19]. Also they state that in order to an interactive technology product or service to offer a Wow experience, its functionality and user interface have to be useful and usable.

Hudson and Viswanadha [9] address Wow based on their experiences as designers and define a Wow product as "*one that* (in addition to meeting the user needs) *also (1) creates unexpected needs and (2) promotes a greater sense of control over the external world*". Among other things, (1) refers to component of surprise or surpassing the expectations, which is recognized also in the definition by Desmet et al [5]. Since Wow includes an element of surprise, it is also apparent that a product or feature that caused a wow will likely not do it after a certain period of time has elapsed. This is recognized both in [5] and in [10]. Related to this, Schauer [18] points out that there has to be long-term Wow to create loyal customer base. Schauer suggests four general principles of creating Long Wow, e.g. *"Tackle a wide area of unmet customer needs"* or *"Organize a pipeline of wow moments that can be introduced through your platform of touchpoints over the long haul"*.

As a design goal, simply aiming at Wow is too vague. Hudson and Viswanadha [9] suggest that to achieve wow experience, the designer should provide apt feedback, offer invitation to play with the interface and create novel forms of interaction. In some cases playfulness may require compromising some aspects that would support traditional usability (efficiency). Novel forms of interaction do not necessarily mean you have to invent new interaction techniques but applying them in improved or unexpected ways.

Like any experience, also Wow experience can be expected to be determined by qualities of the person, qualities of the context and qualities of the product or service [8]. Factors of the product or service possibly triggering a Wow experience are recognized in literature. For example, based on a focus groups study with three groups, Steen et al. [19] found the following factors triggering Wow experiences: *nostalgia, fantasy, sensorial experience, amazement, surprise, beauty, exclusivity, budget, comfort, mastery, connectedness, own world, care, competition* and *inspiration*. They also compare Wow and Flow and state that

these experiences are similar: *"the pleasant sensation that occurs when required skills are in balance with the encountered challenges, in an action system with clear targets and rules and with direct feedback on performance."*

Recent studies show that playfulness can be an important part of positive user experience [1]. Playful Experiences (PLEX) model is a categorization and design tool which can be used as a guideline or design inspiration for specific types of playful experiences such as *competition, challenge, nurture, thrill* and *fantasy*.

The above Wow definitions, design principles and experience categories outline potential sources of Wow experiences. However, to our knowledge there are no studies focusing specifically on how Wow is understood and perceived by the end users of in terms of interaction with products and services. As this research was conducted in industry-lead Cloud software project, our aim was also to understand how Wow is related to users' perception of service domains of Cloud computing. Based on the results of our Wow user studies, we suggest in the end of this paper design implications for how to target at Wow both in general and specifically in the Cloud service design.

3. OUR USER STUDIES OF WOW
The goals of our user studies were:
1) To investigate the general user perceptions of Wow.
2) To explore specific domains of Cloud services in order to understand what kind of Wow experiences users would expect in those domains.

To investigate the general user perceptions, we conducted a qualitative survey. For the specific domains of Cloud services we carried out semi-structured interviews of contact management and security software. We chose there two domains based on the interests of our industry partners and because of their potential to reveal different aspects of user experience and in specific, Wow. Contact management was chosen because it is an essential application in the Cloud-based communication and social media services. Security software is another central component in the Cloud. As opposed to social media and contact management, security software is a pure utility tool typically running on the background, mostly invisible to the user. Still, it was of interest to explore how Wow could appear in this important Cloud domain.

Our user studies took place between April and December 2010. We conducted them in two phases: We first run two surveys. The first one was a preliminary email survey for people with technical background (29 respondents) and the latter, more detailed one was targeted at people with no technical education or profession (23 respondents). The aim of these surveys was to find out people's perceptions of what is Wow and what causes it. The focus was not on any specific technological solutions but in general the phenomenon of Wow. In the second phase of this research, we conducted two sets of semi-structured interviews, one on Wow of contact management (7 interviewees) and one on Wow of security software applications (7 interviewees).

The user groups are described in more detail in the beginning of each subsection of results (Chapter 4). The data analysis was done by qualitative content analysis, categorising users' statements of their Wow experiences gathered both in the surveys and in the interviews.

4. RESULTS
In this section we present the results of our user studies in two subsections: Online surveys of general user perceptions of Wow (Section 4.1) and user interviews related to two domains of Cloud services (4.2), contact management and information security.

4.1 Surveys of User Perceptions of Wow
We first conducted an initial survey with technically oriented people and then a more detailed survey with people with no technical education or profession. The open, qualitative questions of both surveys were: *What does a Wow experience mean in your view? What product or service has caused a Wow experience to you?* In addition, the latter of the two surveys asked more details of the causes and nature of the Wow experience: *Which features of the product or service caused the Wow experience? Why were those features causing Wow for you? When did this Wow experience happen? How long did the Wow experience last? What is your current view of the product?*

We will summarise the results of technically-oriented people briefly, and focus on the viewpoints of less technical respondents, as we believe this is more relevant for the broader objectives of Wow design.

4.1.1 Wow Perceptions of Technical People
The initial survey with technically oriented people was executed as an email questionnaire. The respondents (N=29) were reached via e-mail lists of Digia plc and Oulu university of applied science. Respondents were employees of Digia Oyj (n=10), students of technology (n=14) and employees of technical faculties in Oulu university of applied science (n=5).

For these respondents, Wow experience means something new, unique, or a surprising experience which truly amazes the person. Wow gets the person's 100% attention, at least for a moment. Respondents' also thought that Wow experience means quality, speed, real time, visuality, functionality and interaction. It makes the user want the product and the user feels the product is made for them. Wow experience makes life easier.

Reasons why Wow experiences arise were various. Most commonly mentioned reasons were a feeling of success, usability, uniqueness, extensiveness and versatility, feeling of participating, exactness, functionality and quality.

As a conclusion, when describing Wow experiences, these technically-oriented people felt that Wow is new and unique, and even amazing. In their answers, they focused quite clearly on the functionality, capabilities and features of technology products. While this is interesting, we wanted to run another, somewhat more detailed questionnaire with people with no technical background to gain broader understanding of the issue.

4.1.2 Wow Perceptions of Non-Technical People
This survey was executed as an online questionnaire over Internet. The questionnaire was open for two weeks and the respondents (n=23) were recruited by word-of-mouth by the researchers and screened for not having technical background (education or profession). 17 of the respondents were women, 5 men and one had not indicated their sex. Age distribution was between 23 and 64, average age was 38 years and median was 34. Respondents' education level varied from elementary school to Master's degree. 21 of respondents were in working life and two were students. All respondents used both mobile and other information technology equipment (mainly PCs) on a daily basis.

The categories of things (products, services and their features and qualities) causing Wow are presented in chapter 4.1.2.1. The reasons why the respondents had had a Wow experience varied quite a lot. These results could be classified in five different categories. These categories are presented in chapter 4.1.2.2. Section 4.1.2.3 presents findings about the time perspective of Wow.

4.1.2.1 What Causes Wow

Table 1 presents products and services with which the respondents had felt Wow experience. The table also shows the feature(s) or qualities of the product or service which caused Wow experience. Every respondent mentioned one product or service which had caused a Wow experience. Products and services were thematically coded and are classified in five different categories according to their nature.

Table 1 Summary of the types of Wow experiences (N = 23)

Category	Product / service	Feature / quality
Customer service, or a service from another person	Personal customer service in the net store 'Raum77'	Having personal customer service via internet even the net store is international
	Customer service	Smile and kindness
	Great service in a Russian night club	The service was very fast
	Hairdresser	New hair style
Non-technical product	Cotton pads	Bigger and better shaped than traditional pads; pleasant and practical surface
	Handmade Swedish clogs	Very pleasant to use
	Dark orange chocolate	Taste and smell
	Sexy hair shampoo	Really makes the hair bigger
Technical device, product or its feature	First mobile phone	Text messages
	A movie	Special effects
	Nokia mobile phone	Ease of use
	Mobile phone or gps navigator	Accuracy, predictiveness
	PlayStation 3	Large amount of software
	Short cuts in computer	Useful, quickness
	HDTV, blue ray movie	Sharpness of picture
Software	iTunes	Intuitive interface for Windows users, ease of use, adjustable, smart playlists
	New photographing software	Logical interface and ease of use
	Mozilla Firefox	Double as fast as Explorer and easy to browse interleafs
	Smartmail	Having emails on the mobile phone without a web browser
	Fronter learning environment	Versatility
Internet service	Electronic Helsinki city guide	Service gave useful and relevant information even more than thought necessary. Information came fast and in understandable form
	Supplying and paying a travel via internet	Ease of use, freedom to plan trips by own wishes and to realize these plans within the limits of budget
	Cdon.com (a media merchandise site)	Products were cheaper than elsewhere

Wow experiences seem to come from a very wide variety of services or products, like personal customer service, Swedish clogs or features of a game console. An interesting detail was that every time the Wow experience originated from another person, the respondent was a woman. Otherwise no interrelations between the gender and mentioned products were found.

4.1.2.2 Why Wow Happens

Table 2 presents the reasons for why the product or service caused the Wow experiences described in Table 1. One respondent had not answered this question, so in Table 2 there are 22 answers.

Table 2 Summary of the reasons for the Wow experiences

Category	Product / service	Specific reason for Wow
Effectiveness	Electronic Helsinki city guide	Web service was effective and useful when it stood out from the rest. Usually there are too many choices, service delays, or the results are hard to read.
	Cdon.com	Products were cheaper than elsewhere and came directly to home
	Smartmail	After using mobile phone's web browser to read emails the push email was great
Efficiency/ Ease of use	Mozilla Firefox	Much faster than Internet Explorer
	iTunes	Ease of use and quickness. Possible to customize features.
	New photography program	Earlier had to trust own skills
	Short cuts in computer	Make use more faster and easier
	First mobile phone	Nice and helpful device
	Nokia mobile phone	No need to read manual because the phone was so logical to use
	Customer service of a Russian night club	Never met that fast customer service in Finland
Satisfaction	Cotton pads	Felt luxury to sweep face with such big cotton pads
	Handmade Swedish clogs	Comfort and usefulness
	Dark orange chocolate	Experience aroused a strong feeling
Versatility	Supplying and paying a travel via internet	To experience different parts of use working as planned
	Fronter learning environment	Could use multiple feature in different situations, interactive
	PlayStation 3	So many different programs
Surpassing quality of product or service	HDTV, blue ray movie	Never saw or knew this kind of quality to exist
	Net store 'Raum 77'	Their customer service was ready to deviate from their normal customs for me. Got service via email in the middle of the night. Had a feeling of great customer service.
	Customer service	Rarely have had that good customer service
	Sexy hair shampoo	Surpassed the expectations, because normally doesn't trust commercial texts
	Hairdresser	Made everything what wanted and even more; great customer service
	Mobile phone or gps	Technology is amazing

These results could be classified in five different categories. Some of these categories relate to basic usability attributes (effectiveness, ease of use and satisfaction) and the reasons for Wow arose from the experience being clearly better than earlier ones, or in some other way unexpected. The two other categories, versatility and surpassing quality relate directly to the superior experience, i.e. the product or service offered more or in better ways than expected.

Hudson and Viswanadha [9] present that every Wow reaction they observed occurred with highly usable design elements. This promotes our findings and confirms the relation between Wow reaction and usability. Enablers of usability, such as simple language, promote Wow reaction by helping create an easy experience that formed the basis for a Wow reaction. For example electronic Helsinki city guide produced a Wow reaction because all extra was cut out and the results were in easy-to-read form.

4.1.2.3 Time Perspective of Wow
Some respondents had had the mentioned Wow experience over a decade ago and still had a positive feeling about the product or service. When the current evaluation of the product was neutral, the Wow feature or quality had become a "basic" feature. Desmet et al. [5] give an example of this: the camera in a mobile phone was first a Wow but now it is a basic feature.

Figure 1 presents how long ago respondents had had their Wow experiences. The answers did not specify if the respondents described their last wow experience or if they described the experience which they first remembered. However, Wow seems to happen quite rarely since over half (13) of all the respondents described an experience which happened over six months ago
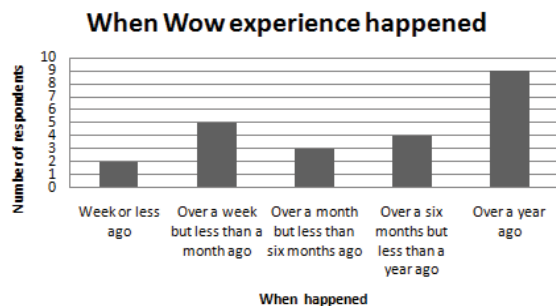

Figure 1 Timing of the described Wow experiences (N = 23)

The length of Wow experience was asked by open question and the answers were categorized. Figure 2 presents the durations of mentioned Wow experiences. According to the respondents' answers, the length of a Wow experience spans from seconds to a continuous or recurring feeling. "Continuous" refers also to experiencing Wow every time using a product or a service.

Only three respondents mentioned their Wow experience lasting for seconds or minutes. These respondents were youngish and the experience was resulting from a technical product. For the rest of the respondents the Wow experience lasted at least for an hour.

Overall, the results indicate that Wow experience is always positive and it might come from many kinds of products or services. Wow is an experience which produces positive feelings or amazes the person. Wow may happen when having a new experience but it may also be a recurring or long-term experience. These elements endorse the findings concerning Wow elements by Desmet. et.al: pleasant surprise, fascination and desire [5].

Figure 2 Duration of the described Wow experiences (N = 23)

4.2 Cloud Service Domain Interviews
We conducted two rounds of face to face interviews of individual participants with similar interview structures and contents. The interview rounds addressed both general views of Wow and specifically, how participants perceive Wow of two Cloud service domains: 7 interviews on contact management (CM) and another 7 interviews on information security (IS).

The main themes in the interviews were: *How do you perceive the term Wow? How do you get a Wow experience? What kind of needs and expectations do you have in general concerning CM / IS services? How would you get Wow experiences from CM / IS?* We did not address any specific brands of CM or IS applications but asked the participants to answer the questions in general based on their views and experiences of related applications.

We recruited the 14 participants via various e-mail lists and electronic notice boards. For contact management interviews, we chose participants by their social activity. The information security interviewees were expected to manage the security settings of their PCs by themselves. However, information security professionals were excluded from the interviews. The participants were mostly university students or already graduated from university. In the contact management interviews, 4 of the participants were male and 3 of the participants were female, all between 18 and 47 of age. The average age was 26.9. In the information security interviews all seven participants were male between 26 and 41 of age, the average age being 31.9.

4.2.1 General Perceptions of Wow
When asked what kinds of thoughts Wow brings up in general, all of our participants said that it is something positive. Wow is also something surprising which exceeds the expectations, it is sudden and magnificent, and often an emotional experience. *"Wow is something magnificent... visually, something surprising... positive, amazing, unexpected, sudden." (IS7: Male, 26)*

The interviewees reported that they get their Wow experiences from various kinds of things and from the feeling of success. The feeling of success can be evoked, for example, by sports and hobby excercises, such as mountain biking or yoga. Wow experiences can also be related to new technical applications and devices as well as to events such as pop concerts and movies.

The participants strongly disagreed that the context (environment, situation or other people) would affect their Wow experiences. They consistently stated that Wow experiences (or experiences in general) are subjective in nature. *"The product is the thing, other factors are irrelevant." (CM6: Male, 34)* This contradicts the well-known principle of UX that context contributes to experiences (e.g. [8]). This finding may be affected by the fact that people are subjective and unreliable observers of their own behavior and thought processes.

The participants' estimations about when they had experienced their previous Wow and how often they experience Wow in general varied a lot. Typical answers were "a couple of weeks ago" or "last summer". In general the Wow is experienced few times a year or monthly but rarely as often as weekly. *"I can't remember when was the last time I experienced Wow; during the last six months, it was related to music." (IS6: Male, 30)* These results are in line with the questionnaire results. Wow is not a very frequent experience and people can remember Wow experiences from rather long period in their past.

4.2.2 Contact Management

According to our definition contact management includes creating, organizing and updating of all kind of contact information. Examples of this kind of information are street and e-mail addresses, phone numbers and photos related to contacts.

Usage of contact managing applications is very diverse and personal. Basic functions, like sending an e-mail and phoning are used quite uniformly, but for example grouping of contacts and naming phone numbers varies and thus these tasks need to be personalized in contact management services. The participants brought up the need for usable grouping functions and easy ways to send mass messages. *"Grouping contact information would be useful, but it's too difficult nowadays, because it needs so much handwork." (CM2: Female, 47)*

Contact management should also work better on mobile devices. Personalization of contacts is needed especially on the mobiles. Additional contact information, like photos or Facebook feeds, should be optional. *"A text box with every contact, where I could add comments about the person. No photos. No Facebook statuses, because Facebook doesn't have to come to any wider use than it is now." (CM5: Female, 21)*

Automatic contact information update was seen important. Phone numbers, names, e-mails, titles, photos, location and person descriptions are the kind of information which should be updated automatically. Sharing own contact information should be in control of the user. *"The information should be updated to everybody who has your contact information [...]. However you should be able to choose, to whom you share your contact information in the first place." (CM5: Female, 21)*

When considering Wow experiences in contact management, some issues arose from the interviews. One of the potential issues is the automatic update and integration of all the contact information in the same place. Such solution could evoke a Wow experience. *"If all the contact information was in the same place and the information would update automatically, that would be a Wow experience."(CM3: Male, 19)*

The service must ease everyday life but that will not be enough for a Wow experience. However, if in addition to good usability there are some especially good user interface design solutions, for example with beautiful animations, a Wow experience would be possible. *"A Wow experience could arise from something new, surprising and fun, like relevant animations." (CM5: Female, 21)*

In contact management, usable and tailored searching and grouping functions could evoke the Wow experience – because they are currently not optimal. Also, personalization and the possibility for different profiles (like home, work, and party) could be enablers for Wow experiences. In general, an emotionally distinguishable Wow experience can arise from additional, well-functioning and nicely designed contact management features. *"New things that ease everyday life could lead into Wow experience." (CM2: Female, 47)*

4.2.3 Information Security

Our definition about information security includes all kinds of information security services and applications for computers and mobile devices in which the focus is on antivirus software.

Managing information security should be possible in two different ways. Some participants wanted information security functions to be as automatic as possible. On the other hand, some of the participants want to be able to do all the functions manually, because they do not think they can trust the automatic functions. The latter viewpoint was promoted especially by the more technically oriented participants. *"I have an information security application which reports about updates and if something happens to my computer." (IS5: Male, 28) "I check my computer every day manually for viruses." (IS4: Male, 31)*

The participants reported spending approximately 2–5 hours a day in the internet. All emphasized that information security is always important. Most of our participants mentioned that they feel usually safe with regards to information security. However some of the participants said that they never feel completely safe when using the internet. Social media, like Facebook, does not concern our participants, but using credit card and bank information via internet always causes some concerns. Nevertheless, all participants use web stores and usually pay by credit card. *"I feel safe when I know that firewall and virus security are on and updated." (IS1: Male, 39)* Still, some participants are always concerned: *"I feel never 100 percent safe." (IS4: Male, 31)*

Our participants are aware of the fact that information security applications can not secure absolutely everything, but having such application supports the feeling of safety. Their biggest fears are identity thefts, loosing personal data from one's own computer and such data ending up in wrong hands. *"Most of all I fear spyware which can access my computer and forward my personal information in to wrong hands; loss of identity." (IS3: Male, 41)*

With regards to Wow experiences in information security domain, many of our participants asked us back why using such services should evoke Wow experiences. From our participants' point of view information security services are not the kind of applications which should evoke emotional Wow experiences, because such experiences might lead to feelings of suspicion and insecurity. *"It [information security] is absolutely not the kind of thing which should evoke Wow experiences. Expectations can't be exceeded, because information security services must work without any flaws anyhow." (IS2: Male, 28) "The service should then do something so amazing and unexpected that in connection to information security would make it feel scary." (IS3: Male, 41)* Serious services should not feel exciting – it is most important that the expectations are met, i.e. information fully secured.

However, some form of long-term Wow experience might be possible if information security software is known to be absolutely safe and easy to use. The software should be light and the settings should be easy to tailor for users with various IT skills (manual vs. automatic). All the relevant information should be easy to find, but otherwise the software should stay in the background. In addition, there could be some innovative visualizations of the data transfers. Such features could eventually cause some kind of Wow effect. *"If it works easily and nicely, and using it is effortless and fast... you could only watch how the bytes are flowing." (IS5: Male, 28)*

4.2.4 Summary of the Interview Results

The study participants perceived Wow experiences to be somewhat challenging in the studied domains. These domains are not seen as primarily "exciting" but rather necessities. Evoking Wow experiences may be much easier in contact management services. For example, an integrated, personalisable, automated and highly usable contact management service could cause Wow. From our participants' viewpoint, information security services are not the kinds of applications which ought to evoke strong Wow experiences. If information security services evoke Wow experiences, they might at the same time evoke lack of trust. Still, some form of Wow experiences could be supported by long-term flawless security, as well as aesthetic and usable user interfaces.

5. CONCLUSIONS

In this section we discuss the Wow elements and design implications, as supported by our study findings.

5.1 Elements of Wow

Wow may arise from a wide variety of products. Wow is relatively rare – not experienced daily but rather a few times a year. Its duration varies from seconds to a continuous or recurring feeling. Wow can contribute to a long-term positive feeling about the product, and it can be remembered even after decades.

Based on the findings of our user studies, we propose that the following elements are central ingredients of Wow experiences:

- *Wow is a surprising, positive, and often an emotional experience.*
- *Wow is often sudden, but it may also arise in long-term usage, when everything proceeds pleasantly and securely.*
- *Wow is one kind of a "peak experience" – it is personal, subjective, meaningful and memorable.*
- *Wow is a pleasurable emotional reaction caused by product interaction which exceeds the user's expectations.*

These elements support the findings of earlier work, in specific the descriptions of Steen et al. [19]; Wow is a *strong, positive emotional experience, surpassing a basic experience*, and Desmet et al. [5]; Wow is a *combination of pleasant surprise, fascination and desire*. Our work extends the earlier concepts of Wow by suggesting that it may also be achieved in long-term usage, when usability and aesthetic experience are especially good and the feeling of trust is consistently maintained.

5.2 Design Implications for Cloud Services

Based on our findings and related work, in this section we propose design implications for Wow. As was described in the Introduction, the specific features of Cloud services – compared to other types of products and services – relate to dynamic service offerings through the Cloud, user's data storage and access "anytime, anywhere", feeling of security and trust in service providers, social interaction with other users and multi-device access to the services. In the following, we present *General Wow design implications* and *Cloud-specific Wow design implications*.

5.2.1 General Wow design implications

Design for unmet user needs. Following practices of human-centered design, analyze users' current practices and uncover needs that are not yet met, then offer novel solutions to them. An example of this would be the automatic integration and update of contact information from different services.

Superior usability and aesthetics. Flawless usability is an essential basis for Wow. However, to achieve a Wow experience the product must go beyond that. Some novel user interface effects are needed, for example beautiful visualizations and animations.

Design towards specific types of Wow experiences which the product or service should evoke. These experiences can be chosen from existing experience categorizations such as PLEX [1]; challenge, nurture, companionship or fantasy, or the categories by Steen et al. [19]; e.g. nostalgia, sensorial experience, exclusivity, comfort, mastery, connectedness or care. Take one of the experience categories and use it as a basis for design vision.

Moderate the level and types of Wow for "serious" application domains. Do not attempt to Wow by explicit Wow features when the application is for serious domain – for example information security – or it might cause distrust. In these domains it is better to aim at superior usability and user interface design.

5.2.2 Cloud-specific Wow design implications

Provide positive surprises by pushing dynamic service features through the Cloud. Offer something new in the Cloud service to keep the user stimulated. These new things can work on different levels: new functionality for social communication, new user interface elements or modalities, or new types of media content.

Support automated data integration of and universal access to user's personal data. Automatic updates through the Cloud will support task flow and create a feeling of being always up-to-date. This data integration can also work between services in a way which allows *mashups* of the user's personal data, e.g. communication feeds from different email services.

Design for personalized multi-device service access. Cloud services may be accessed via multiple terminals, including various mobile devices. The tasks Users should be able to personalize the mobile versions, e.g. for the subset of functionality which is used in mobile contexts.

Support security and trust. In the Cloud, users never have full control of their data and services, because they are not stored locally. The service must communicate the security policy, but most importantly, no threats should be actualized. In the long run, avoiding problems of trust can support Wow experiences.

These design implications can be used as directional guidelines and as a checklist of issues which can help design Cloud services which make their users feel *"Wow!"*

6. DISCUSSION

In this paper we have presented the results of our user studies of how people perceive Wow experiences. The amount of participants in the studies was relatively small but we believe that the qualitative results have shown some interesting insights of how Wow appears and why it takes place.

The biggest benefit for considering Wow as a design target is that it seems to contribute to a long-term positive feeling towards a product or service. Experiencing Wow can make the user feel successful. Furthermore, users may have a positive image about the product even over a decade after having the Wow experience. There are domain-specific differences in how Wow should be targeted at. In entertainment-oriented consumer services Wow can be more attention-seeking and explicit. On the other hand, in more serious domains, such as information security, the products should be more subtle and rather offer superior usability.

A challenge in designing for Wow is that it is so subjective that probably no single feature can Wow everyone. Variety of ways to evoke Wow is needed, however this may also be a risk since unfit attempts to Wow can become serious "un-Wow". There are probably also considerable cultural differences in what kind of Wow effects function for different cultures or target populations.

We found it curious that users strongly felt that context does not influence their Wow experiences. This contradicts the well-known principle that context has an effect to UX [8]. The participants' views on this extreme subjectivity may highlight the importance of the user's internal state and the interaction with the product as the main influencing factors to Wow. Users get immersed and do not observe their surroundings, at least consciously.

The concept of Wow is somewhat fuzzy. When is positive emotional reaction strong enough to be considered a Wow? Should we be able to measure Wow and what would that measure be? We argue that even though the academic tradition might seek an exact definition and measure, for industry and designers it is not important to be exact but rather, the concept of Wow can be guiding and inspiring in the design.

Then, what is not Wow? In relation to "peak experience", Maslow gives examples of "*more usual effects of repeated experiencing, i.e. boredom, familiarization effects, loss of attention and the like*" [12]. In context of product design this could be seen as the opposite of Wow, not offering stimuli or challenge to keep the user intrigued to use the product.

Some negative effects of Wow can also be pointed out. In hypermedia and computer-assisted learning some researchers [16][3] have defined "wow factor" as extremely positive initial reaction caused by superficial UI components such as background music. Teachers should acknowledge this "wow factor" when evaluating learning software to avoid negative results in education. In other words, there may be a risk of the designers focusing purely on the "wow factor" instead of learning processes.

We also stress that the real wow, particularly the "long wow" is not achieved if the core purpose of a product is forgotten. It is achieved only by making the product features and overall design excellent and polished, with some extra surprise elements. As time moves on, what is Wow now becomes standard tomorrow, and new things are needed. In the Cloud services there is an excellent opportunity to provide updates of the service, and thus evoke new Wow experiences.

In the future work, we are planning to do design studies on Wow in the Cloud and testing the services for users' reactions in their everyday lives, both in short and long-term usage. We hope that both researchers and industrial organizations will benefit from the findings presented in this paper. Designing features that Wow the users may act as an important differentiating factor in the growing product and service markets.

7. ACKNOWLEDGMENTS

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