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Autor: Gattiker, Urs E. / Nef, Robert
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Urs E. Gattiker,
born 1965, finished
his years of commercial
apprenticeship at Mö-
venpick and studied at
the HWV in Zurich. Sub-
sequently he attended
Claremont University
to obtain a master in
Business Administration
(MBA) and a Ph.D. in
Business Administration
(Minors in Psychology
and Philosophy). He
has taught in Australia,
Canada, Germany and
the U.S. before coming
to Denmark. His research
interests focus on e-
commerce, new media
and high-tech start-ups.
He has published num-
erous articles and sev-
eral books of which
the most recent one is
entitled «The Internet
as a Diverse Commu-
nity: Cultural, Organi-
zational, and Political
Issues» published by
Lawrence Erlbaum,
2000.

ELECTRONIC COMMUNICATION «À LA CARTE»

Approaching time and programme sovereignty

In the last few years and decades, electronic communication has brought about fundamental changes, not only in the economy but in society as well. And the process is far from over. Even though the technological possibilities which have already been developed have not yet been fully exploited, we should count on there being new innovations in the months and years ahead. Pessimists and critics of technical progress fear an increasing loss of individuality and with it, a loss of individual communication, while optimists foresee greater freedom of choice, leading not only to advances in productivity but also to new, additional possibilities for freely chosen, «tailor made» personal communication.

Robert Nef speaks with Urs Gattiker, Obel Family Foundation Professor of Innovation and Technology Management at the University of Aalborg, Denmark.

Robert Nef: *On the telephone or mobile telephone, we specifically choose the communication partner we wish to contact, and by doing so, we encroach on his time sovereignty. Already today, the Internet allows an immense choice of time-independent information and communication possibilities, yet when it comes to what's on the TV screen, we are still subject to the whims of the television programmers, that is, unless we opt for watching a video cassette instead. Will we be seeing a networking of these four information and communication channels in the future?*

Urs E. Gattiker: Today I am already able to use the Internet to phone my friends around the world, and for a fraction of the cost of using a stationary or mobile/cellular telephone. Naturally, neither the Internet nor my mobile phone can give me the same high voice and transmission quality, which I can expect when using a stationary phone. Nevertheless, the differences are not great and diminishing rapidly.

Convenience is further helped by my having the opportunity to choose when I wish to watch TV. If I miss today's favorite newscast I can either tape the show with my video recorder or go to the Web and view the show on-line (also called Web-casting or Web-TV).

The final option is that I use video-on-demand or rent a movie at the video store. Unfortunately, this might not give me all of the movies I would like to watch except recent blockbusters. Specialty TV chan-

nels have sprung up to fill this niche, whereby high-quality TV may be available on some channels, while others provide me with the normal Hollywood fare of sitcoms, talk and game shows.

Nef: *How should we be imagining the «next step» in electronic networking? What are the possibilities?*

Gattiker: Some people have already taken the next step, but we are each progressing at different speeds. The deciding factor for all technologies and their possible diffusion in the marketplace is:

- what they cost and, most importantly,
- if they satisfy a particular user-need.

To illustrate: my subscription to watch TV or listen to radio is normally fixed per month and depends only on what service I want. For instance, the number of TV channels I subscribe to via cable affects my monthly subscription price. Moreover, if I have a special interest (e.g., sports, movies or art) I may subscribe to a number of different specialty channels to satisfy my desires.

In contrast to the above fixed-subscription model, in most countries in Europe we pay a fixed monthly fee for our phone as well as each call being metered (i.e. charges are according to length of call and during what time of the day). Hence, having one's teenage daughter and/or son surf on the Internet for hours each day, causes a definite jump in the monthly phone bill.

In contrast, in Canada or the USA people pay their telephone companies a fixed

amount per month for unlimited local phone calls. Thus, neither the number of local calls nor time spent on the phone or surfing the Internet matters. Cable rates are also a fixed amount per month. Accordingly, it comes as little surprise that in the USA more than 10 % of people watching their favorite TV show are simultaneously on-line, visiting the show's Website or writing e-mail. If you watch a teenager doing homework on a computer, he or she may be doing an assignment while simultaneously participating in an on-line chat. Something we older people rarely ever do ...

The above would suggest that whatever is most economical and convenient will make the cut. So Arcor's (Vodafone/Mannesmann) efforts to provide Internet access to consumers and small businesses for a fixed price at highly competitive rates is changing the way Germans are using and viewing the Internet.

Nef: Wherein lies the actual benefit of such integrated information and communication systems? What are the time horizons we have to contend with? Years? Decades?

Gattiker: The most important factor here is the deregulation of markets such as telecommunications, electricity and cable TV industries. Technologically it is unimportant if we make telephone calls, surf the Internet or watch TV by using a telephone line, electric cables or the cable TV infrastructure. Even a small satellite dish on top of a house can be used to surf the Internet, receive TV channels and make phone calls.

Unfortunately, Swisscom owns most of Switzerland's telephone infrastructure as well as most of the country's cable TV infrastructure, through Redifusion. Why should Swisscom compete against itself by offering its telephone subscribers a cheaper alternative through cable?

In the UK, some electricity suppliers have begun offering people Internet access, while in Denmark, tests have been successfully completed and in Germany, tests are already underway.

The above suggests that if a client can choose to subscribe to various communications services from a large pool of suppliers using different technologies, prices for such services will drop. Moreover, if the price is fixed and variable costs (e.g. price depends on length of call) no longer

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apply, usage will rise dramatically. Since telephone and electricity supply markets were opened for competition, Germany has experienced dropping user charges and they have yet to stop. Competition lowers prices and helps improve customer service, while time being spent making phone calls or being on-line, surfing the Internet or sending e-mail, increases.

This suggests that a country such as Switzerland should assure competition between suppliers. If we safeguard it and prevent one or two suppliers from dominating an industry or communications service, prices will continue to fall. Finally, offering subscribers the use of a new communications technology at an attractive fixed price per month, regardless of usage, increases demand. In response, the number of users and how much time they spend using the Internet will rise.

Nef: One can't really dispute the proposition that «communication à la carte» is a stimulus behind and additional increase in economic productivity. Doesn't the risk of a two-class society exist: those who have managed a way to «access» these networks, and those who have not – for reasons of economic condition, education or intelligence?

Gattiker: I think I already touched on part of the answer. Nevertheless, preventing the formation of a two-tiered society, as far as use of new communications technology is concerned, can be accomplished in two ways:

- Make sure that there are several methods to gain access to the technology, such as the Internet, by having several technologies to choose from (e.g., cable modem, telephone modem or satellite dish), and
- Competition between several firms (e.g., more than one cable TV company) should help things along further.

If the above can be accomplished, then the technology is affordable. Naturally, the consumer still has to make a choice. A limited amount of disposable income each month requires us all to decide between various alternatives, such as Internet access, cigarettes, going to the movies, and/or having dinner out each evening. If we cannot afford all of them, then we have to make choices.

For me personally, an additional question must also be addressed, namely:

- How can we help our school children become Internet literate?

The best way to address this point is probably to make sure that our educational system uses these technologies wisely. For instance, good writing is considered an important skill in today's labor market. Unfortunately, many graduates are not necessarily very skillful at writing a lucid and well-structured 10-page report. Even so, or perhaps because of this shortcoming, our schools are trying to make sure that writing is part of the entire curriculum. Teachers want their pupils to be able to write well in any subject, such as a history essay, or when writing a chemistry report. Therefore, good writing is not only stressed in a language course but in all courses.

I feel that students also need to learn how to use e-mail effectively to do group assignments. In addition, using the Internet for finding important information online by browsing the university library's collection or by searching the world-wide web, are other skills students must acquire.

What may not be required is programming skills. Being a good car driver does not require one to pass an exam on car mechanics. However, being a good driver re-

quires practice. So does the use of new technology.

In turn, this necessitates that all pupils have access to the Internet during and after school hours through their school. As important, new technologies must also be employed as tools to further help foster learning. This suggests that new technologies must be used throughout the curriculum, as is currently the case for good writing. Special computer courses are not necessarily the answer for the majority of students, however, using them in all subjects will certainly help students become computer literate.

Finally, to ensure that students at all levels become proficient and critical users of new communications technologies, schools must leverage their purchasing power. Accordingly, they need to negotiate deals with Internet access providers that are economical and provide the «biggest bang for the buck.» Unfortunately, a small town school board may not get the same deal as the canton of Zurich might by negotiating a contract for each and every school from day-care to primary school to university. Negotiating beyond a single school district in a competitive market as-



Technology should not rule us. We should be in charge and decide how, when and where we would like to take advantage of it.

sures unlimited Internet access at a highly competitive price for each and every student in Switzerland.

Sadly, bureaucrats have, so far, been unsuccessful in accomplishing this feat. Nor have many teachers supported the process. Instead, we need pro-active politicians and teachers that take things into their own hands. Providing economical and unlimited Internet access for each pupil as well as integrating the Internet into the teaching of every subject is the key. The Internet is not being employed any less in everyday life, as time goes on. Rather, it is becoming more and more crucial for our children to be computer-literate in order to get a job, even a trade (car mechanics, etc.). So politicians, school boards, teachers and parents need to get their act together and get things moving fast.

If we succeed in accomplishing the above, our students will become skilled users of such new communications technologies as the Internet, mobile and satellite phones and thus be able to use these tools to their advantage.

Nef: Communication serves not only the economy in the narrow sense, but also personal development. Will an increase in communication options bring with it «improved relations between people»?

Gattiker: Technology should not rule us. We should be in charge and decide how, when and where we would like to take advantage of it. Research findings indicate that negotiating business deals via the Internet by using such technologies as e-mail has some disadvantages. Trust is hard to develop if both parties cannot see each other, especially if they do not know each other. Moreover, communication via e-mail can result in misunderstandings and the use harsher words than needed can upset the recipient of a message. Instead, communication via the Internet can be of immense help if people know each other and have a chance to meet personally before signing the final deal.

We are doing a major research project between two universities and while we are only 120 kilometers apart, using e-mail alone at the beginning resulted in many misunderstandings. Those were cleared up quickly once we started to meet regularly in person, and we continue using e-mail and sharing files over the Internet. With-

out these capabilities the project would be hard to manage.

Similarly, our e-commerce study across Europe and North America again raises the issue of trust and risk perception. For instance, how can industrial buyers or consumers develop the trust needed to do business with suppliers on the Web? Again, the only solution here is in having all parties undertake various activities in order to build trust over longer periods of time. Most importantly, for B2B (business-to-business) transactions on the Internet or Web, technology is again just a support tool. Communication over the phone or by meeting in person is still needed to clinch the deal.

According to these findings it seems obvious that the Internet and the mobile phone will not improve our communication skills, nor will they replace face-to-face meetings in the immediate future. Men will still continue forgetting important dates such as their wedding anniversary and women will keep nagging. However, an electronic service via the Internet reminding me that in two weeks there is an important date and then again two days before that, when it is just around the corner, is my life-saver. Accordingly, I neither miss the important date nor will I not have the necessary flowers ready to celebrate the date with my friend.

While the above does not directly improve communication, couples will definitely talk more when having a romantic dinner on their anniversary, if the man remembered it. This could certainly help the relationship. But it will definitely not improve communication enough to prevent a couple, whose relationship is on the rocks, from splitting up.

But the ease of using e-mail may also improve the amount of contact one has with friends one does not see during the year. For instance, in the past we may have written a person only once a year, when sending around a Christmas greeting. Today, since e-mail is much faster than a letter, the quest to stay in touch with old school chums is a much easier one. Something as short as an occasional note during the year, typed during a work break, is better than only the yearly Christmas greeting.

Nef: The bottleneck which governs development these days no longer appears to be

one of technology or capital, but rather education. Can we assume that the new technological possibilities will make it easier to learn how to use them, somewhat along the lines of «learning by doing» – i.e., a kind of self-teaching and self-learning communication system, a «teacherless school», a «spontaneous logic» whereby the system and the user adapt to each other?

Gattiker: As pointed out earlier, Switzerland still has to improve, as do most countries. I hope that soon all Swiss school pupils will use computers and the Internet in most if not all subjects at least once a day.

I do not believe that by using a tool, one becomes an expert. Unless that person is a genius. But even if one is self-taught, one tends to learn from others, either by getting their advice or observing them.

Accordingly, I can learn most things on my own and if I practice every day for two hours I will improve. For instance, a pupil with average intelligence who practices mathematics two hours a week by doing homework will do as well as his or her more gifted peer who is not practicing at all.

Nevertheless, one must learn the basics about mathematics or calculus, skiing or playing tennis, before one can improve one's test score or game. Similarly, if one has acquired the skill to search and find information quickly in the library, one should be able to do the same on the Internet. For instance, in five minutes I learned how to use Boolean Searching from a reference librarian at the university. Today, I can use the same technique to improve the quality of search results I get on an Internet search engine.

While learning without the teacher may be a dream, realistically, it will depend upon the pupil's willingness to choose studying at home over spending a beautiful day at the beach. In most cases, students need goals, deadlines and feedback through evaluation to acquire the skill and knowledge needed to be critical thinkers, within an acceptable timeframe.

It is also hard to imagine that with the help of a computer or communications technology, a person can interact and learn the same way as one might be able to in a classroom. Here students discuss an issue with their teacher and amongst themselves. Going to a classroom differs from a virtual setting in that people interact and

many social processes occur including verbal and non-verbal communication. This all helps us in communicating with each other and, as importantly, acquiring the communication skills we need in life.

Maybe in another 20 years, computers can teach us all these things. But will it be more fun to interact with an intelligent machine than with your pals? Will the computer have more humor and show more empathy than our teachers? Will it be able to make learning more fun than laughing together about a comment made by a fellow student during a lecture? Will the computer help us in relating better to each other than we did at the end of 1999?

If the answers are all yes, I am looking forward to being a student again after I have retired. But I am not holding my breath.

Nef: One hears today about human resources shortages in the information technology sector. Are there not enough specialists, or is it merely a matter of time until the technology has become so simple and user-friendly that it functions without an «army of specialists?» Another way of looking at this: When writing systems were first introduced, there was certainly a shortage of professional «scribes». However, once reading and writing were sufficiently widespread, this profession practically died out. Is there an analogy here?

Gattiker: Whatever shortage we have in a market, educators usually respond and try to fill the vacuum. For instance, starting this Fall, in Hamburg a privately funded college for new media will begin training project management leaders. All its students have previously completed a university degree. The school is convinced that it can train the new media specialists so desperately needed in Germany to compete successfully in what some call the «new economy».

Whenever there is a shortage of certain types of skills or products, people and firms try to increase the supply to meet the demand. But eventually, the shortage is taken care off and demand can also shift.

Nevertheless, to succeed as an employee working with new media or as a journalist writing about this subject necessitates that one has acquired the basic skills: namely reading, writing, and arithmetic (the three Rs). In addition, a good foundation in one major discipline in the sciences or humanities is also usually helpful.

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For the journalist, an education in business, economics, informatics or fine arts might facilitate his or her writing about the new media. We might ask, which of these disciplines will serve the journalist best? I don't know but surely a journalist with an economics background will write about a new technology or a service on the Internet differently than one with a fine arts background.

So depending on the focus of the story, one educational and professional background might be more helpful than another might.

Getting a degree in journalism does not guarantee that I understand the business principles to figure out a balance sheet. So how is the journalist supposed to be able to figure these things out, thereby enabling him or her to write an insightful article for the daily?

Similarly, working with new media can be accomplished as a computer wizard, graphic designer or artist. The difficulty is that most of us cannot excel in all these areas. Instead, we are happy if we are doing better than average in one area. The tools programmers use may change within the next five years, and artists may no longer paint but use computer-mediated technology to do art. Regardless of these developments, without understanding programming basics or having some artistic talent, success cannot be accomplished in either of these fields.

While computer operators were once highly skilled professionals, today they are just one type of support worker and no longer paid as well as they were in the past. Similarly, an airline pilot's social standing and the size of his or her compensation package has dropped in the last twenty years, in comparison to other professions.

Playing a board game together with friends and/or children and sharing a bottle of wine may do wonders for our social life and interpersonal relationships.

Nef: Can you outline a «best-case» and a «worst-case» scenario?

Gattiker: I don't think I can, but, I believe the above pretty much points out some of the issues we must address. Nevertheless, while new technology and the Internet may not help us save time automatically, careful use of such technology can help. For instance, we should reduce our unnecessary TV watching and playing a game against the computer for hours. The challenge lies in making pro-active choices, instead of letting technology run our lives, such as having the TV run most evenings instead of doing something else more productive.

To illustrate, playing a board game together with friends and/or children and sharing a bottle of wine may do wonders for our social life and interpersonal relationships. Watching a good TV show, using a mobile phone to call when one has gotten delayed in traffic and sending a virtual greeting card to an old friend are all conveniences thanks to new technology. But we should be more selective in how we spend our time with such technology.

For instance, subscribing to free newsletters offered via e-mail or on the Web will allow us to keep abreast of new technological developments (<http://Security.WebUrb.net>). Trying to read research and industry reports about these trends on-line or download such material for free does not hurt either (<http://Papers.WebUrb.net>). Naturally, watching *Stern TV* might be more entertaining, time consuming and provide one with less breadth. Similarly, participating in on-line chats is fun and entertaining but also very time-consuming. The choice is ours to make, so let us start today and reap the rewards! ♦

Zusammenfassung

In den letzten Jahren und Jahrzehnten hat die elektronische Kommunikation nicht nur die Wirtschaft, sondern auch die Gesellschaft grundlegend verändert. Der Prozess ist bei weitem noch nicht abgeschlossen. Obwohl die bereits entwickelten technischen Möglichkeiten noch nicht ausgeschöpft sind, ist mit weiteren Innovationen zu rechnen. Pessimisten und Kritiker des technischen Fortschritts befürchten eine zunehmende Vermassung und einen Verlust der persönlichen individuellen Kommunikation, während Optimisten von einer Erweiterung der Wahlmöglichkeiten nicht nur einen Produktivitätsfortschritt, sondern auch zusätzliche und neue Möglichkeiten frei gewählter, «massgeschneideter» persönlicher Kommunikation erwarten.