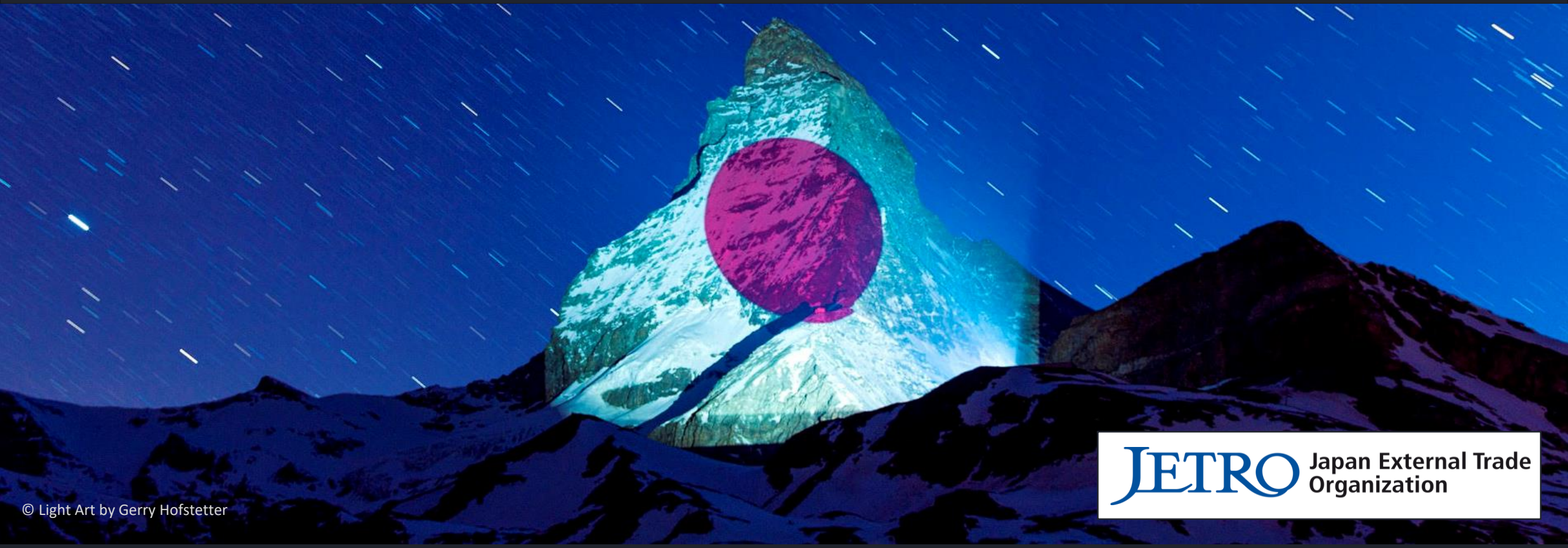
SWISS INNOVATION LANDSCAPE

OPEN INNOVATION & STARTUP ECOSYSTEMS IN SWITZERLAND

June 2021, JETRO Geneva, Innovation Promotion Division



JETRO Japan External Trade Organization

EXECUTIVE SUMMARY

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Purpose of the Report

This report serves as an orientation guide as well as an information base for concrete actions for Japanese companies that are seeking to collaborate with startups in an open innovation process. To this end, it presents relevant information to Japanese companies about the competitive advantages of the Swiss startup ecosystem in the European context and provides a general overview of the Swiss innovation landscape including a deeper analysis of four selected startup ecosystems. In addition, two current collaborations between Japanese and Swiss companies are presented.

Centrals Insights of the Report: The Competitive Advantage of the Swiss Startup Ecosystem

The Swiss startup ecosystem provides an attractive environment for Japanese companies scouting for startups as open innovation partners. The strength of the Swiss startup ecosystem can be categorized into two main components:

1) High Economic Compatibility with Japanese Companies

> Expertise in high-tech and medium high-tech manufacturing, one of the major industries in Japan.

> Shared focus on innovation as continuous, incremental optimization of existing technologies, processes and practices

2) Low Effort and Low Risk for Identification and Collaboration

> Reduced effort required by foreign companies to find and collaborate with Swiss startups due to the geographically small-scale, dense ecosystem network, the high quality of startups and the general interest of startups to cooperate internationally.

> Higher degree of compatibility of Swiss startups with Japanese companies regarding business cultural norms and styles of cooperation, including a higher preference for structures, bilateral open innovation approaches.

> Reliability and trust are key pillars of Swiss business relations, especially with foreign companies, as doing business with them has historically been a crucial success factor for Swiss companies.

CONTENT

Closed innovation processes have become increasingly inadequate to develop satisfactory levels of innovation. Companies are trying to improve their innovative capacity by opening up their processes to external actors.

1. INTRODUCTION – THE NECESSITY OF OPEN INNOVATION I / II

Status Quo[1]

Innovation, the creation of new wealth-producing resources or the endowing existing resources with enhanced potential for creating wealth, has always been an important requisite for the financial success of many companies. Traditionally, corporate innovation activities were conducted in a closed system, where all innovation projects were managed internally and often with a high degree of secrecy.

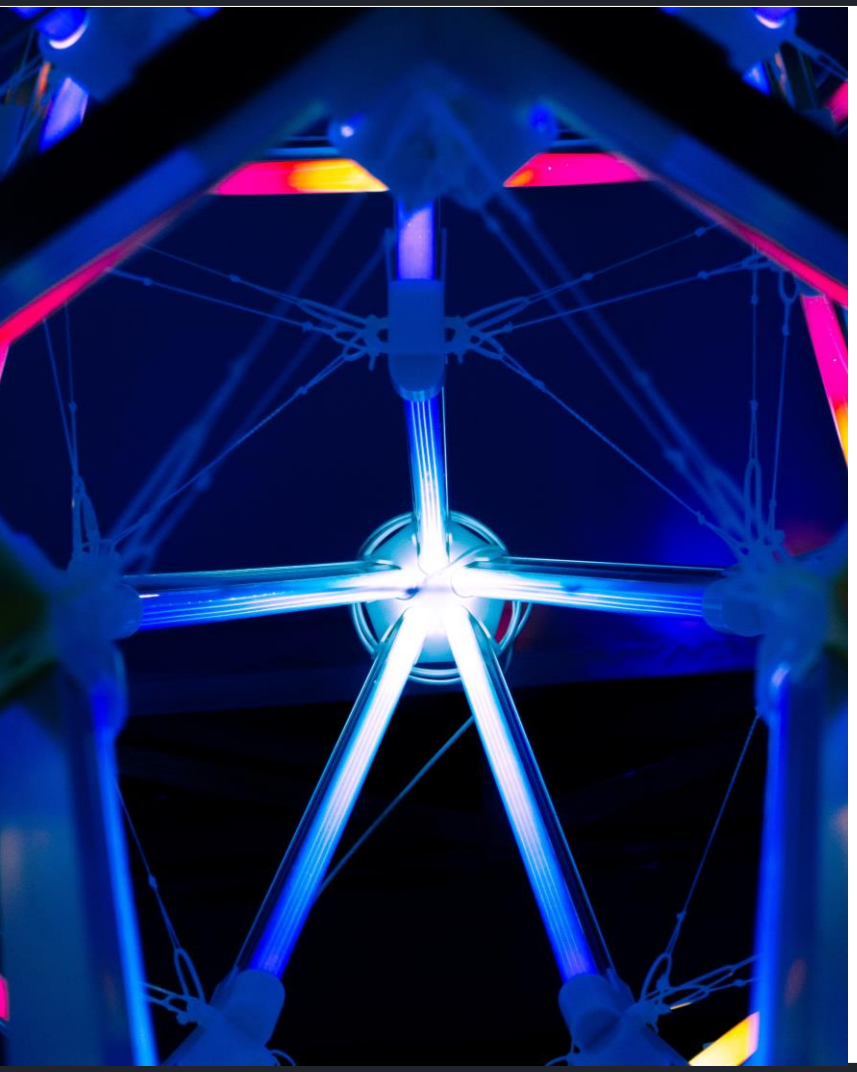
The New Relevance of Open Innovation[1]

However, the dissemination of new, especially digital technologies in the economy and society in recent years has created an increasingly dynamic and complex environment. In this environment, companies with closed innovation processes run the risk to miss disruptive developments due to their limited and lagging understanding of current circumstances and the inert nature of their innovation processes.

To remain relevant and profitable in an increasingly complex and dynamic business environment, companies are moving to adopt principles of open innovation that are considered to be better suited to meet the challenges of this new environment.

1) Drucker (2002)

Open Innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation. It can provide companies with novel perspectives and a larger idea and knowledge base.



1. INTRODUCTION – THE NECESSITY OF OPEN INNOVATION II / II

Definition of Open Innovation[1]

Open Innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation. The open innovation paradigm assumes that useful knowledge is widely distributed, and that even the most capable R&D organizations must identify, connect to, and leverage external knowledge sources as a core process in innovation.

Benefits of Open Innovation[1]

> **Larger Idea and Knowledge Base:** Integrating open innovation paradigms into corporate R&D processes provides access to a larger idea and knowledge base, increasing the quality of available knowledge and ideas.

> **Cross-Industry Synergies:** The networking of knowledge and know-how from different industries opens up new perspectives and can lay the foundation for radically novel innovations.

> **Increased Efficiency:** Open innovation can also reduce development time and costs for companies by handing over activities to innovation partners in the sense of a division of labor.

1) Chesbrough (2006)

One approach for companies to integrate external knowledge into internal innovation processes is to collaborate with startups. They can often offer larger companies innovative insights outside of traditional perspectives.

1. INTRODUCTION – COLLABORATION WITH STARTUPS AS AN OPEN INNOVATION APPROACH

Practical Approaches to Open Innovation[1]

Companies that are interested in integrating open innovation principles are faced with the question of how to practically approach this endeavour. There are various methods to open innovation, such as crowdsourcing and innovation labs. One popular approach, and the focus of this report, is the opening up of internal innovation processes to startups through collaborations.

Benefits of Startup Collaborations[1]

> **Disruptive Solutions**: External innovators often have more freedom to develop truly disruptive solutions. Collaborating with a startup can also facilitate the necessary disruption to one's business model that is difficult to achieve from within.

> **Customer Centricity**: Startups tend to innovate closer to customer needs because they are not as process-driven by default as established companies.

> **Innovation Culture**: Working with startups can infuse corporate R&D departments with a culture of openness that allows for innovation as well as failure on the way to new solutions, which becomes increasingly important in a fast-changing business environment.

> **Disruption Detection:** Working with innovators allows a company to better track potentially disruptive market changes.

> **Willingness to Collaborate:** Startups tend to show a high willingness to collaborate with larger corporates as they benefit through a scalable customer base, access to proprietary assets and market insights, and mentoring.

1) WEF (2018)

A startup ecosystem is network of interdependent actors across disciplines and sectors, interacting as a system for the purpose of stimulating the creation and development of startups, often operating in a specific region.

1. INTRODUCTION – THE IMPORTANCE OF STARTUP ECOSYSTEMS I / II

What is a Startup Ecosystem?

A startup ecosystem is network of interdependent actors across disciplines and sectors, interacting as a system for the purpose of stimulating the creation and development of startups, often operating in the environment of a specific region.[1] These actors can provide various services and resources to startups to support their development: knowledge and technology from research, support through expertise and infrastructure, funding as well as networks for the purpose of matchmaking and information transfer.

Typical Actors in a Startup Ecosystem (by function in ecosystem)

RESEARCH	SUPPORT	FUNDING	NETWORK
Government			
Large Private Enterprises			
Research Institutions		Venture Capitalist Funds	Business Associations
	Incubators & Accelerators		
	Co-Working Space Providers	(Angel) Investors	Co-Working Space Providers
	Consulting & Coaching Firms	Foundations	Information Platforms
		Corporate Ventures	Event Organisers

1) Tripathi et al. (2018)

Startup ecosystems provide an excellent environment to look for innovative startups for collaboration, as ecosystems provide conditions conducive for their development and incentivize collaborative behaviour.

1. INTRODUCTION – THE IMPORTANCE OF STARTUP ECOSYSTEMS II / II

Benefits of Startup Ecosystems[1]

When looking for suitable startups as cooperation partners, existing startup ecosystems can offer companies a favourable environment to conduct their search.

- **Concentration of Innovation:** Startup ecosystems tend to include a relatively high concentration of innovative startups as they provide a conducive environment for their development
  - Facilitated access to human, financial and professional resources and knowledge
  - Creation of innovative added value due to synergies between different actors in the ecosystem
  - More efficient transfer of information and knowledge between organisations
  - Cost efficiency through the pooling of labour and infrastructure
  - Increased motivation and inspiration through community building among entrepreneurs
- **Collaborative Structures and Mindsets:** Startups in startup ecoystems are more likely to have the internal structure and mindset to seek collaborations with other actors, such as foreign companies, as they have developed in a collaborative environment.
- **Findability:** Startup ecosystems are often easier to find for companies scouting for collaboration partners than individual startups, as ecosystems generally possess one or multiple overarching organisations that take up a public relations function. For startups this function tends to be initially underdeveloped.

1) Tripathi et al. (2018)

CONTENT

Switzerland is world-class when it comes to the development of innovative technologies, products and services. It should therefore be strongly considered by all companies looking for innovative startups.

2. SWISS INNOVATION LANDSCAPE AT A GLANCE – PERFORMANCE

OVERALL INNOVATION CAPACITY	
General Innovation Indices	1st place Global Innovation Index (2011-2020)[1] 2nd place Innovation Indicator (2020)[2] 3rd place Bloomberg Innovation Index (2021)[3]
RESEARCH & DEVELOPMENT	
Patent Submissions	7st place worldwide in patent submissions (2019) with 8’249 applications[4]
R&D Expenditure	3rd place worldwide in national R&D expenditure as share of GDP worldwide (2018) with 3.37%[5]
ENTREPRENEURSHIP	
Startup Establishments	2020 was a record year in entrepreneurship with 46’842 new companies being founded in Switzerland (+5.3% to previous record year 2019).[6]
Venture Capital	The average yearly VC investment in Swiss startups between 2015-2019 was 0.06% (as share of GDP), the fourth highest in Europe.[7]

1) WIPO (2020)
2) Bloomberg (2021)
3) Frauenhofer Institut (2020)
4) IPI (2020)
5) UIS (2019)
6) IFJ (2021a)
7) New Invest Europe (2020)

There are several factors that foster innovative behaviour in Switzerland, for example its world-class research institutions, which collaborate closely with the private economy, and its business-friendly economic conditions.

2. SWISS INNOVATION LANDSCAPE AT A GLANCE – SUCCESS FACTORS

There are several factors making Switzerland a highly conducive environment for innovation.[1,2,3,4]

> **Research Institutions and Knowledge Transfer**
First-class scientific research organizations and close collaborations between universities and private companies

> **Business-friendly Climate**
  > Reliable Governance and Political Stability
  > Liberal Labour Market & Attractive Tax System
  > Sound Financial and Capital Market
  > High Purchasing Power
  > Reliable Infrastructure

> **Quality of Workforce**
High-quality workforce due to the applied nature of the Swiss dual education system, prevalence of higher education in population, multilingualism and Switzerland's attractiveness for highly qualified foreign workers.

> **Existing Business & Technology Landscape**
Access to cutting-edge technology and infrastructure (for example in the areas of biotech and AI) thanks to the presence of leading industry and technology clusters

> **Intellectual Property**
Excellent conditions for protecting and harnessing innovation due to the existing legal framework around intellectual property and the availability of specialists in IP management

> **Government Involvement**
Government funding with a bottom-up approach geared towards the fostering of collaboration between the corporate sector and universities

> **International Networking**
The presence of multiple internationally renowned private and public institutions, for example in the areas of research, development and governance, due to Switzerland's central, well-connected position in Europe and high quality of life.

> **Market Competition**
Competitive markets create an environment, where companies are forced to innovate to stay relevant and profitable.

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1) Switzerland Global Enterprise (2020a) 2) Economiesuisse (2013)
3) Switzerland Innovation (2020) 4) SERI (2020)

In 2020, the growth rate of startups continued to increase and total capital investments decreased only moderately. Investments shifted away from newly founded startups and more established startups with expansion plans.

2. SWISS INNOVATION LANDSCAPE AT A GLANCE – THE IMPACT OF COVID-19

Startup Establishments
Switzerland stands alone as the only country in Europe whose growth rate in startup establishments continued to rise in 2020. 5.3% more startups were established than in the previous record year of 2019.[1]

Total Capital Investments[2]
Investors hit the brakes especially during the first lockdown period in Switzerland. In the second of half of 2020, investments became more numerous again and also increased in volume, resulting in a comparatively moderate decline of around 7% of total invested capital compared to the record year of 2019. The surprisingly stable development of venture capital flows was fuelled by a higher number of financing rounds with more capital being deployed per round. On average, investments rose from CHF 1.95 million to CHF 2.9 million.[2]

Investment by Startup Phases and Sectors
Regarding the allocation of capital, the investors were primarily interested in crisis-proofing startups beyond the founding phase and also shied away from financing big expansion strategies, with no big investments of over 200 million francs happening. This points towards a more cautious behaviour by investors during the Corona crisis.[2]
While investments in ICT startups fell from around CHF 1.2 billion to CHF 720 million in 2020, startups in the life science sector saw an increase in capital inflow. On the one hand, this is related to the long-term nature of innovations in drug development, but it is also in line with the global trend toward steadily growing biotech investments.[2]

Innovation Support Programmes
On November 11, 2020, Innosuisse, the federal innovation promotion agency, announced a special impulse program "Innovation Power Switzerland", which will make it easier for SMEs to obtain financial government support for innovation projects.[3]
Around 10% of all Swiss startups also participated in programs guaranteeing credit totalling around CHF 150 million, which were started by the federal and some cantonal governments to mitigate the negative economic effects of the Corona pandemic.[4]

1) IPJ (2021b)
2) Startupticker.ch (2021)
3) Innosuisse (2020a)
3) Startupticker.ch (2020)

We identify six promising innovation clusters in Switzerland based on venture capital investment trends and recent government activity.

2. SWISS INNOVATION LANDSCAPE AT A GLANCE – PROMISING INNOVATION CLUSTERS

Promising Innovation Clusters: Which industries in Switzerland are currently seen by private or public sector stakeholders as particularly promising in terms of innovation? We identify six promising innovation clusters in Switzerland by examining which industries private and public actors are currently paying the most attention to, indicated by venture capital investments patterns and the establishment of innovation support programs by the Swiss federal government in 2020.

CLUSTER	INVESTMENT [1]	CLUSTER CHARACTERISTICS	NTN INNOVATION BOOSTER[2]
Health & Life Science*	CHF 1142.4 Mio (53.8%)	Basel is one of the world's top pharmaceutical clusters, home to major companies such as Roche and Novartis, as well as many medical spin-offs. The University of Basel and the University of Geneva also play an important role in biotechnology-related research.	Sport & Physical Activity, User-Centered Healthcare, Additive Manufacturing
ICT	CHF 500.2 Mio (23.5%)	Research at the frontier of computer science is conducted in Zürich and Lausanne at public research institutions like the ETH and EPFL, which are also the birthplace of numerous spin-offs. Global ICT firms like IBM, Google and Disney also have offices and research facilities in Zürich.	Blockchain Nation Switzerland, Databoosters, Photonics
Finance	CHF 220.1 Mio (10.4%)	Zürich is the location of nearly half of all Swiss fintech startups, large financial players such UBS and Credit Suisse, and two world-class research institutions with the ETH and the University of Zurich. Excellent research is also conducted at the University of St.Gallen.	Blockchain Nation Switzerland
Energy, Natural Resources & Environment	CHF 166.2 Mio (7.8%)	Nearly half of all Swiss cleantech startups are in the cantons of Zürich and Vaud. This is due to the top research conducted at EPFL and ETH, whose spin-offs make up 26% of all Swiss cleantech startups, and extensive support structures, like EIT Climate-KIC Accelerator, Europe's largest cleantech accelerator.	Energy Lab, Living-Labs for Decarbonisation, Applied Circular Sustainability
Micro & Nano Technology	CHF 74.9 Mio (3.5%)	Several smaller clusters can be found in Lausanne, Neuchatel, Basel and Zürich with research from private and public institutions, like CSEM, EPFL, ETH and University of Basel building their foundation.	Microtech
Agriculture & Food	N.A.	The cantons of Vaud and Geneva form a cluster due to their excellent research institutions such as EPFL, startup support structures like Agropôle in Molodin and large food and agriculture corporations like Nestle, SGS and Buhler. A smaller cluster can be found in Zürich, driven by ETH spin-offs.	Super Food Ecosystem, Additive Manufacturing

1) Startupticker.ch (2021)

2) Innosuisse (2020b)

* Including Biotech, Medtech and Healthcare IT

Four startup ecosystems were selected, in which cooperation with startups might be particularly of interest for Japanese companies.

2. SWISS INNOVATION LANDSCAPE AT A GLANCE – ECOSYSTEMS WITH HIGH RELEVANCE FOR JAPAN

Within the identified innovation clusters, we have selected four startup ecosystems with high synergic potential for Japanese companies, based on the current major challenges present in Japan:

I. Promising Innovation Clusters in Switzerland

- Health & Life Science
- Finance
- Micro & Nano Technology
- ICT
- Energy, Natural Resources & Environment
- Agriculture & Food

II. Filter Criteria: Major Challenges in Japan Today

> Handling the consequences of an ageing population, such as financial pressure on the welfare state and labour shortages[1,2,3]

> Increasing productivity and efficiency in food production due to limited cultivatable land[3]

> Combatting the climate crisis and environmental pollution[4]

> Dealing with Coronavirus and its consequences[5]

III. Swiss Startup Ecosystems with High Relevance for Japanese Companies

1. Cleantech
2. BioTech
3. FinTech
4. Smart Farming

*Drones, blockchain, and food tech are also important ecosystems in Switzerland, but we have excluded them from our analysis in this report since we have already published reports on them in the past.

Drones(Japanese): https://www.jetro.go.jp/biz/areareports/2021/c6bc0942944e3b37.html

Blockchain(Japanese): https://www.jetro.go.jp/biz/areareports/2020/5e2996461d69738a.html, https://www.jetro.go.jp/biz/areareports/2020/8286b4164f9898ed.html

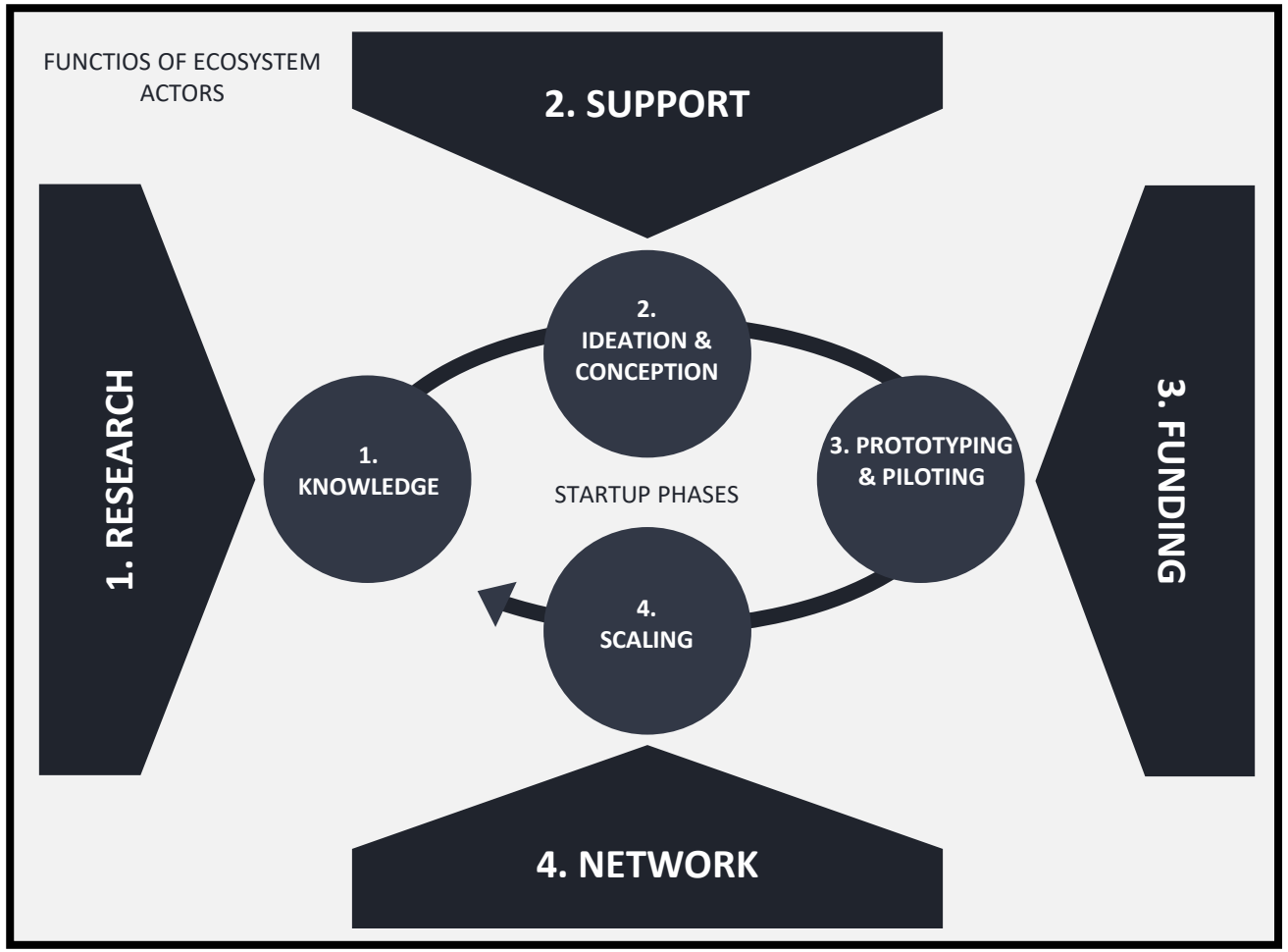
Food(Japanese): https://www.jetro.go.jp/biz/areareports/2020/e77981ff8b2d32c5.html

1) IMF (2018) 2) Janssen (2019)
3) Embassy of Switzerland in Japan (2018)
4) The Guardian (2020) 5) Asia Nikkei (2020)

CONTENT

The selected Swiss startup ecosystems are analyzed on three different levels, the whole ecosystem, the actors that take up functions in the ecosystem and the startups that developed inside the ecosystem.

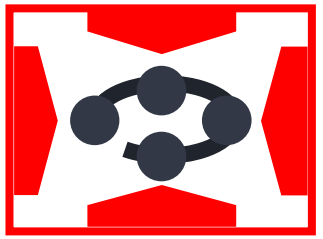
ANALYSIS FRAMEWORK FOR STARTUP ECOSYSTEMS



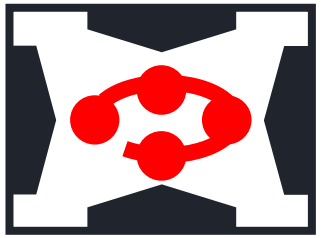
To consistently and transparently analyse the selected startup ecosystems, the analysis occurs on three levels, the startup ecosystem as a whole, the actors that comprise the ecosystem environment and the startups inside the ecosystem.

1. The Startup Ecosystem
Overview over the whole startup ecosystem including aggregate statistics on startup development, capital investments as well as regional distribution.

2. The Ecosystem Environment
Analysis of actors inside the ecosystem, categorized by their function: conducting research, supporting startups with expertise and infrastructure, funding and creating networks.



3. The Startups
Highlighting prominent startups in the ecosystem along four startup development phases: knowledge gathering, ideation & conception, prototyping & piloting and scaling.



3.1 CLEANTECH - THE SECTOR

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DEFINITION

> Cleantech are technologies, manufacturing processes and services that make efficient use of existing resources or contribute to the protection and conservation of natural resources.

> Cleantech approaches are applicable in all areas of commerce and industry and across the entire value chain. It includes areas of application such as waste and recycling, mobility, water and air purification, as well as energy efficiency, generation, transmission and storage.

SECTOR CHARACTERISTICS

> The value added by the cleantech sector is worth 30.8 Billion Swiss Francs or 4.5% of the Swiss GDP (2018).[1]

> There were 211’000 full-time equivalents working in the the cleantech sector, which was 5.2% of the total Swiss workforce (2018).[1]

> There are currently 516 companies registered in the official cleantech company database, “Cleantech Cube” (as of: 10. 02. 2021). The sector is primarily comprised of small- and medium-sized enterprises.[2]

1) CleantechAlps (2020)
2) Cleantech Cube (2021)

3.1 CLEANTECH – OVERVIEW OF THE SWISS STARTUP ECOSYSTEM

STARTUP DEVELOPMENT

> 207 cleantech startups were founded between 2008 and 2017 and are still operating independently today.[1]

> Around 30 new cleantech startups are established every year.[2]

STARTUP FUNDING AND VALUE

> In 2019, 375 million CHF were raised by cleantech startups. That's up from just 30 million in 2016.[2]

> 166.2 Million CHF of Venture Capital was invested in Swiss Cleantech startups in 2020, up from 4.5 million CHF in 2016.[3,4]

> The Swiss startup Climeworks raised 100 million CHF in its 2020 funding round, the largest funding round for a direct air capture startup worldwide.[3]

> No Swiss cleantech startup has yet reached the status of a Unicorn.[5]

REGIONAL HUBS

> 60% of all Swiss cleantech startups are located in the cantons of Zurich, Vaud and Valais, as of August 2020.[2]

1) CleantechAlps (2017)
2) CleantechAlps (2020)
3) Startupticker.ch (2021)
4) Startupticker.ch (2017)
5) CB Insights (2021)

3.1 CLEANTECH – ANALYSIS OF THE STARTUP ENVIRONMENT

1. RESEARCH	2. SUPPORT	3. FUNDING	4. NETWORK
Switzerland possesses several world-class institutions researching fields relevant to cleantech. ETH and EPFL rank in the World Top 25 for "Engineering and Technology" and "Environmental Science", in which the University of Zurich can also be found in the World Top 100.[1] In international comparison, cleantech patents of Swiss origin are fewer in number but of higher technological quality and covering larger markets[2] ETH and EPFL have developed an extensive infrastructure to support their researchers and students in commercializing their findings. As a consequence, 26% of Swiss cleantech startups are spin-offs from ETH or EPFL.[3]	There are more than twenty full-scale test facilities, incubators and technology parks that support cleantech startups in the development of their technology-based innovations.[3] Some of these organizations provide infrastructure, mentoring and/or consultation relevant to specific fields of cleantech, as done in the case of BlueArk Entremont and Energypolis. Other organizations, like Microcity and TecOrbe, also provide business consultation and coaching crucial for entrepreneurs newly establishing and running startups.	The volume of financial resources available to cleantech startups has increased over the last years, but less substantially than in other growing sectors, such has fintech.[4,5] Funding is available through private actors, both domestic and foreign, as well as governmental programmes such as "SWEET" from the Energy Department. However, in international comparison governmental support is still limited.[6] Additionally, Swiss venture capital is unequally distributed among startup phases. There is yet no later stage venture capital fund which provides funding for cleantech startups that are in their growth phase.[7]	There are associations for various cleantech segments that help cleantech startups to network with each other, interact with potential clients and investors, as well as stay informed about relevant developments in the domestic and foreign markets, such as swisscleantech, Swisssolar and the Swiss Water Partnership. There is either un- or minimally restricted access to most cleantech platforms and associations. Participation is in most cases even encouraged through additional benefits, like newsletters and access to additional business opportunities, like in the case of Cleantech CUBE.

1) Top Universities (2020)
2) CleantechAlps (2020)
3) CleantechAlps (2017)
4) Startupticker.ch (2021)
5)Startupticker.ch (2017)
6) Cleantech Group (2017)
7) Ecos (2019)

3.1 CLEANTECH – CENTRAL ACTORS IN THE STARTUP ENVIRONMENT

RESEARCH	SUPPORT	FUNDING	NETWORK
ETH Professorship of Renewable Energy Carriers With its fundamental research in high-temperature heat/mass transfer phenomena and multi-phase reacting flows, PREC pioneers the development of solar concentrating technologies for efficiently producing clean power, fuels, and materials. **Address & Link** Sonneggstrasse 3 8092 Zürich https://prec.ethz.ch	**EIT Climate-KIC Switzerland** The EIT Climate-KIC Accelerator in Zurich is Europe's largest cleantech accelerator supporting over 200 climate-relevant startups a year. It supports entrepreneurs by providing expertise and financial resources. **Other Function:** Funding **Address & Link** Limmatstrasse 264 8005 Zürich http://www.climate-kic-dach.org	**Technology Fund** Technology Fund is a federal funding instrument managed by Emerald Technology Ventures AG that provides loan guarantees of up to CHF 3 million to innovative SMEs whose products contribute to climate protection. **Address & Link** Seefeldstrasse 215 8008 Zürich https://www.technologyfund.ch	**Cleantech Cube** Cleantech Cube is the official database for Swiss cleantech companies, operated by Switzerland Global Enterprise on behalf of the federal government. The database is intended to provide an overview of the Swiss cleantech sector and thus also facilitate networking. **Address & Link** Stampfenbachstrasse 85 8006 Zurich https://cube.s-ge.com/

3.1 CLEANTECH - PROMISING STARTUPS

PROTOTYPING	PROTOTYPING	PILOTING	SCALING
INERGIO INERGIO plans to commercialize a modular, lightweight, and efficient power system that delivers clean electricity wherever it is needed. Due to its patented approach to miniaturize solid oxide fuel cells, the power plant is 80% lighter than most comparable fuel cells and twice as efficient as Diesel engines. **Segment:** Clean Energy **Incorporated:** 2020 **Location:** Lausanne, Vaud **Awards:** - Prix concours RIE 2020 **Link:** https://inergio.ch	**DePoly** DePoly is an EPFL spin-off that has developed a novel technology enabling the chemical recycling of PET plastic back into its two main components, ethylene glycol (EG) and terephthalic acid (TPA), creating a full circular economy for plastics as EG & TPA can be sold back to industries. **Segment:** Recycling **Incorporated:** 2020 **Location:** Sion, Valais **Awards:** - Top 100 Swiss Startups 2020 - IMD Startup Competition 2020 **Link:** https://www.depoly.ch	**Daphne Technology** The nanotechnology-based exhaust filter for marine engines by Daphne Technology will allow cargo and cruise ship operators to reduce sulfur and nitrogen oxide emissions and convert the exhaust gas into fertilizer. In March of last year, the technology was tested for the first time on an industrial prototype. **Segment:** Air Purification **Incorporated:** 2017 **Location:** St-Sulpice, Vaud **Awards:** - Top 100 Swiss Startups 2020 - Venture Leader China 2020 **Link:** https://daphnetechnology.com	**Climeworks** Climeworks has developed and commercialized a direct air capture plant that removes CO2 from the atmosphere. In 2020, it has added Microsoft and Lufthansa to their client list. Its recent funding round worth 100 Million is the single largest investment round for direct air capture technology. **Segment:** Direct Air Capture **Incorporated:** 2009 **Location:** Zürich, Zürich **Awards:** - Top 100 Swiss Startups 2011-14 - WEF Technology Pioneer 2020 **Link:** https://www.climeworks.com

The excellent research environments drives the Swiss cleantech sector's ability to create innovative cleantech solutions. However, the currently limited funding opportunities hamper the commercialization of these solutions.

3.1 CLEANTECH - CONCLUSION

THE STRENGTH
The Swiss cleantech startup ecosystem is capable of producing internationally recognized startups that are also increasingly attracting funding. It does so in a variety of cleantech segments, especially in the areas of decarbonization and clean energy. This positive development is driven by an excellent research environment that provides the basis for many startups and is reflected in Switzerland's 7th place in the 2017 Global Cleantech Innovation Index regarding the creation of cleantech innovation.[1]

THE WEAKNESS
Relative to innovation creation capabilities, the Swiss cleantech startup ecosystem is struggling more to commercialize the innovations it creates, ranking 12th in that category.[1] One primary reason for this struggle is the limited availability of financial resources. Funding is often cited as the most important challenge by cleantech startups.[1] There is for example yet no later stage venture capital fund in Switzerland that would provide more mature cleantech startups with the financial resources to grow.[2]

THE OUTLOOK
Over the past decade, the Swiss cleantech sector has shown above-average growth, both in terms of value added and employment.[3] Given the ongoing shift towards the use of sustainable technologies, further growth of this sector can be expected, especially in the areas of renewable energy and energy efficiency. The developments of the Swiss Cleantech sector are currently driven, primarily positively, by the Federal Council's decision in 2019 to integrate cleantech as an integral part of the business and strategic orientation of each federal agency, as well as by the Swiss Climate Policy and CO2 Act, the Green Economy Initiative, the Strategy for Biodiversity, the Energy Strategy 2050 and the Strategy for Sustainable Development 2020-2030.[3] Generally, Swiss cleantech startups still have to look abroad to find sufficient funding, making it more difficult and cumbersome for the startups to grow. To ensure continued growth, more venture capital would need to be made available in Switzerland, especially for late-stage startups.

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1) Cleantech Group (2017) 2) Ecos (2019)
3) INFRAS (2020)

CONTENT

3.2 FINTECH - THE SECTOR

3.2 FINTECH - THE SECTOR

DEFINITION

> Fintech describes new technologies designed to improve and automate the delivery and use of financial services. At its core, fintech is used to help companies, business owners, and consumers better manage their financial operations, processes, and lives using specialized software and algorithms deployed on computers and, increasingly, smartphones.

> The areas of application can be categorized into deposit & lending, investment management, banking infrastructure and payment.

SECTOR CHARACTERISTICS

> There are 382 Swiss Fintech companies. This corresponds to a growth rate of 7.3% compared with the previous year (2019).[1]

> More than two thirds of them are in investment management and banking infrastructure (68%) and 35% of them use distributed ledger technology as part of their solutions (2019).[1]

> 13% of all Swiss Fintech companies in 2019 have a financing volume of more than 10 million Swiss Francs.[2]

1) Wirtschaftshochschule Luzern (2020)
2) Statista (2020)

3.2 FINTECH – OVERVIEW OF THE SWISS STARTUP ECOSYSTEM

STARTUP DEVELOPMENT

> There were 341 Swiss fintech startups in Switzerland as of February 2021.[1] In January of 2016 that number was at 170 startups.[2]

STARTUP FUNDING AND VALUE

> Startups in ICT, including fintech, attracted a total of 1.2 billion Swiss francs. That's 327 million CHF more than in 2016.[3]

> 220.1 million CHF worth of venture capital was invested in Swiss Fintech startups in 2020, up from 46.8 million CHF in 2016. This corresponds to 10.4% of all invested venture capital.[4,5]

> Bitcoin Suisse, an early-stage startup providing crypto-financial services had the largest funding round in 2020 among fintech companies, collecting 45 million CHF in venture capital.[4]

> In 2019, Zurich-based fintech Numbrs Personal Finance reached a valuation of over one billion euros after its latest round of funding, making it the first Swiss fintech unicorn.[6]

REGIONAL HUBS

> 46% of all Swiss fintech companies are located in Zürich. Other fintech hubs can be found in Geneva. Additionally, in Zug, there is a large concentration of blockchain-based companies.[7]

1) Swisscom (2021) 2) Swisscom (2016)
3) Switzerland Global Enterprise (2020b) 4) Startupticker.ch (2021)
5) Startupticker.ch (2017) 6) Finextra (2019)
7) Swissquote (2017)

3.2 FINTECH – ANALYSIS OF THE STARTUP ENVIRONMENT

RESEARCH	SUPPORT	FUNDING	NETWORK
Three Swiss research institutions are among the 100 best universities for finance and accounting in 2020 (ETH and the Universites of Zurich and St.Gallen).[1] The "Center for Innovative Finance" (CIF) of the University of Basel is specifically dedicated to researching practical issues in the fields of fintech, digital banking and innovative finance. Swiss research institutions are in close contact with organisations in the private economy. In the newly established UZH Swiss FinTech Innovation Lab, domestic and international research institutions are working together with private partners on digitization solutions in the financial services industry.	The variety of programmes and events provided incubators, accelerators, as well as organizers of challenges and awards in Switzerland is large and the landscape constantly changing, adapting to new needs and trends.[2] Many programmes and events are open for fintech startups to participate, such as the Swiss Innovation Challenge, but there are few open exclusively for fintech startups, like those provided by F10 FinTech Incubator & Accelerator.	Despite the large decrease in total funding for fintech companies in domestically and globally between 2018 and 2019, there was a strong growth in later stage investments for Swiss fintech companies, which could be indicative of an increasingly maturing Swiss fintech market. In contrast to the global trends and a positive sign for the Swiss fintech funding scene, there was also a nine percent increase in funding rounds in the same period. There is also steady influx of new venture capitalists targeting the fintech sector, such as the recently established VC funds Wingman Ventures and Spicehaus Partner.[2]	There are several associations helping companies to create synergies and drive innovation inside the Swiss fintech sector such as Swiss Fintech Innovations and the Swiss Finance + Technology Association. Swiss Fintechs can also profit from the presence of technology-focused associations, such as the Crypto Valley Association, which supports companies using blockchain and cryptographic technologies. The news company Swiss Fintech News and a monthly updated Swiss fintech startup map from Swisscom, a telecommunications company, provides the startups with exposure and overview over the sector.

1) Top Universities (2020)
2) Wirtschaftshochschule Luzern (2020)

3.2 FINTECH – CENTRAL ACTORS IN THE STARTUP ENVIRONMENT

RESEARCH	SUPPORT	FUNDING	NETWORK
Swiss Fintech Innovation Lab UZH The interdisciplinary research program researches digitization solutions in the financial services industry together with partners from the private economy. The program now cooperates in an international network of universities in Europe, the USA and Asia. The latest international initiative with Stanford focuses on the interface between sustainability, digitization and financial services. **Address & Link** Plattenstrasse. 14 8032 Zürich https://www.fintech.uzh.ch/en.html	**F10 Incubator and Accelerator** F10 is a Fintech accelerator focused on providing a supportive ecosystem where startups, corporates and investors can collaborate. Supported by its corporate members consisting of financial infrastructure provider SIX, banks and insurance companies, F10 is in a unique position globally to foster collaboration between startups and major international financial players. **Other Function:** Funding **Address & Link** Förrlibuckstrasse 10 8005 Zürich https://www.f10.global	**Swiss ICT Investors Club** The Swiss ICT Investor Club (SICTIC) brings investors together with Swiss seed and early-stage tech startups. It is also the organizer of the Swiss Fintech Investor Day, a pitch event where a selection of fintech startups can present their company to an audience of hundreds of angel investors, corporate ventures and venture capitalists. **Address & Link** Stockerstrasse 44 8002 Zürich https://www.sictic.ch	**Swiss Fintech Innovations** Independent association of Swiss financial institutes committed to drive collaboration and digital innovations in the financial services industry. It does so by connecting stakeholders in advisory boards, academia and public institutions and provide them with relevant information about developments in Fintech and the innovation landscape. **Other Function:** Support **Address & Link** Rämistrasse 5 8001 Zürich https://swissfintechinnovations.ch

3.2 FINTECH - PROMISING STARTUPS

PILOTING	PILOTING	SCALING	SCALING
AIDONIC AIDONIC is a social fundraising and last mile aid distribution technology for humanitarian and development programs. Organizations and governments can distribute tokenized aid vouchers, entitlements or digital cash straight to the intended end-beneficiaries in a transparent and efficient way powered by distributed ledger technology. **Segment:** Payment **Incorporated:** 2018 **Location:** Baar, Zug **Awards:** - Finalist Swiss Fintech Startup Awards 2020 **Link:** https://aidonic.io	**Neon Switzerland** neon is a Swiss smartphone bank. With the neon app or the corresponding Mastercard, users can save, pay, withdraw and transfer money, even internationally, in a convenient and fast manner. The fees are cheaper than with classic providers. **Segment:** Personal Banking **Incorporated:** 2017 **Location:** Zürich, Zürich **Awards:** - Top 100 Swiss Startups 2020 - Finance-IT Innovation Award 2019 **Link:** https://www.neon-free.ch	**Sonect** Thanks to the Sonect app, cash withdrawals are made easier, faster, and more available, as users can withdraw cash directly at checkouts. Sonect's solution democratizes the cash distribution process, eliminating a significant part of the value chain. **Segment:** Cash Withdrawal **Incorporated:** 2016 **Location:** Zürich, Zürich **Awards:** - Winner at FinovateEurope 2020 - Top 100 Swiss Startups 2020 **Link:** https://sonect.net	**AlgoTrader** AlgoTrader is a platform service provider that offers an institutional-grade quantitative trading and trade execution solution for conducting quantitative research, developing trading strategies and strategy back-testing, as well as automated trading for traditional finance and the very first for Bitcoin and other digital assets. **Segment:** Investment Management **Incorporated:** 2014 **Location:** Zürich, Zürich **Awards:** - Top 25 Swiss Scale-Ups 2020 - Top 100 Global WealthTech 2020 **Link:** https://www.algotrader.com

Swiss fintech startups can rely on ample funding opportunities and a world-class research institutions. The struggles of some startups to attract clients might indicate a disconnect between ecosystem activity and market needs.

3.2 FINTECH – CONCLUSION[1]

THE STRENGTH
The Swiss fintech startup ecosystem ranks internationally among the best regarding the quality of its research environment. The world-class Swiss universities in finance and computer science educate a labour force that ranks among the most qualified in the world. Although slow to start, the increasing interest of large, experienced financial corporates in fintech boosts startup development through joint ventures and capital investments. Generally, the Swiss fintech environment provides Swiss startups with ample access to funding and support structures, either provided by domestic or foreign actors.

THE WEAKNESS
Despite the incredibly favourable conditions, many Swiss fintech companies are struggling to find clients, especially the ones built around robot advisors and distributed ledger technology. It remains to be seen whether they will eventually find a sufficient user base, but their struggle puts into question whether the Swiss fintech startup ecosystem is adequately calibrated towards current market needs.

THE OUTLOOK
The Swiss FinTech sector continued to grow and mature in 2019, as highlighted both by the increase in the average number of full-time equivalents employed at Swiss FinTech companies, as well as their total funding. Swiss authorities, especially the FINMA, laid the legal foundation for this development early on through the introduction of more liberal fintech regulations in 2016, a sandbox regime in 2017, guidelines for Initial Coin Offerings and Token Classification in 2018 and a Fintech license in 2019. Furthermore, with a passed legislative package favourable to the fintech sector in 2020 and the expected implementation of the Swiss DLT Draft Law in 2021, Switzerland is continuing to position itself as a location for innovative fintech solutions.

1) Wirtschaftshochschule Luzern (2020)

CONTENT

3.3 BIOTECH - THE SECTOR

3.3 BIOTECH - THE SECTOR

DEFINITION

> Biotechnology is a technology that uses biological systems, living organisms, or parts thereof to develop or produce various products. Biotechnology encompasses many different disciplines, such as genetics, biochemistry and molecular biology.

> New technologies and solutions are developed primarily in the fields of medicine, agriculture or industrial production.

SECTOR CHARACTERISTICS

> The Swiss biotech industry is predominantly made up of small to medium-sized enterprises.[1]

> There are 312 Swiss biotech companies (incl. suppliers) in 2019. The number of biotechnology firms in the country has more than doubled since 1997, and Switzerland boasts the world's highest per capita biotech density.[2,1]

> The number of employees in Swiss biotech companies increased by around 700 people to 15'070 between 2018 and 2019.[2]

> Equally, total revenue stands at 4.8 billion Swiss Francs, 800 million more than in 2018.[2]

1) Switzerland Global Enterprise (2020c)

2) Swiss Biotech (2020)

3.3 BIOTECH – OVERVIEW OF THE SWISS STARTUP ECOSYSTEM

STARTUP DEVELOPMENT

> There are currently 248 biotech startups registered in the “startup.ch” tech startup database (as of: 16. 02. 2021).[1]

STARTUP FUNDING AND VALUE

> Capital Investment in Swiss biotech companies has increased from 823 million CHF in 2016 to 1.2 billion in 2019.[2]

> 820.3 Million CHF worth of venture capital was invested in Swiss biotech startups in 2020, up from 399 million CHF in 2016, and corresponds to 38.6% of all invested venture capital.[3,4]

> VectivBio had the largest funding round among biotech companies in 2020, collecting a total of 143.9 million CHF in venture capital.[3]

> There are two Swiss biotech startups that can be characterized as unicorns: ADC Therapeutics and Roviant Sciences [5,6]

REGIONAL HUBS

> With 2.1 billion CHF, biotech companies in the Basel Area have attracted the most financing between 2017 and 2019. Western Switzerland and the Zurich Area follow with each 1.2 billion CHF.[2]

1) Startup.ch (2021)
2) Swiss Biotech (2020)
3) Startupticker.ch (2021)
4) Startupticker.ch (2017)
5) Swissinfo (2020b)
6) CB Insights (2019)

3.3 BIOTECH – ANALYSIS OF THE STARTUP ENVIRONMENT

RESEARCH	SUPPORT	FUNDING	NETWORK
Five Swiss universities ranked in the 100 best life science universities based on academic performance in 2020 (ETH and the Universities of Zürich, Geneva, Basel, Lausanne).[1] Switzerland not only has a highly productive research environment, producing the highest biotech applications per capita worldwide, but also one focused on high quality output. 53% of its biotech applications are rated as world-class, compared to the global average of 17%.[2,3] Recent cross-sector projects, like the Campus Biotech, try to unite the research expertise from various actors in the biotech ecosystem, to generate synergies that will further improve research quality.	Virtual life science expert networks, such as Biotechnet, and technology and innovation parks for life science in Switzerland like BioArk in Visp, the Swiss Biotech Center in Monthey, the Bio-Technopark in Zürich-Schlieren, Biopôle in Lausanne and the Campus Biotech in Geneva provide entrepreneurs with crucial infrastructure and tailored expertise. These specialized support structures are additional to an extensive support system for startups, provided by both the government, like the CTI Startup programme and easygov, and private companies, such as Fongit and IFJ Support.	Among the European biotech startup ecosystems, Switzerland ranks first in venture capital availability.[4] Four out of the ten most active VC funds in Switzerland focus on biotechnology.[5] The Swiss stock exchange is Europe's leading exchange for life sciences companies.[2] This enables companies to efficiently raise capital with the view to drive scientific discovery through to market launch. In addition, an already attractive funding environment has recently been boosted by the emergence of new specialized Swiss based funds such as Medicxi, ND Capital, Pureos Bioventures, and Bernina BioInvest together with an ever-increasing number of foreign funds.[3]	Organisations such as Swiss Biotech Association, BioValley Basel, BioAlps and Toolpoint, promote the growth of the biotech industry by connecting industry stakeholders and life science clusters, giving members access to privileged information and provide them with exposure to potential collaborators and clients. Biotech companies also have access to international markets through internationally embedded clinical research organizations.[2] The Swiss Biotech Day has become one of the leading biotechnology conferences in Europe, helping to connect local biotech startups with international players.

1) Top Universities (2020)
2) Switzerland Global Enterprise (2020c)
3) Swiss Biotech (2020)
4) Van Wilgenburg et al. (2019)
5) Pitchbook (2019)

3.3 BIOTECH – CENTRAL ACTORS IN THE STARTUP ENVIRONMENT

RESEARCH	SUPPORT	FUNDING	NETWORK
Campus Biotech The campus functions like a giant research incubator, focusing on pure science and its translation into real-world solutions and practical outcomes. It brings together academic, clinical, industrial and entrepreneurial players to ensure that projects have access to the resources and skills they need to push the boundaries of medical discovery and achieve breakthroughs. **Other Function:** Support **Address & Link** 9 Chemin des Mines 1202 Genève https://www.campusbiotech.ch/en/	**Biotechnet** The biotechnet is a partnership of the swiss universities of applied sciences, universities as well as research and technology organizations that helps companies access a wide range of high-level biotechnology expertise and relevant infrastructure by partnering with Swiss research institutions. **Address & Link** Einsiedlerstrasse 31 8820 Wädenswil https://biotechnet.ch	**Swiss Stock Exchange - SIX** The Swiss stock exchange is one of the world's leading biotech and life sciences exchanges and the preferred stock exchange for some of the largest biotech companies in Europe. The Swiss stock exchange recognized the importance of biotechnology in Switzerland early on and developed its own sector-specific index - the Swiss Bio+Medtech Index (SXI) - in 2004 to give the industry greater visibility and access to funding. **Address & Link** Pfingstweidstrasse 110 8021 Zürich https://markets.businessinsider.com/index/sxi_bio+medtech	**Swiss Biotech Association** The Swiss Biotech Association is a non-profit, member-led organization that represents the interests of the Swiss biotech industry. Its focus is on fostering networking through strategic, national and international partnerships, promoting the achievements of the Swiss biotech industry and attracting talent, know-how and financial resources to drive innovation and growth, and developing favourable and competitive framework conditions **Address & Link** Stauffacherstrasse 16 8004 Zürich https://www.swissbiotech.org

3.3 BIOTECH - PROMISING STARTUPS

PROTOTYPING	PROTOTYPING	PILOTING	SCALING
Adiposs Adiposs is developing a first-in-class medical imaging product called ImageBAT to detect early body wasting with a fast, pain-free and cost-effective CT medical scan available in every hospital worldwide. Despite its high prevalence among cancer patients, body wasting remains currently vastly underdiagnosed. **Segment:** Medical Imaging **Incorporated:** 2020 **Location:** Geneva, geneva **Awards:** - Winner Venture Kick 2020 **Link:** https://adiposs.com	**Volumina Medical** Volumina develops injectable 3D scaffolds for the reconstruction of soft tissue volume lost after tumor removal, disease, trauma or for purely aesthetic reasons. It addresses the need of plastic and reconstructive surgeons who lack a safe and efficient solution to repair the body in 3D. **Segment:** Tissue Engineering **Incorporated:** 2018 **Location:** Epalinges, Vaud **Awards:** - Top 100 Swiss Startups 2018-20 **Link:** http://www.volumina-medical.ch	**Cutiss** CUTISS bio-engineers customized human skin, starting from a very small piece of skin from patients suffering from skin defects (e.g., burns). This results in minimal scarring after surgery, as the skin produced by CUTISS is very similar to human skin **Segment:** Tissue Engineering **Incorporated:** 2017 **Location:** Zürich, Zürich **Awards:** - Top Swiss Startup 2020 - Swiss Technology Award 2019 **Link:** http://cutiss.swiss/de/cutiss-ag/	**Crispr Therapeutics** CRISPR Therapeutics AG is focused on translating CRISPR/Cas9 gene editing technology into drugs. Its goals include the clinical approval of drugs and treatments based on genetically engineered immune cells to seek out and destroy cancer cells, and stem cells to repair or replace tissue or organ functions lost due to disease, damage or aging **Segment:** Gene Editing **Incorporated:** 2013 **Location:** Basel, Basel Stadt **Awards:** - Top 25 Scale-Up 2020 - Top 100 Swiss Startups 2015-18 **Link:** http://www.crisprtx.com

The presence of large, innovative pharmaceutical companies, leading research institutions and substantial venture capital make Switzerland highly attractive for startups, despite its struggle to provide sufficient access to health data.

3.3 BIOTECH - CONCLUSION

THE STRENGTH

The Swiss biotech startup ecosystem is ranking among the best in its R&D output, both patents and scientific publications, by private and public institutions, and venture capital availability.[1] Additionally, the presence of multiple globally leading pharmaceutical companies offers a wide range of opportunities in IP marketing, whether it be in licensing, patent transactions, or even strategic partnerships.[2] A large number of organizations and events provide support and networking opportunities for Swiss biotech startups, also providing connections to actors in larger foreign markets.

THE WEAKNESS

There are few obvious weaknesses in the Swiss biotech startup environment. One of them is the overregulation of clinical trials, which leads many startups to take the cumbersome route of conducting trials abroad, even though there are world-class hospitals nearby in Switzerland. It's also often difficult to get in touch with larger pharma companies, as several startup founders noted.[3] Novartis recently recognized this problem and created Biome, a network designed to facilitate contact with the company. Finally, although the business model of many innovative startups increasingly depends on health data, the Swiss ecosystem struggles to provide startups with internationally competitive data sets due to the country's limited size and decentralized structures.[4]

THE OUTLOOK

In line with the global biotech industry, the Swiss biotech sector continued to perform well in 2019. Funding and M&A activities continued and revenues increased.[5] To continue to support an innovative Swiss biotech sector, the federal government is extending its Biotech Master Plan 2013-2020 until 2025 and will introduce new measures to create increasingly favourable conditions for biomedical research and technology development.[6] While it remains to be seen how the Swiss biotech sector will develop in a post-Corona world, the pandemic is not expected to jeopardize the favourable conditions of the Swiss biotech startup ecosystem.[7]

1) Van Wilgenburg et al. (2019)
2) Switzerland Global Enterprise (2020c)
3) Startupticker.ch (2018)
4) Swissinfo.ch (2019)
5) Swiss Biotech (2020)
6) BAG (2019)
7) Swissinfo.ch (2020c)

CONTENT

3.4 SMART FARMING - THE SECTOR

3.4 SMART FARMING - THE SECTOR

DEFINITIONS

> Smart farming is the application of information and communication technologies for optimising complex farming systems. This includes automating agricultural processes and supporting farmers in making informed decisions based on concrete data.

> Precision farming, a subfield of smart farming, is a technology-enabled approach to farming management that observes, measures, and analyses the needs of individual fields and crops.

SECTOR CHARACTERISTICS

> The Swiss agricultural sector has a total output of 10.7 billion Swiss Francs, of which animal products make up 48% (2018).[1]

> In 2017, the sector entailed 51’200 workplaces with 150’900 jobs. In Switzerland 10’500 km^2 of land are used for agriculture, or more than 25% of its total size.[1]

> According to a recent survey, 41.8% of all participating Swiss farmers had already installed at least one application of precision agriculture enabling technologies.[2]

> Currently, the most frequent applications of these technologies are in cruise control (32%) and the moisture measurement of harvest product (20%).[2]

1) Federal Statistical Office (2020) 2) Groher et al. (2020)

3.4 SMART FARMING – OVERVIEW OF THE SWISS STARTUP ECOSYSTEM

STARTUPS

> There is yet no comprehensive list of all Swiss startups focused on smart farming. It is indicated that there are at least 24 Swiss startups that could be defined as smart farming startups.

> Among the identified startups, certain clusters can be identified:
  > A handful of Swiss smart farming startups provide remote sensing solutions to farmers for them to better understand their arable land. A common data source for these applications are drones, as Switzerland is operating at the global forefront in the development of drone technologies. Startups in this cluster include: Gamaya, Sensefly, Precision Vine, Pix4D and Wingtra.
  > With its limited natural resources and long history in environmental protection, Switzerland is an optimal development ground for startups offering resource-efficient, automated gardening solutions, such as CleanGreens, Growcer and Ecogrow.

REGIONAL HUBS

> Lausanne and the canton of Vaud has provided a particularly favourable territory for innovation in the agricultural sector: high-level research in the field, such as EPFL and the School of Business and Engineering Vaud, large agricultural areas, and a diverse range of soils and yields. The region is home to farms of all sizes and varieties, laboratories, incubators and organizations like Agroscope or the Agropôle in Molondin. Successful startups such as Ecorobotix, Gamaya and Sensefly are located in the canton of Vaud. [1]

1) Invest Vaud (2020)

2) Switzerland Global Enterprise (2020d)

3.4 SMART FARMING – ANALYSIS OF THE STARTUP ENVIRONMENT

RESEARCH	SUPPORT	FUNDING	NETWORK
ETH is ranking Top 10 in the world among universities in “Agriculture and Forestry” and “Technology and Engineering”. With the Matterhorn and InnoFarm projects as well as Studio AgroFood, the ETH is well positioned to lead in the search for smart farming and food systems.[1] Many smart farming startups have emerged as spinoffs from EPFL, with much of the relevant research being conduced in TOPO, the Geodetic Engineering Laboratory. Agroscope, the federal competence center for agricultural research, conducts research along the entire value chain of the food sector.	There is emerging wave of the startup accelerators that have one focus on smart farming including VentureKick, Venturelab, MassChallenge and the EIT Food Accelerator.[2] Test facilities and technology parks, such as Swiss Future Farm, Agropôle of Molondin and TecOrbe, that support smart farming startups in the development and testing of their technology-based innovations. Switzerland is also home to some world-leading companies in the food sector, such Syngenta, Nestle, Buhler and SGS, which can support startups in their development in the context of collaborations or investments.[2]	Swiss smart farming startups can try access general startup funding sources, like Innosuisse, and startup incubators and accelerators, which also help by providing a platform to interact with potential investors. Smart Farming startups, especially the ones with a focus of sustainability, can also tap into a larger pools of funding for cleantech startups, such as the ones provided by the Vaud-centered Foundation for Technological Innovation and the Federal Office for the Environment. However, virtually no venture capitalist funds were found in Switzerland specifically targeting startups in the agricultural sector.	The Agritech Day is an event where the newest technological applications for agriculture are demonstrated and an open discussion forum is provided. Swiss Food Research's Agro-Food Innovation Forum offers a professional exchange platform for the further development of ideas and the exploitation of potential with companies, research institutions and startups. There are yet no institutions providing extensive and aggregated information and statistics on the Swiss smart farming startup ecosystem, restricting an overview of the ecosystem.

1) Top Universities (2020)
2) Ivanov (2018)

3.4 SMART FARMING – CENTRAL ACTORS IN THE STARTUP ENVIRONMENT

RESEARCH	SUPPORT	FUNDING	NETWORK
Agroscope Agroscope is the Swiss competence center for agricultural research and is affiliated with the Federal Office for Agriculture (FOAG). Agroscope has selected "Smart Farming" as one of its strategic research fields. In a current project, an Agroscope site has been developed into the "Swiss Future Farm", a unique platform to showcase and test the application of new technologies in Smart Farming. **Other Function:** Support **Address & Link** Reckenholzstrasse 191 8046 Zürich https://www.agroscope.admin.ch/agroscope/en/home.html	**Agropôle of Molondin** Agropôle is a campus that combines industry, service providers and innovators to accelerate the implementation of innovative, sustainable Agritech solutions. The companies at the Agropôle site, selected for the relevance of their entrepreneurial projects, have all passed the stage of applied research and are now in a pre-industrialization phase **Address & Link** Chemin de Greybin 2 1415 Molondin http://agropole.ch	**EIT Food Accelerator Network** EIT FAN Lausanne's Sustainable Food Systems program focuses on startups involved in the production, distribution, packaging and disposal of food, helping them pitch their business to investors. By 2020, the Accelerator program has helped 396 startups raise over CHF 196 million in funding to accelerate their businesses. **Other Function:** Support **Address & Link** Baarerstrasse 18 6300 Zug https://www.innoterra.com	**Swiss Food & Nutrition Valley** The Swiss Food & Nutrition Valley is a nationwide initiative and international campaign to develop, strengthen and promote the Swiss innovation ecosystems in precision farming, packaging science, waste prevention, food processing and nutrition by bringing together key players, enabling collaboration and attracting talent, startups and investment to Switzerland. **Address & Link** Avenue d'ouchy 47 1006 Lausanne https://swissfoodnutritionvalley.ch

3.4 SMART FARMING - PROMISING STARTUPS

PROTOTYPING	PILOTING	SCALING	SCALING
Growcer Growcer is developing Europe's most automated vertical farm, which can produce leafy vegetables and fruits all year round, independent of weather conditions, pesticide-free and with low water consumption. Thanks to short delivery routes, the products can be delivered to local stores on the same day they are harvested. **Segment:** Vertical Farming **Incorporated:** 2019 **Location:** Basel, Basel Stadt **Achievement:** - First Fully Robotic Vertical Farm in Switzerland (2020) **Link:** https://growcer.com	**xFarm** xFarm is a platform that simplifies data collection and analysis for farmers, reduces paperwork, improves efficiency and enables traceability of agricultural products. It is based on a free cloud-based farm management software, IoT field sensors, and offers a variety of services such as crop and fertilizer plans, disease patterns and alerts, and irrigation advice. **Segment:** Farm Management **Incorporated:** 2018 **Location:** Lugano, Ticino **Awards:** - Honoree CES Asia Innovation Awards 2019 **Link:** https://xfarm.ag	**EcoRobotix** ecoRobotix develops a fully automatic and solar-powered weed-killing robot. It detects weeds in the crop and destroys them with 95% fewer chemicals than conventional methods. Weed control costs are also greatly reduced, by up to 50%, as less human labour is required, and fewer herbicides are used. **Segment:** Farm Robotics **Incorporated:** 2014 **Location:** Yverdon-les-Bains, Vaud **Awards:** - Gold Tech Tours 2019 - IMD Startup Winner 2017 **Link:** https://www.ecorobotix.com/en/	**Gamaya** Gamaya provides advanced farmland mapping and diagnostics solutions based on remote sensing technologies, including proprietary hyperspectral imaging, using drone, aircraft and satellite remote sensing imagery and AI-driven crop-specific analysis. **Segment:** Drone & Imaging **Incorporated:** 2015 **Location:** Morges, Vaud **Awards:** - Top 100 Swiss Startups 2015-20 - Finalist Swiss AI-Award 2020 **Link:** https://www.gamaya.com

Swiss smart farming startups can draw on a broad spectrum of cutting-edge research and internationally operating companies. The small agricultural sector limits the growth of startups and therefore their attractiveness to investors.

3.4 SMART FARMING - CONCLUSION

THE STRENGTH

Swiss smart farming startups can draw on a broad spectrum of cutting-edge research (e.g. in the field of drone technology) and a pool of highly qualified experts from the Federal Institutes of Technology and the agricultural research centers of the federal agency Agroscope.[1] The presence of large established agricultural groups with an international footprint offers potential for cooperation, investment and international presence.[2] The emerging networks of private and public organizations around innovation in AgriFood, such as Swiss Food Research and the Swiss Food & Nutrition Valley, could create new synergies and foster the development of new, innovative smart farming startups.

THE WEAKNESS

Despite the excellent research environment, the profitability opportunities for Swiss smart farming startups are limited low due to small-scale agriculture and the small domestic food market, which partially explains why little venture capital is available in this area.[3] Therefore, to ensure their success, many startups need to have an international and export-oriented business model, but this entails additional effort due to fragmented agricultural regulations in different countries.[4]

THE OUTLOOK

Switzerland has the potential to develop an attractive location for startups with high-quality, high-tech smart farming applications due to its excellent R&D environment.[1] Early on, the success of the ecosystem will depend on how easily startups can expand into larger foreign markets. Private and public organization will play a crucial role facilitation this expansion. So far, the Federal Government has primarily focused on promoting research, creating dialogue between stakeholders on the digitization of agriculture and identifying the digitization potential and needs of Swiss agriculture. It is expected that with the new agricultural policy in 2022, the Government will actively support the implementation of smart farming technologies through funding opportunities and facilitated access to technological infrastructure and data.[5]

1) Swissinfo (2020d)
2) Ivanov (2018)
3) Finger et al (2019)
4) KMU Portal (2020)
5) Parlament.ch (2018)

CONTENT

Recent examples of collaboration between Swiss and Japanese companies can provide valuable insights into the industries and forms of innovation that could be attractive for Japanese companies contemplating similar strategies.

4. CASE STUDIES - CONTEXT

In recent years, there have already been a significant number of collaborations between larger, established Japanese corporations with smaller, younger Swiss companies with the aim of developing innovative solutions, technologies and processes. These current examples can provide valuable insights into the industries and the approaches to innovation collaborations that may be attractive to Japanese companies looking to collaborate with startups in open innovation processes and are considering scouting in Switzerland.

For this reason, this report highlights two recent collaborations that involve an established Japanese company seeking to innovate with the help of a younger Swiss company.

The following two collaborations were selected:

> A joint development agreement between Asahi Group Holdings and Embion Technology to come up with new uses of brewery by-products

> A business partnership between Sompo Himawari Life and Dacadoo to develop a personalized health guide for the clients of Sompo Himawari Life

Asahi Group's R&D affiliate Asahi Quality & Innovations is collaborating with Embion Technologies to develop new uses for brewing by-products.

CASE STUDY 1 –ASAHI GROUP HOLDINGS AND EMBION TECHNOLOGIES[1]

FOOD & SUSTAINABILITY

The Collaboration Partners

Announcement Date: 1st of December 2020

Asahi Group Holdings is a Japan-based holding company mainly engaged in the production and sale of spirits and beverages in Japan and overseas markets. With its nine breweries, it is the largest beer producer in Japan and among the largest in the world. The wide-ranging product portfolio also includes food products, such as baby food and health food.

Embion Technologies is a biotech startup founded in 2016 as an EPFL spin-off. Its proprietary platform technology specializes in the efficient extraction and formulation of highly functional nutrients for human and animal health from biomass. With this technology, companies can find new opportunities for higher value creation and create novel, circular production processes.

The Collaboration

In the context of a Joint Development Agreement, Embion Technologies and Asahi Group's R&D affiliate Asahi Quality & Innovations are collaborating with the goal to develop new products from brewing by-products generated by Asahi Group. With the conclusion of the JDA, the partners will work on a detailed study of potential business developments that incorporate Embion's technology. Additionally, as part of the collaboration, Asahi Group participated in the Series A funding round of Embion Technologies.

Corporate's Rationale for Collaboration

The Asahi Group aims to benefit financially from this collaboration through the upcycling of brewing by-products. This upcycling helps expand Asahi's food resources, thereby reducing procurement costs and improve supply security and sustainability. This collaboration also helps to position the company as a global leader in the development of a more sustainable, circular economy.

1) Embion Technologies (2020)

SOMPO Himawari Life is adapting the health app of dacadoo that uses a health score to make health holistically measurable for its clients.

CASE STUDY 2 –SOMPO HIMAWARI LIFE AND DACADOO[1]

DIGITAL HEALTH

The Collaboration Partners

Announcement Date: 28th of July 2020

Sompo Himawari Life is a Japan-based provider of life insurance services. The company offers cancer, medical, death, pension, term, and children's insurance products and related services to individuals and businesses throughout Japan.

Dacadoo, a Zurich-based tech startup, develops and operates a mobile-first digital health platform that helps people live healthier lives through a combination of motivational techniques and automated coaching. At the heart of its platform is a Health Score technology, which tries to make health measurable. It is based on the analysis of over 300 million person-years of clinical data from around the world.

The Collaboration

Under the new business partnership, SOMPO Himawari Life will adapt the health app provided by dacadoo for users in Japan and offer it exclusively to its policyholders and insured. The resulting app, called Linkx Score, is intended to motivate users to improve their health holistically by giving them a comprehensive overview of their body, psyche, and lifestyle in form of a health index, and providing them with personalized advice through a digital coach based on the underlying health data.

Corporate's Rationale for Collaboration

As part of its evolution into a company that supports customers' health, SOMPO Himawari Life now offers a new service called "Insurhealth", which integrates health care functions with traditional insurance operations. The partnership with dacadoo makes it possible to combine health-related activities in everyday life with health risk quantification and disease prevention. Improving the health of its customers is of course of financial interest to SOMPO, but it also enables the company to position itself as a socially innovative insurance provider.

1) Dacadoo (2020)

CONTENT

The Swiss startup ecosystem provides an attractive environment for Japanese companies looking for innovation partners due to the easy findability of startups with compatible approaches to innovation and collaboration.

5. THE BIGGER PICTURE – THE ABSOLUTE COMPETITIVE ADVANTAGE

The Competitive Advantages of the Swiss Startup Ecosystem

The Swiss startup ecosystem provides an attractive environment for Japanese companies scouting for suitable startups as open innovation collaboration partners. The strength of the Swiss startup ecosystem can be categorized into two main components:

1) High Economic Compatibility with Japanese Companies

> Expertise in high-tech and medium high-tech manufacturing, one of the major industries in Japan.

> Shared focus on innovation as continuous, incremental optimization of existing technologies, processes and practices

2) Low Effort and Low Risk for Identification and Collaboration

> Reduced effort required by foreign companies to find and collaborate with Swiss startups due to the geographically small-scale, dense ecosystem network, the high quality of startups and the general interest of startups to cooperate internationally.

> Higher degree of compatibility of Swiss startups with Japanese companies regarding business cultural norms and styles of cooperation, including a higher preference for structures, bilateral open innovation approaches.

> Reliability and trust are key pillars of Swiss business relations, especially with foreign companies, as doing business with them has historically been a crucial success factor for Swiss companies.

To better assess the attractiveness of the Swiss startup ecosystem, it is compared to its counterpart in the Netherlands, a most similarly innovative European country, along the selection criteria of scouting foreign companies.

5. THE BIGGER PICTURE – THE RELATIVE COMPETITIVE ADVANTAGE

Comparative Analysis

To gain more meaningful insight into the attractiveness of the Swiss startup ecosystems for Japanese companies, it is compared to a startup ecosystem in a most similarly innovative European country. In this report, only European countries were considered. The country with the minimum average distance to Switzerland in innovation rankings (WIPO Global Innovation Index 2020[1], the Bloomberg Innovation Index 2021[2] and the Innovation Indicator 2020[3]) was selected.

Most-Similar Country: The Netherlands (7), The United Kingdom (9.3), France (12.6)

To compare the Swiss and Dutch startup ecosystem from the perspective of Japanese companies. We developed its own analytical framework. The two ecosystems are compared along five dimensions, which represent the selection criteria of foreign companies for startup ecosystems when scouting for suitable startups as open innovation partners.

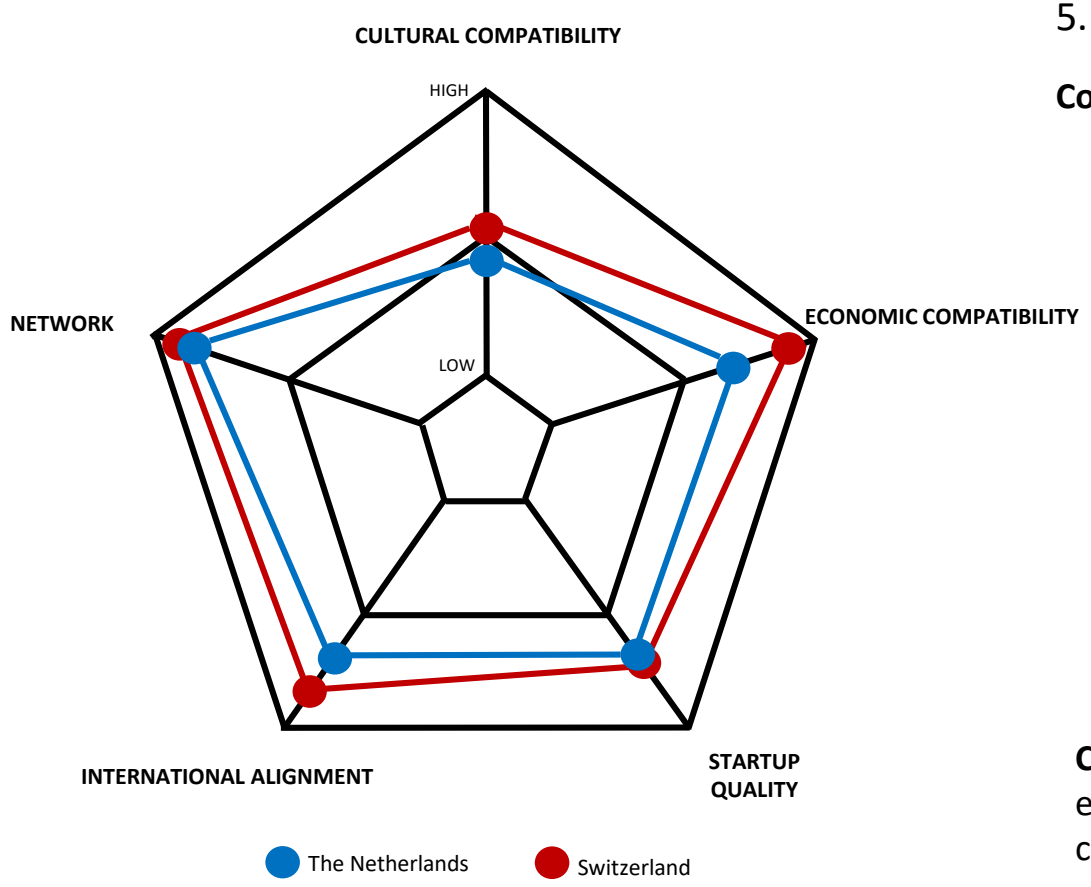
The dimensions of comparison are the following:

- Cultural Compatibility
- Startup Quality
- Economic Compatibility
- Network
- International Alignment

Applying a spiderweb-based comparative analysis using the five dimension, one can identify the major differences between the startup ecosystems in Switzerland and the Netherlands from the viewpoint of Japanese companies.

1) WIPO (2020)
2) Bloomberg (2021)
3) Frauenhofer Institut (2020)

Compared to the Netherlands, the Swiss startup ecosystem is characterized by a more pronounced structural focus on fostering collaborations with foreign companies and higher expertise in the manufacturing sector.



Methodology Spiderweb:
Qualitative assessment of position along dimension based on quantitative indicators.

5. THE BIGGER PICTURE – THE COMPARISON

Competitive Advantages of the Swiss versus the Dutch Startup Ecosystem

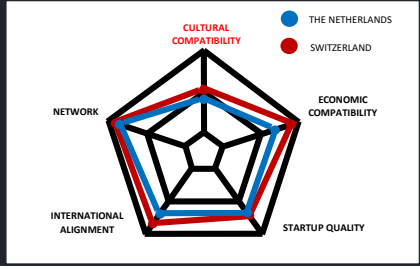
> **Expertise in Manufacturing**
Switzerland is more specialized in manufacturing, especially high-tech and medium high-tech manufacturing, one of the major industries in Japan, than the Netherlands.

> **Orientation Towards Foreign Markets**
The Swiss startup economy is more oriented towards foreign markets than its Dutch counterpart, driven among other things by its smaller domestic market, therefore more highly incentivized to foster collaboration between startups and foreign companies.

> **Compatibility of Business Culture**
According to the Hofstede Model for National Culture, Switzerland and Japan are culturally closer to each other than the Netherlands is with Japan. This can be seen as indicative of a higher compatibility in business culture between Swiss and Japanese companies.

Conclusion: Compared to the similarly innovative Netherlands, the Swiss startup ecosystem is characterized by a more pronounced structural focus on fostering collaborations with foreign companies and a higher compatibility in business culture with Japanese companies, especially for those in the high-tech manufacturing sector.

Bilateral, clearly defined relationships and democratic decision-making processes characterize preferred forms of collaboration by both Swiss and Japanese companies.



5. THE BIGGER PICTURE – CULTURAL COMPATIBILITY

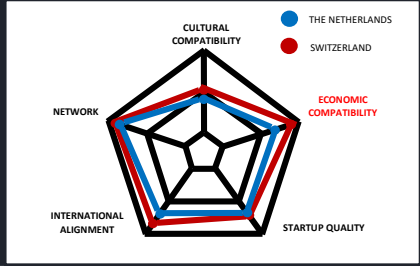
Dimension
The conduct of collaboration is facilitated when company and startup have compatible or similar norms, values and mental frameworks. Cultural compatibility can help improve the synergic potential between the companies of different countries and reduce procedural inefficiencies and misunderstandings. Most important aspects in this regard are the importance of punctuality, diligence, independence, the openness for collaboration and the preference for open or more structured forms of collaboration.

Analysis of Switzerland
Among companies from foreign countries, Swiss business has a reputation as being punctual and reliable, where employees show a high degree of independence. Similarly, they prefer structured, standardized processes and generally show a higher degree of risk aversion. Therefore, when it comes to collaboration, bilateral, clearly defined relationships with other companies are preferred. They also tend to practice more democratic approach to decision-making, where opinions and ideas of various internal actors are taken into account before decisions are taken, also in the context of innovation management. Regarding preference in collaboration approaches, Swiss and Japanese companies show a rather high degree of compatibility.

Comparison with the Netherlands[1]
To quantify and generally compare the business cultures of Japan, Switzerland and the Netherlands, the widely-recognized Hofstede model of national culture can be used, as business culture is likely shaped by a country's national culture. The model consists of six dimensions, scored 0 to 100. The cultural dimensions represent independent preferences for one state of affairs over another. To measure the cultural compatibility between countries we can compare the average differences in the scores along the dimensions. While both the Netherlands and Switzerland are culturally relatively different to Japan, Switzerland is substantially closer with an average difference of 23.17 compared to the Netherlands' 36.17.[1]

1) Hofstede Insights (2021)

Swiss and Japanese companies tend to innovate in the form of continuous, incremental optimization of existing technologies and processes based on their high area-specific expertise.



5. THE BIGGER PICTURE – ECONOMIC COMPATIBILITY

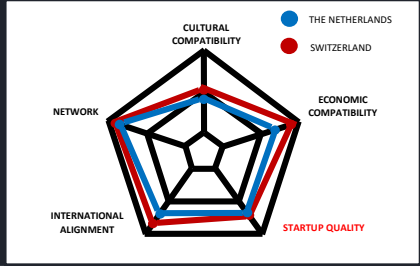
Dimension
A startup ecosystem is more attractive to a company if the types of innovation it offers better match the company's competitive advantages. As startup ecosystems are likely to mirror the competitive characteristics of the underlying economic system, companies should therefore scout in countries that have similar competitive advantages to their own. For example, companies known for their high-value, high-tech products are more likely to find a suitable partner in ecosystems that specialize in technology-oriented, high-value incremental innovations.

Analysis of Switzerland
Internationally, Switzerland is particularly renowned for its industrial sector, particularly for the extensive know-how possessed by Swiss manufacturing and engineering companies, which historically allowed them to adapt to new market demands with goods of market-leading quality. This matches with Japanese companies, which are known for their high quality and technologically advanced products, especially in manufacturing industries.[1] Similarly, both Swiss and Japanese companies tend to generally focus on continuous, incremental optimization of existing technologies, processes and practices, rather than developing radically disruptive approaches and technologies.

Comparison with the Netherlands
Looking broadly at the composition of the three economies, regarding the value added by manufacturing as a share of GDP in 2018, Japan (20.7%) ranks closer to Switzerland (18.2%) than the Netherlands (11.1%).[2] Switzerland ranks world-class in high-tech and medium high-tech manufacturing, placing third in the world in 2020 as a percentage of total manufactured output, with Japan ranking 8th and the Netherlands being 35th.[3] In the Global Manufacturing Scorecard 2018, measuring how well a country's environment fosters the development of manufacturing companies, Switzerland positioned itself on top (together with the UK), while Japan and the Netherlands were both ranked shared 4th.[4] Furthermore, 15.8% of all newly established businesses in Switzerland are in the industrial or ICT sector. In the Netherlands that share is 11.2%.[5]

1) SelectUSA (2019) 2) Worldbank (2018)
3) WIPO (2020) 4) Brookings (2018)
5) Arvanitis (2020)

The quality of startups in Switzerland is relatively high due to high opportunity costs for entrepreneurship and the close relationship between academia and newly founded companies.



5. THE BIGGER PICTURE – STARTUP QUALITY

Dimension

Foreign companies searching for innovation collaboration partners can profit from searching ecosystems that tend to produce economically successful, highly innovative startups. First, the probability of successfully identifying a suitable innovation partner is higher in ecosystems with a higher innovation capacity. Second, foreign companies limit their risk of having to filter through a significant number of glitzy but ultimately low-quality startups in ecosystems known for generally producing higher-quality startups.

Analysis of Switzerland

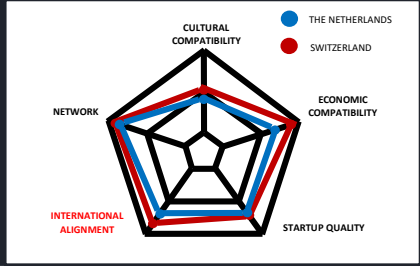
There is a tendency toward general risk aversion in the Swiss population. In combination with relatively well-paid employment opportunities, the threshold of conviction for many in the Swiss labor force to start a business is therefore relatively high. As a result, this threshold can function as a filter screening out low-quality, likely unsuccessful startups from the outset. Moreover, in Switzerland, where innovation revolves around strong academic institutions, the innovative solutions of Swiss startups are often the result of years of world-leading research. In addition, Swiss startup founders tend to have a relatively high creative drive with an enthusiasm for developing innovative solutions, which consequently leads to highly innovative startups.

Comparison with the Netherlands

Regarding the average quality of the startups, the Netherlands has a higher “startup survival rate”, the share self-employed for more than 3.5 years in the workforce, which can be viewed as an indicator of the average startup quality. Both the Netherlands (12%) and Switzerland (11.5%) rank among the world’s best for this indicator.[1] Another indicator for the quality of newly established companies is employment expectation, the share of newly founded companies that expect to grow by at least six employees in the next five years, is substantially higher in Switzerland (28.5%) than in the Netherlands (9.5%).[1] Furthermore, Swiss startups also seem to be more innovative than their Dutch counterparts. The innovation tendency of newly established companies, i.e. the share of product/service that is new to all or at least a large proportion of customers and is offered by only a few other companies, if any, is 31.7% in Switzerland compared to 23.8% in the Netherlands.[1] Switzerland is also better in a subindex of the WIPO Innovation Index called Business Sophistication, which assesses how conducive firms are to innovation activity, ranking second, followed by the Netherlands at fourth.[2]

1) Arvanitis (2020)
2) WIPO (2020)

Due to the historically small domestic market, the Swiss startup ecosystem has refined its structures over time to encourage collaboration between startups and foreign companies.



5. THE BIGGER PICTURE – INTERNATIONAL ALIGNMENT

Dimension

For startups in smaller markets, a focus on global markets through exports and international collaboration is often an essential part of their growth strategy. For small-market startups to flourish, the structure and behavior of startups and their respective ecosystems must be aligned with this outward focus. This includes the presence of central network actors that provide orientation and access to substantial amount of market and startup information to foreign companies as well as the prioritization of trust and reliability in partnerships.

Analysis of Switzerland

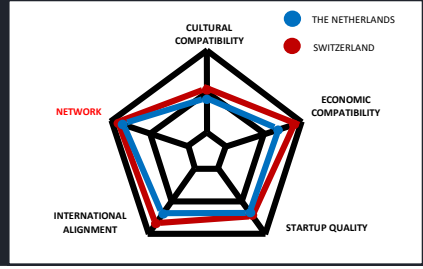
Historically, Swiss companies have tended to be outward-looking in their growth strategies, targeting foreign markets for new business opportunities due to Switzerland's relatively small domestic market. This historical dependence on exports allowed Swiss players to refine over time the internal requirements for collaborating and initiating business with foreign companies. As a result, collaboration with Swiss companies today is generally a low-effort, low-risk activity. A high enforcement and compliance of the rule of law generates a reliable and trustworthy business environment. Easy access to a relatively extensive amount of information on startup ecosystems and startups online facilities the scouting of foreign companies. Additionally, the Swiss population is multilingual, facilitating communication between Swiss startups and foreign companies.

Comparison with the Netherlands

Looking broadly at market size, based on the Domestic Market Size Index by the Worldbank, normalized on a 1-7 (best) scale, in 2017 the Netherlands (4.78) had a slightly larger domestic market than Switzerland (4.41).[1] Not surprisingly therefore that newly established Swiss companies are also more export-oriented than their Dutch counterparts. 33% of Swiss startups make at least 25% of their revenue in other countries, compared to 8.7% of Dutch startups.[2] Furthermore, inhabitants of both countries can be described as relatively law-abiding. According to the Worldbank's Rule of Law index, measuring the perceptions of the extent to which agents have confidence in and abide by the rules of society, Switzerland ranked third in 2019, with the Netherlands ranking 9th.[3] Switzerland has also built up a positive reputation of trust worldwide, ranking second place in perceived trustworthiness and 8th in perceived transparency of business practices in 2020. The Netherlands placed equally well, 9th place in trustworthiness and 6th in perceived transparency.[4]

1) Worldbank (2017)
2) Arvanitis (2020)
3) Worldbank (2019)
4) US News (2020)

The Swiss startup ecosystem is characterized by particularly close relationships between science and business and a small number of central players who assume a networking function.



5. THE BIGGER PICTURE – NETWORK

Dimension

Geographically small-scale startup ecosystem networks, where actors have relatively high number of connections to other actors, reduce effort and time for foreign companies in their scouting endeavors. Furthermore, the presence of few central well-connected actors inside the ecosystem as points of contact facilitates the orientation for foreign companies when entering a new country or startup ecosystem, respectively. Additionally, the flow of ideas between different innovation actors, and access to knowledge are important ingredients of innovation. More and higher-quality connections between actors in a startup ecosystem has therefore the potential to improve the ecosystem's capacity to produce innovative startups.

Analysis of Switzerland

Due to its small geographic size and small number of clear centres of economic and academic activity with the Zurich and Geneva-Vaud areas and to a lesser extent the Basel region, Switzerland has very concentrated ecosystem networks. There is an especially dense relationship network between academia and industry. Relationship in this network can take various forms, from informal relationships to more formal structures such as university spinoff programmes and innovation collaborations between private companies and research institutes. In addition, there are a few actors which take up a coordinative and informative function inside the whole innovation landscape (Switzerland Global Enterprise, Startupticker) or inside specific startup ecosystems (Swiss Biotech Association, Swiss Food & Nutrition Valley), intending to foster the development of relationships between domestic and foreign companies.

Comparison with the Netherlands

Both countries seem to have similarly developed and dense innovation networks. Looking at the subindex Innovation Linkages of the 2020 WIPO Innovation Index, which intends to quantify how well linked a country's innovation actors are, Switzerland is ranked 5th, followed closely by the Netherlands on the 7th place. This indicator combines several factors, such as the extent of research collaboration between universities and industry, the development stage of clusters, as well as the number of joint ventures and strategic alliances deals and of shared patent families filed by at least two offices.[1]

1) WIPO (2020)

2) Arvanitis (2020)

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CONTENT

APPENDIX – INSIGHTS FROM INTERVIEW WITH SPYROS ARVANITIS

APPENDIX – CENTRAL INSIGHTS FROM INTERVIEW WITH DR. SPYROS ARVANITIS

What negative aspects of the Swiss innovation landscape hide behind the positive ranking in global innovation indices?
The Swiss innovation landscaped has long been characterised by a large presence of innovative small- and medium-sized enterprises with them spending a relatively substantial amount in R&D. In recent years, this foundation has eroded. While R&D expenditure continues to rise, it's also becoming increasingly concentrated, with a few large companies being responsible for a large share of the spending. While not inherently bad, it puts the Swiss innovation landscape in a more volatile position due to lacking risk diversification. A reduction on innovation activity in one of these few companies could significantly slow down the innovation capacity in the whole system.

What is the role of startups in the Swiss economy?
Startups generally have a complementary role. They often do not develop into providers of innovative solutions to existing problems. Instead they develop an innovation until just before market readiness, when they are then integrated into larger companies through acquisition or joint ventures. This can partially be explained by relatively high later-stage development hurdles, such as capital procurement, and a less distinctive sense of entrepreneurship among innovators. Swiss startup founders have a relatively low entrepreneurial spirit, but a high creative drive to develop innovative solutions.

What are the strength of Swiss startups?
Historically, the approach to innovation by Swiss SMEs can be described as continuous, incremental and highly specialised. Many Swiss SMEs were monopolies in their small market niche and had a general tendency towards risk aversion. They have found their competitive advantage as a competent second mover, who learns from the mistakes of first movers and can therefore provide significantly higher-quality solutions. This strategy worked for Swiss companies because they possessed a high degree of market expertise, a high knowledge absorptive capacity (the ability to learn from external knowledge) and sophisticated technological infrastructure. While we are lacking statistical data on the business models of current Swiss startups, we can assume that their strategies likely resemble more the historic business models of Swiss SMEs than their current US counterparts.

Which factors contribute to the reputation of Swiss firms in other countries?
It is primarily the Swiss industrial sector that is internationally highly regarded. This is due to, on one side, the extensive know-how possessed by Swiss manufacturing and engineering companies, which allowed them to adapt relatively quickly to new market demands with goods of market-leading quality. On the other side, business-making and cooperation with Swiss industrial firms is generally a low-effort, low-risk activity. Existing standardised structures reduce the necessary effort to conduct business. Furthermore, a high enforcement and compliance of the rule of law generates a reliable and trustworthy business environment.
These foundations of Swiss reputation most likely developed so advantageously because Swiss industry early on had a strong export focus due to its small domestic market. This reliance on exports allowed Swiss actors to hone the conditions for collaboration and business-making with Swiss companies. Additionally, it is generally believed that a sector's focus on exports amplifies innovative behaviour inside the sector, due to larger competition and availability of market niches.

No verbatim statements by Dr. Arvanitis. Statements are a synthesis of the interview with Dr. Arvanitis.

APPENDIX – ANSWERS FROM INTERVIEW WITH SOMPO HIMAWARI LIFE

APPENDIX – ANSWERS FROM INTERVIEW WITH SOMPO HIMAWARI LIFE

Why did Sompo Himawari Life Insurance decide to collaborate with dacadoo, in developing new, innovative solutions? Did they consider different approaches to innovation management?
We chose dacadoo as they have extensive experience of launching apps in many different countries. One of their unique selling points, the "Health Score", is an element which no other companies have used before and it’s a very attractive feature.

What is Sompo Himawari Life Insurance’s experience so far, if any, with startup collaboration to develop innovative solutions?
The collaboration so far has proven very successful and we’re looking forward to what the future will bring. Additionally, as we are very active in new technology, we’ve already developed new services with other innovative companies such as "Binah" and "Neurotrack".

How did Sompo Himawari Life Insurance approach the search for an optimal startup to collaborate with? Or did the dacadoo reach out to Sompo Himawari Life Insurance for collaboration?
One of our group employees learnt about dacadoo at a conference abroad and introduced the company to us.

Did Sompo Himawari Life Insurance rely on any organizations in Switzerland to identify dacadoo as their collaboration partner? If yes, who did you interact with and for what purpose?
No. We did not rely on any organizations in Switzerland.

Did Sompo Himawari Life Insurance specifically seek out Switzerland to look for startups to collaborate with? If yes, why so?
No. We didn't mean to seek out Switzerland especially.

In Sompo Himawari Life Insurance’s experience so far, what are the advantages of collaborating with Swiss startups, especially in comparison to startups from other countries?
Well, it all depends on particular companies, but the quality of apps and engineers at dacadoo seems to be high enough for us to feel reliability.

The answers were provided in written form through an email exchange as a response to a questionnaire provided by WIRE. They are included in the Appendix unchanged.

APPENDIX – ANSWERS FROM INTERVIEW WITH ASAHI GROUP HOLDING

APPENDIX – ANSWERS FROM INTERVIEW WITH ASAHI GROUP HOLDING

Why did Asahi Group Holding decide to collaborate with Embion Technologies, in developing new, innovative solutions? Did they consider different approaches to innovation management?
Asahi Group, whose main businesses are alcoholic beverages, soft drinks , foods, etc. that utilize the blessings of nature, has a history of expanding its business portfolio by using the by-products of each business for other businesses. Embion's platform technology, which brings innovation to agricultural products and food processing, was attractive to the Asahi Group in the context above. For such innovation, we consider not only our own research and development but also collaboration with academia and start-ups with advanced technology and insights as the main means.

What is Asahi Group Holding's experience so far, if any, with startup collaboration to develop innovative solutions?
We have invested in Japanese start-up, KUREi, which discovered antifreeze components in coffee grounds, which is a by-product of our coffee beverages, and are selling agricultural materials (anti-frost materials) for fruits and vegetables. Other than that, we are accelerating collaboration and investment with innovative startups.

How did Asahi Group Holding approach the search for an optimal startup to collaborate with? Or did the Embion Technologies reach out to Asahi Group Holding for collaboration?
Embion did not approach Asahi to collaborate, but we asked an agents in Europe to search for startups that matched the Asahi Group's strategy of cross-sectional utilization of by-products within the group. Then we have come to find Embion, which has the suitable technology.

Did Asahi Group Holding rely on any organizations in Switzerland to identify Embion Technologies as their collaboration partner? If yes, who did you interact with and for what purpose?
For the collaboration with Embion, we did not utilize a third party in Switzerland. However, we are paying attention to Switzerland as an innovation hotspot, and we are receiving information about Swiss companies through the Swiss Embassy in Japan. In June of last year, we participated in a virtual tour via the web arranged by the Embassy.

Did Asahi Group Holding specifically seek out Switzerland to look for startups to collaborate with? If yes, why so?
Asahi Group is interested in excellent startups not only in Switzerland but around the world, and continues to collect information. In particular, we are paying close attention to trends in regions that are said to be hotspots for innovation, such as the West Coast of the United States, and we recognize that Switzerland is one of them.

In Asahi Group Holding's experience so far, what are the advantages of collaborating with Swiss startups, especially in comparison to startups from other countries?
Regarding the startups from Switzerland, we recognize that, in general, they are strong in the food field, entrepreneurship education is substantial, financial investor network is in place, public support is generous, and dry science and wet science fused together unlike other ecosystem. These are the points we are attracted.

This survey was conducted by:

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Please take a few minutes to fill out this survey.

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