Telecommunication services as a mean of expression

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Abstract

This paper describes how telecommunication services have become one of the most important means of expressing opinions and personal experiences, and it describes nine principles for designing telecommunication services, which can offer the user a high immediate satisfaction and make it possible for her to express a wider range of experiences with more details.

Key words: E-mail, emotional usability, expression, joy of use, mobile phone, SMS, user centered design, user experience

1 Introduction

Electronic communication can be seen as a practical mean to transmit information to other people, as a media used to give the receivers a specific experience or as a mean of expression. When a telecommunication service is used as a mean of expression, *what is experienced by the person communicating something is at least as important as what is experienced by the receiver.* This is a new way of seeing electronic communication, and it is important because users tend to choose the means of expression that gives them the best experience.

The increased use of telecommunication services cannot be explained solely in utilitarian terms, and only part of it may be attributed to advertising. It is likely that a significant part of the growth can be attributed to the human urge to express something and the manner in which some telecommunication services satisfies that urge while giving the user an immediate satisfaction. Csikszentmihaly (1997) describes how the highest level of satisfaction (what he calls the flow experience) often is reached when doing a challenging task (for instance when expressing something), whereas it seldom is achieved when enjoying a media-based experience, for instance watching television. Expressing a personal experience can create a satisfaction which is stronger and more immediate than what is possible through designed media experiences: television, movies or multimedia presentations.

People working in an office environment may notice how Email has become one of the most important means of expressing personal experiences, opinions and in general to reflect on everyday existence, whereas collections of SMS messages as Textmates for life (Lou 2000) or The joy of text (Anonymous 2001) indicate that SMS messages begin to fulfill the role earlier served by limericks and other oral poetry. At the same time, SMS has become an important political media; according to the Philippine Daily Inquirer (Salterio 2001) the rapid distribution of news and opinions through forwarded SMS messages played a crucial part when the Philippine president was forced to resign in January 2001.

According to the James-Lange law (James 1890; Rosenbaum 1991) an experience or emotion becomes stronger when it is expressed, making it likely that the user's emotions and experiences are influenced by what she can express through telecommunication. In order to add to the users value of life, a new service should make it as easy as possible for her to express a wider range of thoughts and feelings and to express them more precisely. At the same time, in order to be a commercial success, a new service should offer at least the same level of immediate satisfaction as existing services.

2   Method

I have gathered information about human expression through:
- Literature about personal expression (in particular writing)
- Semi-open interviews with 7 users of telecommunication, 4 in the beginning twenties and 3 in the mid thirties (3 male, 4 female)
- Observations of users of different telecommunication services

I have applied the information about human expression on the design of telecommunication services, with my focus on the service experienced by the user; the user may experience a combination of a teleservice (for instance telephony), supplementary services and the manner in which the services are made available through a terminal.

3   The psychology of expression

Both artists and other human beings express something to confirm their own identity and to develop their thoughts and emotions. They get feedback when looking at a drawing they have made, when listening to their own voice, or when another human replies. The ability to express something is crucial for gaining social acceptance, emotional satisfaction and power to control one's destiny, be it through a phone call, personal letters, memos, jokes, a company's web site or a paper at a conference.

A human being experiences something, captures part of the experience and distributes the result to others. When someone speaks, the three parts are simultaneous – the experience, the words that capture it and the distribution to others. If the same person expresses herself through a letter, she may reflect on the experience before writing about it, and she may wait a couple of days before sending the letter – distributing the expression. Compared to paper-based communication, telecommunication services make it possible for the user almost immediately to distribute an expression with very high speed and without any direct professional assistance. In contrast, telecommunication services does not offer new or better means of capturing an experience: talking, drawing, typing, and photography (still pictures and movies) were in widespread use before telecommunication services incorporating them.

The type of expression is often related to the type of audience: people in the vicinity, one or more individuals the person expressing something knows by name or a wider group where most members are not known. Telecommunication can address all three audiences blending the difference between mass and point-to-point communication: An E-mail user may share a received joke with someone in the vicinity, she may send a personal letter to someone she knows, or she may forward a rumor

knowing that the receivers probably pass it on. (Fortunately my interviews indicate that users are adept at distinguishing between personal expressions and those intended for a larger audience.)

4 Principles of a good mean of expression

I will describe nine principles of a good mean of expression – in particular how they can be applied on a telecommunication service. The principles are similar no matter if the expression is done through song, pictures or written text making it possible to apply features from one mean of expression to the design of another.

Table 1: overview of principles

	Immediate satisfaction of the user	Range of expression
Rhythm and flow	Essential	-
Require almost unlimited skills	Essential for advanced users	Essential for advanced users
Learning by exploring	Contribute	Contribute
Possible to operate with the attention on something else	Contribute	Contribute
Make a pleasant impression without thinking about it	Contribute	Contribute
Immediate activation	-	Contribute
Match the vocabulary of the user	-	Contribute
Support positive relations to people around the user	-	Contribute
Support editing of messages	-	Essential for advanced users

4.1 Rhythm and flow

The proper rhythm and flow is essential for a mean of expression to offer a strong immediate satisfaction. The user gets the first satisfaction when capturing the expression and the second when distributing it to others. Of these, the satisfaction of distribution appears to be the strongest, in particular if it occurs while the satisfaction of capture still lingers. If the user has to recall the thoughts and emotions of the expression, the satisfaction is much smaller. Blumenthal (1977) describes that even when paying attention to something, it fades from the consciousness after 10 to 20 s, and Csikszentmihaly (1997) describes how immediate feedback increases the satisfaction, whereas time with nothing to do (as waiting time) disrupts the satisfaction, often even more than having to do an unpleasant task.

E-mails and SMS messages can normally be send with a minimal delay, whereas someone sending a fax message must wait while a connection is established, the sheets run through the machine and frequently for a retry or retransmission. In spite of the fax offering a larger range of expression, drawings etc., my observations indicate that it is seen mainly as a utilitarian device, whereas E-mail

and in particular SMS, as described earlier, has become important means of expressing opinions and personal experiences.

My interviews indicate that most SMS and private E-mails are sent within a few seconds after they are written. In contrast, anecdotal evidence suggests that paper-based letters often rest for a few days before being send, and that a significant number are not send at all. It appears that if an expression can be distributed within less than 20 s after its capture, it is difficult to abstain from distributing it, but if the user must wait significantly longer before distributing the expression, the urge to do so drops rapidly.

If uninterrupted, the normal length of a thought is between 10 and 15 s (Stroem 1996), similar to the rhythm of breathing or a gently rolling boat. During a phone conversation such a rhythm can be established through the natural pattern of speech, for other types of telecommunication it may be possible to increase the satisfaction of the user by accentuating such a rhythm; for a text-based interface the result may be similar to the rhythm given by the line shift on a typewriter. The concept of rhythm means that a short delay, from 2 to 10 seconds, before distribution, may increase the satisfaction of the user compared to an immediate distribution. The delay gives the user time to build up anticipation before it is satisfied (a similar principle is often used to create suspense in movies). In contrast, if the service implemented in the network creates significant and unpredictable delays, they will destroy the rhythm and satisfaction of the user.

The short rhythm is given by the duration of each thought, whereas the longer rhythm consisting of hours and days are given by physiological processes. The satisfaction the user gets when someone acknowledges and responds to an expression depends on that rhythm. Telecommunication services make it possible to receive replies within hours instead of weeks; they can be used to stay in and reinforce the mood when the first expression was distributed. One of the participants in my interview described in particular, how it was possible to converse intermittently by sending SMS messages back and forth during an entire evening, waiting for the next message or thinking about what to reply.

With the right mean of expression most users can find a rhythm they feel is comfortable. It is more difficult while capturing an experience to think about the proper timing and rhythm for an audience (see Stein 1995). This means that video and dynamic multimedia services requiring timing as part of the composition may be far less successful than current SMS messages or simple collages consisting of a static picture attached to a text or voice message.

4.2   Require almost unlimited skills

Most telecommunication services can be used with a minimum of skills. However, Csikszentmihalyi (1997) describes how a high level of satisfaction requires that a person has to use all his or her skills on a task. In order to provide immediate satisfaction to the advanced user, and to make a wide range of expressions possible, a telecommunication service should continue to challenge the user. Otherwise the expression becomes a matter of habit instead of a new experience. Expression by transmitting a small number of clip-art pictures is limited to the re-experience of something a designer has created. In contrast oral or written communication is virtually unlimited; it is always possible to find new ways of expressing something, to express more thoughts and feelings and express them with increasingly more details.

4.3   Learning by exploring

Murray (2000) describes how skilled writers must do an effort to break their habits in order to stop repeating themselves. In a similar manner, when the use of a telecommunication service becomes habitual, the user tends to repeat the same types of expressions with a resulting boredom similar to the one caused when the user sees the same movie one time after the other. In order to counter that tendency a good mean of expression should invite the user to explore it, to do something new and see what happens. Spoken or written language does that to some extent, a user may hear or read a new word and start using it. In contrast, it is in general either potentially damaging or impossible for the user to change the settings of a telecommunication service.

4.4   Possible to operate with the attention on something else

It is possible for some users to feel a strong immediate satisfaction while being engrossed in the operation of the telecommunication service. However, the user cannot capture any other experiences while focusing his attention on operating the telecommunication service.

The mean of input may demand a larger or smaller part of the user's attention: speaking is easy, training makes it possible to type as a fast automatic process, whereas, according to Stroem (1996), most pen-based interfaces continue to be cumbersome to use, because the hard writing surface cannot offer a perceptible tactile feedback.

Delays or noise in the connection may also demand the user's attention. Nofsinger (1999) describes how the perception of hesitations in a conversation are essential for initiating repairs in it, for instance rephrasing immediately something that was not understood. He (Nofsinger 1999) describes typical hesitations on 0.3-0.9 s in conversations, making it likely that the 360 ms roundtrip coding delay between two mobile phones (4 * 90 ms, Olsson et al 1997) screws up the instantaneous repairs and natural flow of a conversation. The user must ask explicitly for clarification and wait a moment after each sentence to give the person in the other end time to reply. In a similar manner, the user must focus on speaking more slowly and clearly on a noisy connection (or use slower and larger gestures on a low quality video). The user must in particular pay attention to his manner of expression because of the limited feedback. In contrast to a musician with headphones he cannot perceive directly how the audience hears his voice. (It might be interesting to test a telecommunication service that gives the user an emulated feedback similar to what the audience hears or sees.)

4.5   Make a pleasant impression without thinking about it

The user can feel the largest satisfaction when he can express himself freely and with confidence, while the telecommunication service ensures that the result is pleasant for the audience. In karaoke echo is added to the singers voice such that it sounds more pleasant. In a similar manner voice communication could include a function for making the speaker's voice sound more pleasant.

A telecommunication service could warn the user if the contents of a written message are overshadowed by its negative tone. Anecdotal evidence indicates that such a feature is needed. Written communication does not offer any immediate feedback which makes it possible to repair an oral conversation, and 3 out of 7 participants in my interview reported that last time they wanted to get something off their back they used an E-mail without thinking about the impression it made on the receiver.

4.6 Immediate activation

Blumenthal (1977) describes that if we do not pay attention to something we perceive, it fades from the memory after approx. 1.5 s. In order to capture a fleeting thought or experience, it should therefore be possible to activate a mean of expression within 1.5 s. A particular problem with telecommunication services is the time required for selecting a receiver before capturing something. It is possible to enter the text of an SMS or E-mail without selecting the receiver, and it is possible to enter a well-known phone number as an automatic process, but finding and entering a less familiar phone number occupies the user's attention between 6 s. and as long as it takes to find the number in a phone book.

4.7 Match the vocabulary of the user

The vocabulary of the user consists of words, pictures, smileys and other symbols she may use when capturing an experience. In order to make it easy to capture precisely a wide range of human experiences the telecommunication service should be capable of representing a major part of the user's vocabulary. However, above a certain minimal threshold, the satisfaction of most users appears to be independent of what can be represented (exceptions are professionals, for instance a professional writer who may complain when he has to use a hyphen instead of an em dash).

It appears that most users are willing to and good at adapting their expressions to the available means: using smileys when it is not possible to add a drawing or abbreviating words in SMS messages to compensate the limited length (160 characters) of such messages. William James (1890) describes how the fringe or context of a thought is part of the manner in which we in a specific moment thinks about it. The user's thoughts about a symbol- for instance an icon to be transmitted from one mobile phone to another – are influenced by what he wants to express; he focuses on similarities between the symbol and what he wants to express.

Unfortunately, all types of telecommunication services limit our expressions, and thereby our experiences, when we get used to the limitations and stop noticing them. I recently did a study of a pen-based input device (the Anoto pen) and noticed how often users combined text and drawings, for instance added hearts and flowers in the middle of a message. In contrast, almost without exception users adapt to the linear character-only format of E-mails without thinking about it.

Instead of limiting the user's experience, a telecommunication service might enrich it by helping the user to discover new symbols or to recognize them in a list instead of having to recall them. That might be possible through an extended version of the T9 predictive coding used in mobile phones today (it matches entries on a keypad with a list of words in a dictionary, adding some sort of thesaurus would be fairly easy).

4.8 Support positive relations to people around the user

People around the user may be a willing or unwilling audience: the user may share something with them, she may get a strong and immediate feedback, and people close to the user may influence the experience she captures. In my interviews, 6 of 7 participants mentioned the importance of showing consideration while using a telecommunication service. At the same time the user of a telecommunication service often focuses her attention on the service, not the environment. Some problems may be caused by a low usability of the terminal, whereas others may be caused by

characteristics of the service offered by the network, for instance if the user talks excessively loud because of an apparently bad connection. It appears that the quality of today's voice transmissions, and probably of future picture transmissions, is determined by what is required by an isolated user in a quiet environment, not by what is needed when surrounded by the noise and light levels which are common in public areas.

Even though telecommunication services sometimes are used by a group to express something (Weilenmann 2000), it is frequently complained that users of a telecommunication service withdraw from people around them (Ling 1999). It is therefore worthwhile to consider how terminals and services (for instance using Bluetooth) could be designed to strengthen relations between the user and people in the vicinity.

4.9   Support editing of messages

According to Stroem (1996) human beings are in general good at overlooking flaws and errors. An editing facility should therefore highlight flaws and errors, for instance by removing anything that might mask errors in the pronunciation in a voice message.

People skilled at expressing themselves spend a substantial time editing; that is the case for writers (Elbow 1981), architects (Birgerstam 2000), and even oral storytellers who mentally edit their stories by retelling them (personal observation). However, the majority does only a minimum of editing. A significant amount of E-mails are written as a stream of thoughts or speech; in my interview only one participant told that he had done an extensive revision of the last private E-mail he had sent, the rest had at the most corrected a few spelling errors. It is possible that a significant number of users want to know what their expressions sounds or looks like, but they will normally make none or at the most a few minor corrections.

5   The urge towards expression

Information technology makes it possible for ordinary people to distribute their opinions and expressions with speed and ease, and they may experience the exhilarating rhythm and flow of creativity that formerly was experienced only by skilled artists. One consequence is an almost addictive urge to express something. Of the 5 SMS users in my interviews, one reported that he periodically went crazy about sending SMS message, another reported a 3 month phone bill with 1297 messages (14/day), and a third participant told that he send between 40 and 50 SMS messages each day (most were send through the internet and therefore free).

The use of telecommunication services may be as difficult to control as sexuality and other human urges, and it is likely that the urge to express something can be as strong within organizations and companies as within a group of family and friends. People in organizations and companies may spend large amounts of time and money on satisfying an urge to express something, no matter if their expressions contribute to the purpose of the organization or the bottom line of the company.

Similar to what is seen for personal communications, telecommunication users in a company or an organization may restrict the range of their thoughts and creativity, for instance when trying to express through E-mails what could be captured more precisely through a hand drawing, and they may not even notice the restrictions which are built into a telecommunication service.

Existing telecommunication services increase the amount of human expression and speed up global thinking, now we need to look on designing services to increase the range and precision of human expression.

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