CH21

**Swiss Information
Society Initiative**

Contents

What I like about the Internet

I can do practically everything – from playing games to working – on the Internet. For instance, I take part in an online game; I log onto it almost every day. That's easy for me now; as since Christmas I've had my own computer with an Internet connection in my room. I can download game rules (for PC or Playstation), or I can download music. You can do different things on different sites. On some sites, you can write your opinions down in forums. On some sites, you can play games, and on others, you can download images. I also like Web sites that you can read interesting things on, sites that help you to understand things better, for instance, game rules or pages that describe a company or what a corporation is.

What I also like about the Internet is that you can make new friends on some sites. I can't think of any right now. But you can also read news, for example, to see if Real Madrid won their last game or lost it. I find that interesting because I have a jersey from Real Madrid. You can also look up tables so you know who's in first place and who lost. I always check to see what place my floorball club is in; right now we're second. I also think that MSN Messenger is good; that's something like a chatroom.

Moritz, 12 years old, Zurich

The Internet does have disadvantages though, It ties up the telephone lines. And there are lots of illegal Web sites, for example, pornography sites. Different modems, like ADSL or ISDN, make surfing the Internet easier. ADSL is by far the fastest connection! You can also order things online. For instance, if you need a new microwave, you can go to the Mediamarkt Web site. You can also find out a lot of things. If you want to know how high the Eiffel tower is, you can search in Google and go to the page shown in the hit list. I also think e-mail is a good invention. When you send an e-mail, it arrives in two seconds! That's a lot better than sending a letter by regular mail. You can also read about new research projects, for example, about new findings on Mars. Or that there was a bad accident or some other terrible thing happened. Or that Bill Gates isn't the richest man in the world anymore, or that there's a new computer program out. If you're like me and are the goalie in floorball, you can get a helmet made online and have it sprayed however you like. Or you can inquire, for example, about how to get to the Hardturm stadium, if you don't know where Zurich's soccer stadium is. Or you can read about the weather or see how to get to a sport club. You can also see when the next train will arrive or depart, or you can see if it is advisable to drive on a particular highway if there are other ways to get to your destination.

That's why I think the Internet is good.

What does the Internet have to offer?

When I entered the wonderful world of the Web four years ago, I enthusiastically downloaded half of the Internet, until I finally realized that less is more. The art and photo collection from that time now serves me well for making letter paper and creating illustrated e-mails, which my e-mail friends enjoy. I have contact with friends from Australia to Berlin and from Biel to Gais. Through the interest group www.seniorinnen.ch, with around 120 members, I have met and made friends with 80 people. This club was founded a few years ago to enable exchange of experiences and advice on computer problems, but it was also designed to allow people to maintain personal contact with others. I do not merely have virtual contact with my private e-mail friends; we visit each other every now and again. I had the pleasure of learning that all these computer fans are exceptionally open to new ideas and things and have a multitude of interests. One of my female friends from the early days of my time in this community was persuaded by her grandchildren to write to me (on a so-called visiting card), and now she has become one of my very best friends. A few years ago we couldn't have imagined something like that, even in our wildest dreams.

On the other hand, I find surfing in the Internet boring; I'd rather let other people surf for me. Every morning when I open my mailbox, I am greeted with a quote for the day. Also, I am a subscriber to "wissenschaft-online", hich sends me a daily mail containing short summaries of articles. If I am interested, I read the entire article on the Internet or download it if I need to. My archaeology, medicine and astronomy collections increase in volume considerably this way, but my son-in-law assured me that I still have enough computer memory. I regularly receive very interesting news from a nutritionist in the U.S., and from "Health and Age" I get very useful tips and the latest news relevant for more mature – not old – people ;-).
I also enjoy the editorial in the "British Medical Journal," written once a week by the editor-in-chief, who makes use not only of the famous British Humour but also of a vast amount of expertise and knowledge. From the German publication "deutsche Ärztezeitschrift," I have read and made use of a few good articles on alternative medicine. Those are just a few nonprivate contacts that are possible on the Internet. If I want an answer to a question that is still current and not yet in the encyclopedias, I search in Google and am always astonished that I get a useful answer. I tried out the "yellow net," but I think it requires too much effort (I am also learning the new spelling through the Internet!).

What do I want to say with all this? I want to provide all older people who are somewhat shy of this new medium with the courage to bite the bullet and become a part of the World Wide Web, so that they can discover a new, previously unimagined world opening up to them.

Lilly Kobelt, 75 years old, Berne

CH21: Objectives of the Initiative Program

The CH21 initiative was a private two-year initiative for bundling and promoting activities and programs suitable for advancing Switzerland in the field of information and communication technology (ICT). The initiative was actively supported during the 24 months it ran by numerous personalities, companies, associations and institutions. A complete list of the members of CH21 can be found at the end of this brochure.

All members signed the CH21 charter, which, amongst others, stated "the signers of the CH21 charter pledge that they will plan and implement internal and external activities within the scope of the CH21 initiative that either directly or indirectly support one or more of the objectives of CH21." Thereby the participants avowed that they would actively contribute to the promotion of the use of new technologies in this country, in the fields of education, government, economy and society. Progress was periodically checked over the course of the program using a barometer created within the scope of CH21. The chapter entitled "Barometer: CH21 Put to the Test" describes the extent to which the objectives formulated at the start of the project were achieved. In several congresses, which took place in all regions of Switzerland, selected and successfully implemented projects were introduced to a wide audience. These congresses served toward the exchange of information and know-how transfer, but actually they were also social events for the large number of personalities interested in the topic of ICT. Not only that, but they also enabled the formation of a network extending beyond the scope of the CH21 program to ensure that the initiative would be continued after the program ended.

The final report on the CH21 initiative shows how we are doing in terms of ICT, namely, in terms of education, government, economy and society, the fields deemed relevant. This by all means critical treatment is intended not only to provide an overview but also to provide stimulation. For reflection. For weaving new thoughts. Numerous personalities invested a great deal of creative potential in the CH21 project. It would be fantastic if their findings and experiences could contribute to the creation of new projects and, thereby, the continuation of the CH21 initiative.

Impressions from a CH21 informational event
hosted by Swiss Re in Rüschlikon

Usually the future is here before we're ready for it.

John Ernst Steinbeck
27. 2. 1902 to 20. 12. 1968,
American writer,
Pulitzer Prize (1940),
Nobel Prize for Literature (1962)

"With the initiatives CH21 and 'Internet for Schools', the government and the business community have provided the push necessary to promote ICT in education. We must continue to ensure that these dynamics are maintained – even in a difficult business environment. Central to this are the education and further training of teachers and the creation of pedagogical teaching models. A 'digital' division of the population must be prevented."

**Ernst Buschor, Education Director of the Canton of Zurich**

"Soon people who don't know how to use the Internet will be faced with the same problems that those who can't read or write today are faced with. That's why Swisscom, through its commitment to 'Internet for Schools,' is providing all Swiss schools with free broadband Internet access. With this, we are making a long-term investment in Swiss education and workplaces."

Jens Alder, CEO, Swisscom

"Knowledge is the basis for competence and thereby the prerequisite for successful action. Knowledge is not just information or knowing it all. Switzerland is capable of competing in the knowledge field. Success only comes, though, if in the end people roll up their sleeves, make decisions and implement the thing."

Peter Friedli, entrepreneur and venture capitalist
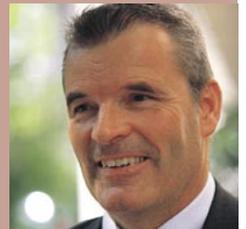
Walter Dettling, Professor at the University of Applied Sciences in Basel (FHBB)

Mr. Dettling, anyone who speaks about computer-assisted learning will sooner or later refer to "digital education." What does it really mean?

Walter Dettling: I must admit that I don't know what digital education is. Is it knowledge of how computers function? Is it confidence in using digital devices and the ability to exhaust the potential of computers? Or is it recognition of the effects that computers have on our society and economy? I believe we are not yet in a position to be able to speak about a definite, generally accepted phrase to describe education in the Information Era.

In your opinion, do we need more training about how ICT functions or completely new educational content in the ICT Era?

Dettling: Of course we need experts who understand a lot about technology, and it would certainly be helpful if they all would know something about how ICT functions. However, the applications and effects of ICT in school, on the job and in one's free time are much more comprehensive and can really be felt by everyone. Therefore we should think about the new educational content that our children will need in the future in order to be able to get by in this new world.

Are there different approaches that need to be taken for different school levels?

Dettling: I am not a trained pedagog and would not want to provide advice here in all areas. A great challenge at all school levels is the fact that the prerequisites that children have to have are changing rapidly. Today hardly any child starts primary school without having already used a computer. At the university, we still have many students who made their first experiences with computers as young adults. There's a big difference between using the computer or the

When Markus Pfluger and André Schneeberger, students at the Berne Institute of Technology and Architecture, put their undergraduate thesis on "E-Learning in the Year 2001 in Schools in Switzerland" on paper in October 2001, they reached a clear conclusion in their "Management Summary": "The situational analysis shows that 'e-learning' has hardly been introduced into Swiss schools, or if it has, that it is still in the early stages." They wrote further: "The reasons for failure of these new teaching methods to catch on are, on one hand, the scarcity of resources (hardware, software, networks, connections, support and maintenance) and networks that grew without a concept and do not meet today's requirements. On the other hand is the inadequate knowledge of teachers in the field of computer science in general and in e-learning in particular. This is why e-learning is hardly being used in the schools." These are clear words from students who surveyed all public, nonprivate secondary schools in the cantons of Berne, Zurich, Solothurn and Lucerne, as well as technical colleges and universities in these cantons and the ETH Zurich.

Private Business Initiative

It is indisputable that today knowledge and abilities in the field of ICT play an important role on the job market, and it is also clear that it must be the duty of elementary schools (primary and secondary level I) to familiarize schoolchildren with these new technologies. An important indication of the commitment in making this happen is provided by the density of computers in our elementary schools. In 2001 82 percent of elementary schools were equipped with computers; at the secondary level I, it was practically 100 percent, corresponding to an increase of around 60 percent since 1989. If the number of Internet connections is used as a measure of the development toward "e-learning" in schools, the following picture is obtained: At the end of 2001 66 percent of all elementary schools and 93 percent of all schools at the secondary level had Internet connections; at the primary level, in contrast, this value was only 53 percent (see figure). Since the Swisscom Group started the initiative "Internet for Schools" with other private companies and the federal government, this development process appears to have been accelerated. As of the end of December 2002 1789 schools, or 25,231 classes, have profited from this initiative. Since then 457,363 schoolchildren have been surfing the Net via a broadband connection sponsored by Swisscom.

Up to now the smallest school to be connected to the Internet in this way is the primary school in Vogorno (TI). There ten children have Internet access on four PCs. The largest school in Switzerland to benefit from "Internet for Schools" is St. Gall's vocational college: There 5310 students play around on the Web on a total of 335 PCs for learning purposes. The best school in terms of available equipment is

Internet Connections at Elementary Schools in Switzerland in 2001 According to School Level

Source: Swiss Federal Statistical Office

■ Internet connection available
■ Internet connection planned
□ No Internet connection
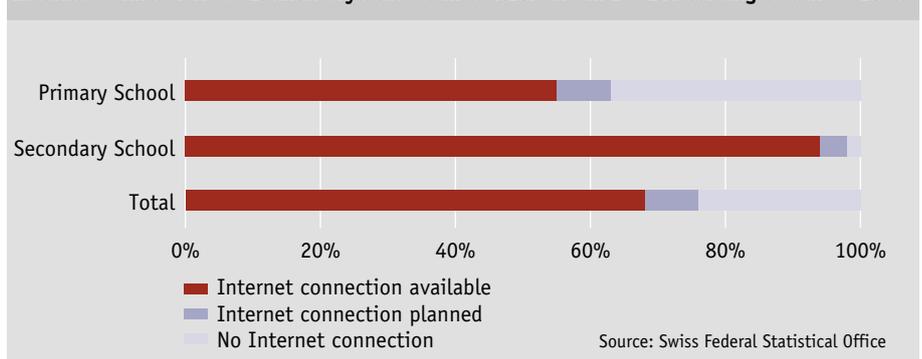
the Ecole Technique in Porrentruy/JU: There are 50 PCs with Internet connections for 45 students.

Also demonstrating that especially in most recent times efforts have been intensified to prepare Swiss schools for the Internet Era is the fact that direct ICT investments at the primary and secondary level have increased from 1999 to 2001 from nearly 30 million to 51 million Swiss

Internet Access in Schools 1 = very limited access 7 = universal access		
Rg.	**Country**	**Points**
1	Finland	6.5
2	Canada	6.1
	Singapore	6.1
4	Iceland	6.0
	Sweden	6.0
6	Denmark	5.9
7	USA	5.7
8	Australia	5.6
	Korea	5.6
10	Taiwan	5.5
	Great Britain	5.5
12	New Zealand	5.4
13	Estonia	5.3
	Hong Kong	5.3
	Norway	5.3
16	Hungary	5.1
	The Netherlands	5.1
18	Austria	5.0
19	Czech Republic	4.9
20	Slovenia	4.8
	Switzerland	4.8
22	Belgium	4.7
	Germany	4.7
24	Ireland	4.6
25	Chile	4.4
	Portugal	4.4
	Slovak Republic	4.4
28	Israel	4.3
29	France	4.2
30	Lithuania	3.9
	Spain	3.9
Source: The Global IT Report 01/02		

Francs. This amount yields an investment per school of around 10,000 Swiss Francs, or around 70 Swiss Francs per student, and it appears as if this level of investment is going to be maintained: For this school level, ICT investments of around 60 million Swiss francs were planned for the previous year. Thus investments in the previous four years are estimated to amount to a total of some 180 million Swiss Francs – a world record. If you ask where exactly these millions were invested, the answer is clear: Two-thirds of the money flowed in 2001 into the acquisition and replacement of hardware, and only nearly every fifth Swiss Franc invested was used to purchase software. Training of teaching staff was hardly financed by this money at all: The amount spent on this has remained at the low level of two to three million Swiss Francs since 1999. To qualify this statement, it should be mentioned that additional training for teachers is not generally financed directly by schools or school communities, but rather by the cantons. Still, the fact that additional training measures for teachers are greatly disproportionate to investment in hardware and software appears to be clear.

Swiss Need to Catch Up

Despite great efforts with respect to investments, the Swiss badly need to catch up with the rest of the world. If Internet access in ours schools is judged in a global context, results are incongruous. According to the "Global Information Technology Report 01/02", Switzerland does not shine out internationally. On a scale of 1 to 7, where 1 means access is very limited and 7 means the majority of students access the Web frequently and intensely, our country, with 4.8 points, just makes it to twentieth place, ranking far behind the frontrunners Finland (with 6.5 points), Canada and Singapore (both with 6.1 points), only slightly higher than Chile and Portugal (both with 4.4 points) and twice as high as countries such as the Dominican Republic, Ecuador and Mauritius (each with 2.4 points).

Another key aspect indicating the development of a country in terms of its ability to deal with

Internet "just for fun" as a child and being cognitively confronted with it as an adult. In the coming years the "just-for-fun generation" will grow through the school system and create challenges for the teachers.

One problem that arises is the decentralized educational policy in our country. Do you have an idea of how this can be bypassed so that a coherent educational offensive can be realized for digital education?

Dettling: Unfortunately a very curious territorial attitude still exists in Switzerland. Communities, cantons, the federal state, conferences, associations, universities and technical colleges, etc. have marked their territories and concentrate on protecting their interests. This political reality in Switzerland was created by history, but unfortunately it has little to do with the reality of practicing educationists, that is, teachers. Having 26 different reading courses (in reference to PISA) is just as absurd as having 26 education portals on the Internet.

One possible way that I can propose would be the creation of a federal pedagogical institute (EPH). We could thereby unite to develop methods and contents for the entire Swiss educational system. Every school level and every canton would profit from this, and Switzerland would even be in a position to become known internationally in the field of education.

Conveyance of educational contents always has something to do with conveyance of values and valuations. In your opinion, what do we have to concentrate on in the ICT Era?

Dettling: Not only is the manner in which we access contents changing, but also the value systems with which we evaluate these contents are changing. The digital society is confronted almost in real time with occurrences and facts from the entire world. This information, however, also carries values with it, thereby questioning us and our value system. How do we overcome

this pluralism of values that is drowning us along with the flood of information? How do our children overcome it? As a representative of a liberal point of view, I am at the same time convinced that we do well by retaining social, political, moral and religious values in our educational system. The great American writer Norman Mailer is a role model for me. He speaks about conservatism of values, which differs clearly from conservatism of form. Not everyone who opposes change wants to retain values, in as far as this is important to him or her. I also often doubt that all reforms are really understood by those who supported them and that it is only rarely that changes are made more to the shell than to the core contents. The most dangerous are those who don't even have values anymore. In my opinion, the loss of values poses the greatest danger for a rich country such as Switzerland.
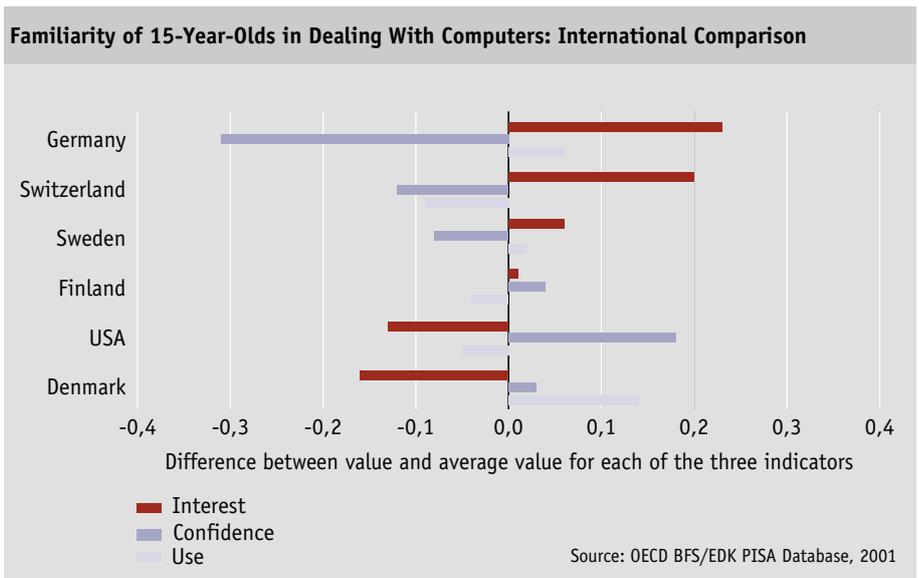
Walter Rudin
Principal, Greppen Primary School

Mr. Rudin, you spoke at a CH21 congress on the topic of "digital classrooms." What is the meaning behind this phrase?
Walter Rudin: The Digital Era is a reality that penetrates even the doors of a primary school classroom. Although elementary schools should beware of becoming too mentally cumbersome and therefore also practice the development of "hand and heart" according to the principles of Pestalozzi, sensible use of new media should be taught. Children have already used it at home in their free time; this use should just be guided properly.

You have shown concrete examples of making use of PCs by the schoolchildren at Greppen Primary School, your school. What do you consider to be the advantages of using PCs in school?
Rudin: The biggest advantage is definitely that pupils can be taught individually.

Familiarity of 15-Year-Olds in Dealing With Computers: International Comparison

Difference between value and average value for each of the three indicators

■ Interest
■ Confidence
■ Use

Source: OECD BFS/EDK PISA Database, 2001

ICT is the manner in and extent to which young people use computers in their daily lives. In the international study PISA 2000, in which, among others, the countries USA, Denmark, Germany, Sweden, Finland and Switzerland were considered, a total of 65 percent of surveyed 15-year-olds stated that they used computers. Switzerland, at 67 percent, was slightly above average for the countries in the survey. A more in-depth survey, in which qualitative aspects of computer use were also indexed, shows that Switzerland is only average and far behind the USA and Germany. An interesting related fact is that except in the USA, girls in all countries surveyed showed much less interest in computers than boys did.

Having an interest in computers is doubtlessly an important prerequisite for using them intensely. Dealing with the new technologies only becomes natural when confidence in one's own abilities has been developed accordingly. In the PISA study, the results for various questions regarding confidence in dealing with computers were indexed, and they present a revealing portrait of the situation: The 15-year-olds in the USA show more confidence in dealing with computers in their daily lives than any other country even comes close to showing. In this respect, Switzerland and Germany perform much worse than average and occupy the last places. It is possible that the starkness of this result was influenced to the detriment of German-speaking countries through cultural differences in the formulation of the questions. However, the tendency probably reflects the real situation.

Great Interest in PCs

For a sort of topographical representation of countries in terms of computer affinity of young people to be formed, the parameters deemed important – interest in, lengthiness of use of and confidence in dealing with computers – must be shown in relation to one another. This produces the following result: In Germany, although the interest of 15-year-olds is above average, confidence in dealing with computers is hardly mentionable when considered on an international scale. At a generally high level when compared with other countries, the USA especially stands out in terms of confidence in dealing with computers. In contrast, Swiss youths show great interest in computers, but

they have poorly developed utilization intensities and especially confidence in dealing with them. Hence, it will not come as a surprise that according to "Global Information Technology Report," the American population is online five times longer than the Swiss population is on a daily basis.

This, however, does not mean that Internet projects have not been growing in innumerable schools in all corners of Switzerland, which should have the effect that obviously is missing: Self-confidence in dealing with computers and the Internet must be developed from childhood onward so that in time it becomes as natural as using the telephone.

- For instance, in Baden-Daettwil in the canton of Aargau, primary-school classes and the Villa Kunterbunt have formed a virtual children's village (www.daettwil.net), about which the teachers who initiated the project write: "The virtual children's village is a good example to show that already in the first grade, schoolchildren can have positive experiences with computers and the Internet, if topics from the real school world are combined with stories, fairy tales, fantasies and visions." And the schoolchildren do not only show interest; they also display perseverance. On the homepage of their virtual village, they write the following: "We started building the virtual village Daettwil.net in April 2001, when we were in grade two with Marianne Bolliger, and moved into the first house, the Villa Kunterbunt. Now – in the school year 2002-2003 – we are in the fourth grade with Annmarie Brugger."

- The Gestadeck primary school in Liestal (www.gestadeck.force.ch) has been on the Net since 1998. At that time virtual art exhibits and over 40 school projects were documented on the homepage, providing an abundant source of ideas for teachers and classes who wanted to gain experience with the Internet and schools. As a special feature, a language-independent robot guide was developed for the electronic newspaper.

- Students in the ninth grade at the school in Escholzmatt, LU photographed the community. The community can now be explored starting from the village square. The tour of the "vir-

tual" village can be navigated independently using various routes and turn-offs.

- Students at the Minerva schools in Basel (http://projekte.minerva-schulen.ch/html/projekte/webside/titel.htm) published interactive ultrashort stories with 250 photos and 28 different dramatic final sequences on the Web under the title of "Web Side Stories." This large project, which spans classes and subjects, has already won the young Internet pioneers diverse industry prizes.

These few randomly selected examples show that at the primary- and secondary-school levels, activities are underway to promote confidence in using the Internet. The way in which the Internet is used by young people can thereby serve as an additional indication of Switzerland's position internationally. The PISA study involving 15-year-olds shows that with respect to this, too, action must be taken (see figure on page 14). Computers are used in this country by the teenagers surveyed predominantly for surfing the Net and also for communicating interactively via e-mail several times a week. In comparison with other countries, however, the extent to which this occurs is rather below average. The computer is especially poorly utilized as a teaching medium in schools: Not even every fifth Swiss youth makes use of this possibility. This is also a poor showing in an international context: In Denmark, for example, ranked highest in this aspect, every second youth uses the computer for learning purposes. This result clearly shows where educational policy-makers have to make efforts in order to ensure that computers will serve the knowledge nation Switzerland over the long term.

Federal Restraints

The students mentioned above, Pfluger and Schneeberger, are of the same opinion, concluding their thesis entitled "E-learning in Switzerland" as follows: "We have to come to the basic realization that communication is an important

Today for every stage of learning there is a suitable learning program. Pupils work on their weaknesses and develop their strengths.

The canton of Lucerne wants to introduce computer science in all of its primary schools by 2005. What do you think of that?

Rudin: The numerous reforms in the canton of Lucerne have to some extent been met with great resistance, especially from teachers. This goal probably will not be able to be reached, unfortunately, but this is mainly due to lacking financial resources in the community. It looks like only the classrooms of the Middle Level II (fifth and sixth grades) will be equipped with PCs.

What area needs the most work in order for ICT to be able to be used in schools?

Rudin: Definitely training of teachers. Well-trained people are much more motivated and better prepared to advance innovations.

Thomas Limacher, Prorector
Cantonal School of Enge, Zurich

Which philosophy do you adhere to regarding employment of ICT at your school?

Thomas Limacher: At our school computer science should be regarded as one tool among many. It serves as an aid to pupils for supporting the learning process and helping learning objectives be realized. This philosophy implies that computer science does not represent an end in itself and is not part of the syllabus. However, it is clear that this tool must be mastered. This is why we are investing time and money: to guarantee basic education in computer science.

Where can you see additional possibilities for use by pupils and teachers?

Limacher: The IT offering at our school is more than adequate. Anyone who wants to

use IT in the class can do so using our infra-structure and, thanks to our computer-science-delegated system, has the possibility of acquiring the necessary know-how.
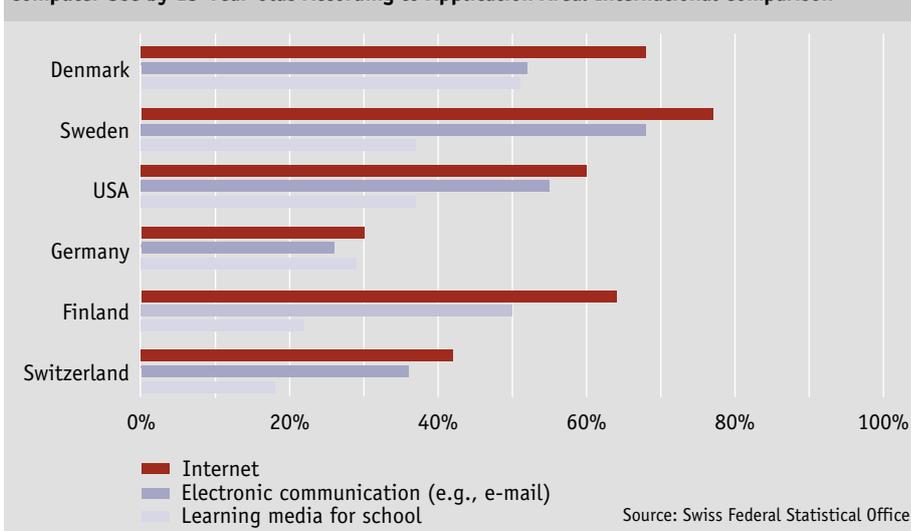
How would you assess the familiarity that pupils and teachers show in using computers and the Internet?

Limacher: Pupils are very familiar with computers. This is, however, a very superficial familiarity, founded on computer games and surfing. Use of relatively difficult programs causes problems, and programming causes even more problems. For teachers, differentiation into different groups is necessary. They range from fiddling computer freaks who use every opportunity they can to employ IT in their teaching methods to fundamentalist IT abhorrers. Our efforts in pedagogical computer science have succeeded in bringing about a continuous increase in the number of teachers who use IT in the classroom.

Would you welcome additional offerings in this area for education and further training of teachers?

Limacher: In the field of IT, there should be no "training stockpiles." Education and further training most effectively consists in decentralized and institutionalized sharing of knowledge between teachers and making use of "best practice" experiences.

Computer Use by 15-Year-Olds According to Application Area: International Comparison

Legend:
- Internet
- Electronic communication (e.g., e-mail)
- Learning media for school

Source: Swiss Federal Statistical Office

part of our culture, that it is of fundamental importance for education, for the conveyance of information and knowledge. With the new media, the way in which we communicate with one another will be decisively altered. Now this change must also occur in education." Michael Resnick, director of Massachusetts Institute of Technology (MIT), in an essay entitled "Rethinking Learning in the Digital Age," comes to the following conclusion: "While new digital technologies make a learning revolution possible, they certainly do not guarantee it. Early results are not encouraging. In most places where new technologies are being used in education today, the technologies are used simply to reinforce outmoded approaches to learning. To take full advantage of new technologies, we need to fundamentally rethink our approaches to learning and education – and our ideas of how new technologies can support them."

It is exactly this aspect that needs to be addressed. Today, Swiss education experts and educational practitioners react to the effects of ICT on educational concerns either in a technologically cumbersome manner ("Internet for Schools") or with innovative concepts from individual teachers. Both approaches are nothing more than a drop in the ocean. A basic, intercantonal concept for implementation of ICT

in the Swiss educational system is still missing. "Without a basic pedagogical discussion, we will still be speaking about isolated individuals who show commitment and sluggish changes in the overall system for decades to come," Walter Dettling, director of the Institute for Applied Business Economics at the University of Applied Sciences in Basel (FHBB), warns. The dedicated scientist has therefore proposed the creation of a federal pedagogical institute, which would fulfill this need and be able to provide pedagogs with teaching materials relevant for the ICT Era.

Government Internet-Based Interactions Between Government and Citizens

"In light of the very difficult budget situation in public administration, it isn't surprising that the objectives of CH21 in the area of administrative tasks were not reached. Scarcity of funds necessitates closer consideration of economic feasibility in planning of e-government solutions. For administrative solutions spanning several levels, rapid success is usually hindered by the often necessary consolidation of the data structures that have evolved."

Peter Schönenberger, Governor of the Canton of St. Gall

"Knowledge is Switzerland's most vital raw material. However, a knowledge society consists not in the accumulation and distribution of information alone, but rather in the beneficial processing of it to form knowledge. It is in this process that ICT plays a critical role."

Peter Quadri, CEO, IBM Switzerland

"The possibilities and benefits of e-government for every single resident must be made known on a broader scale, with the goal of breaking down skepticism and building up trust. This would form the foundation for advancing the introduction of e-government at the community, canton and federal levels. Innovative communities that are willing to take on leadership roles (e.g., Anières, GE in e-voting and Rodersdorf, SO in e-government) should make their know-how and experiences available to all other interested communities to contribute to faster spread and acceptance of the idea of e-government. At any rate, government agencies must surely be interested in the new possibilities offered by e-government."

Eleonore Grolimund, Mayor of Rodersdorf, SO

**Maya Lalive d'Epinay
National Councilor, FDP, SZ
President, SwissICT**

In February 2002 the Federal Council adopted an e-government strategy. Was that just a makeover, or was it a real step in the right direction?

Maya Lalive: The strategy is certainly a step in the right direction, but it came too late and was implemented rather sluggishly. The number of programs and initiatives already introduced at the e-government level is large, whereby the wheel was reinvented many times in doing so, as the synergy effect that exists in principle could not be fully exploited. In the meantime many of these absolutely praiseworthy initiatives have become obsolete (with respect to technology or design approach), which additionally hinders the coordination and harmonization of certain offerings and federal services, as well as the associated business processes. Added to that is the fact that e-government is often externally equated with a homepage and electronic government agency transactions. The actual benefits – increased efficiency and added value of services through redesign and electronification of the offering's underlying business processes – could barely be seen up to now. Concerning e-democracy and e-politics, we are still in the infantile stages. Although we have carried out a few positive pilot projects – for example, the e-census and the recent e-voting attempts – in terms of widespread implementation, we are still proceeding at a leisurely tempo in comparison with other small democratic countries in Europe.

How would you, as National Councilor, assess the political pressure in Berne to actively pursue e-government over

The community of Rodersdorf in Solothurn has 1,313 residents, 81 of whom are foreigners, and a total of around 500 households. Most of the community's perimeter line (88 percent) is simultaneously the country's border. On April 19, 2000 this nationally almost unheard-of dot on the map of Switzerland managed to make it into the national news column of the "New Zurich Newspaper" (NZZ). "National E-Government Premiere in Leimental" was the headline of the four-line story, in which read: "Since Thursday the 1,300-soul community of Rodersdorf in Solothurn is, according to its own statements, the first Swiss community with a 'fully functioning and transaction-capable e-government solution.' The difference between this solution and previously typical online counters is that here direct modification of the community database is possible." In fact, the border community put an e-finder, or a central search engine, on the Net to allow residents to provide details of changes in all aspects of life, from births, divorces and job searches to retirement, applications for social security and death announcements, online to the community's administration, as well as register and deregister at the registration office. This pioneering act fills Mayor Eleonore Grolimund with pride: "We wanted to set up an interactive homepage to serve our citizens," she says, "but also to make our own experiences in the currently running standardization process for e-government as a small community." The service is also being used: Around 60 transaction login IDs have been assigned, meaning that nearly 15 percent of all households deal with the community administration online. At the top of the hitlist are official residency documents and confirmations of place of residency. As far as is technically and legally possible, Rodersdorf also wants to introduce e-voting and online tax returns.

Rodersdorf is not an isolated case. The phenomenon of e-government is seeping unchecked into the consciousness of the Swiss public. In 1998 the first three articles on this subject were published in the NZZ; in 2000 there were 33. In the period 2001-2002 the intensity of reporting on this subject rose exponentially.

In communities and cantons, the mood regarding e-government likens gold rush fever. For example, the canton of St. Gall adopted its own e-government strategy, and the newspaper "St. Gall Daily News" reported in August 2002 that "the electronic system for submission of tax returns is receiving widespread notice." By the end of the year in this eastern Swiss canton, over 21,000 tax returns were submitted online, "simply and securely", as the canton's homepage proudly reported. On January 17, 2003 the cantonal administration expanded the range of services offered at www.steuern.sg.ch: An integrated list of market quotes with tax values and dividends for the officially quoted securities was built into the electronic tax program, enabling direct data import into the securities directory. This electronic offering from the cantonal tax office has also obviously been met with approval by taxpayers. Already on the first day around 4,000 residents visited the homepage with the new service offering, thereby setting a new visitors record.

Internet Fever in the Cantons

The Internet fever has suddenly broken out in other Swiss cantons and regions – and the official proclamations are continuously in the superlative. In June 2002, for example, the newspaper "Aargau News" wrote, "Basel is Number One in E-Government", and referred to a recent study on e-government activities in cantons and cities. In this rating, based on 58 criteria, the City of Basel ended up in first place, followed closely by Lucerne and Zug. Only a half a year later the same newspaper reported the region's next big success: "E-Government: Basel Region is Pioneering." Recently it has been made possible for companies and private individuals in northwest Switzerland to obtain work permits online – "the first e-government application in the canton," the paper proclaims. In central Switzerland, the newspaper "Lucerne News" reports "Zug and Baar in the Top Ten" and refers to a contest announced by Bedag Informatik of Berne to award the best Internet presences in Swiss communities. "The community of Jona received a prize for the best e-government pres-

ence in 2002," according to the "St. Gall Daily," and from Biel, it is announced that "dog tags are available online;" from Thun, it is noted that "the city of Thun has one of the best Web sites of all cities in Switzerland", and for the business newspaper "Cash", www.geneve.ch is "the Helvetian model pupil for e-government." Thus the success stories of 2002 come from practically every region in Switzerland. Even when the CH21 association announced a competition for e-government solutions, the resonance from both small communities and cities was strong. The community of Konolfingen, BE, for example, with 4,711 residents, set up an online counter at www.konolfingen.ch to enable "citizens to carry out, order and pay for various community processes, such as relocating, moving away or to the community or obtaining ID cards, container seals or SBB Flexicards online in the comfort of their own homes," according to the stated objectives. The benefits to residents are obvious: "service and up-to-date information around the clock, as well as convenient ordering". The community's administration thereby has arrived at a "rationalization of processes and unburdening of administration" and has increased its quality as a location. Similar projects are also being submitted by other communities. The 9,300-resident community of Romanshorn, TG has set up an information point at www.romanshorn.ch – according to them, the first public outdoor Internet terminal in Switzerland – which offers up-to-date community information, the facility of sending e-postcards. The community of Zollikofen, in which currently 745 young people born in the years 1984 to

1990 are resident, is planning to set up a "virtual youth parliament." This should allow the youths "to exchange information about various topics, become informed and provide suggestions for village politics." The "virtual youth parliament" should also receive its own powers, for example, through two youth motions a year that must be handled in the community's parliament. By the middle of 2003 a first trial run should have been made – the first of its kind in the German-speaking world.

Lesser Staff Thanks to the Internet

The community of Jona, SG is planning on providing all of its 17,400 residents with e-mail accounts via the Internet platform www.myJona.ch to enable direct communication with the community's administration and fellow residents. The city of Lucerne, with 36,500 taxpayers and 56,000 residents, organizes administration of records, compilation of tax return data, assessment and processing of simple forms online. Thereby the changeover to an annual tax assessment at the beginning of 2001 was streamlined. The result was that around 15 employees for the planned additional tax administration were not needed. The Daycare department of the city of Winterthur, has launched the project "E-Family Services," networking the 23 city-run nurseries with 400 places and 33 daycares with 650 places online. It should enable parents "to be able to inform themselves thoroughly and independently about the various possibilities and offerings for supplementary childcare" – especially about

the long term? Does a political will exist for this?

Lalive: Considering this critically, I'd say that: In a broad sense, the political will does not exist. This applies both to the Parliament and to the National Council. It is present where a direct commitment or a direct relation to the subject matter exists: in project managers and employees-in-charge of administration, directly involved politicians and executive members. If, for instance, we had to vote on the project "Internet for Schools" today, the outcome would probably be negative.

Why?

Lalive: I've often had the experience that employment of ICT is assessed as being "nice to have," but not relevant, let alone imperative. Hot issues such as old age pensions and health insurance, unemployment, the financial situation, the problem of asylum and the economic downturn keep pushing ICT to the back burners. That's a very short-sighted outlook, because it is exactly the intelligent utilization of ICT that could help us with these concerns. Above all, ICT will fuel the economy of tomorrow. Already today it is contributing around 10 percent of the GDP, and the entire economy depends indirectly on ICT. Hardly any company – from any branch of industry – would be competitive today without using ICT.

How would you summarize the results after two years of CH21?

Lalive: CH21, as a network, united many people who otherwise would not have come together. Prejudices were able to be dissolved, discussions were sought and found and work was done on joint projects. The program also motivated on a smaller scale; numerous projects found their way to the public and, thereby, to broader acceptance through us or were able to be started through our support. The seminars and competitions that we organized made that apparent. One objective that we were not able to achieve was the acceleration of the

Swiss Cantons With Their Own Web Sites: 1995-2001

Source: BAKOM, 2002
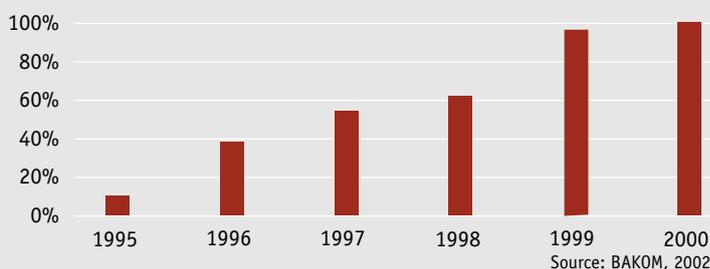
process. I am sure that the unfavorable economic conditions of the time had a negative effect on our project in this respect.

How is Switzerland positioned compared to the rest of the world?

Lalive: On the whole, unfortunately only in the upper middle range. I think we need to be in the top three in Europe and in the top five internationally. It is like industrialization: Whoever is there at the beginning when the first applications of a new technology are being used and then helps in developing it further has a long-term competitive advantage. The field of economics today is feeding on the commitment of farsighted pioneers from the 19th century.

We are optimally equipped (in terms of hardware), but we are not particularly innovative in the area of software use, in either a narrow or a broad sense. This also applies to e-government. Ireland, Great Britain and the Scandinavian countries are acting as role models in demonstrating their e-government activities; we would do well to follow their lead.

Which areas need the most work in the future?

Lalive: In my opinion, the most pressing tasks of the federal government as initiator and manager, or the federal government in cooperation with the business community, are:

First, coordination, and I mean mandatory coordination for the purposes of focusing funds on the essentials (at the various government levels),

Second, standardization, modularization, and integrated redesign of business processes (associated with the first task),

Third, concentration on services having concrete benefits for the economy and society,

Fourth, creation of awareness and acceptance of the benefits/significance of ICT at all levels,

Fifth, assumption of thematic (i.e., not financial) leadership,

the number of available childcare places. The results of the pilot project, which is supported by the canton of Zurich, should be transferred "to other communities in the canton or even to other cantons and their communities within the framework of 'Guichet virtuel,' the virtual counter."

Since 2000 all cantons in the country have had their own Web sites as a result of this industriousness. Five years before that there were only three cantons present on the Net (see figure on page 17), even though the primary objective of an Internet presence is the same everywhere: to provide the populace with information. In contrast, intensive and interactive use of the Internet is developing at a much slower pace in the cantons. Until the year 2000 only four cantons had strategies for e-government; ten others announced them for 2001, and six are planning to take no steps in this direction in the medium term, according to the Swiss Federal Statistical Office (BfS). These were the results of a "Prognos" survey carried out in October 2001 for the Federal Office of Communications (BAKOM). All states except the cantons OW, NW, AI, SH took part in the survey.

At the community level, a similar portrait emerges: In October 2000 only one third of Swiss communities had their own Web sites; at

that time only the group of communities with more than 50,000 residents had 100-percent representation on the Web (see figure). Only 42 percent of communities without Internet presences that were surveyed by Prognos AG of Basel stated that they wanted to activate their own Web sites by the end of 2001. Today it is likely that more than half of all Swiss communities have taken the leap onto the Internet. However, especially small communities and microcommunities have come up against their financial and human-resources limits in this respect.

Not at the Top

Especially the most recent activities involving Internet presences raise the impression that e-government has been discovered in all corners of Switzerland. They could also serve to solidify the assumption that our country is forcing its way to the top of this development – especially since the government adopted the "Federal E-Government Strategy" on February 13, 2002 and noted under the heading of "Vision" that "Switzerland wants to be an international leader in the implementation of e-government."

Of course we are far from achieving this. On an international scale, Switzerland is not a leader, as various indicators show:

Swiss Communities With Their Own Web Sites According to Community Size: 2000

Source: BAKOM, 2002
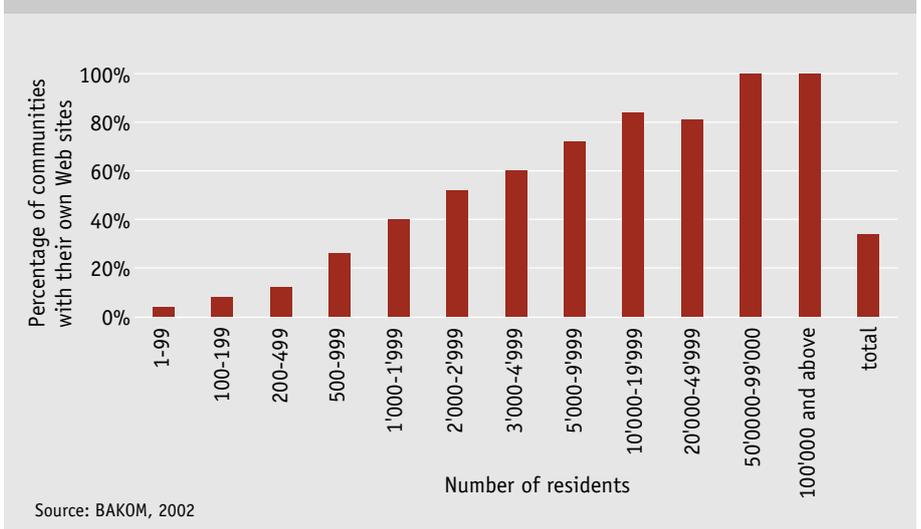
- Internet infrastructure: In July 2001 Switzerland had 74 computers with Internet connections per 1,000 residents, more than three times as many as in 1997, but still far below the OECD average (see figure). In addition, the growth rate was considerably lower in Switzerland than in the leading countries USA, Finland and Canada.
- Web sites: This indicator, too, shows that Switzerland is behind the leaders. With 17 Web sites per 1,000 residents, our country is only on a par with the OECD average.
- Web servers: In July 2000 Switzerland, with 192 secure Web servers per million residents, was well above the OECD average (119 secure servers per million residents), but still far behind the USA and Canada. Still, two years before that Switzerland only had 21 servers per million residents. Growth in this area has clearly accelerated.

A study published by the United Nations and the American Society for Public Administration in May 2002, entitled "Benchmarking E-Government: A Global Perspective," calculated a so-called E-Government Index for the then 190 UN members, which weighted two essential indicators of the level of e-government activities of the member states: "First, national government Web sites were analyzed for the content and services available that the average citizen would most likely use. Second, a statistical analysis was done comparing the information and communication technology infrastructure and human capacity for UN member states." The authors of the study calculated the E-Government Index from this data. Switzerland, not being a member of the UN at that time, was not considered in the study. Despite this fact, the study provides an illuminating glimpse into the status of internationally leading standards in the field of e-government. According to the study, the average E-Government Index is 1.62; ranked number one globally is the USA, with an index that is nearly double the average (see table on page 20), and leading in Europe is Norway, with an index of 2.55, followed by Germany with 2.46. The USA's governmental Web site www.firstgov.gov, Norway's www.norge.no and Germany's www.bundesregierung.de are being taken as benchmarks. The governmental Web presences achieved top points in these countries, as did the PC densities per hundred residents (USA: 58,5; Norway 49,1 and Germany: 33,6). In terms of the number of computers with Internet connections per 1,000 residents, USA, with around 275, was the clear leader, far ahead of Norway, with around 125,

Sixth, creation of legal security (i.e., digital signatures, electronic ID cards, protection of privacy, etc.)

Seventh, accelerated implementation of the strategy via focused PPP projects and

Eighth, continuous adaptation of framework conditions, in which, for example, ongoing legislation is designed for the future, not the current status quo.

**Dr. René Buholzer
Executive
Vice-President,
economiesuisse**

After two years, what has the CH21 initiative accomplished?

René Buholzer: That is difficult to answer. We are finding ourselves right in the middle of a social transformation, in which IT is assuming a central role. CH21 certainly made us more aware the fact that IT is a technology that pervades our entire lives and is not a branch per se, as it was described in the literature two or three years ago.

What results from this realization?

Buholzer: The goal cannot be just to promote the economy or e-business in small and medium-sized businesses (SMBs). We are being confronted with a social phenomenon that is all-pervading. Therefore, it is important that the economy, the federal government, education and society all progress at the same rate.

What does this mean concretely?

Buholzer: The deciding factor cannot simply be the provision of computers. We have to shift the emphasis to education and break down inhibitions. Statistics show clearly that well-educated, urban, young males are above-average users of new technology; it is the rural, lower-income, usually older females who must be supported through projects for females and seniors. We have to ask ourselves how we can get people who

Number of Computers With Internet Connections per Thousand Residents: 2001

Source: Swiss Federal Statistical Office
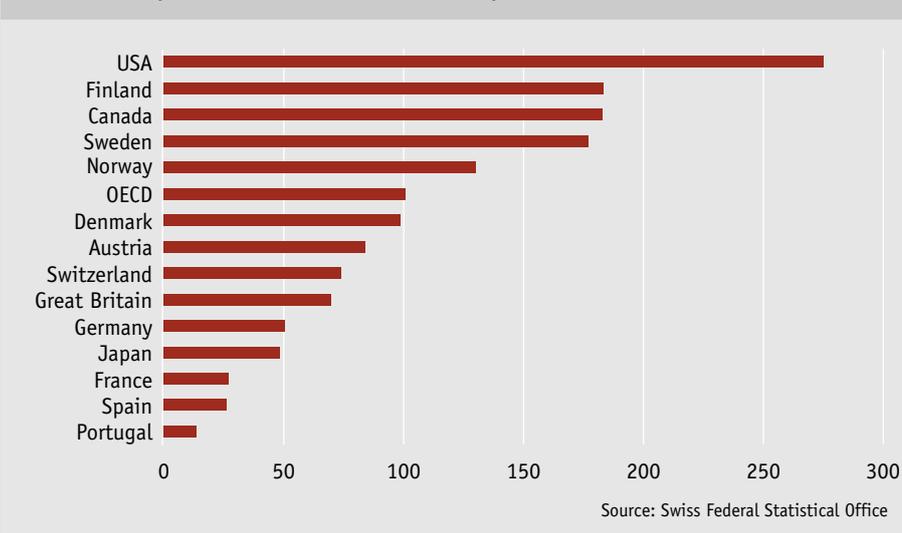
were previously afraid of this technology to start using it.

A good question.
Buholzer: The idea behind CH21 was clearly a "bottom-up" solution. Motivate, bring together and promote exchange of ideas – those were our goals. We wanted to organize participants so that they could find and modify solutions themselves. Unlike many federal programs where a couple of experts sit around discussing the importance of modern information technology for the economy, CH21 provided the impetus for helping people help themselves.

Did it succeed in doing so?
Buholzer: Personally, I am thrilled with this initiative. Of course, it hasn't made the Information Society break out, but it accomplished a lot with very few resources. Numerous people were motivated and brought to a table, and a broad debate ensued. Now it is important that concrete projects, such as the job-sharing exchange or teacher training by pupils, are continued.

and Germany, with a modest 50. Also in terms of percentage of population with online connections, USA was the undisputed champion (62.1 percent); Norway was at 54.4 percent and Germany at slightly over one third. Only in the measurement of "Human Capital" in terms of Internet affinity and education did all three of these countries have similarly high and globally leading indexes.

Leadership Missing in the Federal Government

Carried over to Switzerland, this would probably mean that our land would have an E-Government Index lying somewhere between that of Norway and that of Germany and thereby would be able to take a leading position worldwide. Switzerland is surely not a driver of development.

Also directed toward this is the criticism of Andreas Schneeberger, coauthor of a recently published study on the status of e-government in Switzerland.

He has formulated three theses:
- E-government either does not exist or exists to a small extent in the consciousness of the target groups. Hence, the "market pressure" is missing.
- E-government is often an isolated initiative in the political system. Connections to process-optimization projects is largely lacking.
- E-government is currently low on the political agenda due to the fact that the benefits in relation to investments cannot be proven.

The study's authors come to the conclusion that Switzerland has reached an admirable level, but still has a long way to go if it wants to be able to take a leading position worldwide. Current initiatives are not enough to allow us to reach this goal. "E-government is at a turning point," Schneeberger summed up, justifying his statement as follows: "After an initial phase, which can be called the phase of electronic supply of administrative information, the processes both between target groups and administration and within administration must be trimmed down and realigned (orientation to customer/life events). Even those initiative-showing people

Country	E-Gov. Index
USA	3.11
Australia	2.60
New Zealand	2.59
Singapore	2.58
Norway	2.55
Canada	2.52
Great Britain	2.52
The Netherlands	2.51
Denmark	2.47
Germany	2.46
Sweden	2.45
Belgium	2.39

responsible for e-government assess the ability and desire for comprehensive changes as very critical."

Those surveyed within the scope of the study expected the federal government to provide strong leadership, concrete objectives and support. The judgment was that "the initiatives of the federal government are assessed as being too slow, too theoretical and too diffuse." Successes must be better communicated, and the needs of cantons and communities must be given more consideration. It is clear that for e-government, at both the canton and the community level, neither binding standards nor a uniform line of attack exists. A homepage does not constitute an e-government strategy, and as long as ICT is not applied extensively in communities and cantons in interactive processes between the government and its citizens, the cost advantages will remain marginal.

"The job market and problems of economic policy demand total integration of ICT training at all levels. National offensives such as CH21 are pioneering; they expand horizons, help to stem federalism in education and promote transparency."
**Astrid van der Haegen, President, Swiss Businesswomen**

"Currently existing associations reflect the fragmented and specialized ICT industry and therefore must struggle with weak political clout. It is high time that the powers of the various associations are bundled and, using clear positions and professionalism, the framework is improved to the advantage of the ICT industry."
Maya Lalive d'Epinay, National Councilor, FDP, SZ and President, SwissICT

"It seems that after initial enthusiasm and subsequent sobering about the 'e-bubble,' the passion for innovation has cooled. What is currently being demanded in companies is advancement of core expertise. It would be fatal if you concluded from this that you could just quasi fall back on your knowledge. The last few years have shown that knowing what you know is not enough. Organizations have to know a lot, but above all they have to implement this knowledge rapidly and be able to combine it with other knowledge. Especially now that funding is scarce, alliances and cooperation with other knowledge bearers are especially crucial. Just as imperative is the linking of knowledge with emotions. What good does knowledge do individuals and companies if they cannot adequately communicate and thereby impart it? Knowledge only pays when others receive it. That's the important thing."
Walter Anderau, Member of the Executive Board, Swiss Re Group
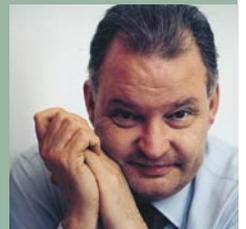
Markus Fischer
Instructor at the Institute for Business and Computer Science at the Lucerne School of Business and Leader of the CH21 Working Group "E-Business Opportunities for SMBs"

Since the kick-off of the working group of the CH21 initiative in the fall of 2001, you have presided over the working group "E-Business Opportunities for SMBs." What was the predominant goal?

Markus Fischer: The objective of our working group was to improve the abilities of SMBs in the area of e-business. This essentially includes effortless handling of modern information and communication technologies (ICTs) and their usage in daily business operations. The SMBs have to identify the opportunities and potential benefits that e-business can offer them. In many places, the prerequisites for this have to be met first. Problem areas must be identified and concrete problems must be solved.

Your assessment after working for 15 months on ICTs and SMBs?

Fischer: The technological competence existing in SMBs is actually good; SMBs are in the position to deal with technology and innovation. As soon as new technologies and applications become complex and abstract, the opportunities for rapid adaptation and successful employment decrease. Dealing with PCs, Notebooks and networked applications is still not natural for many people in the working generation of today. While the cell phone has become a "commodity" today and has pervaded society, the Internet and especially e-business with all its application possibilities have not.

For SMBs, the major obstacle is the need for financial investment.

Fischer: That's correct. According to the study entitled "Introduction and Use of the Internet in Swiss SMBs" (http://

When Markus Fischer, instructor at the Institute for Business and Computer Science at the college in Lucerne, is asked about his personal interest in e-business for SMBs, he doesn't need time to think. "I have complete confidence in the new technologies," he replies. The project leader for the CH21 working group "E-Business Opportunities for SMBs" is also convinced that the modern information and communication technologies open up enormous business possibilities, especially for SMBs – provided that e-projects are implemented with a high degree of professionalism and have suitable long-term financial, strategic and manpower-related concepts.

Judging by the numbers, the demand for e-solutions for SMBs appears to be high: Of the 306,871 private-enterprise businesses in Switzerland, 9.9 percent, or 30,472 companies, employ between 10 and 49 people (numbers according to Swiss Federal Statistical Office business census dated 2001) and are thereby concentrated in the segment in which Fischer sees the greatest need for action with respect to e-solutions.

Anyone who delves deeper into this topic gets a stronger impression that a need for action exists. A telephone survey of 2,240 managers of SMBs performed in 2002 by the Swiss State Secretariat for Economic Affairs and Dr. Pascal Sieber & Partner AG (http://www.swissict.ch/ag/cno/public/Nutzung_des_Internets.pdf) shows the following findings:

- 70 percent of SMBs exhibiting a growth in revenues are Internet users, whereas less than 40 percent of SMBs showing a drop in revenues are. This allows one to conclude that successful SMBs employ the Internet, whereas those with stagnating or receding economic activities are more likely to do without the Internet.
- 8 percent of SMBs state that they do not want to use the Internet for their business activities now or in the foreseeable future; an additional 15 percent do not even have any computer equipment.
- While Internet use among PC users is rising by 20 percent, use among SMBs is growing only by 8 percent (see figure).

- Use of e-mail by SMBs increased once again in the last few years; in 2002 it was at the high level of 80 percent. In the meantime almost half of all SMBs have their own homepages; in 1999 only around 12 percent did.
- Internet use is increasing greatly in all branches of industry; it is now over 60 percent in the hotel and restaurant industry, nearly 70 percent in the construction and energy sectors and almost 80 percent in trade and industry. The highest use level of around 98 percent is found in credit and insurance.
- Swiss SMBs invested around 2.7 billion Swiss Francs on Internet services over the last few years. However, individual sums are usually modest, at up to 10,000 Swiss Francs.
- Economic indicators are gaining in importance in the usage analysis of the Internet. In the past the central motive for investing in the Internet was to groom the company's image, whereas now aspects such as quality, cost reduction and shortening of work processes are key.
- However, most SMBs do not yet use the Internet interactively as they use it sparingly for buying and selling products and services. Only 13 percent generate appreciable revenues via the Internet; 25 percent buy regularly through it.

Trust in Technology

This survey allows several conclusions to be made. Trust in the technological maturity of the Internet exists by all means in Swiss SMBs, and base applications such as e-mail and Internet presences are used broadly. Application of the new technology in an interactive form that is integrated into the business processes, however, is hardly taking place. "Swiss SMBs currently find themselves in the second developmental stage of Internet use," the authors of the Seco study claim. They continue, "After trust in technology has been built up, the Internet will start being used to support business-critical processes." The modesty of the extent to which this is occurring, however, is shown by the fact that the e-commerce volume of all SMBs together, like procurement via Internet, is still in the infantile stage: It amounts to a mere

SMBs Using the Internet: 1995-2003

Quelle: Seco 2002
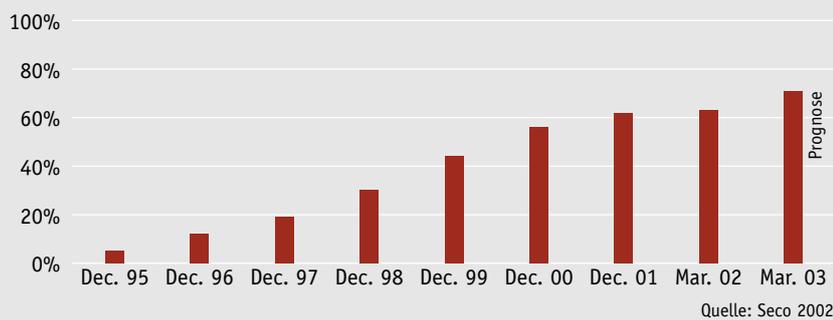
few hundred million Swiss Francs. SMBs in this country are equipped with Internet technology, but only a few here and there are realizing its latent possibilities. The majority of the SMBs currently find themselves at the interface between networking and integration and are thus behind the leading European countries.

Concerning the employment of ICT by SMBs for integrated use of business activities, countries such as Ireland, Finland and Denmark have become considerably more advanced in the short time of commercialization of the Internet.

"The technological competence of the Swiss population is above average," assesses Markus Fischer. He adds, "Our country is actually somewhat of a country of engineers. The fact that we are lagging behind the rest of the world in terms of employment of information and communications technology is related to the fact that this use is not transparent enough for many people." Added to that is the cost factor, which plays a critical role for an SMB: In a number of areas in which Internet solutions could be interesting for SMBs, low-cost standard solutions do not yet exist.

Probably the biggest factor preventing the widespread introduction of e-solutions in SMBs is of a psychological nature: the e-business hype of recent years led to unrealistic expectations regarding financial effects of e-projects and the time required for market introduction of new platforms and services. At the same time expectations for achieving an increase in revenues and a spectacular increase in new custom-

ers through the use of Internet solutions were unrealistically high. These two multiplicative effects lead to disappointment and, especially in SMBs, to a critical or even antagonistic attitude toward Internet-supported business activities. "The persistently steep Internet curve, the mobile boom and a minimally differentiated, short-term-profit-oriented investment behavior have promoted an unhealthy 'hype & hope' toward e-business in the last two years of the previous millennium," according to Fischer. He continues, "Unfortunately the retreat was just as undifferentiated as the advance was; hence strategic projects that were bound to succeed were also cancelled in the process."

Of course, Klaus Schwab, founder of the World Economic Forum (WEF), is right in saying that "information and communications technologies have become a key factor of modern economies" that will play a role in determining economic prosperity. This applies similarly to SMBs, and for the businessperson the question arises as to how he or she can employ these technologies to obtain the highest value-added benefit for his or her company.

A survey performed by the management consultants Mummer & Partner on 300 German companies shows where SMBs hope to achieve the most rapid effects with e-projects. Asked about their motivation for investing in e-business, nearly a quarter replied that the top priority was to lower costs; in contrast, improvement of customer services appeared to be much less important.

www.swissict.ch/ag/cno/public/Nutzung_des_Internets.pdf), 55 percent of businesses surveyed have annual budgets for Internet use of less than CHF 5,000. With that, they couldn't even afford to buy more than two laptops, let alone invest in e-business applications and their integration into companies.

That is obviously too little. If you want to use e-business, you need a corresponding business concept, hardware, software, support, etc. A Web site with applications with which ordering and other transactions can be performed online, i.e., an interactive solution, quickly ends up costing somewhere around 100,000 Swiss Francs.

E-business also has considerably more complex processes than, for example, correspondence via e-mail, which is already being done in 70 percent of the SMBs surveyed, does.

According to another study, around two-thirds of the SMBs do not even have an e-business strategy, which would serve as a basis for successful use. In spite of this, investments are being made in components such as servers, Intranets, etc.

Only a few SMBs have a strategy and a concept of how the business can be improved or modified through the employment of this technology. Many SMBs do not even have a precise idea about cost/benefit aspects, since no corresponding data from accounting exists.

Another handicap is that an online communication solution, e.g., a company Intranet, leads to a better democracy regarding information. The boss has to make company-relevant information highly transparent. Is he or she prepared to do so?

Fischer: If the boss of an SMB says he or she is not going to release any information, but is rather going to keep it private, then he or she is going against the idea behind a network, which can and should make interactive business models possible in the first place. Network solutions imply the will to

share information with internal and external individuals and partners.

Do SMBs understand this?

Fischer: In many companies, a few individuals have comprehended the necessity and opportunity. These are the incubators or "forerunners" who create the consciousness of this within the companies and who empower its development. This is no different in SMBs than it is in other areas in which the use of modern information and communication technologies has to be advanced, i.e., in education or public offices. In large enterprises, this process has been completed to a great extent.

There is still a lot to do, even now that the CH21 initiative CH21 is over.

Fischer: Absolutely. However, we have identified the "initiative takers," or the implementing partners for the proposed measures; they will advance the topic in practice. The actual "think tanks" are the technical colleges. The wealth of experience of companies, which are the ones that put e-business into practice, has been developed and made accessible, thanks to the case-study database "eXperience" (http://experience.fhbb.ch/cases/experience.ns). In the meantime, we have completed the outline of the implementation concept in our working group and can release it, as soon as the contents, the responsible parties and deadlines have been specified. For practical "on-site" implementation, we need the support of regional technical colleges as well as associations and media partners, who inform the SMBs and motivate them to participate in the practical seminars and thereby gain from e-business opportunities. In this way, we are giving the topic of "E-Business Opportunities for SMBs" a framework, concrete contents and means of communication.

Use of Internet Services in Companies: 2001

Source: Seco, 2002
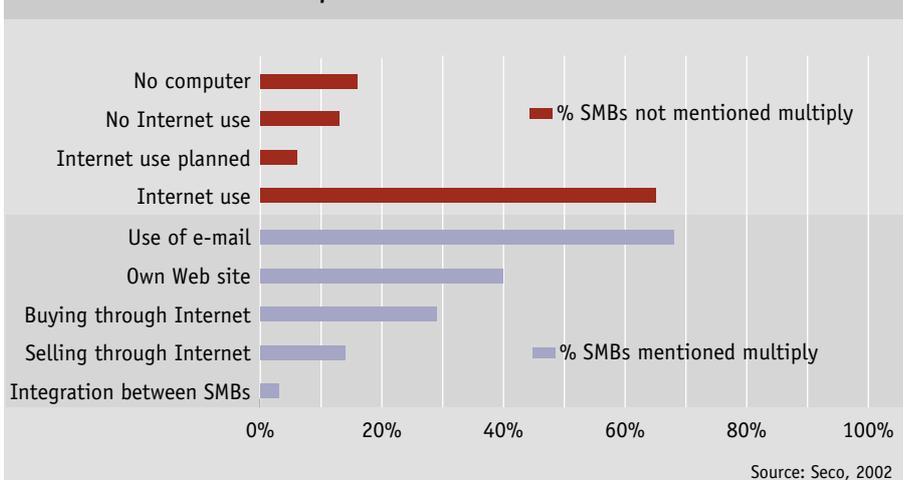
The fact that this is exactly the area in which the future of e-projects for SMBs lies is inarguable, according to Jeannine Pilloud, former CIO of the Bon Appétit Group. Being the manager of the largest online shopping platform in Switzerland, she gave a presentation at the CH21 congress on e-business on April 17, 2002 using the example of the portal "Le Shop.ch": "The customer is still king – and we still want to make money." For "Le Shop" this meant, Pilloud was certain, that the platform, established in 1997, would have to be able to handle 7,000 orders per week, with a peak rate of 1,200 orders per day, and 6,500 products in the foreseeable future. Only nine months after this appearance, the SMB with 69 employees had revenues of 13 million Swiss Francs and served 16,000 customers – and despite being the market leader decided to sell the company to private investors.

The skeptics, of whom in SMBs there are especially many, must view this as confirmation that effective customer linking through e-business appears to be impossible. The "Wall Street Journal Online", which at the beginning of 2002 ran the title headline "Le Shop is a dot-com survivor", seems to have erred for once – just like Le Shop CEO Christian Wanner, who in the light of impending closure of the online portal at the end of the year brought out the state-

ment that the break-even point was at around a revenue level of approx. 40 million Swiss Francs. In comparison, in England – where online shopping is more advanced than in Switzerland – 1.5 percent of all groceries are bought online. If these results were to be transferred to Switzerland, a market potential of around half a billion Swiss Francs would result, but Le Shop, Coop and Migros together amount to a mere 22 million Swiss Francs.
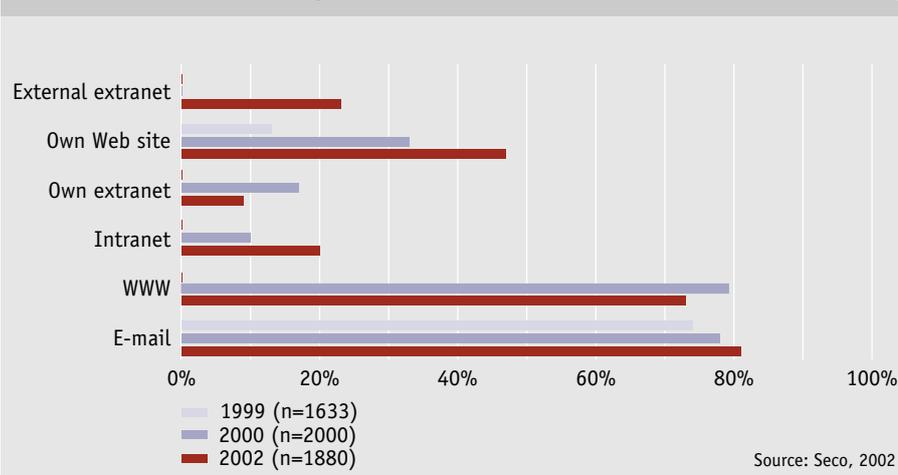
High Expectations

From this follows that the expectations for online business and customer linking are great and inversely proportional to reality. Is "Le Shop" not a "survivor," but a late casualty of the dot-com Era? Quod erat demonstrandum?

Gabriela Payer Fruithof, managing director of UBS and head of E-Channels & Products appeared at the same congress. She gave a presentation entitled "UBS E-Mission: a Multichannel Commitment" and explained the bank's strategy for action in the field of e-business since May 2001 as being "to provide an outstanding service to all our clients worldwide, by aggressively exploiting Internet technologies to create and deliver personalized innovative financial solutions, and improve efficiency while retaining the traditional Swiss values of trust, quality,

Use of Internet Services in Companies: 1999-2002

Chart: Use of Internet Services in Companies: 1999-2002. Categories (top to bottom): External extranet, Own Web site, Own extranet, Intranet, WWW, E-mail. Horizontal axis 0% to 100%.

1999 (n=1633)
2000 (n=2000)
2002 (n=1880)

Source: Seco, 2002

**Hannes Zaugg,
Edition Renteria SA, Zurich**

What motivated you to participate in the SMB working group?

Hannes Zaugg: We are a small specialized publishing house for the media branch. For us, in the long term it is a must that we also offer online services. Because we are small, we are looking for something to lean on to provide us with the security that we are going in the right online direction. We would barely be able to afford a flop.

After being involved for two years, have you gained any insights?

Zaugg: The primary one is that in the field of the Internet, there exist too many theoretical visions and too little desire for implementation of these visions. Without having an intense discussion with users, you will hardly be able to get a Web project on its feet. The secondary one is that the numerous Web ideas should be consolidated into a few implementable projects.

What are you going to implement in your SMB?

Zaugg: Today we are looking more intensively for suitable partners with the same target group, the same way of thinking and the same desire for concrete action, i.e., for offering Internet-based services.

In your opinion, in which area is action by SMBs most urgently needed?

Zaugg: In every branch of industry in which broad sales channels are beneficial, i.e., in which multichannel marketing makes sense, and I mean for spreading information and for selling services.

Are you going to continue the initiative of the CH21 program? In what form?

Zaugg: Absolutely. I received a number of important incentives for action, I met interesting people with whom I'd like to remain in contact and I will hopefully be able to participate in the implementation of the projects discussed in the program.

security and discretion." The next speaker, Monika Ribar, CIO of Panalpina, came up with lofty expectations, predicting growth through e-commerce from 2 to over 7 billion dollars between 2000 and 2004.

Encouraging Examples

For SMBs, the question arises as to what to do next. Is e-commerce a fata morgana that cannot be realized, despite the promises of promoters? Or is the problem merely that a company can use the Internet to make profits, but that there are too many wrinkles to be ironed out before the Net can be employed for customer profitably? There are many indications that the latter is the case. In the meantime, there exist numerous encouraging examples of this in Switzerland. The database "eXperience", the only systematic collection of pioneering e-business case studies in Switzerland (http://experience.fhbb.ch/cases/experience.nsf), lists nearly one hundred success stories from more than a dozen branches of industry. It shows that e-business can be successful – in all branches of industry. The following are two examples of this.

Construction: Koch AG, a family-run business with 50 employees, is one of the leading general contracting companies in the region of Freiamt, Aargau. The company already has a homepage (www.koch-ag.ch). Hosting of the Web site is done externally by the Swisscom subsidiary Bluewin. All employees who have access to a workstation also have unlimited Internet access through a central ADSL connection. "Hopefully the unlimited access will persuade employees to deal with the Internet," it says in the case study. Only a small proportion of employees have their own e-mail addresses. For now jointly used addresses such as architektur@koch-ag.ch and holzbau@koch-ag.ch are available. In the future all employees who regularly use a workstation will be equipped with an e-mail address. The Internet is hardly being used for procurement: "If an order has to be made or an offer has to be received, it is done by fax 90 percent of the time." The tax returns that are prepared jointly with a trust office are still being filled out manually – in the near future computers will be used for this, once the canton of Aargau provides the online forms on their Web site (www.steuern.ag.ch).

Accounting is already being done online: All salaries and payments are handled via e-banking, "allowing for more rapid and transparent account management," according to the case study. Finally, the Web site, costing around 10,000 Swiss Francs annually, provides Koch AG

Franziska Tschudi
Wicor Holding AG, Rapperswil

Do you use modern ICT in your company, and if so, in which areas?
Franziska Tschudi: We supply our customers worldwide and are set up as a global corporation with plant and sales support locations. E-mail has long been a part of daily operations and is used intensively. We are directly integrated into customers' supply chains in many fields, especially in supply to the automotive industry. In the field of e-commerce, we also use technologies such as e-auctioning and Web shops.

Where do you think the greatest benefit lies for your company?
Tschudi: The main benefit lies in the achievable cost savings through high-speed communications and automated execution of standard processes.

Beneficial employment depends on regulatory activities of the federal government. Where do you think the greatest need for action lies?
Tschudi: The federal government should create a legal and organizational framework to fight the currently inherent weaknesses of electronic communications, with respect to, for example, mailbox flooding (spamming) and security issues (encryption, authentication, virus protection and hacking).

Would you agree to the federal government assuming a greater leadership role?
Tschudi: Specifically in the area of digital signatures, I expect clear leadership from the federal government. I could easily imagine that government agencies could take over the duty of issuing digital certificates like passports.

with an "important platform for making contact with new customers."

Woodworking: The Internet offers handworkers completely new forms of cooperation, as the virtual carpentry shop Koncraft-Manufakturen demonstrates. Market and profit-margin pressures are forcing small woodworking shops to perform the time-consuming and hence expensive planning work – from square one for each new contract. If various carpentry shops were to pool their planning documents, they could profit from each other's experience: A pool of knowledge can be formed to allow planning work to be done faster and cheaper. This idea led to the establishment of Koncraft-Manufakturen, with a central database. In order to guarantee effective data exchange, a joint storage area in the form of an extranet, in some aspects a joint virtual office, was set up on the Internet. This guarantees that every partner with Internet access and an Internet browser has access to the complete set of data at all times. "The Koncraft shops were recognized several times for their intelligent use of the Internet," the study concludes.

Multitude of Application Possibilities

These two examples show that the Internet, when employed properly, has numerous application possibilities – as a sales or buying platform, for support of administrators and internal and external communications or as a joint knowledge platform. In these options possibly lies the only common denominator that can be used to define an action plan for the future: to fulfill prerequisites at SMBs so that the Internet is employed in a way to ensure that business processes are optimized over the long term.

"Although I already had previous knowledge and also use the electronic animal trade database, I still feel more confident after having participated. I have a much better overview of search functions and e-mail and their possibilities."

Toni Thalmann, farmer and participant in the education initiative "schoolgate," primarily aimed at farmers

"The Internet has advantages and disadvantages. Clear pluses are communication at all hours of the day and night, fast data transfer and help in obtaining information. You can even shop through the Internet; this could be a great relief for handicapped and single people. Here too, though, you unfortunately can't rule out the possibility of misuse, I mean, pornography, terrorism and data misuse. That definitely has to be stopped."

Alina Schönenberger, scholar, Rüschlikon, ZH

"Centers, or so-called computerias, where elderly people interested in new technologies can meet in small groups to obtain knowledge important to them, should be enabled. A computeria team can then provide assistance directly when problems arise – according to the motto "learning with and from one another." Moreover, computerias are given a forum at Seniorweb, allowing them to reach a broader public and free people from isolation by enabling contact."

Marga Stumm, moderator of Dorfplatz forum and Computeria Manager

Joachim Griese, Professor Emeritus at the University of Berne and former Director of the Institute for Business and Computer Science at the University of Berne (IWI)

Mr. Griese, you created the so-called CH21 Barometer. What was your purpose in doing so?

Joachim Griese: Goals must be measurable. Only if they are can you determine if they were achieved or not. The idea of the CH21 Barometer stems from Mr. Quadri, Mr. Prof. Fleisch from HSG proposed the dimensions of the Barometer scale and I proposed the steering committee.

Now that the initiative has run for two years, which of the initial goals were achieved and which weren't?

Griese: Let me name two extreme situations: Goals were exceeded for B2B Electronic Commerce; Swiss companies take full advantage of the rationalizing effect of the Internet. On the other hand, these companies are providing the fewest openings for computer science apprentices; in this respect, a sustained effort to groom successors is missing.

Why do you think a large number of the objectives were not able to be reached?

Griese: CH21 was only able to motivate and initiate individual projects via the CH21 working groups. Internet users could be motivated, but politicians (for example, regarding the question of digital signatures), as is often the case, proved to be resistant to being motivated.

In your opinion, where must action be taken in each of the four areas government, society, the economy and education in order to move this development forward?

Griese: Society (digital divide) and the economy are well on their way; the need

If you want to measure the degree of acceptance of information and communication technologies (ICT) in modern societies, you have to assess the available infrastructure in these countries. The spread of computer science, the Internet and mobile telephony plays a critical role; it goes along with the liberalization in the telecommunications market in the last decade.

In Switzerland a boom in PC sales occurred in the 1990s: Between 1990 and the turn of the millennium, the percentage of households with at least one PC rose fourfold from 15 to 61 percent. Two or more PCs could be found in one out of a hundred households at the beginning of the decade; a decade later nine percent of all Swiss households had two or more PCs. Compared with the rest of the world, our country looks quite good: Only countries such as the Netherlands (70 percent of all households had at least one PC in 2000) and Denmark (65 percent) achieved a higher PC density, while in the USA only every second household had a PC, in Spain and Italy only every third one and in France only in every fourth. The equipping of households with modems – still the most usual Internet connection for private use – lags behind the PC infrastructure: Only one in three households had a modem at the turn of the millennium. On the other hand, the demand for ISDN (Integrated Services Digital Network) lines has experienced a dramatic rise since the middle of the 1990s in this country. By 2000 the number of subscribers, at 737,000 connections, had risen by more than tenfold.

The latter point demonstrates that the public invested in ICT relatively heavily. In 2000 alone every single resident spent on average 2,700 euros for ICT products and services. This puts Switzerland at the top of all OECD countries, even beating the USA. Other industrialized countries such as England, France and Germany had much lower per-capita spending on ICT, at 1,400 to 1,700 euros. A further indicator for the affinity of the population to ICT is the average monthly amount spent by households on ICT products (computer hardware, audio and data storage devices, software, radios, televisions, telephones, fax machines, photography equipment and film) and services (telecommunications without Internet, radio and television license fees, cable television subscriptions, electronic equipment rentals and Internet rates). In 2000 the following scene emerged: A Swiss citizen spent on average 85.3 Swiss francs a month – 23.9 Swiss francs for computer equipment, 22.5 francs each for data storage devices and software and 21.4 francs for each of radios and televisions. In the area of ICT services, average monthly spending amounted to a total of 168.5 Swiss francs, of which 121.7 Swiss francs was spent on telecommunications. For Internet services, in contrast, only a single Swiss franc was invested per household per month – a value lagging far behind other ICT spending.

Investment-Happy Population

These numbers depict clearly that the Swiss population invests to an above-average degree in hardware and products that enable the availability of information and communications technologies. The technological prerequisites for intensive ICT usage have been met in this country. Of course, this says nothing about the actual familiarity of the population with these technologies and all of their possibilities.

They are immense: The World Wide Web does not just offer the user the chance to network and communicate with anyone in the world online; the Internet is also the largest "reference book" in the world. Nowhere else is such a richness of information from all areas of life available, and nowhere else can the thirst for knowledge and curiosity be satisfied as efficiently, quickly and thoroughly. No other communication instrument offers such a wide range of interactive tools. The CH21 initiative showed mercilessly that this is (still) being accorded too little notice – especially in the fields of the economy, education and government. This is a downright fatal finding, because modern ICT is pervading all three areas equally. Only when development proceeds at the same pace in all areas can the ICT Society advance. In business, employment of ICT is more than just a promotional tool;

it also serves toward the acquisition of new knowledge and the advancement of learning processes at all levels of a company. In the field of government, the e-census forms the interface between citizen and government and represents, aside from data transfer, a nucleus for active use of modern technologies by the population. In education, dealing with PCs must be promoted from childhood onward so that it becomes second nature.

A society is only advanced in terms of ICT when its members have integrated the new technologies in all sociological classes and age groups, independently of cultural backgrounds, in their private lives and in their daily buisness. Sociodemographic data on the use of ICT can provide an indication of the extent to which this is true, just as the intensity of use of ICT educational and further training offerings can. In November 2000 Switzerland achieved a European first: During the 2000 census, carried out by the Swiss Federal Statistical Office (BfS), it was possible to return the data electronically to the BfS. The e-census was made use of by only 121,000 households and a total of 281,000 people (equaling around four percent of the

for long-term action exists in the areas of government and education. In the area of the government, Switzerland is in need of more political leadership, and in education, grooming of job successors and thereby knowledge needed for successful use of ICT must be advanced in an enduring fashion.

How do you personally assess the CH21 program?
Griese: For me, it was an impressive experience to compose the CH21 initiative with the CH21 steering committee. Even more so than at the beginning of 2001, today it is clear how important commitment is for the use of information and communication technology in the Swiss Information Society.
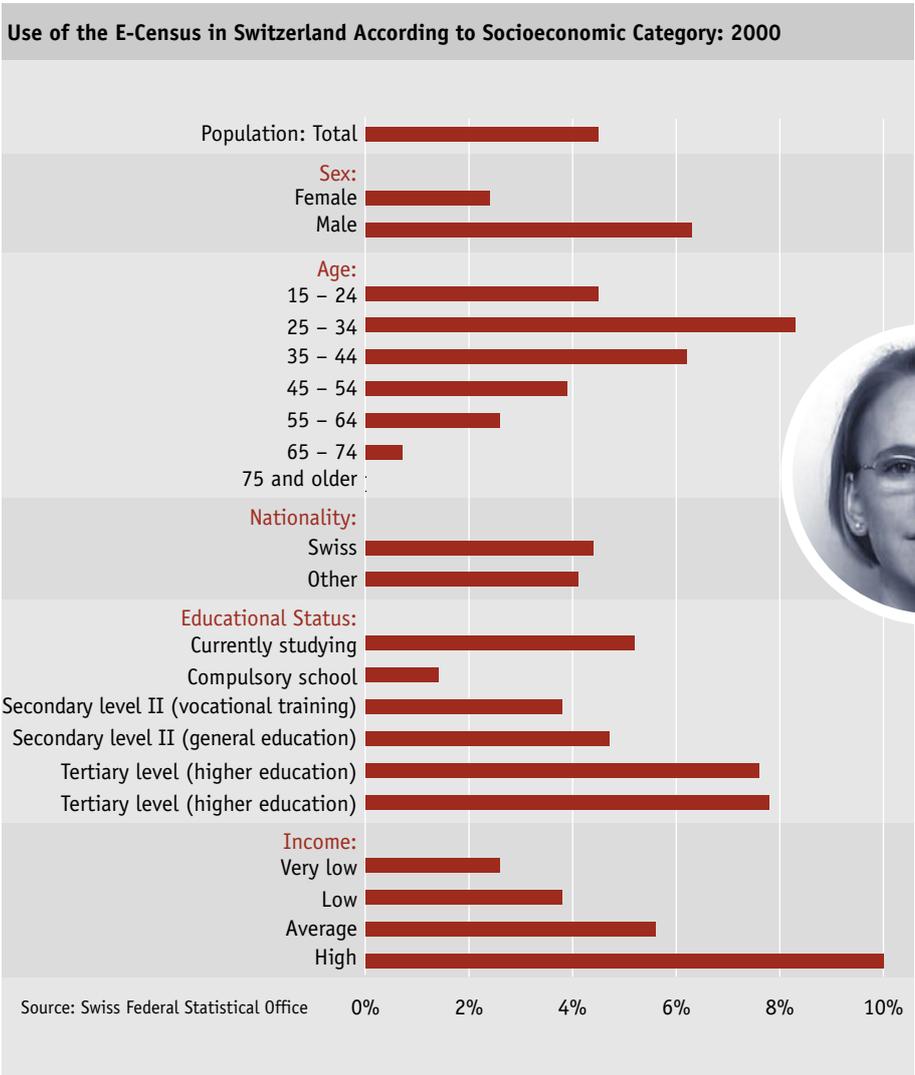
Petra Beck
Student Assistant, IDT-HSG, Institute for Public Services and Tourism, University of St. Gall

You participated in CH21 on the topic of e-government. What did you learn?
Petra Beck: I think I learned two things: first, I saw that a motivated team can achieve a fair amount with a reasonable amount of effort, and second, I experienced that the process of forming a team and developing an idea, a common goal, is much more difficult than implementing the result.
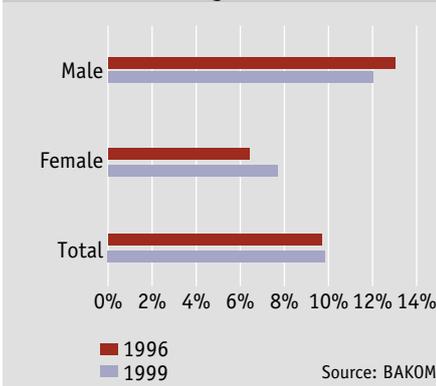
The federal e-government strategy states that if it is possible, all information about the federal government should be available online. Have you, as a student, ever used this offering?
Beck: I've profited more than once by the information published at www.admin.ch. The federal government's offering is well organized and comprehensive; in addition, numerous high-quality documents can be downloaded for free. Of particular use for

Use of the E-Census in Switzerland According to Socioeconomic Category: 2000

Source: Swiss Federal Statistical Office

me have been the Federal Supreme Court decisions, the law collections and the Web site of the Swiss Federal Statistical Office.

Recently in Geneva, the first attempt at e-voting was made. As a member of the young Internet-oriented generation, would you vote online if you could?
Beck: Because I always miss the opportunity to submit a written vote, I often have no choice but to go to the urn on Sunday morning. Sometimes I would be happy to be able to fulfill my civic duty with a click of the mouse; If protection of privacy is guaranteed, I'd vote online immediately.

Another project is related to tax returns, which, for example, in the canton of St. Gall can already be submitted online. Have you ever used this service, or would you ever use it?
Beck: Last year I filled out my tax form online. I didn't have second thoughts about security. Still, I am quite critical of the Internet when it comes to dealing with money and I try to avoid making payments online. The reason for my distrust is that I don't know how my data is protected; if the process were more transparent and understandable to me, I'd have more trust in the technology.

Angeline Fankhauser
Swiss Councilor for Seniors (SSR)
"Web for Everyone"

You campaign on behalf of seniors who want to use the Internet. What is your motivation?
Angeline Fankhauser: Seniors have lived comfortably with the telephone up to now. Now we have additional communication media with enormous possibilities. I want to facilitate the access to the opportunities presented by the Internet.

Where does the greatest need for action lie in the immediate future?

eligible population having the possibility of filling out the form via Internet as an alternative to sending it via regular mail). This was the case for around 90 percent of the inhabitants of Switzerland. At the time of the census (end of 2000), every third person in this country used the Internet regularly, indicating that only every eighth person with Internet experience filled out the form online. Still, this is a relatively high level, considering the fact that the electronic questionnaire did not provide any significant advantages over the paper version.
To a certain extent as a side effect of this procedure, interesting conclusions about the socioeconomic use of the Internet, indicating to some extent society's acceptance of modern ICT, can be read from the tool of the electronically filled-out questionnaire. Accordingly, people with an above-average inclination to the Internet are males between 25 and 44 years of age with higher-level vocational training or a university degree as well as a high income (see figure on page 29). In other words, seniors and women tend to abstain from using the Internet.

Unexploited Potential
Similarly, investigating the progress of ICT degrees according to training or education type shows the following: "The respective fractions of women in various ICT training and educational programs point to a possible unexploited economic potential," the report entitled "Swiss Information Society 2002" by BfS and Bakom states succinctly. This result can be found at all educational levels. In 2000 in Switzerland, only nine percent of all ICT degrees were awarded to women. In comparison, the number of female students receiving their degrees was above average at colleges for business and computer science and universities (14 percent each), whereas it was comparatively below average for apprenticeships (three percent), technical schools (four percent) and polytechnic institutes.
This trend could, of course, be reversed in the near future. If you take the number of trainees and students in the field of ICT as a measure, two tendencies become apparent. Since the middle of the 1990s more apprentices and students – with a higher ratio of women – have

ICT Programs Completed in Switzerland According to Training/Education Type: 1990 - 2000

UNI (universities)
HTL (polytechnic institutes)
TS (technical schools)
HF (higher technical schools)
DIPL (technical diplomas issued by federal authorities)
EF (technical certificates issued by federal authorities)
BBG (apprenticeships regulated in Law on Vocational Training)

Source: BAKOM

Participation Quotas in Advanced Education Courses in Computer Science in Switzerland According to Sex

Source: BAKOM

flooded these occupational fields and educational programs. This is underlined by statistical evidence: In 2000 there were 14 times more ICT apprentices than in 1995 and technical colleges and universities also reported a marked increase in enrolment. Between 1999 and 2000 the total number of apprentices and students in the field of ICT rose more than threefold, thanks also to a higher number of females at all levels. In total, the proportion of female apprentices and students rose by 13 percent, thereby reaching a level that was nine percent higher than the fraction of women who completed their studies in ICT. Currently 25 percent of ICT students are female (see figure on page 32). This signifies that female students are gaining on their fellow male students.

In the field of advanced education, computer science courses received a great deal of interest – around ten percent of the population participated in them in 1999, whereby a fifth of the courses offered related to IT – but women were still underrepresented in the participant group. The participation quota for men was 12 percent and for women, eight percent (see figure), whereby independent of gender, the quota rose with an increasing level of education. While only three percent of graduates of compulsory schools in 1999 made use of ICT tertiary education offerings, ten percent of those who completed secondary school and around 15 percent of all graduates of higher-education schools

did. If the participation quota for advanced education courses in computer science is shown according to age group, different tendencies are found for the period between 1996 and 1999 for 20- to 24-year-olds and for 55- to 64-year-olds, with the first group showing a receding trend.

A Focus on Women

The conclusion is that with respect to the social development of ICT, the greatest need for action lies in the area of women and elderly people. This has been confirmed by individuals active in the CH21 project. For Brigitte Tommasini, leader of the CH21 working group "More Women in IT", it is certain that "for women the technological cumbersomeness of the computer represents the biggest barrier to using of the Internet, this must be removed." Furthermore modern ICT enables work to be done independently of time and location, thereby accommodating working women. For Angeline Fankhauser, copresident of the Swiss Seniors Council, this new technology represents the major restraint that keeps seniors from using computers. "Elderly people often have the feeling that they are too old to learn new things," she says, "at least until they have become involved with computers themselves." The Internet is perfectly suited for networking elderly people and promoting communication between seniors.

Women and seniors also constituted a primary theme in the CH21 project in the field of ICT and society. For women, three key topics were dealt with over the course of two years – and only marginal success was achieved:

- "Women on the Web": This working group attempted (similarly to the German model) to promote Internet access among women and gain sponsors for the project from private-enterprise companies within the scope of a public-private partnership. The latter objective was, of course, extremely difficult to achieve – partly due to a negative business environment. For this reason, the project was canceled at the end of 2002.
- "Job-Sharing Exchange" (JSB): The objective

Fankhauser: Hurdles must be removed: The Web has to be brought to the people if they cannot find their way to the Web. For example, PCs could be distributed along with technical support for free-of-charge Internet use.

Based on your experience, what do senior citizens consider being the greatest hindrance when using the Internet?

Fankhauser: Especially former female employees have inhibitions because they are afraid of using a keyboard. Also, managers who always had their own secretaries, admit to having respect when dealing with PCs.

You are involved in the pilot project "Web for Everyone". What is planned, and what are your goals?

Fankhauser: We lease out PCs with Internet configurations and offer operating instructions. Seniors in particular often shy away from the costs associated with the installation of a PC. We try to get around this initial hurdle. We also try to bring together interested seniors on the Internet. Problems can be solved more readily in a group. However, we would need more support to coordinate the project professionally.

You supported the CH21 initiative for seniors in the Information Society. What did the CH21 initiative achieve in relation to this?

Fankhauser: I received a great deal of verbal support. However, I would have also liked some active help, for instance, money for an office as a contact and coordination center or for PCs and software. A lot is being said about a digital divide, but I don't notice real, concrete efforts to prevent it from occurring.

was to promote part-time work with the help of the Internet, whereby part-time-job seekers could meet via the Internet and apply jointly for full-time positions. Part-time job offerings were also supposed to be made more transparent through the World Wide Web. The project was met with great interest, but it didn't make it past the pilot phase. Despite this, it should be continued in 2003.

• "Writing Shop for Women": On a platform at www.globallokal.ch a writing shop for women was set up to provide a virtual and real learning environment. This project, too, will be continued in 2003, despite having minimal funding and personnel.

Offerings for Seniors

For seniors, the CH21 initiative was able to make use of existing Internet offerings:

• The Internet site for seniors www.seniorweb.ch, initiated by Mirgos Kulturprozent, Pro Senectute Schweiz and Eurag Schweiz (Association of the Older Generation in Europe), among others, has existed since 1998. It contains current news and information about various events, as well as providing an exchange and contact forum and a database listing all the organizations in Switzerland dealing with the topic of aging.

• "Web for Everyone" club: This involves a pilot project, initially limited to Basel and surroundings, that should facilitate the introduction of the Internet to seniors. In the first stage, interested seniors receive scrapped computers on which they can access the Internet. These people in turn support other interested seniors who want to start using the Internet. The project will be financed by the federal government,

which will provide the phased-out computers, by lottery funds from the Basel region and the Zurich company Zeix AG, which will contribute one Swiss franc to the pilot project for every Internet manual it sells. It is intended to extend the project to the rest of the country.

However, despite these efforts, the conclusion is clear: The claim "Web for Everyone" is far from being realized for women and seniors. What applies for these two groups also applies to a lesser extent for the entire society: The medium of the Internet has now become anchored in the public consciousness, but with respect to daily use of ICT, practical and theoretical knowledge about the possibilities offered by this technology, we are far from where we should be.

Percentage of Female ICT Apprentices and Students in Switzerland According to Training/Education Type: 1990 - 2000

Source: BAKOM

- UNI (universities)
- HTL (polytechnic institutes)
- TS (technical schools)
- HF (higher technical schools)
- DIPL (technical diplomas issued by federal authorities)
- EF (technical certificates issued by federal authorities)
- BBG (apprenticeships regulated in Law on Vocational Training)
- Total
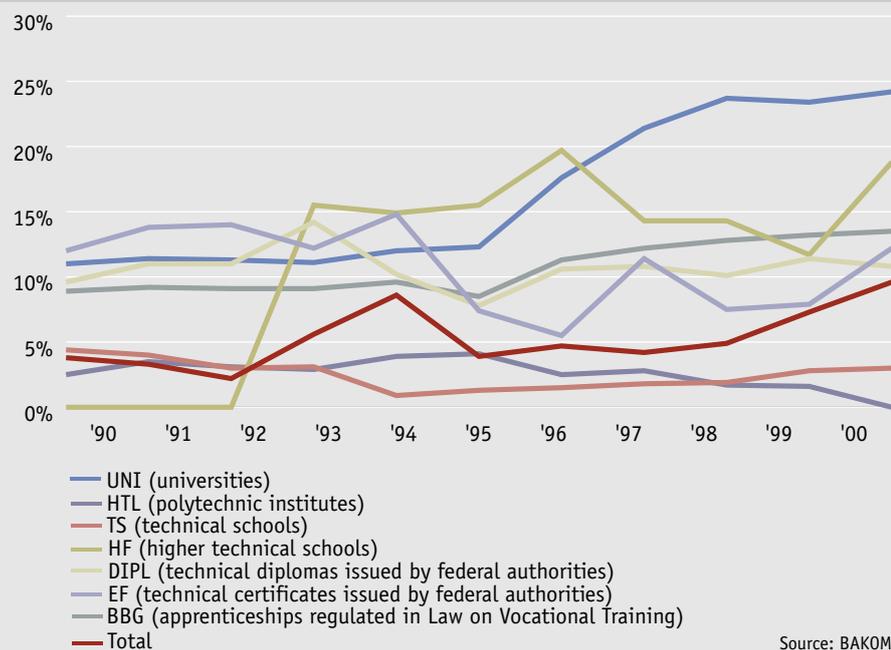
"Switzerland is leading in terms of ICT equipment and investment. The CH21 initiative contributed to better utilization of this outstanding infrastructure, especially through the programs for improved linking of schools and for getting the older generation onto the Net. The real challenge for Switzerland still lies in going from a 'user' to a 'developer' country."

Thomas Held, Director, Avenir Suisse

"The unrealistic heights of the information and communications technologies are being displaced by usable, realistic and implementable concepts. Switzerland is still chasing after the advanced nations and must therefore increase its implementation speed. The fact that in the private sphere as well as in the political/governmental sphere, acceptance of and courage toward innovation has visibly increased provides us with hope."

Peter Hasler, President, Swiss Employers' Association

"The potential for using information and communication technologies has not yet been exhausted in Switzerland. In order to promote the effective and efficient employment of computers and the Internet, we should give top priority to investments in educational and other training programs – within the areas of education, private business and public administration."

Maja Huber, Swiss Federal Statistical Office, Department of Education and Science

The Barometer: A Measure of CH21's Success Story

The CH21 initiative was active for two years, and from the start it was clear to promoters that possible advancements in development of information and communication technologies (ICTs) had to be depicted memorably in a simplified form in Switzerland. The business and computer science institutes at the University of Berne and the University of St. Gall developed a so-called CH21 Barometer, which enabled progress in the central areas of education and further training, government, society and the economy to be represented graphically. It was especially designed to enable a comparison of the target and the actual status for the measured parameters so that it could be determined if the objectives formulated by CH21 were actually achieved or not. In defining the objectives in the various key fields, scientists considered the following points:

In questions of education and further training, since the end of the 1990s the importance of grooming successors in ICT – especially in the area of vocational training – had forced its way more and more into the public consciousness, and to an increasing extent apprenticeship spots for computer science occupations (software, hardware and media engineers) were created. In 2000 new computer science apprenticeships at Swiss vocational schools added up to around 2,200. CH21 had the objective of placing 1,000 new apprentices in computer science occupations per year for the duration of the initiative and reflecting this accordingly in the Barometer.

Promoters of CH21 hoped for a similarly positive experience in the governmental sector. By the end of 2000 the federal government, cantons and numerous communities had their own Web sites, but only a minority of the interactive administrative processes could actually be handled via the Internet. This was reason enough to include this aspect in the Barometer. The objective was to be able to report a rising trend. In the same time, in the Legislative, the passing of a draft law regarding digital signatures was pending. The opportunity was therefore provided for not only supporting this move but also incorporating the acceptance of the digital signature into the Barometer as a parameter.

Independent of these political activities regarding ICT, the social acceptance of the Internet increased further over the course of the CH21 program. However, it was shown that the majority of users are young, relatively well-educated, relatively high-earning and male – i.e., not average Swiss citizens. If a socially positive development was to be recognized during the CH21 project, the profile of people attracted to the Internet as a whole had to correspond to that of the average person. This indicator was also added to the Barometer.

Objectives Formulated

At the end of 2000 the economy was being shaped by the worldwide e-hype, and companies promised themselves substantial cost advantages through electronic business in the B2B area. By the time the initiative started, B2B volume in e-commerce in this country was around five billion Swiss francs; CH21 made it an objective to annually double the e-commerce volume until 2002 and also include this aspect in the Barometer.

With these five indicators and the formulated objectives, the CH21 Barometer was to represent a meaningful and demonstrative control tool that could continuously monitor the initiative's development and progress in achieving objectives with a reasonable amount of effort.

In the first year of CH21 activities, the following development materialized: In education and further training, the envisioned goal was clearly missed. Instead of the envisioned thousand newly occupied apprenticeships in computer science, only half that number was achieved.

With respect to government, the situation was different: Since the Federal Council adopted its e-government strategy on February 13, 2002 and an internal administrative coordination group for an information society (KIG) devoted itself to the topic, a real e-government explosion could be recognized, which increasingly reverberated through the cantons and communities. Federal concepts such as the "Guichet virtuel" portal also allow one to conclude that Internet-supported and interactive administrative transactions will become more common in the future. The topic of digital signatures is also pointing the way to this, having been placed on the political agenda once again. Progress has doubtlessly been made in this area: In the first half of 2001 the draft law on digital signatures

Situation at End of 2001 Depicted by CH21 Barometer: Only One Objective Achieved
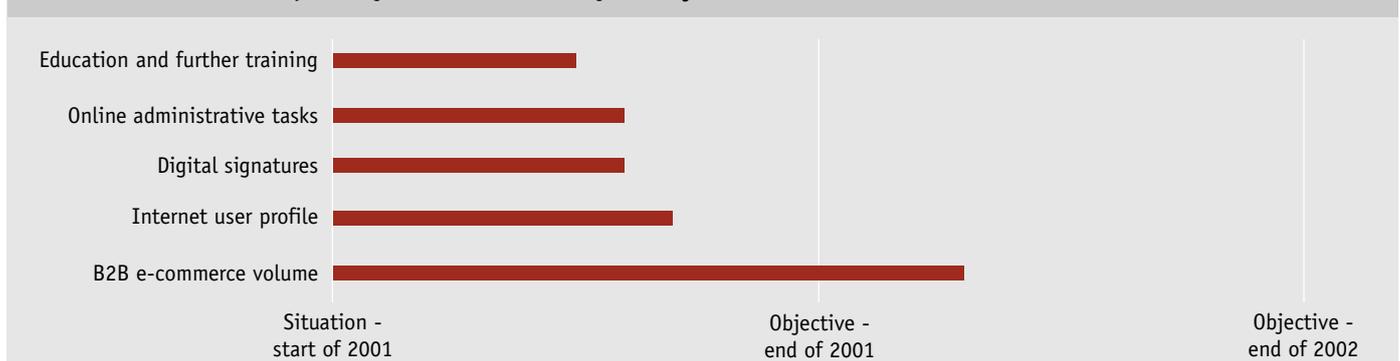
reached the consultation stage; in July 2001 the proposal was passed and became a federal law. Parliamentary debate on this topic in the chambers was first planned for the second half of 2001, but it was then postponed to 2002. Still, since the end of the year the Federal Tax Administration (ESTV) has been accepting digitally signed invoices. In the area of government, therefore, the acceptance of digital signatures has mutated to become an important indicator of an ICT society.

Another Barometer catchword is the Internet user profile. Use of this technology made enduring progress in Switzerland in 2001: 37.4 percent of the Swiss population used the Internet several times a week at the end of 2001, as opposed to 26.4 percent at the end of 2000. The Internet user profile had more closely approximated that of the population, but still there were visible differences between the two. Thus, around 65 percent of Internet users at the end of the year were male, compared to 49 percent of the population being male.

After the E-Hype

In 2001 the e-hype was over and the economy calmed down, but B2B volume in e-commerce had made a lasting development: In 2001 ICT-related product and service transactions between companies to the extent of 11 to 15 billion Swiss francs were completed via Internet; that is around 4 percent of economic inputs.

If the data up to the end of 2001 is analyzed using the CH21 Barometer, a clear picture is obtained (see figure):

In 2002, the second year of the initiative, the economic slump and "clean-up action" in the ICT industry were reflected dramatically in the number of people entering computer science occupations. Thus in 2002 newcomers decreased by around 200 compared to the previous year. In contrast, the public-private-partnership (PPP) project "Internet for Schools" achieved lasting success. The CH21 steering committee therefore suggested that the development "Internet for Schools" should also be redefined in the CH21 Barometer. At the end of 2001 66 Swiss primary schools (primary level and secondary level I) had Internet connections; the goal was to make all primary schools in Switzerland Internet-compatible by the end of 2002.

In the area of government, implementation of the e-government concepts proceeded more slowly than was expected; this could be largely attributed to the federalist structure of Switzerland. Up to the end of 2002 only a few e-government projects that would enable Internet-supported and interactive completion of administrative tasks were started up at the federal, canton and community levels. Also, the proposal for a federal law on digital signatures was still being blocked by parliament in 2002. One reason for this was that the certification provider Swisskey dropped out of the market, making the question resurface as to how digital signatures were to be certified in Switzerland.

Internet use increased further in 2002, and the Internet user profile came even closer to that of the Swiss population. Thus, at the end of 2002 only around 56 percent were male users, whereas the percentage of males in the population (logically) remained constant at 49 percent.

In the economy, B2B volume in e-commerce developed very positively: In 2002 ICT-related product and service transactions between companies to the extent of 21 to 25 billion Swiss francs were completed via Internet; this is more than 6 percent of economic inputs. Because this development already emerged in 2001 and accelerated in the following year, the CH21 steering committee decided to integrate Internet use by companies into the CH21 Barometer. At the end of 2000 78 percent of companies of the second and third economic sectors with more than five employees used the Internet, at the end of 2001 85 percent did, and at the end of 2002 an estimated 90 percent did. Now all companies with 50 or more employees are online. The nonusers can, therefore, solely be found in small companies with fewer than 50 employees. As one of its objectives, CH21 took upon itself the task of being able to demonstrate with the Barometer that all companies in Switzerland were Internet users.

If the situation at the end of 2002 is analyzed using the extended parameters of the CH21 Barometer, the following result is obtained:

The parameters added in 2002 have a positive effect on the overall picture. The activities of the CH21 working groups certainly contributed to

Situation at End of 2002 Depicted by Extended CH21 Barometer: Progress Made

	Situation - start of 2001	Objective - end of 2001	Objective - end of 2002
Education and further training			
Internet for schools			
Online administrative tasks			
Digital signatures			
Internet user profile			
B2B e-commerce volume			
Internet use by companies			
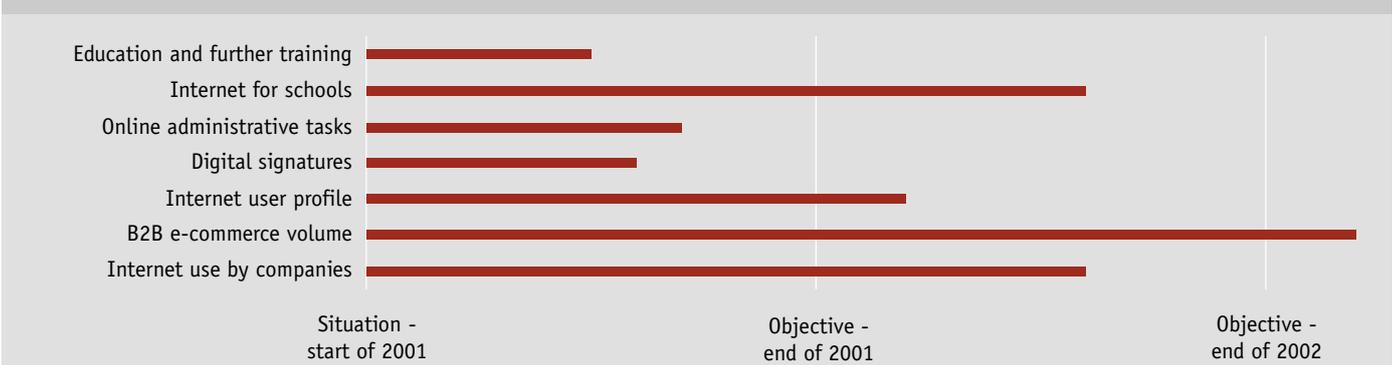
this development, having taken upon themselves topics from the fields of education and further training, government, society and the economy. The following working groups were active in 2002:

• Education
• E-government
• Internet presence of political communities
• Internet for seniors
• E-business SMBs

With the results of the CH21 Barometer in mind, examination of international developments in the field of ICT would be worthwhile. Internationally comparable data, including, for example, the so-called "E-Readiness Ranking" and the "Information Society Index," was collected from around ten public and private institutions in 2001.

The "E-Readiness Ranking" is composed of the following categories, which are weighted and added together to form the index:

• Connectivity and technology infrastructure (25 percent)
• Business environment (20 percent)
• Consumer and business adaptation (20 percent)
• Social and cultural infrastructure (15 percent)
• Legal and policy environment (15 percent)
• Supporting e-services (5 percent)

In this ranking of 60 countries, Switzerland was eleventh, behind the USA, Sweden and Finland, (in 2001); by 2002 Switzerland already occupied fourth place, together with Sweden, behind the USA, the Netherlands and England.

Rivalry Among Nations

The "Information Society Index" is composed of the subindexes "Computer", "Information", "Internet" and "Social", which themselves are made up of individual weighted parameters (for example, in the field of Internet, "Business Internet Users", "E-Commerce Spending", "Home Internet Users" and "Education Internet Users"). With respect to the "Information Society Index", two years ago Switzerland was seventh, behind such countries as Sweden and Norway. In Switzerland reached third place in a 55-country ranking. However, it must be considered that a degree of uncertainty is inherent to these types of international comparisons. For instance, in another international study measuring the so-called "Networked Readiness Index" of 75 countries, Switzerland ended up sixteenth.

If one ventures a look into the future, the following can be ascertained: The CH21 initiative was sensibly limited to two years, but international competition proceeds. An indicator in the field of the economy is thereby the growth of work productivity. The following reports published in November 2002 make this clear.

• Booz Allen Hamilton (publishers), International E-Economy Benchmarking: The world's most effective policies for the e-economy, London, 2002.
• Staatssekretariat für Wirtschaft (publisher), Der Wachstumsbericht, Berne, 2002.

It can be concluded that e-commerce in the field of B2B will grow further. In the USA, according to forecasts, B2B transactions carried out online will amount to around 26 percent of total sales of the companies concerned in 2006; in Europe, it will be 19 percent of all B2B sales. The so-called "digital divide" will widen in the future not only for private users but also for companies. The continent of Africa, for example, not only has the lowest number of Internet users; in 2006 the Dark Continent will also continue to have a negligible contribution to global e-commerce, at 0.5 percent.

The report from Booz Allen Hamilton depicts an e-economy benchmarking system in the form of an analysis in the fields of "Environment for the E-Econom", "E-Maturity of Citizens", "E-Maturity of Businesses" and "E-Maturity of Governments" for the G7 countries Canada, Germany, France, Italy, Japan, England and the USA, as well as for Australia and Sweden – In this study, too, the dimensions of the CH21 Barometer can be found; as well as parameters that especially promote progress in the individual fields. Thus, for example, Canada, Sweden and England focus on ICT in the field of education and further training.

Since the start of the CH21 initiative availability of data on ICT usage in education, government, society and the economy has improved immensely throughout the world. At the same time numerous countries are ICT placing more importance through public and private-enterprise activities. The rivalry of nations in global competition is also being played out on this field.

"The fast and thorough access to information granted by the Internet is of basic sociopolitical significance and represents a vital competitive factor for business, science and administration. We have to ensure that the population is prepared to deal with the rapidly changing information and communication technologies, both in education and in vocational training."

Pascal Couchepin, Federal President

"The technologies are there and new ones are being delivered to our doors every month – from the USA, from the North and from Asia. The Swiss option is to use them. Profound data and bureaucratic know-how are included, as are business-related services and process flows. In order to prepare young people for this, you have to teach them how to read, write and calculate."

Beat Kappeler, author and publicist
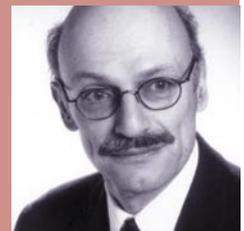
"The information and communication technologies (ICT) have the potential to make a lasting impact on economic growth in Switzerland. We must therefore succeed in creating an innovation-friendly framework within which the new technologies and markets can optimally flourish. The facilitation of the spread of ICT to a broad circle of people, increased competition in telecommunications, improved user capabilities, development of trust in the new technologies and the positioning of the federal government as both user and promoter should therefore take priority."

Ueli Forster, President, economiesuisse
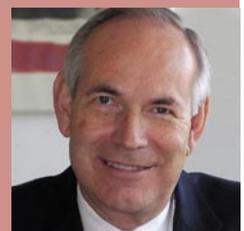
The CH21 initiative was designed to run for 24 months. It had the objectives of taking Switzerland a step forward toward the Information and Knowledge Society, thereby focusing on the bundling, networking and acceleration of existing programs and initiatives. Many good projects were already underway, and many programs were already conceptualized. The results, which were measured using the Barometer, could therefore be attributed to numerous valuable contributions. The projects and outstanding work of the various CH21 working groups fit in seamlessly with these.

It would be desirable to have these projects and programs continued and supplemented with new ones. Crucial is that, as before, representatives from the private, business and government spheres become involved and thereby offer assurance that the Information and Knowledge Society is viewed as an opportunity by everyone and is used by everyone.

A few suggestions.

1. Data privacy and data security are a top priority from a technological and a legal point of view. Data privacy and data security on the Internet are indispensable prerequisites for widespread use of information technology. The current status of development of the Internet cannot be viewed as a reliable basis for the exchange of knowledge. Ease of access must be weighed against security for the user and quality of the information exchange. In this area, lawmakers are needed, as are providers of Internet services. Both government and industry must agree upon a global standard for data security. This problem can only be satisfactorily solved through cooperation on an international scale, with the government being accorded a key role as a regulatory body.

2. Training and education in the use of information technologies and modern knowledge conveyance must be promoted continuously. The project "Internet for Schools" provides an outstanding platform for this. "Internet for Schools", as a public-private partnership initiative, must have secured funding for the medium to long term and be integrated into the ordinary cantonal education budget. In addition, investment into the know-how of instructors at all levels must be guaranteed: Apprenticeship, education and tertiary education offerings must be redesigned accordingly.

3. SMBs should concentrate more on exploiting the opportunities presented by employment of information technologies. Today most companies are present on the Internet and are completing some of their transactions via the Internet. In doing so, they need to determine whether business processes can be simplified and new markets opened up. Thus, know-how transfer, as is already being practiced in the seminars of the "Praxis-Arena" (see www.ecademy.ch for details), should be used to support the SMBs. In workshops, SMBs, together with experts, customize e-solutions and implement them. The already existing case-study database ("Projekt eXperience") provides valuable services in relation to this. These efforts must be continued.

4. The government dealt with the topic of the Information Society at an early stage and took action. This action, however, was not aimed at securing a leading role for the government and promoting and shaping the development. Many projects are progressing parallel to one another and in an uncoordinated fashion. The new eCH initiative provides a good platform for coordinating all contributors. Work on creating a legal framework for digital signatures must also be continued. A breakthrough can only be made if the government works closely with the business community.

Within the scope of the CH21 initiative, numerous committed personalities who already contributed to projects or could be motivated to participate in new projects. They all deserve praise and recognition.

Ahead of us lies an exciting, challenging and promising era, characterized by new possibilities for knowledge generation and the resulting benefits which allow the economy and society to flourish.

For Switzerland, too, this represents a great opportunity – an opportunity that must not be missed.

Members of CH21

Accenture AG

AITI Associazione industrie ticinesi

ALaRI Institute – University of Lugano

Alcatel Schweiz AG

AMCHAM American Chamber of Commerce

Amt für Informatik Basel-Landschaft

Arthur Andersen AG

Arthur D. Little (Schweiz) AG

Ascom Management AG

Asetra Group AG

asut
Schweizerischer Verband der Telekommunikationsbenützer

Avenir Suisse

Bayer International SA

Beecom AG

Betty Zucker + Co.

Bilanz
Das Schweiz. Wirtschaftsmagazin

Bildungsdirektion Zürich

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bremen online services GmbH & Co. KG

BroadVision AG

BSI SA
Banca della Svizzera Italiana

Bundesamt für Informatik und Telekommunikation BIT

Bundesamt für Kommunikation BAKOM

Camera di Commercio industria e artigianato TI

Cap Gemini Ernst & Young (Schweiz) AG

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Cisco Systems (Switerland) GmbH

c-matrix group ag

Compaq Computer (Schweiz) GmbH

Computerias Schweiz

Conextrade AG

CPTIC (Centre pédagogique des Technologies de l'Information et de la Communication)

Credit Suisse

CSC Switzerland AG

Delec AG

denkbilder

Département de l'instruction publique, Genève

Derendinger AG

Die Mobiliar Versicherungen

Die Post

Digicomp AG

DV Bern Holding AG

Easylearn

Ecademy

Ecole de Multimedia et d'art de Fribourg SARL / EMAF

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Edition Renteria SA

EDS (Schweiz) AG

educa.ch

eduswiss

Eidg. Departement für auswärtige Angelegenheiten EDA

Eidg. Finanzdepartement EFD

ELCA Informatik AG

EMPA / Ugra

Engineers – Shape our Future INGCH – Ingenieure für die Schweiz von morgen

EPFL Ecole Polytechnique Fédérale de Lausanne

ESPRiT Unternehmensberatung AG

ETH Zürich

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Fiduciaria Mega SA

Furrer Informatik AG

Gate Informatic SA

Gebert Rüf Stiftung

Gemini Consulting AG

Generalsekretariat FDP

Global Human Resources Ltd.

Global Knowledge

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Groupement Romand de l'Informatique, Lausanne

Gruppe Rüstung, VBS

HES-SO Haute Ecole Spécialisée de Suisse Occidentale

Hewlett-Packard (Schweiz) AG

Hilti AG

Hochschule für Technik und Architektur Biel

Hochschule für Wirtschaft HSW Luzern

Hochschule für Wirtschaft und Verwaltung HSW Bern IWV

Homburger Rechtsanwälte

IBM (Schweiz) AG

IBM Forschungslaboratorium

ICLIP AG

ICTnet

Industrie- und Handelskammer (IHK) St. Gallen-Appenzell

Infras AG

Institut für Informatik der Universität Zürich

Institut für öffentliche Dienstleistungen und Tourismus, St. Gallen

Institut für Technologie-management, St.Gallen

International institute of man-agment in telecommunications (iimt) – Universität Fribourg

Interxion (Schweiz) AG

ISolutions GmbH

itopia – corporate information technology

ITZ InnovationsTransfer Zentralschweiz

Jugend Kultur Haus Färbi

Junior Achievement Switzerland

Kanton Zürich Datenschutz

Kantonales Steueramt St.Gallen

Klaus J. Stöhlker AG

Küssnacht am Rigi Tourismus

Lego

Lernklick

LeShop SA

Lexsys AG

Logitech International SA

Lombard & Howell AG

McKinsey & Company, Inc.

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Mercuri Urval AG

Microsoft AG

Migros Genossenschafts-Bund

NCiCube AG

Notes Development AG

Oberstufenschulhaus Rüschlikon

Observatoire technologique de Genève

OOIT.com AG

Paninfo AG

Philips AG

Poth & Partner

PricewaterhouseCoopers AG

Primarschule Greppen

PSI Paul Scherrer Institut

PubliGroupe SA

RJM-Studio

R-Konsalt

Robert Weiss Consulting

RTC Real-Time Center AG

SAP (Schweiz) AG

Schoolgate

Schweiz. Arbeitgeberverband

Schweiz. Bibliothek für Blinde und Sehbehinderte

Schweiz. Fachstelle für Informationstechnologien im Bildungswesen SFIB

Schweizer Informatiker Gesellschaft (SI)

Schweizer Radio DRS

sederwäl ag

seniorweb.ch

Sercon AG

Siemens Schweiz AG

SISR Societé des Informaticien, Section Romande et NT Consulting SARL

SKU Schweizer Kurse für Unternehmensführung

smartwrite

SoftConn GmbH

Staatssekretariat für Wirtschaft SECO

Stiftung für Datenschutz und Informationssicherheit

Stiftung Hasler-Werke

Stiftung Infosurance

SUN Microsystems (Schweiz) AG

Sunny Connection

SUPSI Dipartimento di informatica ed elettronica

SVI/FSI Schweizerischer Verband der Informatikorganisationen

SVIN Schweiz. Vereinigung der Ingenieurinnen

SWICO Schweiz. Wirtschaftsverband der Informations-, Kommunikations- und Organisationstechnik

Swiss Economic Forum GmbH

SWISS International Air Lines AG

Swiss Re

Swiss-American Chamber of Commerce

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TUS Telekommunikation und Sicherheit

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vasp datatecture

VZH Verband Zürcher Handelsfirmen

Werbal GmbH Werbeagentur ASW

Wisekey SA

Worldcom AG

XPERTEAM Management Consultants AG

YESI Young Enterprise Switzerland

youTS you take success AG

Zeitraum

Zeix AG

ZENIS Zentrum für Internet-Strategie

Zobrist Consulting AG

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Education

www.educa.ch
Swiss education portal – a joint project of the Swiss Conference of the Cantonal Education Directors (EDKs) and the Federal Office of Occupational Training and Technology (BBT) implemented by the Swiss Agency for Information Technologies in Education (SFIB)

www.zeix.ch
Web site providing advice on the Internet and PCs

www.zumnet.ch
Project of Mediaschule – center for teaching media on the Internet

www.bbt.admin.ch
Web site of the Federal Office of Occupational Training and Technology (BBT)

www.schoolnet.ch
Created as part of Swisscom's "Internet for Schools" education initiative, schoolnet offers a variety of menus, including School & Study, containing information on schools and learning, the environment and other topics, as well as sms messaging, chat and games, Fun & Lifestyle and more

www.schulweb.ch
Education server sponsored by business for teachers, providing information on topics ranging from fiscal to social policy, from the world economy and international trade to bilateral agreements, etc., with all business-related topics documented and updated regularly

www.alice.ch
ALICE stands for Adult Learning Information Centre and is the education server for life-long learning operated by the Swiss Federation for Adult Learning (SVEB). SVEB is a blanket organization for all advanced general education and occupational training.

www.swissuni.ch
Web site containing information on continuing education at Swiss universities and colleges

www.switch.ch/edu
Switch, the Swiss Education and Research Network, offers information on all higher education institutions, libraries, research teams, publications, etc.

Government

www.electronic-government.ch
Center of Excellence for Electronic Government (CE eGov), University of St. Gall

www.admin.ch
Web site of the Federal Authorities of the Swiss Confederation with links to all cantons, among others

www.e-gov.ch
E-government site for the canton of Zurich

Economy

www.insider.ch/kmu
Internet advisor for small and medium-sized companies

www.e-business.fhbb.ch
Web site of the Institute for Applied Business Economics (IAB) in the Business Department at the University of Applied Sciences in Basel (FHBB)

www.iwi.unisg.ch
Web site of the Institute for Business and Computer Science at the University of St. Gall

www.pascal-sieber.ch
Web site of Pascal Sieber & Partners AG, with ideas for the networked world and interesting research results and events

www.seco-admin.ch
Web site of the Swiss State Secretariat for Economic Affairs (Seco)

Society

www.infosociety.ch
Web site offering all documents of the federal government on the topic of the Information Society as well as national and international studies, reports and statistics providing insight into various aspects of the Information and Knowledge Society

www.seniorweb.ch
The SeniorWeb club sponsors the Internet platform at seniorweb.ch, which provides seniors with information and the possibility to meet other seniors.

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