

Project IP3.ch

“A Nation at Risk”

Final Report

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Management Summary

Switzerland is one of leading nations when it comes to computer usage. However in the last years an increasing shortage of IT-professionals has built up. The problem remains severe as the Swiss educational system continues to fail to produce enough qualified students for the Swiss IT-industry. Professionals from all over the world are hired to fill the gap. However, the handling of foreign job-applications, particularly those from outside Europe, is a difficult, time consuming, error prone and tedious task for the involved IT-Managers as well as the HR-professionals. The shortage of Swiss educated IT-professionals is due to many factors. Besides demographic developments, an exponential growth of IT-usage worldwide, the chaotic IT-education landscape in Switzerland as well as in most other countries does not help to attract prospective students.

The 60+ IFIP Member Societies adopted in 2006 **the global initiative International Professional Practice Partnership (IP3)**. IP3 envisions to fully exploit the enormous potential of IT and to deliver the maximum benefit to the greatest number of people. IP3 consists of leading IT-associations across the globe sharing a common vision to establish IT as a profession that is recognized and valued globally. **We strongly recommend an early and active participation of Switzerland in the IFIP/IP3 standardization activities**; this will allow aligning the upcoming standards to the needs of the Swiss industry and business.

We propose a Swiss certification authority for IT-professionals (referenced throughout this proposal as **"IP3.ch"**) IP3.ch is run by a private organization and remains compatible with IFIP activities, but operates a certification scheme, customized to the specific needs of Swiss industry and business. The responsibilities of the IP3.ch certification authority would include providing guidelines for IT-education in Switzerland, finding ways to incorporate professional experience in its certification scheme, simplifying the hiring process of foreign as well as national IT-professionals, etc.

The next pages present a more detailed plan of the IP3.ch Project, more detailed information about Swiss IT-professionalism and a closer look at the expected benefits of such a certification authority.

Some general references from the last 3 years (2007-2008-2009) :

- consult the item « **Reports** » of the SIC (Swiss IFIP Committee)
- consult **the last IFIP Newsletters**
http://www.ifip.org/images/stories/ifip/public/Newsletter/2013to2014/news_sep_2013.pdf
- consult **the dedicated web sites for IP3**
<http://www.ipthree.org/> and
<http://www.ip3interactive.net/> (in "Public Document Repository" option "guest")

Introduction

IT-Professionalism

Over the last decade analysts have reported consistently and more or less constantly about high failure rates of IT projects. Gartner reports in 2005, that up to 75% for IT-projects exceed budget or overrun their schedule, and that 33% of all IT-projects fail altogether [¹]. OASIG reports similar numbers: they report that 80% to 90% of IT investments do not meet performance objectives, 80% are delivered late or are over budget, and that 40% are abandoned as failures [²]. The Chaos Report conducted by the Standish group shows over the last 15 years some fluctuation of success and failure rates, but shows no clear trend of improvement over this time span (see Table 1).

Table 1: Success, challenge and failure rates of IT-projects over the last 15 years [³].

Year	1994	1996	1998	2000	2002	2004	2006	2009
Successful	16%	27%	26%	28%	34%	29%	35%	32%
Challenged	53%	33%	46%	49%	51%	53%	46%	44%
Failed	31%	40%	28%	23%	15%	18%	19%	24%

These numbers indicate that failures of IT-projects are systemic. A direct measure against this devastating situation is to improve project management, e.g. educate project managers, standardize project management methods and tools, etc. Despite the effort to improve project-management skills the IT-deficiency-rate remains constantly around 70%! **Therefore other causes must be evaluated.** There are many different factors contributing to such a poor performance, but one of the main reasons appears to be a general lack of IT-maturity as well as a lack of an adequately high level of professionalism. We would simply not expect such a poor performance from a mature profession which is carried by highly skilled professionals. To our opinion, the key to improve today's situation lies in attaining high levels of professionalism of the IT-practitioners as well as the IT-organizations.

¹ Failure to deliver the specified system by the due date was cited in 62 percent of projects. in Gartner (2005):

² IT Project Failures (OASIG, 1996). Outcomes from IT investments: 80% to 90% do not meet goals. 80% delivered late and over budget. 40% fail or are abandoned. Less than 40% address training and skills enough. Less than 25% integrate business and technological objectives properly. Only 10% - 20% meet all success criteria."

³ Stanish Group (2009).

Everybody believes in professionalism, its role in a successful career and that it is an inspirational standard. However, it seems to be less clear what professionalism exactly is and how it can be achieved properly.

Professionalism is grounded on several essential elements, which include competence, integrity, responsibility, accountability as well as public obligation. A professional is **competent** when his/her skills are up-to-date and comprise the relevant knowledge areas, when he/she is capable to fulfill a particular task, and when his/her technical skills are supplemented by the appropriate non-technical skills in communication, business, leadership as well as management. Skills have to be carefully maintained, nourished, and properly documented throughout his/her entire professional life to sustain a high level of competency. The **integrity** of a professional implies that he/she follows a code of conduct and respects professional ethics, which are both accepted and recognized by the professional community. Professionals are willing to assume **responsibilities** and **accountabilities** alongside contract-based obligations with their employer or client. A professional's **public obligation** encompasses the social responsibility as an individual, citizen and craftsman as well as the commitment and contribution to the professional IT-community.

Increasing IT-professionalism will improve the ability of businesses and other organizations to exploit the potential of information technology more effectively and consistently. Other industrial professions have shown the way and have organized and standardized their area of competencies. This has led to an increase of their professionalism and guarantees a high level of quality to the customer (e.g. medicine, law, and accountancy). **Today IT-professionalism needs to reach similar levels.** Competent suppliers working with competent customers are eight times more likely to deliver successful projects.

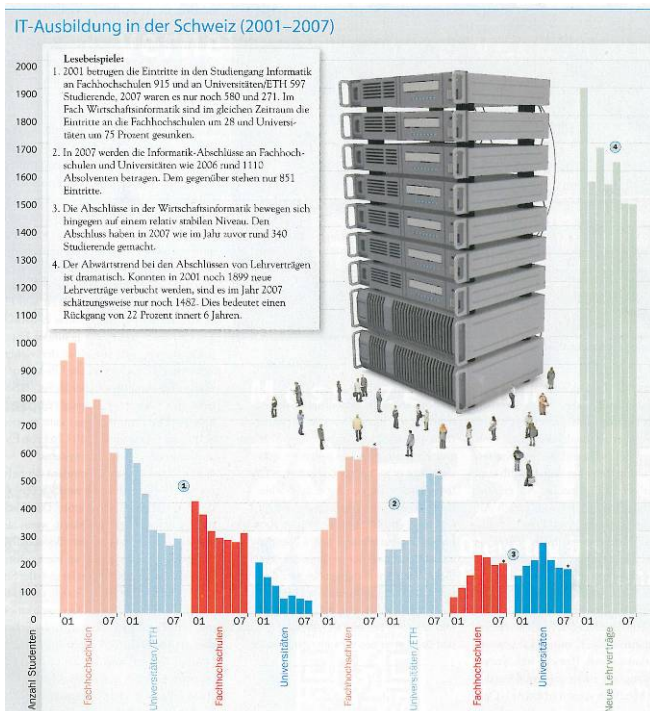
The introduction of educational standards by means of certification is an effective way to increase professionalism. Such a certification organization would be responsible to implement, control, enforce, and update the standards as well as to keep the standards compatible with their international counterparts. A more standardized education facilitates the comparison of educational organizations, which in turn will improve education, and which will increase the overall quality and performance in the field in the long run.

The situation in Switzerland

Approximately 120'000 people work as IT-professionals in Switzerland, of which more than 70% have neither an accredited degree nor a professional education in computer science [4]. Each year 5'000 to 7'000 IT-professionals retire and about 2'500 students (including Berufslehre) graduate in Computer Science. This results in a severe shortage of 2'500 to 4'500 Swiss IT-professionals per year. **The problem is not resolved and not new.** Between 2001 and 2006 the number of first-year students signed up for IT-related courses, dropped by 60% (even by 70% for courses in Wirtschaftsinformatik - computing applied to management & economics) and in 2007 the number of

4 Carl August Zehnder: „Erosion der Informatikausbildung“, In: NZZ-Online: http://www.nzz.ch/nachrichten/medien/erosion_der_informatikausbildung_1.649088.html [last visited: 25th October 2008].

students in IT-related fields was as low as in 1981 [5,6]. In all Swiss universities as a whole the number of freshmen in computer science has dropped by 50% over the last five years [7].



CASHspecial, 16.Mai.2008

Despite high wages, IT has lost its appeal for young people. Even the growing number of IT-related educational programs in the last years does not seem to have a positive effect. **The lack of educational standards** has led to a plethora of different programs making it increasingly difficult to understand the content or the differences of the different educational programs (e.g. Informatik (Computer Science), Wirtschaftsinformatik(see above), etc.). The high number of the confusingly similar alternative programs is not only a problem for the prospecting student, but also for HR-departments, as they have to rely more and more on highly-specialized recruitment experts to understand the skills of an applicant. More distinctive educational programs, with clear cut educational goals and decisive objectives should be considered to sort out the field and stop this decay in student-numbers. For a prospective student, who is starting an educational endeavor for the next couple of years, it is mandatory to fully understand the distinctive competencies he or she will gain during the courses. This requirement is logical, as competencies as well as the area of expertise are crucial for subsequent job opportunities and employment.

For a long time, IT has played the role of innovative and enabling technology, and has captured the young peoples' idealistic and futuristic dreams. However, the generation growing up now will be **"digital native"**. This new generation has not known a life without IT as former generations have. In turn this makes it more challenging to explain the innovative power of IT. Although IT has become a common and mass-produced good, IT remains a core enabler for many new businesses, provides the

5 CASH special, Business Computing: "Immer weniger wollen Informatiker werden", 16th May 2008.

6 NZZ-Online: «Informatiker braucht das Land », http://www.nzz.ch/nachrichten/zuerich/aktuell/informatiker_sucht_das_land_1.579712.html , [last visited 25th October 2008].

7 Medienmitteilung Informatica08: „Informatiker werden Mangelware in der Schweiz“, 20th November 2007, http://www.informatica08.ch/presse/MM_Informatiker%20als%20Mangelware?yanel.webdav=propfind1, [last visited: 25th October 2008].

foundation of execution for most existing businesses, and helps meeting today's information demands. Paradoxically, even though many businesses depend heavily on IT, **it is quite common to find business people that do not understand their dependency on IT**, do not recognize truly the important role IT plays in their company, and have no clue about what the basic concepts of IT are. Similarly, **the broader public** uses IT readily but **has not recognized the role of IT in our society**. This situation is further enhanced by the lack of IT-professionalism and the unstructured way in which IT-education is organized.

The demand for IT-professionals in Switzerland is partially met by career changers, they come mainly from engineering, physics, mathematics, and related disciplines. The high number of career changers underlines the urgency of the problem: even though such changes are quite common they involve many difficulties and shortcomings. Enticing professionals from their original discipline is expensive (at least for the subject and the society paying twice for the education) and increases the heterogeneity of the population of IT-professionals further and poses tricky problems for HR departments.

As a consequence, there is no alternative but to fill the gap through foreign recruitment. Following the current trends, over half of the IT-job-applicants in Switzerland will be foreigners in the near future; e.g. in 2007 more than 1'400 IT-professionals migrated from outside Europe to Switzerland [⁸]. Foreign applications lead to larger operation expenses of the evaluating HR-departments, as they have to deal with highly heterogeneous CVs, with a plethora of IT-job-roles, and all sorts of foreign certificates and diplomas. This heterogeneity is a significant cost-factor when evaluating job applicants, planning their continuing education and advanced training. This heterogeneity reflects missing standards on national as well as international level for IT-education and for IT-professionalism. This is particularly true for the academic education in "Wirtschaftsinformatik" (computing applied to management & economics), where for example the underlying knowledge and scientific concepts differ substantially between academic institutions. For the international competing IT-industry a chronic lack of highly-qualified IT-professionals does not add to the locational advantage of Switzerland and might contribute to relocation of businesses and industries [⁹].

Product-specific industrial certificates (e.g. CISCO, Microsoft, and others) do not solve the problem, as it remains unclear how these certificates relate to each other (especially between companies) and how they relate to other educational or academic degrees.

The situation is not unique to Switzerland; most European and world countries face similar problems: There is a substantial lack of IT-professionals, probably worldwide. Thus, Switzerland competes with European countries for human resources in IT and the competitive pressure between countries soars. Finally it has to be considered that the IT-landscape will be affected profoundly by initiatives, such as the European Service Directive (planned to be carried out by 2010 and realized in steps between 2009 and 2018). Such initiatives will obviously create an even higher demand for IT-professionals and will speed up the integration and the acceptance of pan-European educational standards.

⁸ e.g. NZZ (7. Jun 2008) „Ausländer- und Asylpolitik in guter Phase“

⁹ e.g. NZZ (7. Feb 2007) „IT-Standort Zürich in Gefahr“ and NZZ (5. May 2008) „Zürich könnte zum Silicon Valley Europas werden“

The project IP3.ch

Vision – Swiss IT-Profession

Our vision is to make (and maintain) Switzerland one of the leading IT nations by creating a Swiss IT-profession, which is equivalent in prestige and structure to other established professions such as law, accountancy and medicine. **The Swiss IT-profession will bring in essential services** to a broad range of stakeholders including employees, employers, customers, governments and key national and international bodies. **Swiss IT-professionals have to adhere to high standards of competency, integrity, responsibility, accountability as well as public obligation.**

A Swiss certification authority for IT-professionals

We suggest the creation of an IT-certification authority, who will assure quality, guarantees professional-standards, and keeps up with the ever faster changing world of IT. Such a certification authority needs for an organizing structure, and a set of professional certification schemes recognized and trusted nationally as well as internationally (and not only at the European level). The gist is to obtain a highly professional and lean organization (“and not a gas-factory”) organized as a Foundation (“**Stiftung**”). The main objective is to issue certificates and accreditations.

We observe today strong efforts to consolidate the numerous IT-associations in Switzerland, who perfectly reflect the chaotic IT-qualification and IT-education landscape of Switzerland. A joint mission of all IT-related areas compassing language regions could further strengthen and speed up an progressive organizational fusion. The transformation of the Swiss IT-qualification landscape towards a higher levels of IT-professionalism and a well ordered and adequately structured IT-education could help to **unify the Swiss IT-landscape even further.**

Aims of IP3.ch

- **IP3.ch** is strongly anchored within various IT-related organizations of the language regions of Switzerland, e.g. IP3.ch will provide and use **multilingual** translation lists to ensure that certificates will be easily translated.
- **IP3.ch** re-organizes and **simplifies the Swiss IT-landscape** by introducing an easy-to-understand accreditation scheme for IT-educational organizations granting them to issue globally recognized certification.
- As a national certifier of international certificates **IP3.ch implements an easy-to-understand accreditation scheme** for Swiss as well as foreign IT-professionals based on diplomas and other certificates (e.g. IFIP, EU, IEEE).
- **IP3.ch** streamlines the educational efforts according to the **needs of the industry**. (To deliver the "right stuff" for high-quality and high-performance industrial jobs. Goal: “Employable nerds”.)
- **IP3.ch participates in and influences standardization activities within international bodies**, such as IFIP, and makes sure that the Swiss certificates are compatible internationally (IFIP, EU, IEEE).
- **IP3.ch supports** "self-made" professionals, career changers, as well as specialists by accrediting proven practical experience in academia, business and industry.

- **IP3.ch broadens IT-professionalism** by including non-IT-related skills, such as project-management, communication skills, etc. Its certificates are provided in accordance to the specific governing organizations or bodies (e.g. Project management providers).
- **IP3.ch allows for exam-based certification** of actual as well as legacy technology through qualified educational institutions. IP3.ch does not issue product specific certificates (e.g. Microsoft, CISCO, etc.), however IP3.ch uses these for their own certification process.
- **IP3.ch accreditation scheme** for evaluation and certification requires only moderate resources.
- **IP3.ch certificates bridge the gap** between international certificates and those tailored to the specific needs and IT-knowhow of the Swiss industry and educational system.
- **IP3.ch supports and encourages life long learning** and development by documenting and preserving the educational investments adequately, e.g. a proper job with a certified title.

Strategies of IP3.ch

- **IP3.ch should involve a strong minority of stakeholder:**
 - (1) The IT-landscape in Switzerland has to change.
 - (2) More IT-professionalism is urgently needed.
 - (3) The proliferating chaos in IT-education has to be straightened out as soon as possible.
- **IP3.ch adopts** from the very beginning on and during all subsequent project-phases a **consensus based multi-stakeholder approach**.
- **IP3.ch** will establish and cultivate **direct cooperation with powerful partners** and adequate **two-way communication** with important industrial stakeholder.
- **IP3.ch** will **implicate involved IT-professionals** as well as -- and equally important -- **young people**.
- **IP3.ch** will **use all available technology for its internal and external communication** and interaction (e.g. from standard paper-based investigations over social-networks to Web 2.0 based technologies, knowledge management, wikis, etc.)
- **IP3.ch** will proceed in the spirit of Kotter's 8-phase change management process [¹⁰] and will work with boundary objects following current practice. **Its key message will adapt Howard Gardners 'Five Minds for the Future' [¹¹] for the market of IT-professionalism:** That is, the disciplinary capability comes first, but other capabilities such as abilities for integration and that for creative invention are equally needed for truly sustainable success in the IT-business.

¹⁰ Kotter, John P. (1996). *Leading Change*. Harvard Business School Press. ISBN 0-87584-747-1.

¹¹ Howard Gardner (2007). *Five minds for the future*. Harvard Business School Press: Cambridge, MA.

Expected side effects of IP3.ch

- The structure provided by IP3.ch will significantly **reduce the current chaos** in IT-education and in IT qualification/certification..
- We expect more future students in IT-related professions. **We also expect greater motivation on the part of these** students, as they will understand better the enabling power, innovative potential, and idealistic values of IT.
- An explicitly and openly defined set of goals and objectives, a well defined body of knowledge, skills and professional values will strengthen **the understanding of IT as a credible discipline**.
- A common educational standard shall simplify education and will make learning more efficient. It also **increases competition** between educational institutions, which leads to an increase in **quality** and **quantity** of the provided education.
- Through a certification authority assimilation of new technologies in their educational programs can be **accelerated to avoid the leeway due to the misalignment of business needs and educational programs**.
- A common and well defined body of knowledge and a set of standards has a positive impact on productivity and **makes it easier** to manage IT-projects.
- **The hiring of IT-professionals becomes easier**. The standards provided by the IP3.ch certification authority makes it easier to hire IT-professionals and makes job-profiles more transparent and easier to understand. A direct consequence will be a reduction of miscasts, usually an expensive and time-consuming error. Agreed upon standards also make easier to describe job-profiles and to match the abilities of the applicants, leaving more room for the HR-departments to focus on their core competencies. This will create economic growth beyond the IT-business itself.

Life-time of IP3.ch

The life-cycle of IP3.ch starts by a careful analysis of the national as well as international stakeholders and their demands and needs (1). In the following step the adequate organizational structures of certification authority are implemented (2). In later stages IP3.ch will incorporate business-, government-, education-, and industry-experts as well as an inevitable organizational maintenance effort (3) The project proposed here, will take up only a minor part of the whole life-time resources of IP3.ch. However, this step will significantly influence the overall costs as well as the overall success of the IP3.ch implementation.

The focus of this project lies on the initiating IP3.ch.

Key Stakeholders of IP3.ch

- **Young people** and **prospective students** who are interested in IT itself as such and in becoming IT-professionals.
- **IT-professionals** and **non-IT professionals** relying on IT knowledge.
- **Organizations that provide IT-Education** (Applied and traditional Universities, ETH, BBT/Berufslehre, private sector educational institutions.)

- **Industries** that have IT as foundation for operation.
- **HR-professionals**, HR-departments, and specialized recruitment organizations.
- **IT-organizations and associations** (ICT Switzerland and + 20 IT societies , ...)
- **Swiss government departments** (such as BBT, immigration, SECO, etc.)

Project plan to initiate IP3.ch

Course of action

In the first steps three documents representing the key aspects of the analysis (kind of state of the art) will be created. The first step is to define and develop a description of existing qualifications based on investigations a **task and method landscape (TML)**. In a second step (partly parallel to step one) a **qualification and experience landscape (QEL)** is developed, which takes all forms of qualifications as depicted above into account. In the third step, a **qualification certificate scheme (QCS)** will be identified, with mappings between the QEL and the QCS as well as the QCS and the TML.

For the design of the TML, existing classifications have to be collected, integrated and carefully analyzed to find any missing areas. These missing areas have to be identified and filled based on additional field interviews with experts. Thereby, it is critical to obtain an easy-to understand and exhaustive classification without too many overlaps. It is further important to distinguish between the “whats” and the “hows”. Even more so, when most managerial text books focus on the “what” whereas many certificates focus on the “how”. **Both, the TML and the QEL should be developed by a strong involvement of Swiss IT-experts as well as of existing Swiss IT-organizations.**

The QCS will be an “interpolation” of the TML and the QEL, and is customized according to the needs of the Swiss industry while retaining compatibility with international certification schemes and standards such as those developed by IFIP. **IFIP is particularly important for two reasons:**

- (1) Figures indicate that it will be necessary to get more than 50'000 IT-specialists from abroad over the next two decades to fill the needs of Swiss industries;
- (2) On the other hand, allowing Swiss IT-specialists to gain experience abroad requires internationally compatible Swiss certificates as well.

The output of the IP3.ch project will be validated concepts in the form of documents, architectural sketches and graphical representations. These documents will show that it is critical to understand the knowledge, the skills, and the attitudes needed to create value in and for the IT businesses¹². This may look very much like standard academic procedures. However, in IT-engineering and business informatics it is considered as mandatory, that problems as well as solutions are explicitly described and named, carefully justified and critically validated with respect to their practical relevance. During this process architectural sketches and diagrams are used for clarification and to depict problems and or solutions on a high level of abstraction level.

¹² The standard structure of all documents will be: Meta-requirements, Requirements, Validation of requirements, Solution, Validation of solution.

Problem statement, solution design, as well as description of the requirements will be done with a multi-disciplinary perspective, taking also the managerial aspects into account as well.

There are two important requirements:

- **Preparing on a conceptual level the adaptation of the certification and considering existing utilization.** This will be achieved by building and maintaining strong links with international activities. In particular those of IFIP, which we will have to adapt to our Swiss local systems and legal standards.
- **Anticipating possible future changes in needs,** etc. that will arise from the technological developments as well as from the evolution of new practice and use of future applications. This will be achieved by an intrinsic change in engineering, management, and communication of concepts.

Once these results are compiled, the key challenge of the project is to prepare the implementation. To aim, a dedicated risk and quality management will be performed during every phase of the project, starting from the very beginning. Sharing the process with existing professional and institutional partners will play a central role for both.

International Activities of the IP3.ch-Project

In order to develop a certification scheme, which is linked to international schemes, **IP3.ch will have to assume an active role at the international level as well.** Participating in international bodies will give IP3.ch **the opportunity to exert some influence to defend the specific needs of the Swiss industries and businesses.** This will require taking the lead within IFIP to develop specific modules, a possible task if based on existing contacts and information. Such a participation would properly establish Switzerland as one of the leading IT-nations. IFIP on the other hand has vital interest

(1) to distribute their responsibilities among participating organizations,

(2) therefore to win strong national partnerships able to issue certificates compatible with IFIP.

Project- and quality management

The IP3.ch project will be managed in accordance to established standards (e.g. Ould, 1999 [13]). Considerable resources will be spent to ensure that all partners fully understand the cardinal aims of the project as well as their anticipated side effects. They require, according to our experience, a moderate, but constant flow of information, careful anticipatory management of announcements and milestones, as well as a high redundancy in communication.

Project management will start with the precise definition of several registers (risk, stakeholders, including national and international time-lines, etc.), which will be maintained and adapted throughout the whole project. Additionally, a quality management plan will be used and maintained throughout the whole project, which includes a clear definition of in-between products, the affiliated

¹³ Ould M., Managing Software Quality and Business Risk (Paperback) Wiley, 1999, ISBN 047199782X.

quality goals, and milestones. On the basis of the registers and the quality management plan a resource management plan will be developed.

The key success factors for this project are : to create a good concept and to ensure careful communication, in order to convince the different stakeholders and take into account their different perspectives without becoming unspecific.

Communication

Communication will be the critical virtue of IP3.ch, especially during the proposed initialization project as described in this paper.

Internally project's successes will be reported to the project steering committee, using both a traditional milestone reporting (referring to the work program) and a cockpit reporting (referring to various critical success dimensions).

Depending on the stakeholders' involvement different communication channels will be used. It is important to establish a two-way communication between the project team and the different stakeholders of the project. We will use several different communication paradigms:

1. Traditional one-way mass media information. This requires the role of a dedicated Journalist Relationship Management and a professional pre-production of contents for the mass-media. The target media are: TV, Radio, Newspapers, (daily: NZZ, Tagesanzeiger, 20-minuten, News, etc.; weekly: Weltwoche, etc.; specialized; Computerworld, Infoweek, Netzwoche, etc.)
2. Two-way communication relationships with key stakeholders and their representatives, as well as with opinion leaders in politics, business, and industry.
3. Many-way Web 2.0 networking groups as well as discussion forums.
4. A project and progress presentation at the annual ICT Networking Party.
5. Cockpit like presentation of the project process to the steering committee and semi-annual workshops with the steering committee, to obtain feedback from its members.

Risks and Benefits

The project IP3.ch involves considerable expenses that have to be measured against the expected beneficial impact of IP3.ch and the involved risks.

First, there arises considerable economic risk, if IP3.ch is not implemented. A recent increase in national and international competition, partially due to the drastically slowed economic growth is being observed. This situation underlines the need for Switzerland to initiate measures to increase productivity and to gain a competitive advantage. Not implementing a certification scheme, when most other relevant economies are doing so, is a disadvantage for the Swiss economy (e.g. when hiring) and may lead to a lower or slower growth rate. The ongoing activities of IFIP will lead to certification authorities in several other countries, which will attract highly qualified IT-professionals. Against which Switzerland would have to compete for human resources.

Other Risks

Certification intervenes with the existing curricula of educational organizations and can lead to additional costs when adapting courses, accrediting the organization, etc. It also allows for better comparison of the educational organizations, increasing the competition between them. These factors can induce opposition by some of the organizations. However, a proper certification scheme will increase the overall number of IT-students, which still is the best legitimation for committed educational institutions.

Benefits

Due to the nature of IP3.ch and its dependency on education, many benefits will become apparent in the long run but will however not materialize immediately.

IP3.ch will reduce an immanent risk of the Swiss economy: Switzerland is one of the world leaders in IT usage and the lack of locally trained IT-professionals increases the dependency of this country on a constant influx of foreign IT-professionals. This couples the Swiss economy to the situation in other countries, especially as Switzerland has become one of the leaders in the development of an immaterial economy.

In the short term range of the first 1-2 years we expect only little benefit to be visible. There might be some positive effect at the launching the project, which will influence the ongoing discussions and adaptations of the curricula within educational organizations.

In the mid-term range of 3-5 years we expect to see an effect on the growth of the Swiss IT-based economy, e.g. a reduction of growth risks to Swiss economy (which is difficult to quantify).

Prospective Human Resources and Budget Estimate

Organization of project team

IP3.ch will have a **steering committee** and a **project team**. The project team is responsible for the project work and reports to the steering committee. The project steering committee is responsible for supervising and steering the project work of the project team.

Steering committee

The steering committee will consist of representatives of relevant Swiss industries and businesses, Swiss IT-association, Swiss government, institutions involved in IT-education and of other major stakeholders. It will meet regularly (twice a year) to evaluate the project's success and to discuss steering and activities.

Project team

The project team will consist of IT-experts, management experts, and communication experts. It will include the following roles:

1. Project leader (experienced in leadership of multi-disciplinary teams, with both Swiss and international professional backgrounds).
2. Coordinator with IFIP (with a broad IT-related knowledge background and international experience).

3. Project architect, responsible for structuring the landscapes and the mappings between them (with a broad IT-related knowledge and practical modeling expertise).
4. Communication experts (with experience in stakeholder communication for innovation programs and at least a good general understanding of the IT business).
5. Researchers responsible for work package contributions (with both practical and theoretical knowledge background in informatics, information management, and teaching).
6. Administrative assistant (able to communicate in German, French, and English).

First draft of a budget

We envision that the IP3.ch project will be initiated within 3 years and will generate approximately 13.5 person years of work. For this about 2'000 kCHF for human resources are needed plus another 600 kCHF for other expenses (see Table 2 and Table 3)

After the initial three years required establishing IP3.ch the organization will be handed over and run by a Foundation with a capital of 500 kCHF (see Table 4).

The total investment will be 3'100 kCHF, cost that will be used to secure sustainable growth of the Swiss economy. We believe that this will generate a far greater benefit by increasing the attraction of the IT-business for young people as well as easier IT-recruiting of foreign experts.

Table 2: Estimated costs for the human resources in the project phases

Project Phase	kCHF
A. Analysis of Situation in Switzerland	380
B. Develop solution(s)	520
C. Implementation	900
D. Project management	200
Total	2'000

Table 3: Overview of other expenses for the project phases

Project Phase	kCHF
A. Analysis of Situation in Switzerland	300
B. Develop solution (s)	150
C. Implementation	75
D. Project management	75
Total	600

The IP3.ch foundation

At the moment we envision an IP3.ch foundation, which is selling certificates and accreditations for educational originations and that is conducting educational market research for IT businesses and educational organizations.

Table 4: IP3.ch - Foundation (Stiftung)

Project Phase	kCHF
A. Administration & Fees for founding foundation	20
B. Foundation capital	500
Total	520

List of possible partners and sponsors

The success of the project will heavily rely on partners and sponsors.

Partners play an active role and will provide expertise, public-relations and networking within their communities, as well as human resources. **Sponsors** play a mostly a passive role in the project (except for very special activities), but will provide the financial resources needed. Partners as well as sponsors will increase the reputation of the project and thus increase the trust and confidence among all stakeholders.

Possible partners/sponsors:

ABB	Adecco	Avenir Suisse	BAKOM / OFCOM	Bâloise
Banque Migros	BBT / OFFT	BCV	Bedag	Bilan
Bilanz	CISCO	Clariant	Coop	Crédit Suisse
Economiesuisse	EDK / CDIP (SKIB)	Google	Hasler Stiftung	Holcim
Hublot	IBM	Infomaniak	Julius Bär	KTI / CTI
La Poste	Le Temps	Microsoft	Nestlé	Nobel Biocare
Novartis	Novotel	NZZ	Oracle	Postfinance
Raiffeisen	Richemond	Roche	SAP	SBB / CFF
SBF / SER	SECO	SIK	SUN	SUNRISE
Swatch	Swisscom	Swisslife	SwissRe	Syngenta
Synthes	Trade Unions	UBS	USAM	Zurich

