On the Way to an Information Society

A Critical Assessment of the Activities of the Swiss Federal Government

Center for Science and Technology Studies
Zentrum für Wissenschafts- und Technologiestudien
Centre d'Etudes de la science et de la technologie
Centro di studi sulla scienza e la tecnologia

Center for Science and Technology Studies

The CEST develops, monitors and assesses the fundamentals for policy decisions in the fields of research, tertiary education and innovation in Switzerland. Through this it contributes to the development of the country's scientific, economic and cultural potential. To this end it carries out analyses, evaluations and prospective activities.

Zentrum für Wissenschafts- und Technologiestudien

Das CEST beschafft und überprüft die Grundlagen zur politischen Entscheidfindung im Bereich der Forschung, Hochschulbildung und Innovation in der Schweiz. Es leistet damit seinen Beitrag zur Entfaltung ihres wissenschaftlichen, wirtschaftlichen und kulturellen Potentials. Zu diesem Zweck führt es Analyse-, Evaluations- und prospektive Tätigkeiten durch.

Centre d'études de la science et de la technologie

Le CEST rassemble et examine les éléments de base nécessaires à la réflexion et à la décision politique en matière de recherche, d'enseignement supérieur et d'innovation en Suisse. Il contribue ainsi au développement des potentialités scientifiques, économiques et culturelles du pays. C'est dans ce but qu'il procède à des analyses, des évaluations et des études prospectives.

Centro di studi sulla scienza e la tecnologia

Il CEST raccoglie ed esamina gli elementi necessari alla riflessione e alla decisione politica in materia di ricerca, d'insegnamento superiore e d'innovazione in Svizzera. Esso contribuisce così allo sviluppo delle potenzialità scientifiche, economiche e culturali del paese. È a questo scopo che il centro produce delle analisi, delle valutazioni e degli studi prospettivi.

On the Way to an Information Society

A Critical Assessment of the Activities of the Swiss Federal Government

Results of an Evaluation Commissioned by the
Information Society Coordination Group (ISCG)
and the Working Group on Scientific Assistance

Center for Science and Technology Studies
CEST

Contents

1. The Current Situation

„Information Society" is the term used for a society and economy that is characterized by the intensive exploitation of communication and information technologies. Within this concept, we talk of the convergence of the devices, which help manage information, and networks, which are used for the exchange of information. The Information Society is taking the place of the Industrial Society. Therefore within the Information Society, information is considered an important resource just as coal, oil, or steel were for the Industrial Society.

Many nations have developed programmes during the course of the 1990s,
* with which they wanted to create better opportunities for their citizens to come to terms with the Information Society,
* through which they wanted to create a better situation for their economies in an environment of global competition, and
* with which they wanted to adapt their government administrations to the demands of an Information Society.

This is also the case in Switzerland. Here the starting situation is favourable: the superior quality of the data networks, the high standard of education, and the large number of enterprises and private households that have Internet access via computers. In international rankings, Switzerland is among the leading nations; compared to other nations, the Swiss spend far more than any other people for information technology (on a per capita basis compared to gross domestic product). Switzerland is in fourth place with regard to hosts (per thousand inhabitants). In contrast, however, Switzerland is among the „medium-intensity" user nations of information and communication technologies according to an OECD study.

The Swiss Federal Council sees the Information Society as an opportunity for Switzerland while, at the same time, wanting to avoid possible negative consequences. It released its „Strategy for an Information Society" in 1998. This tied into previously initiated programmes of the federal government and until today has provided a roadmap for the administration. This strategy paper calls for the creation of a structure for the coordination of federal activities among the individual departments – the „Information Society Coordination Group" (ISCG). The Federal Council establishes in this paper the strategy for the individual areas in which the administration should be active:
* an education offensive for the Swiss population;
* an increase in the attractiveness of Switzerland as a centre for commerce;
* electronic commerce;
* electronic official traffic;
* new cultural forms;
* secure and accessible information;
* scientific assistance in implementing the strategy; and
* a legal framework structure.

The Federal Council signalled that the Information Society is a priority and confirmed this again as a focal point of its policy in its objectives for 2002. The strategy of the Federal Council and the annual report of the Information Society Coordination Group (ISCG) are available at www.infosociety.ch.

The Centre for Science and Technology Studies (CEST), together with a group of international experts, set out to conduct a critical evaluation of the strategy of the Federal Council as implemented through the fall 2001. The complete results and the report of the international experts can be downloaded at www.cest.ch. In the following, CEST presents a concise summary of its work, and emphasizes points, where it could prove useful for the future work of federal agencies.

2. Results from the Individual Areas

2.1 Administration in the Information Society

First of all, public administration wants to put its house in order for the Information Society. In order to do this, it first must orient its internal procedures and processes in such a way that they take advantage of information and communication technology as much as possible. At the same time, it wants to be a partner for the people and companies alike and communicate efficiently while using electronic media whenever possible: in other words, „eGovernment."

The NOVE administration reform programme was well under way before the Federal Council's 1998 strategy was published. NOVE-IT will reorganize the information services within the administration by 2003. The „eGovernment Strategy of the Federal Government" was first presented in fall 2001. It shows on which basic principles the support for government and administration through information and communication technology should rest. The eGovernment strategy encompasses a series of ongoing or planned projects. These concern the exchange of data among the federal agencies („government to government") as well as services for the people („government to citizen") and commerce („government to business"). The existing collaborative effort, namely of the Confederation's IT strategy board with the Federal Council's Chancellery, provides the groundwork to ease the work of the administration into the Information Age. Plans also call for interfaces to the registries and the federal archives. The plans implemented, initiated, and planned correspond to the 1998 strategy paper and the action plans presented since then.

Despite satisfying results, the evaluation nevertheless reveals that uniform rules for the handling of electronically prepared documents (for example, e-mail) are still not applied within the federal administration. Furthermore, comprehensive knowledge management embracing all agencies is lacking.

2.2 Administration Services for Citizens and Business

The federal government wants to improve its communication with the people and business by progressing from the mere provision of information via the Internet to real communication with partners and finally to the electronic processing of transactions between administrative agencies and external parties. The previously mentioned eGovernment strategy spells out the necessary objectives. Furthermore, the federal government wants to trigger a degree of coordination among the administrations of the communes, cantons and federal government in this matter. An intelligent portal should bring about the desired result for the people and business. The end result should be that users need no longer wonder whether their concern is the responsibility of the commune, canton, or „Bern" and which agency they should turn to.

The Swiss federal government has had an Internet presence through its Confoederatio Helvetica homepage at www.admin.ch since 1995. This allows it to provide important services for users online such as the Bundesblatt (Federal Gazette) or the systematic compilation of laws, decrees, and regulations. A portal for the company index (Zefix), which is very often used for queries, was also set up without a co-ordination based on the 1998 strategy paper. The Official Swiss Trade Gazette (Schweizerisches Handelsamtsblatt) will also go online in the near future. Those subject to value-added tax will soon be able to deal with the tax office electronically. A similar functionality will be the ability to process import and export documents and duties electronically. Those who rely on geographic information for their businesses, can call this up in electronic form for all of Switzerland. One portal that has already been realized is the „Guichet créateur", which advises those setting up companies and directs them to the regulations they need and also shows them how to find the agencies responsible for their questions.

The „Guichet virtuel" (virtual frontdesk) deserves special mention as a uniform government portal organized according to life's milestones such as births, marriages, moves, or deaths. It is designed to allow citizens to obtain all important information and conduct transactions by visiting a single virtual

„government desk" in the future. This is a high-priority project that is being driven forward with great constancy. Several important hurdles have already been crossed. Contracts have been signed with the cantons; without their participation this would be just a federal „frontdesk". This project is well on its way to achieving its objectives.

On the one hand, the net result of these efforts is therefore generally positive in the areas of „government-to-government" and „government-to-citizens" as well as „government-to-business". Many interesting individual projects have been implemented or are just about to go live. On the other hand, the coherence foreseen in the eGovernment strategy has not yet been achieved. There are also no noticeable efforts underway for a basic reengineering of the structures and procedures of the federal administration using the potential of information and communication technology throughout all of the existing modules and routines. The preconditions for an exchange of personal and business data among the federal agencies as well as between the federal and cantonal agencies have been established but questions have been raised whether important data protection issues (right to privacy) have been sufficiently addressed.

2.3 The Legal Framework

The possibilities created through the electronic handling of business transactions require amendments to the legal framework initially. Persons and official agencies need to know who they are dealing with online when preparing a tax form or paying an invoice, for example, or when making an entry in the Property or Official Registry. In pre-electronic times, a person's signature or official certification (notarisation) served this purpose. Digital certification and signatures had to be invented for an electronic world.

In a broader sense, all of the measures from legislation to jurisdiction and prosecution form part of the legal framework. These should provide citizens and enterprises alike with a sense of trust, reliability, and legal security when electronic transactions are handled. Furthermore, the authors, artists and composers along with the companies that represent their

interests, need to know that their rights are protected which includes electronic use and copying (intellectual property rights and copyright laws). Finally, telecommunication services must be clearly regulated. The media branch and the consumers, who use its services, all must know exactly where they stand and what rights they have. A country that had especially wise regulations of this kind and was known for the clarity of its laws would be an ideal business location for electronic commerce.

The certification ordinance published in 2000 and the draft of the federal law on certification services are successes resulting from the implementation of the federal strategy. The telecommunication act already went into effect in 1997. This laid the groundwork for a liberal regulation of the telecommunication market. The final step to achieving liberalization – the freeing up of the so-called „last mile" – was recently blocked by the federal court, however. The current revision of the radio and television act will take into consideration the convergence of media (radio, television, telephone, and computer with Internet access). Following requests from many sides, current applicable law was also partially examined as to whether its regulations somehow unnecessarily restrict the development of an Information Society.

The evaluation showed that electronic commerce primarily requires trust to come about. In many areas, a digital signature is of far lesser importance than sometimes thought. That the previous private provider of electronic certification services has pulled out of the market because of a lack of demand is another indicator of this tendency.

The experts missed a coherent presentation of federal legislative policy for the Information Society. It should lay down guidelines about where new laws must be drawn up or existing regulations adapted, how a degree of harmonization with foreign laws can be achieved and where advantageous special standards must be worked out for Switzerland's economic interests. In this conjunction, standards for copyright law, fair trade regulations, consumer protection and data protection standards must be discussed in a single context. Special attention must be paid to the mediation or arbitration of the conflicts, which result from electronic trans-

actions. Finally, more discussion is needed on whether Switzerland really needs a uniform electronic identification for its citizens and companies or whether it would be better to establish identity on a case-by-case basis.

2.4 Electronic Democracy

The 1998 strategy paper already indicated that the use of information and communication technology would enable new forms of civic participation and public opinion. It also stated that an opportunity could be present to intensify the nation's political life through this.

The utilization of information and communication technology also has an impact on democratic freedoms and not just on the relationship between the citizens, on the one hand, and the administration or government, on the other.

Information and communication technology can support the democratic process among a nation's citizens. Perhaps it can also lend the process a new dimension, because experts claim that these technologies collectively offer more than just the availability of web forums. Those who know how to use new technology can inform themselves more easily but not necessarily more reliably. They find out faster what others think, and they can express and organize themselves better through discussion forums.

The administration's contribution to these processes should primarily be through information and transparency (principle of public access to state documents). It could make it even easier to exercise political rights, for example, by permitting voters to cast their ballots not only at the polling station or by mail but also through an electronic method. The introduction of the „electronic vote" is being prepared by the federal administration. The report published at the beginning of 2002 on the opportunities, risks and feasibility of exercising political rights electronically, shows, however, that numerous political, technical and economic questions first must be clarified and that the earliest possible date for electronic voting is 2010. Among other questions under discussion is what means could be used

for right to privacy protection for the voters who participate in electronic votes and elections.

In contrast, a wide ranging discussion about how a harmonization of administrative procedures among the communes, cantons, and federal government – which is what the „Guichet virtuel" will finally bring about – will and should impact the nation's federalist structures and principles in an Information Society, for example, is still lacking.

In the conventional Swiss democracy, the Stammtisch (regulars' table at the local pub), neighbourhood gatherings, clubs, associations, opinion media, not to mention the political parties, and increasingly, since the 1960s, the new social movements have contributed to the formation of public opinion. If citizens are expected to participate more actively in politics in the Information Society, such intermediary institutions must be strengthened. Expanding their opportunities through electronic means serves this goal. Is it conceivable and meaningful that public funds are used to support their Internet sites in setting up and expanding interactive forums?

2.5 Security

One service of a state is to ensure security for its citizens and enterprises when the individual person or company is no longer able to manage. Such service has civil, economic and military aspects. The electronic steering of production processes, logistics and the utilization of electronic information systems inherently bring new technical dependencies. Vital systems are vulnerable in a new way. A broad spectrum of possible critical and catastrophic scenarios open up ranging from the consequences of technical defects to incorrect operation and sabotage through hackers, from espionage to electronic warfare.

The InfoSurance Foundation, the special staff agency for information security, and the volunteer agency for information infrastructure have made general arrangements that make it possible to uncover and fend off attacks on the systems important to the private economy and public administration. That major international corporations have already adopted their

own course is not reason for reproach. The efforts of the federal government and the semi-private organization it supports therefore are chiefly focused on the needs of small and medium-sized enterprises and companies primarily doing business in Switzerland (for example, Swisscom).

It was not possible during the course of this evaluation to uncover what information security efforts have been undertaken by the defence department, and therefore these are not assessed here.

The experts recommend that the regulations and technical solutions are complemented through more communication among those responsible in the various affected areas. For them, security is a process in which a continuous exchange of experience plays a central role.

The subject of security has other aspects as well. Whoever stores data or information electronically would like to have the assurance that he is able to find and reuse it again in its complete, unaltered and original form at any time. Therefore, those responsible for collections, libraries and archives – in other words, our cultural heritage – are especially interested in this range of issues, where documentation specialists should also be called in. Business procedures as well as the creation, transmission, management and storage of electronic documents are questions that concern the federal administration here. Those in charge of registries, archives and collections deal with fundamental problems related to the handling of electronically produced objects. Added to this is the output resulting from the digitalisation of analogue objects. The task of guaranteeing the security of information storage is closely related to the task of ensuring that information is accessible for today's as well as for tomorrow's users.

The Working Group on Security and Availability, which was reorganized under new leadership in 2001, has important work to do. This ranges from determining what subjects and tasks it must cover to the development of solutions. The federal government must develop these to a large extent itself, since, according to the experience of the experts, the industry offers no directly applicable solutions. It is unfortunate, however, that the federal government is not further along in dealing with this complex of questions.

2.6 Cultural Heritage

The federal government administers a portion of Switzerland's cultural heritage. This includes the collections in the National Museum, art collections, the National Library, the Federal Archives and other institutions. These institutions take on additional assignments in the Information Society. It is expected that electronically produced cultural objects, whether the work of artists who work with electronic media, records for administrative bodies, governments, parliament, etc. financial data, census records, etc. are correctly labelled, stored and made available on request. Furthermore, it is also expected that older, analogue recorded information, such as reel-to-reel tapes, videos, movies, and photographs can be rescued for the future through new digital technologies. Finally, there are tendencies to digitalize all collections retrospectively either for documentation purposes or to make them more readily available to the public for educational, research, entertainment, or other reasons while protecting the originals. A prerequisite for storing and communicating, however, is cataloguing the collections in indexes. It is considered standard practice today to publish indexes as databases in the Internet so that those interested are able to get a clear picture of the complete collection.

This work is well advanced at the Federal Archives. The project for the archiving of electronic data (AREL-DA) will ensure the conservation of digitally produced information; the federal government information centre project (IZ Bund) will provide virtual access to information in archived material and enhance this with context information. It is hoped that these projects can be realized on schedule. The Working Group on Security and Availability has already been mentioned. The Federal Archives plays a leading role in these, which results in meaningful synergy. The cooperation with the Confederation's IT strategy board creates good conditions.

A digitalisation and referencing project exists for material in the collections, museums, and the National Li-

brary. Through the work of a private consulting firm, this took on a comprehensive shape in 2001. This now has a solid foundation according to the opinion of the experts, but the realization of the project must still take place.

Parallel to this, a concept for the maintenance, development, and transmission of electronic works of art was developed. This has begun to take on a concrete form, and a mandate has been granted to project participants. This work takes place under the „sitemapping.ch" project package, which began with a stocktaking of the needs of the participants in this area.

Finally, the federal government is already supporting the conservation of electronic expressions of cultural and cultural-political work within the so-called social-cultural projects. Up until now, 110 videos from the social unrest of the 1980s have been digitalized in Zurich as part of a pilot project. In the same framework, a group was supported that electronically archived the work of and with laymen on everyday culture (living history).

The projects for working on cultural heritage and collective memory are expensive. In the summer of 2000, the federal government made available the so-called eGovernment funds for those projects that were already worked out in some detail. This removed one of the hurdles that limited the development of these projects previously.

Synergies were sought among the archives, libraries, and museums that had often gone their own ways in the past. However, the conservation work for media works of art was apparently hardly taken into consideration. In the realm of the archives, it seems that the level of cooperation between the Federal Archives and those of the cantons and larger cities still could be improved, because the latter have contracted separately for their own national strategy for dealing with electronically produced records and information.

During this evaluation, no information became available on how far the pilot projects under the heading of social-cultural projects have been successful and what conclusions were drawn for the next steps.

2.7 Supporting the Arts

The federal government has supported the arts in Switzerland for some time. Now it must deal with the expectation that artists, who work with new media, enjoy the same support. In the process, it was recognized that such media artists could easily slip through the established support framework.

In an exemplary demonstration of cooperation among those concerned, the needs of the artists were worked out at two conferences within the „sitemapping.ch" project. The result was a draft proposal for comprehensive support ranging from training and ongoing education, production, technique, and networks to showing and conservation. In the meantime, project plans have been developed. These should contribute to the development of Switzerland as an attractive workplace for innovative art, as the experts advised. If we accept the outlines of these drafts, the only area still open to question is training and ongoing education. It seems that greater emphasis could have been placed on cooperation with the universities of applied art and the vocational institutions.

The experts emphasize that media artists are professionals, who bring together many entirely practical skills across the disciplines (research and development of software, design concepts, and distribution solutions). In a certain sense, they are the researchers, developers, and engineers of the Information Age. And this leads to another point of view. Whoever takes this stand demands that not only schools of fine arts, but also the technical institutes of higher learning must account for the education, research and development aspects of the media arts. If this point of view is adopted, an initiative is needed to bring about a closer collaboration between those who need support and industry, because the work of the former is ‚functional' in economic terms. And if the private sector should increasingly support the media arts, the offices in charge of the project must examine whether the federal government could not develop a tax relief concept that would provide an incentive for this group. What would be ideal is an association among the media arts, teachware and related software branches, the utilization of the results from

education projects (see 2.8 below), the area of cultural heritage and media enterprises (for example, publishers). Artists as a moving force with usable skills could be seen and supported as part of a content industry, which served as the centre of a Swiss ICT cluster. This cluster would be co-equally propped up by support for the arts, education policy, and the promotion of small and medium-sized enterprises.

2.8 Education

Education is a key topic in the Information Society. The only way to reach the idealistic goals spelled out in the 1998 federal strategy paper is through appropriate educational efforts. Individuals should be empowered in such a way that they can use the information and communication technologies on their own and autonomously instead of being at their disposal. This empowerment simultaneously has a social-political effect. It is a measure against the impending division within society between those with and those without mastery of culture techniques, which are called for in an Information Society. Furthermore, educational institutions at every level must apply these new forms of technology for contemporary education and methodology. Finally, the economy is calling for human resources, who can deal with these new forms of technology independently and innovatively, who are prepared for life-long learning, and who can remedy the lack of information systems specialists.

The federal government has made great efforts to achieve these objectives. Due to the country's federalist principles, the federal government can only be active in such questions with the cooperation of the cantons, except in the area of vocational education and the universities of applied art and science, where the federal level has granted greater authority.

The federal government has been successful in bringing together in a coordinated fashion the cantons, the private sector, and itself in the area of general education through its impulse program Public Private Partnership – Schools on the Web. The ICT and Education Task Force played an important role in this success. Parliament approved funding for the federal government for this programme that can now primarily be

used to train the trainers. The requirements of the education offensive are fulfilled to a large extent through the impulse programme that the 1998 strategy paper demanded.

It will only be possible to assess the concrete effects of the initiative much later. Success will depend in part on whether it is possible to continue the groundbreaking work of the pioneers among the educators and progressive cantons. The development of tools, didactic methods, and content must also keep pace with technology. The Educa education server could play an important role here if it is not just used as a networking platform but rather as an instrument for active development and content distribution.

Good conditions were created for vocational education as well. The modular approach for the definition of vocations and the efforts to create more flexible teaching elements, which can be used for training and ongoing education alike, are promising. The Cooperative for Informatics Vocational Training in Switzerland (I-CH), set up through the initiative of the federal government, is designed to implement the new concept of a modular apprenticeship as an information systems specialist as well as ongoing vocational training leading to federal certificates and diplomas in informatics.

At the higher education level, the Virtual Campus programme is in place and was subsequently opened for the universities of applied arts and science. The first course modules will go online on a trial basis in 2002. Relatively little was taken in the way of precautionary measures to permit the technical knowledge (engineering), which is necessary to support virtual learning, to unfold correctly. What is not readily apparent, however, is how the successful projects later should be transformed into spin-offs, for example, or become subject of further development through professional publishing houses or software companies.

The results in the area of education deserve recognition; these include other approaches, such as project development through the Commission for Technology and Innovation that we will skip here. However, the achievements will still fall short of what is desired even if all of the projects develop as planned. It remains

to be seen whether a truly virtual learning space can grow from the numerous, mostly disciplinary individual projects. The higher education projects of the Virtual Campus actually should be opened in order to affect the secondary schools as well. A virtual learning space, which better speaks to the needs of those groups in society that benefit especially from distant learning, namely the handicapped, people with up-bringing and care responsibilities, etc. is desirable.

Finally, that under development here could provide an immediate positive impulse to Switzerland as an industrial centre. Content and teaching techniques are being created in the education projects that promise to be interesting contributions to a content industry. If we are successful in converting Switzerland's continually mentioned potential (or skills) in dealing with linguistic-cultural variety in this industry, this would result in a clear competitive advantage for Switzerland as a production centre.

2.9 Scientific Assistance

The 1998 strategy paper called for scientific assistance for the federal programs. This was finally implemented in three concrete directions. (1) This evaluation provided the opportunity to have the activities examined and assessed by an outside party. (2) A project has been started at the Federal Statistical Office which is designed to be a recording of the current situation of the Information Society in Switzerland in the form of a snapshot as well as developing and implementing statistical indicators that can be used to observe the Information Society on an ongoing basis. (3) Finally, a national research programme was proposed, Le Défi Virtuel or The Virtual Challenge. This will fulfil two requirements if it is realized: research on the Information Society in Switzerland would be intensified, and the developments in society and commerce would be scientifically monitored.

The objectives spelled out in the strategy have thus been achieved to a large extent. In retrospect, however, we can ask ourselves whether the expertise offered by the Centre for Technology Assessment at the Swiss Science and Technology Council should not have been used more purposefully. We could also

have imagined something else under the term scientific assistance: in the Swiss science landscape, there are various competencies, which could have been exerted more to provide guidance through scientists for the federal programs. The evaluation could have been more useful if we had been able to run a continuous, consequential, and formative evaluation of the federal programmes. Finally, the federal government already could have dealt with the international tendency to establish observatories, i.e. institutions which observe (monitor) the Information Society on a comparative basis and are supposed to report undesirable developments to those carrying political responsibility.

3. On Balance

The federal programmes have consistently reported successes in all of the areas named by the strategy paper since 1998. These correspond to the objectives of the Federal Council's strategy. The impact, however, is still in store in most cases.

Those who head up and work on the individual projects have demonstrated a high level of personal involvement and through creativity, persistence, and negotiation skills have formed the alliances needed to wend their path to complex goals through a maze of interdepartmental and extra-official channels. In some projects, however, too little attention was paid to communication and cooperation with the players outside the federal establishment: the private sector, teachers in schools, scientists at the institutions of higher learning and, in some cases, parliamentary groups.

The division of the federal activities into individual areas proved meaningful in the initial step. In the future, however, the potential of the Information Society will unfold better if projects transcend specific areas, are networked more, and advance in a more transparent manner. As an example: the Information Society website of the federal government – in itself highly useful – is hidden behind the difficult to decipher acronym ISPS. It is recommended to open a portal that provides immediate access to all of the projects, even those for eGovernment, which today benefit from their own Internet presence.

Unfortunately, there was not enough data to calculate the total cost required to achieve the objectives spelled out in the strategy paper. Since the Federal Council has expressly stamped the activities for an Information Society as a priority in 1998, an estimate of the financial consequences should be available which could then be compared to the available funding.

The Information Society Coordination Group (ISCG) together with its steering committee and support office is a „lean" structure. It fulfils the coordination tasks pursuant to the 1998 strategy paper quite well. Nevertheless, we could ask whether the composition of the committee by department is ideal in every way. Due to this makeup, some working groups had the impression that the committee worked at some „distance" from them. It is also conceivable that the ISCG structure could be more actively open for some circles with which communication could be improved. This opening could vary during certain phases depending on the emphasis established.

4. Recommendations

4.1 Overview

In the following, CEST presents its most important recommendations for discussion: A revision of the 1998 strategy paper should place the federal programmes on a broader foundation and create conditions for coordinated activities in the areas, where the ISCG previously took less notice. The ISCG structure should be further expanded and strengthened on the basis of the previous, positive experiences. In addition, CEST proposes two thrusts that the federal government should follow.

Taking into consideration that the ISCG is soon to be involved in a process of consolidation, differentiation, and reorientation, the recommendations are structured such that they correspond to the anticipated phases of the processes:

- Assured communication: Creation of an Information Society Switzerland Service Office with responsibility for external communication, internal communication and knowledge management; active arranging of partnerships, observation, early detection and warning of unfavourable developments;
- Continuing basis: Revision of the 1998 strategy paper for an Information Society with amendments to the areas on the law, healthcare, defence, security, north-south and east-west co-operation;
- Two new thrusts: Content as a cross-departmental task; and democracy in an Information Society.

The Information Society is tied to considerable costs in some cases. The essential concern is whether a society can keep pace or fall back thanks to the completed, mostly comprehensive investments in an international (globalised) environment. The 1998 strategy paper shows that the Federal Council is firm in its resolve to contribute what it can within its powers so that Switzerland remains a leading Information Society. It has stated clearly that this is a priority objective. Whoever is in charge of financial policy therefore should provide the resources required to implement the established strategy. For their part, those in charge of projects, however, should create cost-benefits transparency that permits effective controlling.

4.2 Assured Communication: Information Society Switzerland Service Office

Recommendation

After the expiration of the current ISCG mandate, a new temporary structure should be created that takes the place of the current ISCG, its commission and support office.

The new structure should be created through a Federal Council decree.

This structure should fulfil the following tasks:
1. *Coherent and intensified external communication with political, private sector and society leaders and organizations;*
2. *Internal communication and knowledge management;*
3. *Active mediation of partnerships taking into consideration agencies outside the federal government; and*
4. *Observation, early detection, and early warning.*

The structure should be
1. *interdepartmental;*
2. *made up of core staff members (scientific and technical personnel, management);*
3. *a board (advisory and supervisory; through leaders from the administration, institutions of higher education, society, business, and culture);*
4. *consist of a network of people and institutions providing the necessary expertise; and*
5. *have its own research and development budget.*

The ISCG committee should decide on the optimum size (number of positions and budget) and the administrative linkage (human resources office, bookkeeping and infrastructure).

Commentary

The structure should permit a relative degree of autonomy with detailed functions. Within this, it should build on the services that are provided by the current structure and link tried and tested elements with ongoing improvements.

These four functions touch on a common foundation, primarily an ICT management system for the knowledge

basis, and should operate as a single structure so that synergies can best be realized. The possible negative effects of the so-called administrative federalism should not hinder the effectiveness of the structure. It would therefore be advantageous if it were to function on the basis of a mandate from the entire Federal Council that outlines its obligations and rights, establishes its objectives and milestones and assigns sufficient resources.

Task 1: Coherent and intensified external communication with political, private sector, and society leaders and organizations

The implementation activities of the federal Information Society Strategy Office should be communicated more intensively and coherently to key leaders and groups in society, business and politics. Among the target groups are, for example, teachers, heads of business branch organizations, or members of parliament.

This will
1. result in as positive an image of the federal programmes as possible among leaders in society, business and politics;
2. provide valuable information through feedback;
3. ease the search for partners for public-private partnerships of all kinds through advanced, intensive communication efforts;
4. open access to information about ICT projects outside the administration.

The quality of many projects deserves the goodwill of leaders outside the federal administration, indeed assumes this to be the case in order to achieve the set objective completely. Furthermore, the projects need the feedback to gain a sense of how they are perceived by the general public.

This requires
• qualified „ambassadors" as field reps, who are thoroughly familiar with the current projects and strategic objectives and speak the language of the group being addressed as well;
• a coordinator in the „home office" who establishes objectives, acts as guarantor for their achievement, balances assignments, makes sure that messages flow constantly from the body and

feedback is channelled properly and ensures the transition to other tasks belonging to the service office.

Task 2: Internal communication and knowledge management

The individual projects of the various federal agencies are decisively dependent on intensive, prompt and comprehensive communication among the project sponsors and the project implementers at every level. The availability of complete, current and correct information about all areas and projects is fundamental.

A specially dedicated group at the service office ensures active knowledge management using ICT. This results in
• an information and documentation agency, i.e. a systemized, up-to-date information office under the agency's editorial responsibility that maintains information about projects coordinated by the ISCG as well as those of external administrative agencies; this information is available online and can also be requested by e-mail and telephone;
• a homepage which provides www.isps.ch with additional functionalities for all projects and unifies all of the Information Society websites under one roof as an intelligent portal instead of offering links;
• an e-mail news agency (e-newsletter) that can be customised.

Task 3: Active mediation of partnerships taking into consideration agencies outside the federal government

Experience has shown that within the so-called administrative federalism those projects progress best which are borne and realized by a meaningful assembled alliance capable of action. Everyone responsible for the implementation of the Information Society strategy should therefore promote alliances whenever possible.

According to recommendation 4.3 (see below), new tasks and tasks with revised objects will be given to the various federal agencies. Furthermore, additional alliances with partners outside the federal administration (the private sector, for example) will be necessary. The task of forming alliances remains current and must be supported on an ongoing basis.

This requires an active mediation body, which

- brings together those seeking partnerships with suitable alliance partners, supported by knowledge management;
- actively creates content-related synergies by generating awareness for gaps and twin-tracked efforts, again supported by knowledge management;
- organizes conferences, seminars and discussion groups, which continues the tradition that the ISCG began with its plenary events.

Task 4: Observation, early detection, and early warning

The implementation of the Information Society strategy should (continue to) be supported scientifically. This support should fulfil the following roles:

Internally

- it evaluates the work of the federal agencies according to effectiveness and efficiency criteria;
- arranges scientific of use for the project work by putting together and maintaining a panel of experts.

Externally

- it observes how the development of the Information Society affects society, culture and commerce in Switzerland using appropriate scientific methods;
- it makes available useful information to the players within and outside the federal agencies;
- it edits and distributes regular reports about the current state and trends;
- it evaluates up and coming technologies; and
- it alerts the responsible agencies as soon as undesirable developments or unwanted side effects arise in the sense of early detection.

To do this, it maintains a network organized on a partly virtual, partly real basis. Sufficiently funded, under pragmatic-scientific leadership, it coordinates this portion of the service office. This observation network is independent from other particular interests of individual groups or agencies and possesses the necessary professional authority. However, it does not have a monopoly on the gathering or interpretation of information.

The network includes existing federal agencies, such as the Swiss Federal Statistical Office; institutes closely affiliated with the federal government, such as the Centre of Technology Assessment at the Swiss Science and Technology Council; competence centres at the universities and universities of applied arts and sciences; as well as task forces and research units that it establishes itself. It works closely with international agencies, such as the observatories of neighbouring countries and the planned European Commission and United Nations observatories.

4.3 Continuing Basis: Revision of the Information Society Strategy

Recommendations

The 1998 strategy paper should continue to provide the basis for the activities of the federal agencies until its objectives have been achieved.

It should be expanded to include topics (political areas) that were not taken into consideration for various reasons in 1998.

Some of the existing individual subject areas should be reformulated in order to correspond better to insight gained since then.

Commentary

The 1998 strategy paper has proved itself as a foundation for the federal programmes. Since it is intended to be an instrument for the steering and coordination of project work, it should be updated periodically.

The recommended updating introduces new topics, modifies formulations in existing sections, and clearly defines a postulate contained in the preamble that previously did not correspond to a topic section.

Law

The 1998 strategy paper already contains a chapter entitled Law. The appointment of a working group to implement the objectives rubricated therein was not a practical solution. Therefore, the aspects surrounding the law were delegated to groups working in other political areas, such as Commerce. The results of this have been criticized in various regards (cf. experts'

reports, Law section, CEST publication 2002/3).
Therefore, a new draft of the strategy's legal-political guidelines in the chapter on the law should be drawn up and address the following questions, among others:

• how much regulation is necessary to whose advantage in which areas;
• how can cantonal law and federal law be harmonized for the Information Society;
• in what relation should Swiss legislation stand to European and other national legislations;
• in what way should Swiss law be distinguished from the laws of other nations for the Information Society, such as by possibly anchoring a competitive advantage in the national legal framework.

As an enabling measure, scientific authority should be transferred to the project work and the legal-political guidelines for each project should be clearly defined and implemented.

Healthcare

In close collaboration with the Federal Department of Interior and the Federal Health Office in particular, and through the use of previous work carried out by the Centre for Technology Assessment, a strategy chapter on the intensification and harmonization of ICT usage must be worked out for the area of healthcare.

This chapter should establish the objective that the efforts of the various players in the healthcare area should utilize ICT intensively and in a coordinated fashion while critically reflecting the compatibility of such efforts with basic rights such as those related to personal and information privacy. These objectives concern e.g. knowledge management for relevant medical information, handling information for insurance issues, electronic patient dossiers, etc.

Defence

The Department of Defence, Civil Defence and Sport (Eidgenössisches Departement für Verteidigung, Bevölkerungsschutz und Sport or VBS) should clarify whether national defence aspects could not be integrated more strongly into the strategy. The central issue is ICT-supported knowledge systems as are used for security policy. These are basically related to similar solutions developed for conflict and security re-

search at the universities as well as to those for (civil) foreign policy agencies.

Naturally, secrecy is a part of defence, and we should not expect that sensitive information would appear in the strategy paper. Nevertheless, ICT aspects of our national defence should become a topic in a chapter of the strategy. To the extent that secrecy issues permit, one objective would be to coordinate VBS projects with others and bring all these together as a part of the overall strategy of the federal government for an Information Society. This would especially be useful before the backdrop of coordination between the military agencies and militia organizations.

Security

The present chapter on security issues in the strategy paper should be revised and divided into two sections.

• The first section should be a departure from the area that covers the clearly defined institutions and measures such as the Special Staff for Information Security and the InfoSurance Foundation and reflect on their current status. Further target objectives should be spelled out there, which would lead to true comprehensive security for the ICT structures in the national interest. To do this, connections to the objectives in the area of defence should be delineated.
• The other section should take up and present the discussions in the Working Group on Security and Availability that was reactivated in 2001. Its targets of securing availability and the quality of information must still be achieved. Consideration should be given to whether the word „availability" could be replaced, since it leads to misunderstandings (technical „availability" of equipment).

North-South and East-West (Development and Co-operation)

In close collaboration with the responsible federal agencies, a strategy chapter should be developed that points out the positive potential of realizing the Information Society in the major regions of the southern and possibly eastern hemispheres. At the same time, it should also show what Switzerland can contribute to the reduction of an international or regional Digital Divide. This should lead to the initiation of coherent projects and programmes, which are coordinated with

the general objectives of the federal government for an Information Society. Current approaches should be brought into close relationship with the other federal activities. This will particularly impact the authority of the Federal Department for Foreign Affairs.

One sentence on the north-south divide in the preamble of the strategy paper suggests inserting a corresponding passage into the paper's main text. Therefore, the postulate should be clearly spelled out in its own section.

This development and co-operation policy topic should be strategically coordinated with those directed toward the state, society, and business in Switzerland. On the one hand, the federal agencies in a broader sense also provide for the nation's security beyond Switzerland's borders. On the other, their activities could benefit from synergies in certain questions, such as the law, healthcare, eGovernment and eCommerce.

4.4 Two New Thrusts:
• Content as a Cross-Department Task
• Democracy in the Information Society

a) Content as a Cross-Department Task

Recommendation
The federal activities in the areas of education, commerce, and culture should coherently be oriented to optimising the opportunities of a content valorisation through the content industry, which builds upon the specific strengths of Switzerland.

Commentary
Superior quality, international, and interesting content is sufficiently available in the areas of education and culture. Here, as well, there is no lack of competent people, who work on, develop and provide content.

Appropriate content and expertise is already present:
• at institutions of higher learning, i.e. in the departments and interdisciplinary institutes at the universities and the universities of applied arts and sciences, and at the fine arts schools;
• in the hands of artists, who work intensively with ICT;
• in the possession of school teachers at all levels;
• in business, namely in the area of the media (publishers and audio-visual producers) and software business (software companies specializing in eLearning, teachware, etc.).

Projects and approaches, such as the Public-Private Partnership – Schools on the Web, the Virtual Campus, the ongoing support programmes within the Federal Office for Vocational Education and Technology, the ideas of the Federal Office for Culture for the promotion of training, and projects of artists who work with ICT can all be converged toward a common point of orientation in a natural manner. This point should be called content.

This orientation point is relevant for all levels, such as:
• the conception of virtual spaces;
• development of presentation and communication instruments;
• design;
• adapted content;
• marketing.

The ultimate goal should be the formation of a cluster in the sense of a value-added chain.

As the experts' reports strongly suggest, Switzerland could gain an international competitive advantage and thus export opportunities if significance were attached to „Swiss" aspects. Among these are multilingualism, cultural variety and regionalism.

b) Democracy in the Information Society

Recommendations

In politics and science, a fundamental discussion of principles should take place about the possible, desired and avoidable effects on federalism, separation of powers, civic freedoms and democracy resulting from a more intensive ICT use within the federal government.

A policy on democracy should be formulated. Its goals should lie in maintaining the traditional, liberal democratic rights for the citizens in the Information Society as well. These rights should be expanded as far as possible through the utilization of opportunities specific to ICT.

The goal of self-organizing, autonomous citizens in the sense of the principles laid down in the 1998 strategy paper should firmly guide its implementation in the areas of eGovernment („government-to-citizen") and eDemocracy supported by the principle of open public access.

The federal government, in an initial step, should examine whether an increased and more consistent use of ICT through intermediary groups, such as political parties, organizations and social movements can be supported. For this, thought must be given primarily to the steps from information to true communication and transaction.

Commentary

In the future, attempts to conduct a critical discussion of possible developments of the democratic system in an Information Society should be supported (and, if necessary, initiated).

A policy on democracy is called for that retains and, whenever possible, expands the achievement of liberal, democratic rights for citizens under the new circumstances. These range from a separation of powers to the self-organization of a civil society, from basic rights to the rights of active political participation. The new technical possibilities and their cultural realizations should consistently be placed at the service of such a policy.

A federal policy fostering the self-organization of the civic society by extensively using ICT will benefit the role of the citizens in an Information Society.

Publications edited by the Center for Science & Technology Studies (CEST) can be accessed at the following site: www.cest.ch. They can be either consulted and printed out in a PDF format, or requested in hard copy form at the Science Policy Documentation Center (edith.imhof@cest.admin.ch).
It is also possible to order publications of the former Swiss Science Council (today Swiss Science and Technology Council) which are indexed at the same address.

Die Publikationen des Zentrums für Wissenschafts- und Technologiestudien (CEST) finden sich unter www.cest.ch und können entweder als PDF-file eingesehen und ausgedruckt oder als Papierversion bei der Dokumentations-stelle für Wissenschaftspolitik (edith.imhof@cest.admin.ch) bezogen werden.
Die Publikationen des ehemaligen Schweizerischen Wissenschaftsrates (heute Schweizerischer Wissenschafts-und Technologierat) und dessen Geschäftsstelle können ebenfalls unter den genannten Adressen eingesehen und bestellt werden.

On trouvera les publications du Centre d'études de la science et de la technologie (CEST) à l'adresse: www.cest.ch; elles peuvent être consultées et imprimées en format PDF ou demandées en version papier auprès du Centre de documentation de politique de la science (edith.imhof@cest.admin.ch).
Il est également possible de commander les publications de l'ancien Conseil suisse de la science (aujourd'hui Conseil suisse de la science et de la technologie), elles sont répertoriées à la même adresse.

Si possono trovare le pubblicazioni del Centro di studi sulla scienza e la tecnologia (CEST) all'indirizzo seguente: www.cest.ch. Esse sono disponibili in format PDF, o essere ordinate in una versione sciritta presso il Centro di documentazione di politica della scienza (edith.imhof@cest.admin.ch).
È inoltre possibile comandare le pubblicazioni dell'ex Consiglio Svizzero della Scienza (oggi Consiglio della Scienza e della Tecnologia), anch'esse repertoriate allo stesso indirizzo.