

Understanding Convergence

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Convergence has been the mantra of the information and communication-technology industries for the past few years, and it is defining the strategy of every Telco, broadcaster, ISP, and phone manufacturer in the world.

Technically, *convergence defines a multimedia environment and/or network where signals, regardless of type (i.e., voice, quality audio, video, data, etc.) and encoding methodology may be seamlessly exchanged between independent endpoints with similar characteristics* [1]. From the user's perspective, this means that all media and communication channels can be merged and received on any device, and the related brands will soon be offering all the related services. This opens the way to an exponential series of combinations, such as SMS on the TV; TV on the mobile phone; digital pictures moving from the PC, to the TV, to the mobile phone, and so on; IM bundled with music, etc. Therefore, it is of strategic business value to understand how people are presently using the disparate services and devices.

In 2004 we started an observatory of technology usage within Swisscom, the largest telecom operator in Switzerland, with the objective of understanding the potential of converged services. Each year we visit close to 300 different households in Switzerland, and we conduct observations and

interviews about how people communicate, view TV, play games, use the Internet, listen to music, and inform themselves. We spend time with all the members of the household and often ask them to keep diaries of their activities. In 2005 we also started a longitudinal study with 60 households that we will follow until the end of 2008, looking at every aspect of their ICT usage at home.

Ethnographic user studies have become a staple of many companies that want to be at the edge of innovation. What makes our experience unique is our focus on *all* the ICT technology in the home, from PC to TV, from hi-fi to mobile phone, from land line to digital camera. We systematically put this in the context of people's daily schedules and lifestyles. When we look at the evolution of communication patterns, we compare the use of all channels and devices and can therefore consider the full palette of tools our participants have at their disposal.

The Divergence of Communication Channels. One of the recurring questions in the debate about converged services concerns the interrelation of different communication channels, such as email, mobile voice, instant messaging, and SMS. Should all channels be on every device? Should we be able to seamlessly move from one channel to another?

Should content and communication be linked more closely? And most significantly, what benefits will users find in the convergence of all the channels?

In the past three years, we have asked more than 500 people, from all age groups, life stages, professional, linguistic, and regional backgrounds, to keep a record of all their communications, with the exclusion of professional exchanges and face-to-face conversations. Participants have been asked to keep a diary for four days, jotting down every mediated interaction. This includes dialogues that occurred via SMS, email, voice calls on the landline and mobile phone, and IM sessions or calls from the PC. For each exchange we asked participants to indicate whom they've communicated with, which channel they used, what topic they discussed, and other critical information about the call. We have then gone back to discuss the diary with the participants individually, in order to understand, line by line, why they chose one channel of communication over another.

When discussing, for instance, the rationale behind selecting SMS instead of a phone call, it becomes obvious that the reasoning is highly sophisticated and cannot be reduced uniquely to cost or location. Factors such as privacy, discretion, needing

[1] Convergence definition, <http://en.wikipedia.org/wiki/Convergence>, accessed on 11.12.07

How We Collect Our Data

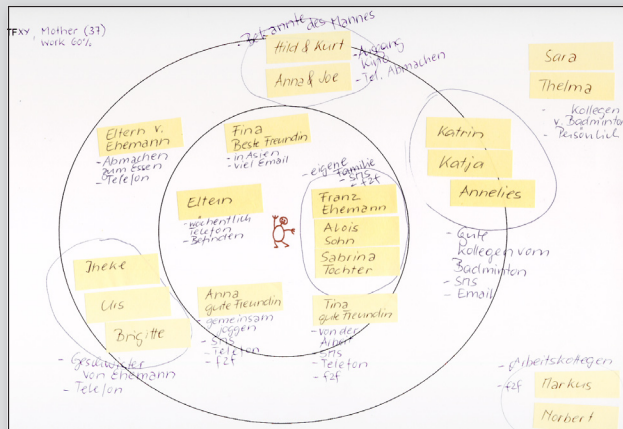
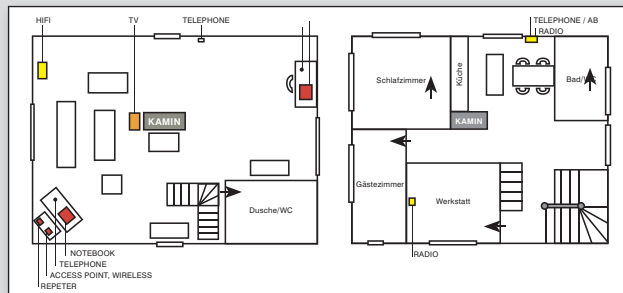
The team of the User Observatory comprises a group of 11 social scientists, two sociologists (Daniel Boos and Petra Hutter), five anthropologists (Jeanne Carruzzo, Susanne Jost, Caroline Hirt, Cora Pauli, Veronica Pagnamenta), and four psychologists (Stefana Broadbent, Valerie Bauwens, Myriam Fournier, and Regula Zimmermann). Thanks to the variety of backgrounds, we developed

a special mix of field techniques to collect information about the daily lives of our participants.

Every month we visit a number of households, focusing on different topics that can range from communication to entertainment, from the use of social-networking sites to the use of VOIP. Although the focus may change, all contextual interviews follow a certain pattern, and we are careful to collect a certain base set of information in order to continue building a comparable set of data across studies. All interviews and observations are recorded, and field notes are taken. Interviews are then transcribed in a semi-summarized format, and data is made anonymous. Alongside recording conversations and taking field notes, we have developed a series of small artifacts to collect our data. These artifacts can be thought of as cultural probes, in that the participant completes the artifact and is therefore actively producing content.



Personen	6:00 h	8:00 h	10:00 h	12:00 h	14:00 h	16:00 h	18:00 h	20:00 h	22:00 h
Mother 43	6:15h wake up, breakfast	Sewing course	household work	Lunch	Household	Relax	Cook	TV: Football	
Father 47	7:00h wake up, breakfast	Work, office	Lunch at a restaurant	Work, 1.2h way home by car			Relax	Men's evening, bowling	
Boy 15	7:00h wake up, breakfast	School		Homework	Reading a book, Relax	Bob, SGA, son, Andrea	Playing outside with friends, Football		
Boy 13	6:30h wake up, breakfast	School		TV: 2 new DVD "Kingdom of Heaven"	Reading a book		Playing outside, Transpines		
Girl 9	7:00h wake up, breakfast	School		Lunch at home	Reading a book, Playing electronic instruments	TV Series "2011"	Dinner, Bath		



1. A communication diary. Participants are asked to complete a diary for four days, jotting down every private exchange they have that is mediated by technology. This includes the use of SMS, email, voice calls on the landline and mobile phone, and also IM or calls from the PC. For each exchange, we ask them to write down who they were communicating with, what they were “talking” about, where they were, and at what time. Participants are instructed to take the paper diary everywhere, and to fill it out immediately after a communication event has occurred, in order to reduce the risk of forgetting over time. When we come back to retrieve the artifacts, we discuss the diary with the participant to understand why a certain channel was preferred over another in a given situation.

2. A timeline. Participants are asked to develop a timeline of their previous day, and we coconstruct the artifact with the participants. We ask the entire household to sit together in front of the paper and draw out the timeline of the previous day. The collective exercise makes it easier for people to remember, as it sparks discussions, and we can find redundancies that make the reconstruction more reliable. We also ask the household to draw the last weekend day. Based on the timeline, we also systematically inquire about the organization of the household in terms of responsibilities and chores, about travel time and means of getting to work, school, or leisure. We discuss hobbies and sports, and leisure time in general.

3. A map of the home. Next, participants are asked to draw a map of the position of technology in the home. Participants draw their home in “plan view” and place all information-technology devices on the map. If a device is mobile, we discuss where the device is used most frequently.

4. A social map. Finally, the participant is asked to draw a social map or personal network. We ask each participant to write down the names of the people who are meaningful to them and with whom they are in contact on a regular basis, and to place them in order of proximity to themselves. The inner circle represents people that are very close. Names that are placed further out are less close or contacted less frequently.

immediate feedback, availability of the communication partner, frequency of conversations, familiarity or formality of the relationship, time available, and quality of the exchange all contribute to the choice of the channel. Users are very good at identifying and exploiting the specifics of each channel to create the appropriate communicational setting for each conversation and for both communication partners.

These choices and preferences do not seem to be purely idiosyncratic. On the contrary, there are some clear general patterns of usage that have emerged. While a channel is rarely uniquely dedicated to a certain topic or interlocutor, we see a specialization of function emerging.

We are observing that the *fixed phone* is the collective channel used for managing the daily life of the whole household, rather than the individual. Calls made from the landline are often relevant for the whole household, or at least for individuals in their role as household members. It is, typically, the preferred channel for keeping in contact with the social network of the family and for services and contacts relevant to the home. In contrast, the *mobile phone* is the more personal channel, which is used for micro-coordination with the closest sphere of family and personal friends. SMS is the channel most dedicated to intimate emotional exchanges with a slightly larger sphere of friends. The content of SMS is more personal than any other channel, with the exception of *instant messaging*, which, in its user group, is growing to be a very intimate channel. Instant messaging has emerged as a disruptive channel, in as much as it has introduced

the idea of being continuously in contact. Thanks to presence information and the fact that it can run in the background, users have gotten used to the idea of having very long instant-messaging sessions and a sense of continuous companionship. *Email*, on the other hand, is used more for “administrative” purposes in support of online activities (e.g., travel and shopping preparation) or coordination with associations and clubs (e.g., receiving newsletters from the club; coordination and organization of club events). People contact friends and family by email only to send pictures or other digital content. *Social-networking sites*, in our samples, are not being used so much for communication as for entertainment and are rarely, if ever, mentioned in our diaries.

Thus, in our studies, we are finding a very clear specialization of the different communication channels that are used. Although each new emerging channel somewhat redefines the role of the preexisting ones, users tend to add new channels to their existing palette because they find

a new function for them that did not previously exist. This is why, in our opinion, old channels are never really supplanted by new ones: IM has not supplanted email or SMS, but each has continually redefined its function. This is also why we tend to recommend that channels should be kept quite distinct and that boundaries between them should be blurred with great caution. Convergence on devices, convergence of address books, and seamless transition between written and oral communication, while ostensibly aimed at simplifying users’ lives, are not necessarily solutions that people will want to adopt if this means renouncing the diversity of uses that the different channels allow.

A Convergence of Communication Partners. What also emerges from our research is that diversity is linked to redundancy. One of the striking features of our results is the concentration of conversations and exchanges among very few partners. The diversity of channels, in most cases, does not include a diversity of interlocutors on a daily or weekly basis.

Field Notes of Technology Usage

When it comes to discussing technology, we follow a simple principle: We always want participants to show us what they do with their channels and devices. This means that we sit with them in front of the device and ask them to show us their favorite sites, buddy lists, emails or pictures. We look at their profile pages or personal websites, and we look at the content of their HD recorders linked to their TVs, and at their collection of DVDs and CDs.

Within a home, we talk to and observe each member of the household, children and teenagers included. When a household is composed of multiple members, this provides multiple points of view on what is going on in the home. The same devices are used differently by different household members, and this plurality of usage also gives us insights on how technology is being domesticated in the home.

[2] Fischer, Claude S. *To Dwell Among Friends: Personal Networks in Town and City*. Berkeley: University of California Press, 1982.

[3] Spencer, L. and R. Pahl. *Rethinking Friendships: Hidden solidarities today*. Princeton: Princeton University Press, 2006.

[4] Wellman, B., P. Carrington, and A. Hall. "Networks as Personal Communities" in *Social Structures: A network approach*. 130-184. Cambridge: Cambridge University Press, 1988.

[5] Wellman, B. and B. Hogan. "Connected Lives: The Project" Chap. 8 in *Networked Neighbourhoods: The Connected Community in Context*, edited by P. Purcell. Berlin: Springer, 2005.

Multiple channels are being used with the same partners for different situations and contents.

Over a period of four days, participants report an average of 35 to 40 private exchanges, all channels included. Some of these exchanges can be very short, like an SMS, and some can be an hour-long IM session, but all of these interactions are concentrated among a few people. Although on average the number of interlocutors mentioned in the diaries ranges between seven and 15, most of the contacts are concentrated among five people. This is particularly true when we look at voice calls from the mobile phone. Written channels such as SMS and email seem to be slightly more spread out in terms of the number of communication partners.

Younger respondents in general have significantly more exchanges per day than the older participants, typically because they are using IM more than their elders. However, when buddy lists are discussed with teenagers, they systematically tell us that although they may have hundred of buddies, they actively communicate with a maximum of only 10 best friends. This qualitative result is confirmed by a large survey of IM users in Switzerland in 2007.

Not surprisingly, the communication partners on which there is the strongest concentration represent the participants' closest ties. They are part of what we call the inner circles of respondents' personal networks.

When asked to draw a map of their personal social network, respondents of all ages tend to write the 20 names of the people they feel closest to, and these

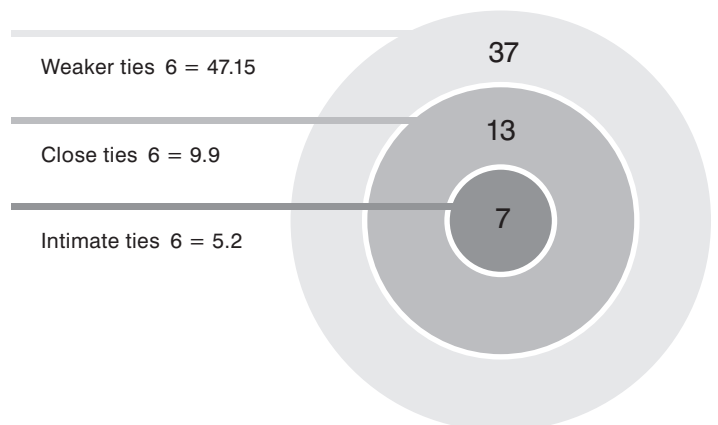
for the most part are also the people with whom they are in contact frequently. Similar figures are mentioned in other studies made in other Western countries [2, 3, 4, 5].

However, the social environment of our participants is not limited to their closest friends and family. When asked to write down all their contacts, with the help of memory props such as phone books, mobile phones, or email inbox, the list of contacts becomes much larger. In a study with 114 people who were asked to list all their significant contacts, alongside the usual list of 20 close links, we found an average of 37 other "weak" contacts. The list of weak ties showed a huge interpersonal variability, with some people mentioning as few as 10 connections and some as many as 400. While there was an overall consensus between participants with regard to whom to include in the close sphere, there are certainly many different interpretations as to whom to include in the more extended group of connections ("Should I include all of the members of the

hockey team or just a couple of mates? Should I include all of my in-laws or just the ones I like?").

When we looked at the composition of the participants' contacts list, we again found similarities with other studies [5]. The core network comprises mostly family members (around 70 percent) and a few close friends. As we move to outer circles, there is an increase of people met in school, at work, in clubs, and just through going out for fun.

How do people stay in contact with the outer circles? In many cases, the relationships are maintained solely due to contextualized face-to-face encounters, such as meeting at a sports training event or at work. For relationships that are geographically or temporally distant, participants often prefer sporadic written channels. Many respondents tell us that it is difficult to maintain regular contact with everyone, as there are only so many hours in a day. Social-networking sites such as Facebook or Myspace seem to position themselves as communication channels that allow users to keep in touch with



people whom they don't see on a daily basis. However, our respondents—even those that have profile pages on social-networking sites—never mention these as communication channels. While social-networking sites are a fun way to visualize one's social network, participants revert to one-to-one media, such as IM or email, to engage in personal exchanges with their friends and contacts. The problem with the more occasional contacts is that they are rarely redundant, and often only one channel is being used to stay in touch (e.g., the phone call to the distant relative, an email with a picture to a distant friend, the Christmas card to old friends). The lack of diversity and of redundancy is often frustrating and leads respondents to fear that they might lose contact with their weak ties.

In conclusion, results with communication diaries show that over the period of a few days, respondents use many different channels to communicate with a relatively small number of very close ties. Different channels are used successfully to cover

different situations, with users appreciating the different possibilities offered by each channel. When it comes to weak ties and people who are not necessarily in the inner circle of relationships, respondents report a much smaller range of communication resources. It is not, therefore, just the frequency of contact that is reduced but also the diversity of channels used for communicating. Given that each channel really does permit a different level and type of "conversation," reducing the range of channels may also mean that there are registers of communication that are less available.

Thus, the challenge for converging communication channels lies in finding a way of better supporting exchanges with a larger cohort of relationships with a larger range of channels. The issue is not to find the right channel for weak ties, but the right combination of channels to keep in touch with distant friends. The objective is to combine solutions in a way that does not compromise the need for intimacy and redundancy, while at the same

time not requiring a time investment that people seem unable to maintain.



ABOUT THE AUTHORS

Stefana Broadbent is the head of the customer observatory at Swisscom Innovations. Before joining Swisscom Innovations in 2004, she was a part of the management team of IconMedialab a multinational digital consultancy in Stockholm. In 1993 she founded CB&J, a company specialized in human factors and user research that was later acquired by IconMedialab in 1999. Stefana holds a Ph.D. in cognitive science from the University of Edinburgh, she has also been a lecturer in anthropology and ergonomics and has published in the field of digital interaction.



Valérie Bauwens is currently a senior ethnographer for Swisscom Innovations, the research and development department within Swisscom.

For the past six years, she has focused on building and establishing user research as a core center of competence within Swisscom Innovations. At present she is mainly involved in the management of the User Adoption Lab, running a wide range of studies on user behaviors and habits regarding ICT usage. She has 14 years of varied telecom experience ranging from finance, business development, to user research.

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