The Swiss IT apprenticeship
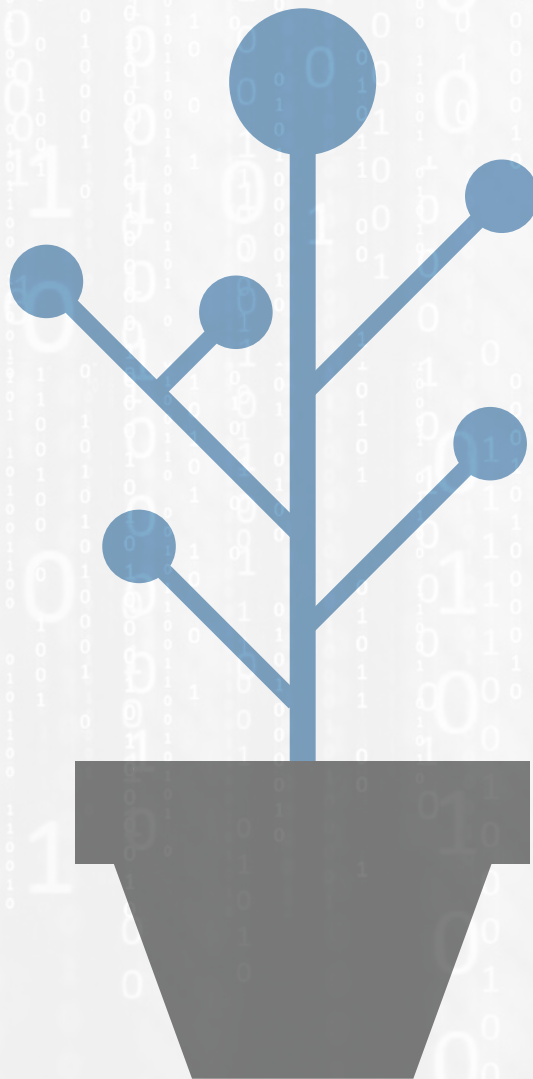## in a disruptive, global and agile world

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in a disruptive, global and agile world

Introduction and Discussion Points

The think tank series of the FHNW School of Business provides current and relevant information on digital transformation topics in general and on the status of transformation of Swiss organizations in particular. The extensive FHNW study with over 2,500 respondents provides a sound basis for discussions. The study shows how Swiss organizations develop their digital business capabilities.

Two think tank sessions on 9 April 2019 and 2 July 2019 dealt with the challenges, opportunities and central themes of vocational training (apprenticeships) of IT (Information Technology) professionals in the digital age. Following the presentation of study results and important models, participants discussed central issues of vocational training – including current challenges and potential actions. The results have been summarized and published in this report.

The following topics were discussed in the think tank of the FHNW School of Business:
– The need for IT professionals and the public perception of vocational education training
– The set-up of vocational training programs
– The market participants and stakeholders which enable these programs
– The current challenges and future opportunities
– The option of an international apprentice exchange

Background – Business Transformation in the Digital Age

Digital transformation in Swiss organizations is driven by the need for efficient processes, new customer requirements and by the advancement of technology. IT software investments are sizable with a focus on enterprise resource planning and collaboration/project management solutions. The biggest barriers to achieve successful transformation are seen in the required time and the lack of know-how; with risks identified around IT and data security and a lack of specialist resources in 42 % of Swiss organizations (Peter, 2017).

To manage these opportunities and reduce barriers, Switzerland has a need for almost 90,000 IT professionals over the coming eight years. Of that number, through the education and vocational system, a large number of professionals will join the workforce. However, the country will be short of around 40,000 IT professionals (ICT-Berufsbildung Schweiz, 2018). The recruitment of talents and building of IT skills in organizations is a driving force for the competitiveness of modern organizations. Vocational training – the topic of this think tank – is seen as an attractive model to attract, educate and provide IT professionals to the workforce.
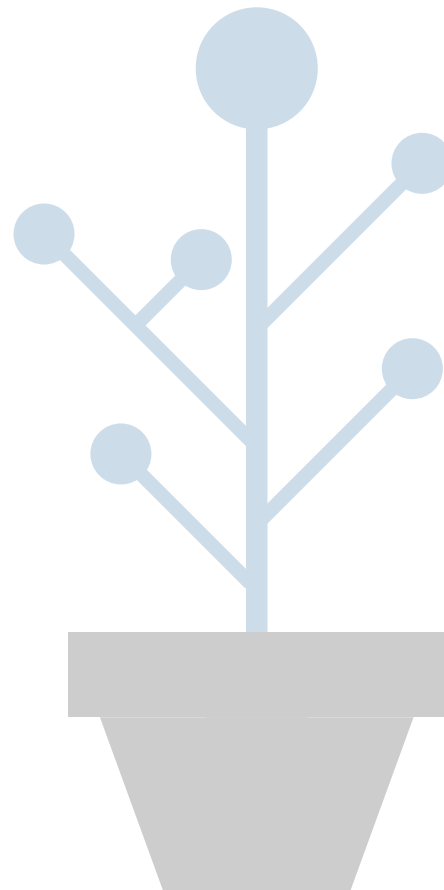
Vocational Training and the IT Apprenticeship Scheme

The vocational training scheme has a long tradition in Switzerland with over 230 provided vocational and professional education programs. Over 220,000 Swiss residents are currently in a vocational training program and therefore referred to as apprentices, and almost 250,000 residents are university students and referred to as undergraduate students (BFS, 2018a). The IT vocational training program gained in attractiveness from around 5,000 apprentices in the late 1990s to over 25,000 in 2017 (BFS, 2018b). Once an apprentice graduates with a federal certificate, they can continue with further studies, leading to a diploma and then further to a university provided Master of Advanced Studies degree. This enables both apprentices as well as undergraduate students joining traditional universities to advance to the master degree level.

The IT vocational training program takes four years to complete (Fig. 1). Apprentices spend one to two days per week in a vocational training school and have the choice of three specializations, namely application development, business informatics and systems administration/engineering. Various models exist for the first two years. In some cases, apprentices already work on the practical application from year 2 onwards.

In order for the vocational training program to succeed, a number of market participants and stakeholders collaborate (Fig. 2, next page). The host organization identifies and articulates the need for apprentices and skilled, young IT talents, whereas apprentices shall be attracted by the IT vocational program and apply to advertised vacancies at host organizations. Apprentices will either attend a vocational training school (VTS), which are government operated by many states, or join a vocational career center (VCC). The two streams – the VTS and VCC options – will be explained later in more detail. Finally, the vocational training scheme has dependencies on the extended eco-system, namely vocational associations which define standards, training content and examination requirements (along with the management of the annual exam), and state and federal government which approve and monitor the scheme.

Year 1	Year 2	Year 3	Year 4
Foundation year	Maintenance and support	Practical application / on-the-job experience	Practical application / on-the-job experience
	Projects		

Figure 1: The Swiss IT vocational training program

Both the hiring host organization as well as the apprentices have the choice of two different streams:
– The VCC stream where apprentices join a dedicated career center and spend the first two years in the VCC, followed by two years with the host organization; or
– The host stream where apprentices spend all four years with the host organization and attend a state allocated VTS.

In the first year of the program, apprentices have to acquire the foundation, a core body of IT knowledge. It is estimated that 20–30 % of apprentices join a VCC, and 70–80 % stay with their host organization. The advantages of a VCC, as articulated by the think tank participants, are:
– A larger IT portfolio, i.e. more topics, are covered;
– The opportunity for networking among multiple organizations;
– The provision of HR and administrative support services to the host organization;
– It is generally the more productive approach and therefore cost efficient; and
– Professional lecturers and support staff are available to guarantee a positive outcome.

On the other hand, an integration with the host organization in year 1 also has some advantages:
– The apprentice is exposed to business practice and the corporate culture;
– Specific industry and business knowledge will be obtained; and
– The apprentices will be exposed to the products and services provided.

In the second year of the program, apprentices in the VCC stream will work on various client projects, provide IT support and maintenance, which again exposes them to multiple organizations and projects, while apprentices in the host stream continue working in the host organization (as mentioned earlier, in some cases, apprentices already work on the application of their knowledge from year 2 onwards). It is assumed that the VCC stream overall has some distinct advantages for the host organization, which include economical, quality and performance factors. Hence, the focus of the VCC stream is the building of practical competencies.

In the third and fourth years, apprentices are assigned to their host organizations, continue to provide value to the host and benefit personally from additional on-the-job work experience.
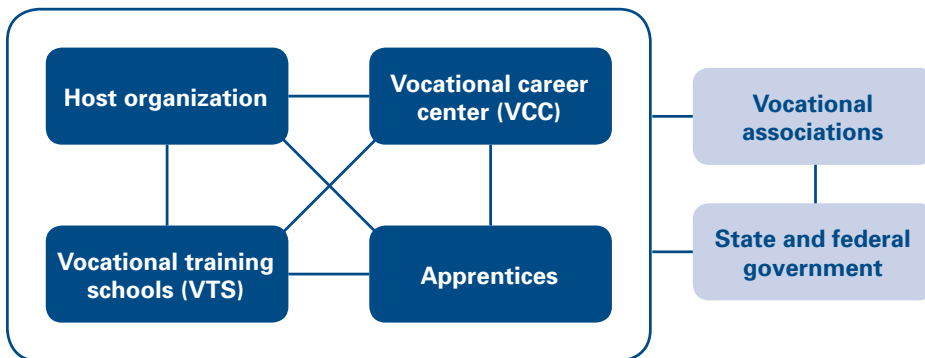

Figure 2: Market participants/stakeholders in the IT vocational training scheme
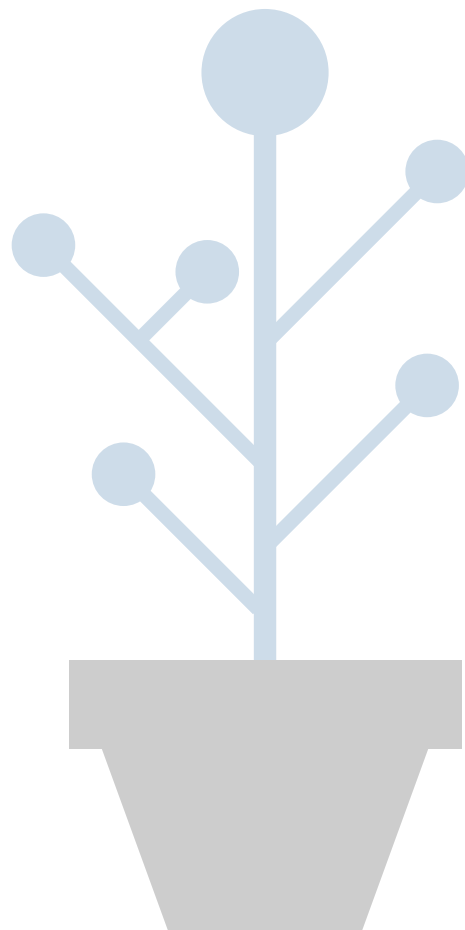
Challenges

Driven by the shortage of IT professionals, think tank participants highlight the need for marketing funds made available by the government to promote the benefits of the vocational training program and host organizations' vacancies. Serge Frech responded to the conversation by highlighting the many activities which are already in place to promote the IT vocational program.

Barbara Surber believes that the challenge is not only to provide apprenticeships, but to attract enough talent, i.e. applicants and potential apprentices, to the program. Here, colleges implemented data protection regulations which make it difficult for vocational training associations to promote their offerings to students and their parents. The lack of access to schools, parents and students is therefore seen as a major challenge. A further challenge has been identified by the relatively slow adoption of learning modules and content, since federal and state government bodies approve standards and policies.

Sonja Wollkopf highlighted that vocational training programs often have the stigma attached that they are of lesser value than a university program, e.g. a bachelor degree. This challenge is further driven by an application process to vocational programs and apprentices which is often more time consuming (for instance because of the interview process and entry tests) than the application for a undergraduate program at a state university. The group also discussed the cost associated with a four-year apprenticeship, which is set at about CHF 120,000 to 150,000.– ; or about CHF 3,000 per month (this includes VTS fees of about CHF 25,000.– and salaries). The group concludes that while this might appear high in the first place, it is an investment in talents for the organization and allows the development of a skilled team with excellent product knowledge and high output (the retention rate of apprentices is around 50–80 %).

The think tank concludes the discussion with the challenges and the opportunity to develop and offer a professional bachelor degree, which would reduce the perceived value gap between an apprenticeship and a university undergraduate program. Unfortunately, primary schools have a bias in promoting colleges over vocational educational training programs. Apparently, in the past, the vocational training associations themselves have not supported the idea of such a professional bachelor degree. The group highlights the historical background since in earlier years, apprenticeships were mainly provided in the blue-collar profession. Only now, with the fourth industrial revolution, the white-collar share of apprenticeship schemes has increased in relevance.

Opportunities

The IT profession seems to be more resistant to economic downturns because of the ongoing need for IT talents. Even in challenging times, IT projects will allow organizations to be more cost efficient. Barbara Surber explains that vocational programs are an excellent alternative for university students who, in the first year, decide that a more practical study mode is more attractive to them. Serge Frech states that the various market players should further promote the vocational program as a meaningful alternative to university programs, even though university programs are growing with the rise of university of applied sciences in Switzerland.

One point that has been raised by both Sonja Wollkopf and Adrian Krebs is the attractiveness of a vocational training program as a second career path, for adults who want to move into the IT field (about 20 % of apprentices are adults). Serge Frech points out that the relatively low salaries of apprentices may reduce the attractiveness.

The group discussed the need for a sophisticated education of school graduates to support their educational decision-making, as well as a selection process at university level in order to ensure that young talents embark on the most appropriate route of either an apprenticeship or an undergraduate program. At this point of time, the think tank participants discussed the potential need for a numerus clausus for university students and the potential for vocational training schools to be privatized in order to drive improvement and develop more compelling market offerings. One potential new market offering is the idea of a global project assignment as part of the apprenticeship (see page 8).

Business Reality

The second think tank from 2 July 2019 aimed at identifying the viewpoints from business practice, i.e. from organizations who already have or plan to engage apprentices.

The group started with a general discussion about the challenge to access public schools in order to promote the IT apprenticeship scheme to address students early on as they decide on the most appropriate career path based on their goals.

Jürg Brunnschweiler from ETH Zurich explained that a large share of students want to study IT nowadays. While the large providers (e.g. universities) have a strong brand in the market, it is difficult for alternative providers – as well as the apprenticeship scheme which is offered by many organizations but not a single entity – to have their share in the market or a platform where they can promote their programs. Robert Bonomo from Cognizant observes how new young talents join their graduate program with a Bachelor's degree. They will only study later for a Master's degree as they are keen to experience the practical side of business practice. Moreover, they start to enjoy the amenities of work. Apprentices on the other side seem to want to obtain a Bachelor's degree after their apprenticeship because they think that it is required in today's market (when looking at their older co-workers who have just completed a Bachelor's degree), and to obtain more theory. So both parties aim at what the other one has.

At Accenture, Peter Frei explains that in the past, new recruits mainly came from the University of St Gallen or ETH. Over time, Accenture identified the need for additional talents. This is why apprentices became an interesting option. Accenture then started hiring employees with a business apprenticeship. Soon after, the need for apprentices with an IT background rose. They can now see that the USA is keen to replicate the Swiss apprenticeship model. The feedback from the market (Accenture sent project teams which also had apprentices to UBS for a project) is very positive. At this point of time in the discussion, Flurin Hess wonders how the IT apprenticeship can be made more "tangible" for teenagers so they can see the advantages of the IT apprenticeship.

This leads to a conversation led by Sonja Wollkopf from Greater Zurich Area who is keen to understand how the IT apprenticeship could be promoted more actively, and what a potential story could look like. Rainer Wittwer from Cognizant explained how they actively tried to promote the IT apprenticeship in collaboration with local young talent supporting organizations in the previous year, but market response was not as high as expected. Think tank participants then discuss how traditional media and communications channels do not seem to resonate with the young generation. Jürg Brunnschweiler says that "considering content to communicate is one thing, but we also have to adjust our channels and the way we communicate to fit potential apprentices' needs; and to be able to communicate with this younger generation properly". Serge Frech mentions that his association invests heavily into the promotion of IT apprenticeships, however, the success rate is lower than expected. Especially women, while attending the introduction sessions, do not seem to sign up to the IT apprenticeship. Serge Frech believes that a driver for this situation is the still old-fashioned cultural values of job categories suitable to women and men; which points to a much needed value system change. ICT Berufsbildung Schweiz is therefore focusing on a strict gender neutral messaging.

Patrick Müller from UBS shares his view about the challenging situation: "In the financial industry, we should gain an industry-wide approach in promoting the IT apprenticeship as an industry; a combined effort would most likely generate a higher interest in the market". Participants share the view that employers are not quick enough to build new modern work practices and work models to make an employer attractive for young talents and in order to start an apprenticeship. Even young people are thriving for part-time work, for instance to complete their studies while already working. Here, Accenture incorporated a system where employees can adjust their employment from full-time to part-time: They do not have to ask their manager, but can determine themselves if they want to reduce their employment mode down to e.g. 80 % or even 40 %, would like to have a local project assignment or buy more vacation days. About 10% of employees took advantage of the new offering with positive feedback and no identified disadvantages. Adrian Krebs from Noser Young confirmed that all of his fifteen apprentices would like to have the option of working part-time once they graduate.

Driving the IT Apprenticeship

So why is it so difficult to promote the IT apprenticeship? Rainer Wittwer believes that promoting IT apprenticeships at public events might result in a more positive perception. Serge Frech believes that the current system with about 24 independent associations in Switzerland makes it difficult to utilize a combined force to promote the various options for public school graduates. Attempts to collaborate, for instance with the youngest and one of the largest associations, did not result in a fruitful outcome. Collaboration across associations would be beneficial to everybody and funds could be better used as several attendees confirmed. Both Peter Frei and Jürg Brunnschweiler believe that teachers play an important role; a role which they do not embrace yet at the fullest potential. Teachers are crucial influencers: they and their opinion have a great impact on students and their career choices. If teachers could be motivated to promote the IT apprenticeship and its potential, more students would take up the apprenticeship option. However, the think tank group believes that this is a difficult task, especially because the market is growing too quickly. Daniel Kalt from UBS points out that associations should identify the influencers, including career counsellors, and collaborate with them.

Samuel Berger observed that in general, employees leave their jobs because they need change and new challenges. Young talents might choose an apprenticeship if companies would succeed in promoting the ideal combination of work practice and school (theory), providing students a varied, mixed business experience. He believes that start-ups should advertise and utilize the apprenticeship theme to attract talents who enjoy working in a flexible environment. Daniel Kalt points out that a separate IT start-up apprenticeship could be promoted in the market.

The discussion ends with additional comments about the massive potential for SME (small and medium sized enterprises) to promote the IT apprenticeship (given the lack of IT personnel in most SME), connected with the challenge that still today, the government of each Swiss canton still has to approve an apprenticeship position in a company, an administrative barrier which might reduce the attractiveness of apprentices for SME.

Going Global

In a global and connected world, apprentices shall be exposed to global collaboration and foreign cultures in the third and fourth year of their apprenticeship. This global option, an apprentice exchange (as opposed to a student exchange) of one to twelve months, would benefit apprentices and host organizations alike.

During the first think thank session, Barbara Surber and Sonja Wollkopf express the need to build global awareness and understand different social and corporate values. They explain that the benefit of an international exchange lies in the experience that in a global setting, professionals have to rely on their colleagues in other locations in order to complete a project. Serge Frech explains that global organizations especially have a need for graduates with global competencies, and in turn, young talents who have a desire for global exposure will be attracted by such a program option. Here, Adrian Krebs highlights the benefit of building loyal employees: If the host organization provides a global option, the attractiveness of the employer increases and therefore, graduates will remain longer in the host organization. It is evident that many organizations in Switzerland – including Accenture, Credit Suisse, Google, Siemens and UBS – are interested in this new global option. The think tank participants believe that 30–50 % of all apprentices might take advantage of such a global opportunity.

In the second think tank session, participants explain the need from businesses to be able to attract English speaking talents. The group highlights the practical benefits of an international exchange. Robert Bonomo explains that their apprentices all speak English on a daily basis, but they are shy when they first join the business. An international program would benefit apprentices tremendously. At the moment, apprentices joining the Swiss business of Cognizant are already sent to overseas assignments, including trips to India and Spain as part of their on-boarding program. Especially in the IT industry, an apprenticeship might be the much smarter and exciting option for students because of its practical nature and international exposure.

Conclusion

The Swiss vocational training scheme is highly attractive and provides experienced graduates with practical competencies and a high work ethic to the nation's labor market. This, among other factors, makes Switzerland the country with the largest share of apprentices globally, but also benefits society and the economy with the second lowest youth unemployment rate. In addition, it drives global competitiveness (Financial Times, 2017).

In summary, four challenges and five opportunities were identified and elaborated in the first think thank session (Fig. 3). Challenges include the need for marketing funds to promote the IT apprenticeship scheme, to attract talents to apply for apprenticeship vacancies, to enable access to schools, parents and students; and the value perception of apprenticeships in society. Opportunities, on the other hand, include awareness building and better career selection support, the promotion of apprenticeships as an attractive alternative to undergraduate programs, apprenticeships as a second career path, a global option with an apprentice exchange; and finally, a professional bachelor program as an add-on to the federal apprenticeship certificate.

In Switzerland, both the apprenticeship system and university education have proven successful over many years. However, more permeability between the two systems and detailed individual clarifications as to which path is more suitable for each young adult are desirable.

In the second think tank session, participants concluded the discussion with the following statements:

- Many apprenticeships still dictate the future career path of individuals too much: teenagers who do not know what to study go for business. IT, on the other hand, provides a large base of options for the future and provides that flexibility. This benefit should be better promoted.
- Organizations and associations should try to identify how to better engage with young talents who are still in school so they can be given all options to consider for their future career steps.
- In addition, new work as well as educational models are required, and apprenticeships models shall be transformed into the digital age.
- Parents play an important role in the career decision-making process and they should be considered as important stakeholders.
- More concrete action is required to promote the IT apprenticeship and its benefits.

The group concludes the discussion by articulating the need for a more agile vocational training scheme, the consideration of the needs of the economy and host organizations, a more global oriented apprenticeship and finally, a higher impact in the market by articulating the value propositions of apprenticeships. In summary, vocational training is important for Switzerland or any other nation which has a need for highly skilled and practical IT professionals.
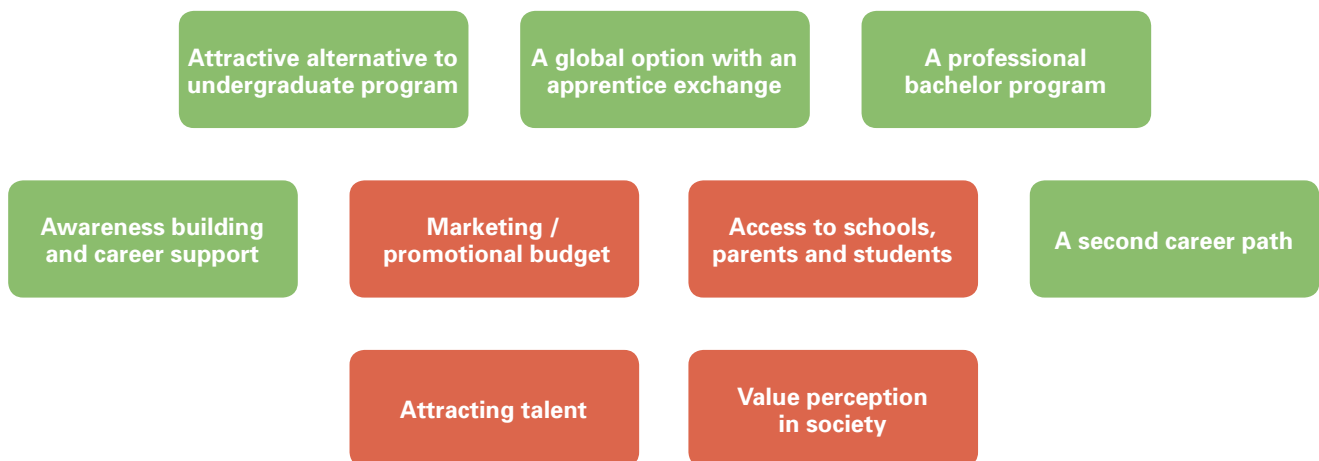
Figure 3: Challenges (red) and opportunities (green) of the Swiss IT vocational training program

The Think Tank

On 9 April 2019 and 2 July 2019, Noser Young and the Center for Digital Transformation of the FHNW School of Business invited selected organizations to a think tank discussion about IT apprenticeships in a global and agile world.

The think tank is part of a series of discussions whose goal is to elaborate topics around digital transformation and to transfer applied knowledge from Swiss businesses to practice and research.

The FHNW School of Business develops and publishes the think tank series in the form of white papers under the guidance of Prof Dr Marc K Peter.

Think Tank Participants 9 April 2019:

Serge Frech	CEO, ICT-Berufsbildung Schweiz
Corin Kraft	Research Associate, FHNW School of Business
Adrian Krebs	CEO, Noser Young
Marc K Peter	Professor, FHNW School of Business
Barbara Surber	CEO, ICT-Berufsbildung Bern
Sonja Wollkopf	CEO, Greater Zurich Area

Think Tank Participants 2 July 2019:

Samuel Berger	Partner & Board Member, Witena Leadership Advisory
Robert Bonomo	Head QE&A DACH & Eastern Europe, Cognizant
Jürg Brunnschweiler	Head of ETH Global, ETH
Serge Frech	CEO, ICT-Berufsbildung Schweiz
Peter Frei	Principal Director/Lead Technology Switzerland, Accenture
Flurin Hess	Partner, Dezentrum
Daniel Kalt	Managing Director/Chief Economist, UBS Switzerland AG
Corin Kraft	Research Associate, FHNW School of Business
Adrian Krebs	CEO, Noser Young
Patrick Müller	HR Junior Talent, Program Manager IT Grundbildung
Marc K Peter	Professor, FHNW School of Business
Robin Röösli	Intern, Julius Baer
Barbara Surber	CEO, ICT-Berufsbildung Bern
Rainer Wittwer	Service Manager and Vocational Trainer, Cognizant
Sonja Wollkopf	CEO, Greater Zurich Area

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