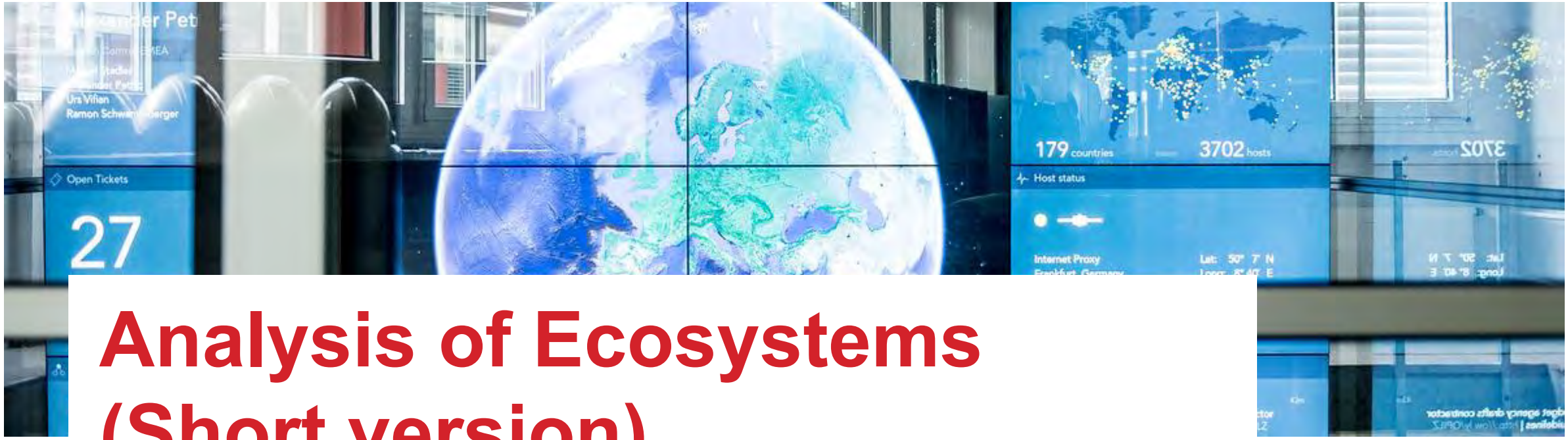
enabling new business

SWITZERLAND GLOBAL ENTERPRISE



Analysis of Ecosystems (Short version)

April 2022

Executive Summary

5 ecosystems for investment promotion

Where to play

- **Ecosystems create significant economic and societal benefits for their host countries,** by increasing GDP, creating high quality employment, accelerating innovation. They are "self-reinforcing" – vibrant ecosystems attract further players to join and add high value in surrounding areas, both in terms of activities and geographies
- **Five ecosystems are suggested as priorities based on a detailed analysis of attractiveness and strategic fit with high potential for significant value-add**: (1) Life Science, (2) Future of Food, (3) Future of Finance, (4) Industry 4.0, and (5) Digital Tech
- **Six underlying technologies and capabilities are critical for the prioritized ecosystems (based on earlier work on "5Tech"):** Robotics, Data & Analytics (including Artificial intelligence), Blockchain, Biotechnology, Microtechnology, and Material Science & Eng.

Approach investment promotion Switzerland

How to win

- **Being top of mind of international executives is key to attract investment, as well as being clear on Switzerland's proposition around the (constantly evolving) attractiveness factors for decision-making.** International companies typically use a structured decision process for choosing locations, starting from a longer list of options and then evaluating critical factors of attractiveness
- **Switzerland is not always top of mind –** Switzerland's leading position in Life Sciences and Future of Finance is acknowledged globally, but the profile in Future of Food, Industry 4.0 and Digital Tech is less sharp
- **Relevant attractiveness factors for decision-making differ by ecosystem:** Talent availability is a game changer across high value-added ecosystems, as is Quality of Life. Access to growth capital beyond venture capital is important for scaling up innovative business models across ecosystems
- **Globally recognized strengths of Switzerland include quality of life, a favorable tax environment in international comparison, and regulatory reliability –** those strengths need to be highlighted
- **Talent availability (including cost of talent), lack of access to growth capital, and market access are major development areas of Switzerland** – Talent availability in particular due to complex inbound mobility and low absolute number of STEM graduates

Overall plan of implementation

Make it happen

- **Switzerland needs to act as one - orchestrating all available resources and focusing on the ecosystems.** All stakeholders (S-GE, regions, cantons, Swissnex, Switzerland Innovation, Presence Switzerland, Innosuisse, SECO, FDFA etc.) need to be aligned and committed to the direction and consequently coordinate their actions
- **Switzerland is proactive about the five ecosystems.** An overarching roadmap has been developed to support and speed up the implementation, including a clear timeline of actions as well as roles and responsibilities
- **Pilot before scale-up.** Switzerland should roll out the ecosystem approach first in selected pilot markets (e.g., USA) before adapting it globally

Content

5 ecosystems for investment promotion (Where to play)

Approach for investment promotion Switzerland (How to win)

Definition of ecosystems

A common understanding of the term “Ecosystem” is key to the success of the study

Definition

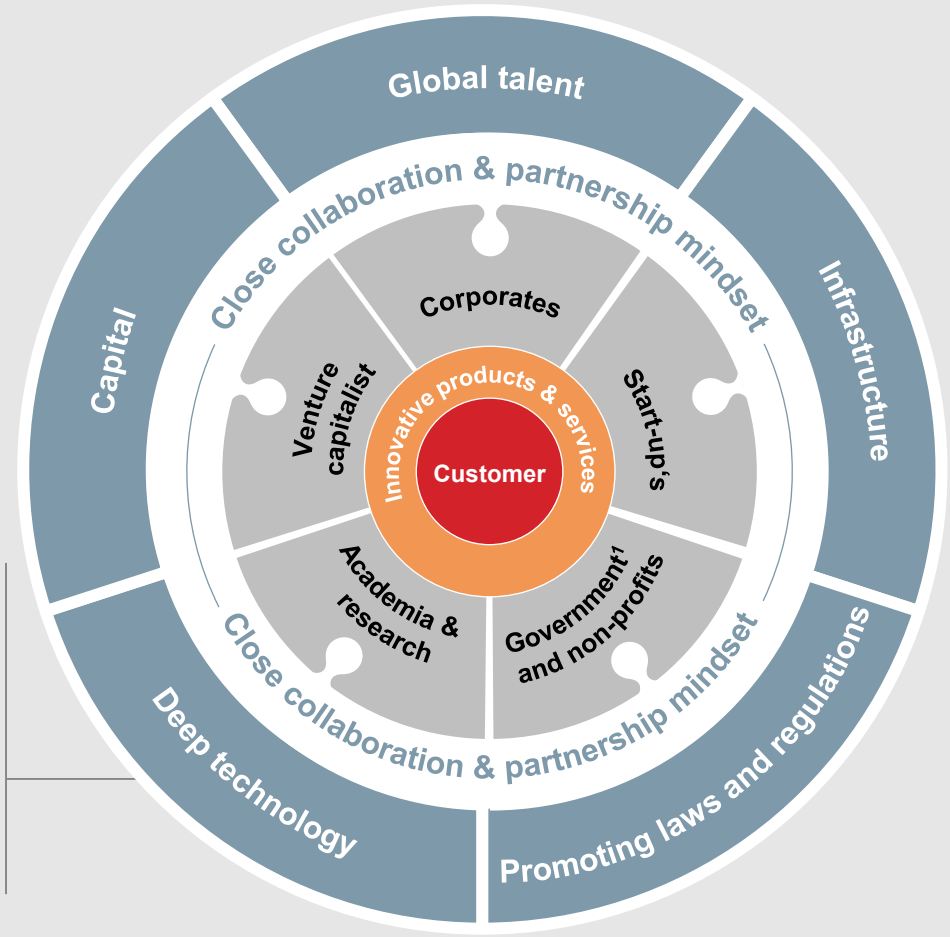
Set of **highly interconnected stakeholders** across different industries (corporates with different size and focus, start-ups, research centers and universities, governments and regulators, etc.) which are **providing innovative products and services based on leading technology and a partnership mindset.**

Value-add of the system goes far beyond what the sum of individual player could deliver and is increasing disproportionately by adding further players (network effect), driven strongly by regional spillovers.

Structure

Enabler

Interconnected stakeholder



- Artificial Intelligence
- Robotics
- Personalized health
- Blockchain
- Advanced manufacturing
- ...

Ecosystem case examples

6 international case studies reveal that ecosystems generate a significant impact for the host country

Boston-Cambridge: Life Science

Israel: AgTech / FoodTech

Singapore: Life Science

Luxembourg: Finance / FinTech

Ireland: Life Science

Silicon Valley: Tech

Note: Most case studies have been chosen based on similar country attributes compared to Switzerland in terms of size and wage cost structure

Source: Pictures based on web research

Lessons learned from global case studies (1/2)

Ecosystems create significant economic impact for their host countries

Impact	Description	Example
Creation of employment	Ecosystems lead to a significant growth of attractive employment opportunities, typically for highly qualified staff	8.5% annual R&D job growth in biopharma ecosystem in greater Boston area
GDP increase	Ecosystems have the potential to substantially increase a country's output	Financial sector representing a third of Luxembourg's GDP
High R&D activity	High R&D spending of corporations within the ecosystem lead to creation of innovation	EUR 2 bn annual R&D spend by IDA Ireland client companies in biopharma
Future innovation	Ecosystems often „generate" a high number of innovative start-ups with significant future growth potential	>330 biomedical science start-ups in Singapore (doubled since 2014)
Distribution of wealth	Through targeted location promotion and network effects, peripheral regions can also benefit from ecosystems	Israel is focusing its food tech investments to rural areas with higher unemployment and poverty

Lessons learned from global case studies (2/2)

Several enablers need to be in place to create a successful ecosystem

Enablers & success factors	Description	Example
Human capital and talent	Access to highly qualified talent is key for most companies to be successful	Ireland invested EUR 60 mn in a research and training center which gave training to over 4,000 people in 2019 in Bioprocessing
State-of-the art research centers	Research is the engine for innovation and therefore for companies in ecosystems to develop new offerings	Singapore launched „Biopolis“ in 2003 as a biomedical research hub that hosts more than 40 research labs
Regulation & policy	Unbureaucratic and business-friendly regulation & policy can decrease cost significantly and increase speed of action	Luxembourg House of Financial Technology established the FIN5LAB, which offers due diligence and integration services
Funding / Investment	Funding enables institutions to promote specific industries and influence corporate decisions	Israel has promised agri-food tech companies in Northern Galilee salary subsidies, free land and tax breaks
Connectivity	Best-practice sharing between different parties of economies increases overall output	Organizations such as the Irish Centre for Business Excellence and IBEC, work with the IDA to facilitate best practice-sharing between companies.

Value of allocation of companies in ecosystem

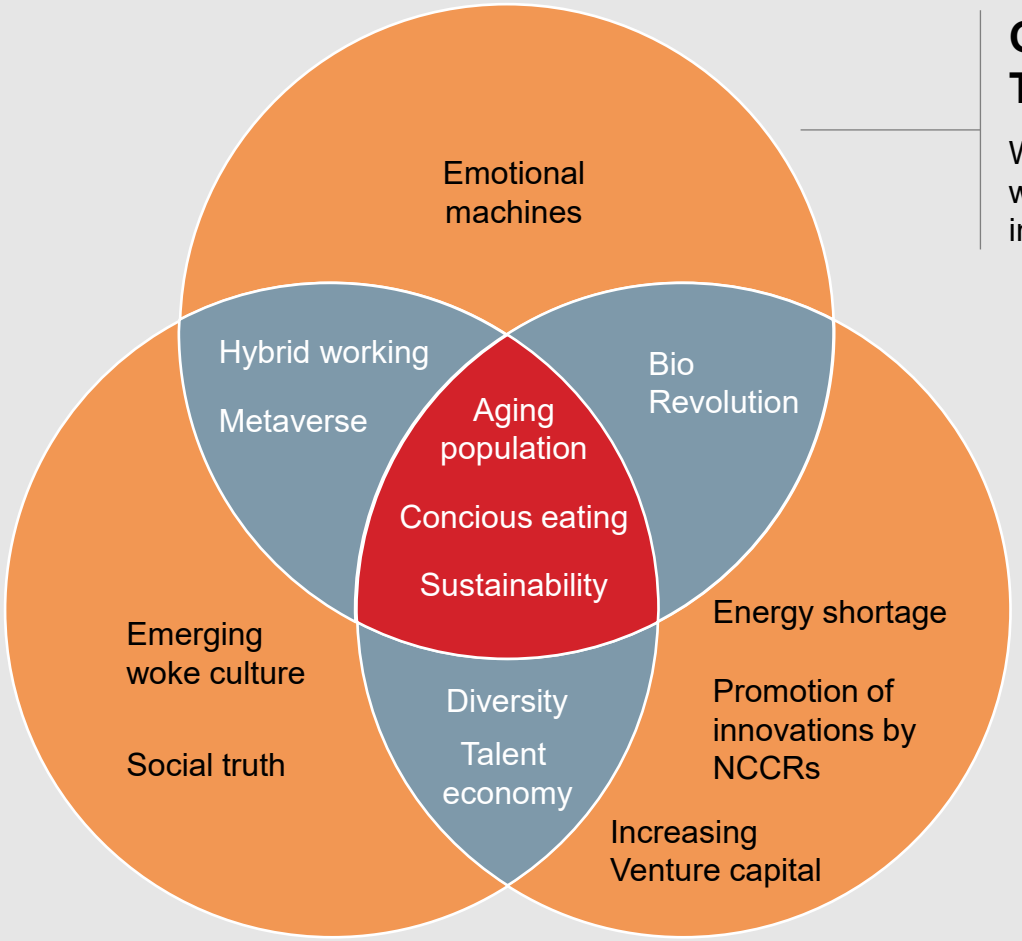
Over time, companies in ecosystems generate significant value and network effects for the Swiss economy

Source: Web research

EXAMPLES

Trend analysis

Application of 3 different lenses in the trend analysis – global macro trends, societal game changers, and CH-specific developments



Global Macro Trends

Where is disruption happening – which trends have a positive impact on Swiss economic growth?

Societal game changers

Which trends are leading to a social change in Switzerland?

Swiss specific developments

Which Swiss specific developments should be considered / leveraged in the investment promotion?

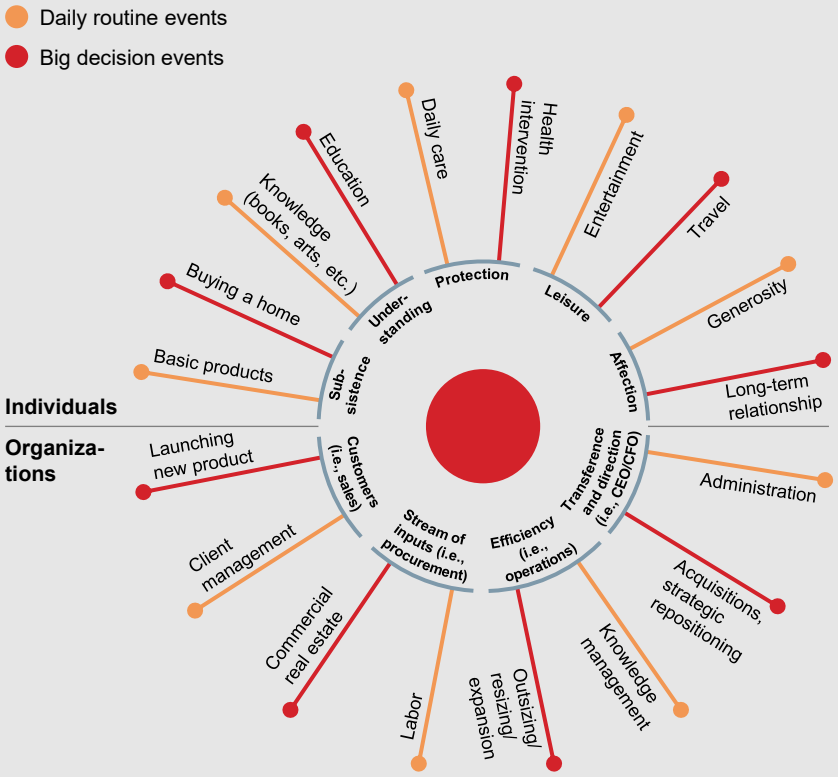
Source: Trend One, leading universities and institutes, web research

NOT EXHAUSTIVE

Global ecosystem industrial perspective

The list of ecosystems used in the analysis has been defined based on a 3-step methodology

Based on the basic needs of individuals and companies …

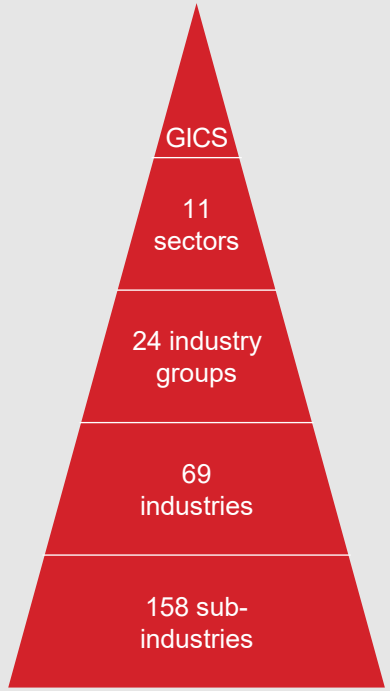


Subset and examples of Max-Neef classification of needs

… ecosystems were defined that are centered around fulfilling customer needs

- **Health & Life Sciences**
- **Digital content & entertain-ment**
- …

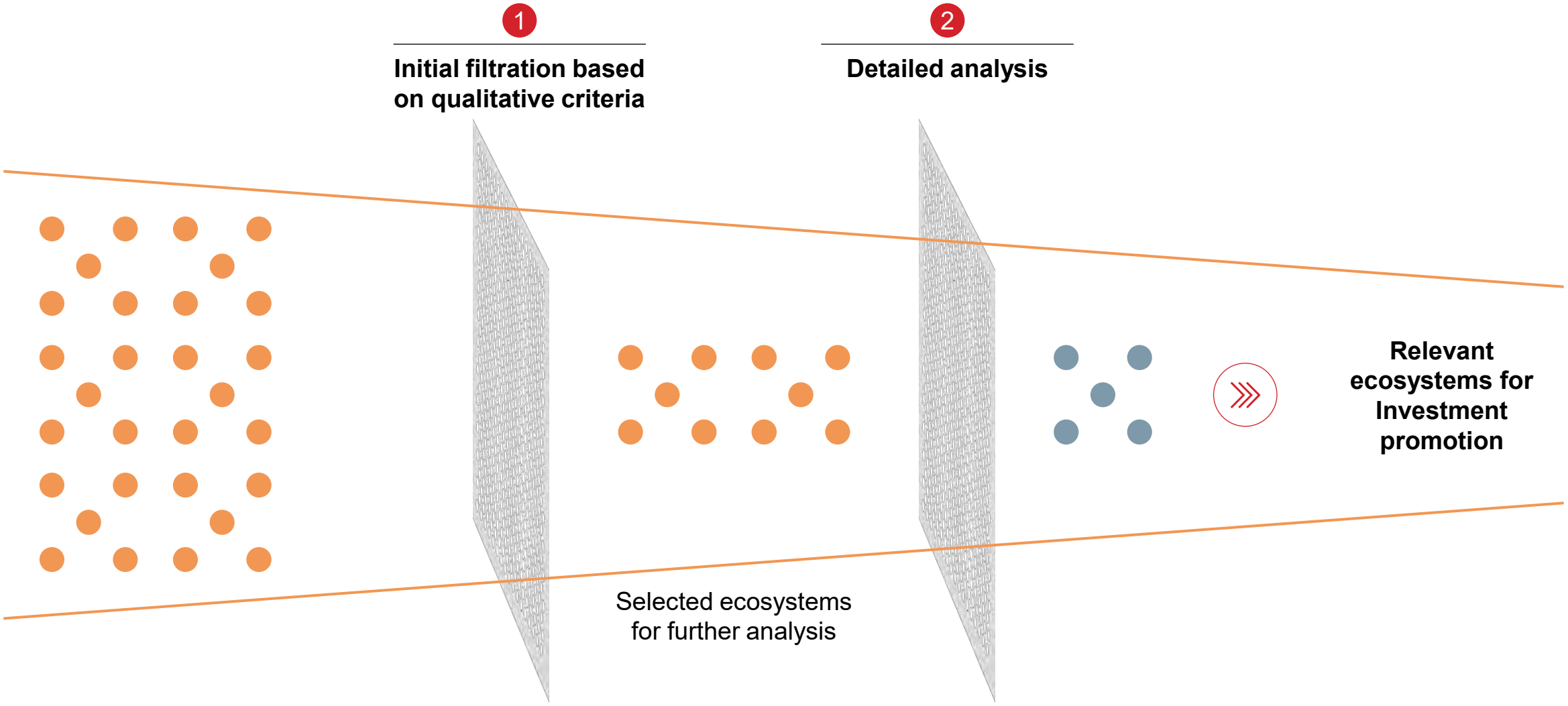
Industries and sub-industries were matched to those ecosystems



Definition of (sub-)industries was based on the Global Industry Classification Standard (GICS) of MSCI and S&P

Source: MSCI, Human Scale Development by Max-Neef

The overall list of ecosystems goes through a two-step process to determine which ecosystems are prioritized



Global ecosystem industrial perspective

Based on these initial criteria, a few ecosystems with high compatibility can be shortlisted for further assessment

Shortlisted

Housing	Wealth and Protection	Mobility	Transpor-tation	Travel & Hospitality	Consumer Goods	Energy & Material	Educa-tion	Health & Life Sciences	Public services	Digital content & entertain-ment	Digital services & IT	Global corporate services	B2B operations
Home Re-pair & Main-tenance	Wealth & Asset management	Car Rentals	Air Freight & Logistics	Hotels, Restaurants, & Leisure servcies	Apparel & Fashion	Paper & Forest products	Primary	Healthcare equipment (incl. MedTech)	Public Administration	Advertising	IT Infrastructure & Hosting	Corporate financial services	Machinery & Equipment
Rental	Capital markets (incl. Trading)	Car Insurance & Service	Airlines	Travel Arra-ngements & Insurance	Electronics & Appliances	Energy Equipment & Services	Secondary	Pharma & Biotechnology	Social Security And Defense	Broadcasting	Software	Research & Consulting services	Real estate
Purchase	Banking incl. Mortage financing	Auto-mobiles	Marine	Tourism	FMCG	Oil, Gas, & Consumable Fuels	Tertiary Education	Life Science tools & services (incl. CDMO)	Environ-mental & Facilities services	Cable & Satelite	IT Services (incl. Outsourcing, system integration, etc.)	Human Resource & Employment Services	Construction & Engineering
Renova-tion	Insurance	Public transport	Road & Rail		Telco Sales	Electrical equipment[1]	Education services	Digital health	Water Supply, Sewerage	Publishing	Technology Hardware and Storage	Security & Alarm services	Security & defense
Furnishing	Payment	Auto comp-onents			Luxury goods	Independent power and Renawable Electricity Producer		Healthcare facilities		Movies & Entertainment	Electronic equipment & instruments		Building products
					Retail & trade	Chemicals[2]		Healthcare distributors		Interactive Home Entertainment & Media[3]	Semi-conductor		Industrial automation
					Food & Nutrition	Construction Materials		Health insurance			Cybersecurity		Aviation & Space technology
					Tobacco	Utilities (Gas, Electric, Water)		Healthcare services (incl. dialysis centers or lab testing)			Communica-tion equipment		
					Household & Personal products	Containers & packaging					Telecommuni cation services		
					Leisure products	Metals and Mining							

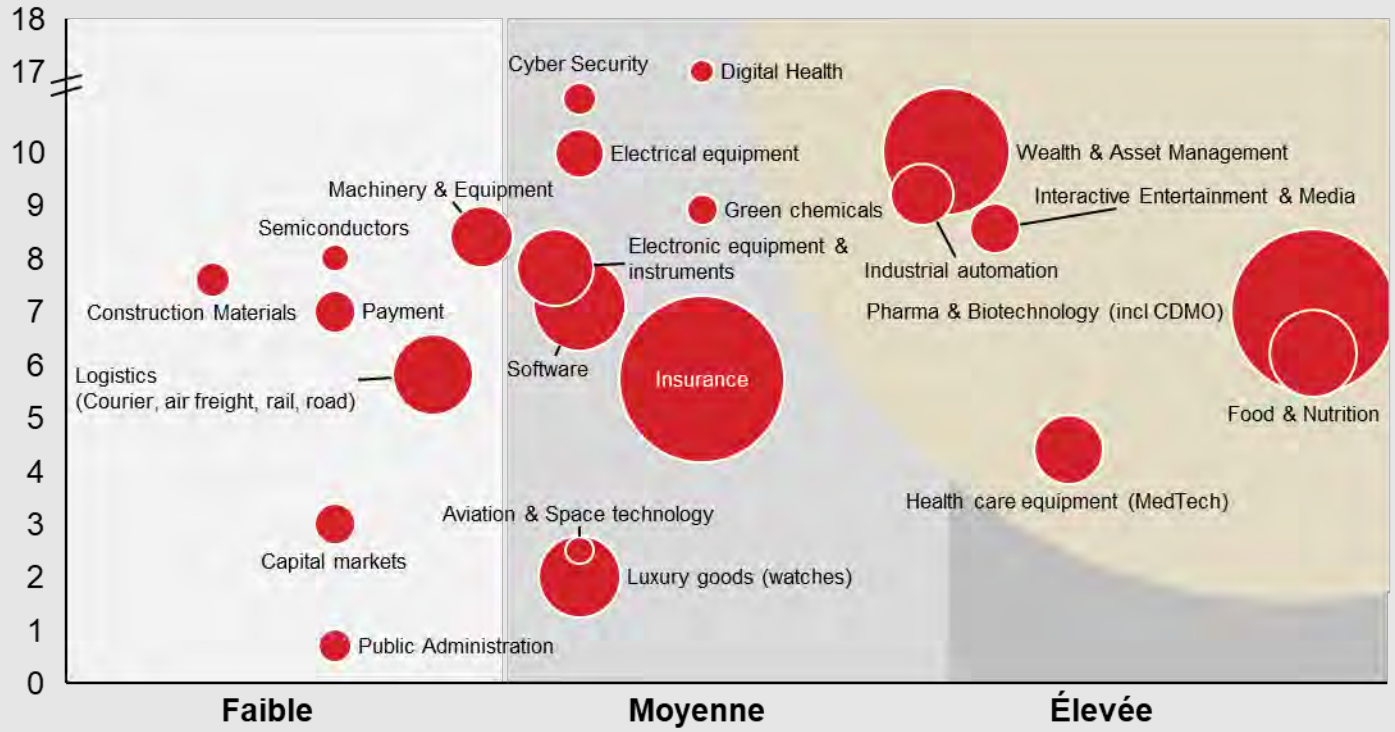
1. Focus on energy storage and distribution technology
2. Focus only on material science and "green" chemical processes including recycling, carbon capture, etc.
3. Including Metaverse

Prioritization of ecosystems

Based on attractiveness and strategic fit, Switzerland should focus on sub-industries Pharma & Biotech (incl. CDMO), Food & Nutrition, Healthcare equipment (MedTech), Interactive Entertainment & Media, Wealth & Asset management, and Industrial Automation

Source: IHS, market research, expert interviews

Prioritization of ecosystems / sub-industries



Strategic fit (qualitative)

- High competitiveness
- Science & technology focus
- Positive impact on sustainability

1. Primary source: IHS
2. Primary source: Market research, Expert interviews
3. Average growth of total annual revenue from sales of all private and public enterprises within the specified sector from 2019 – 2025
4. Value-added is sales revenue less cost of purchases of inputs and supplies (operating expenditures) required for production. The sum across all industries, by definition, equals national GDP

Overview of prioritized ecosystems

Within each ecosystem, focus segments and key players are identified (details on next pages)

XXX «Marketing» name

	Ecosystem	Relevant sub-industries	Focus segments	Key players (HQ outside Switzerland)	Rationale
1 «Life Sciences»	Life Sciences	Pharma & Biotech (incl. CDMO)	Oncology, Immuno-suppressants, Dermatologicals, Vaccines	abbvie, Johnson & Johnson, MERCK, GINKGO BIOWORKS, biosplice, CARIS LIFE SCIENCES	Long history and large footprint across CH; strong science and R&D focus with world-class research facilities; embedded in highly developed CH healthcare system
		Healthcare equipment (MedTech)	In-Vitro-Diagn., Dental, Urology / Neprhology, Endoscopy	Johnson & Johnson, PHILIPS, GE Healthcare, Abbott	
2 «Future of Food»	Consumer goods	Food & Nutrition	FoodScience, AgTech, Consumer Tech	Mondelēz International, AgroFresh, OATLY!, BEYOND MEAT, Cargill, BASF We create chemistry, JBS, FARMERS BUSINESS NETWORK	Strong industry in CH covering whole value chain from farm to fork
3 «Future of Finance»	Wealth and Protection	Wealth & Asset management	Sustainable investing and finance, financial software	BLACKROCK, Amundi ASSET MANAGEMENT, MAMBU, Goldman Sachs, infor, Finxact CORE AS A SERVICE	Combining traditional strengths of CH in financial industry with new capabilities, e.g., software
4 «Industry 4.0»	B2B operations	Industrial automation	Machinery, robotics, & control equip., tooling & sensors, connectivity & software	FANUC, TERADYNE, SIEMENS, Geek+, Horizon Robotics, OMRON, LOCUS	Combining existing MEM footprint with highly attractive future applications in robotics
5 «Digital Tech»	Digital Content	Interactive entertainment & media	Social networking platforms, video games, search engines, streaming platforms	LinkedIn, ACTIVISION BLIZZARD, Tencent, Baidu 百度	Scaling CH ecosystem (e.g., Google) with significant growth potential; research focus of Swiss technical universities

«Life Sciences»

1: Life Sciences – Biotech & Pharma

BioPharma ecosystem is engaged in the research, development of pharmaceuticals or products based on genetic analysis and engineering

Focus segments

Leading production process

Shift from conventional to biotechnology drugs – share of prescription & OTC sales of biotechnology drugs will increase to 35% in 2026

Fast growing therapy areas

1. **Oncology** (12% CAGR)
2. **Immunosuppressants** (15% CAGR)
3. **Dermatologicals** (13% CAGR)
4. **Vaccines** (8% CAGR)

Disrupting technologies

Bio innovations

Use of biomolecules and biosystems innovations (e.g., cell & gene therapy) could potentially have annual direct impact of USD 500 billion to USD 1.2 trillion globally

Data & Analytics (incl. AI)

Data & analytics is leading a paradigm shift in several functions (e.g., R&D or operations)

Small batch production

New manufacturing processes enabling production of small batches / personalized health products (e.g., new type of bio-reactors)

Leading geographies

USA

16 large biopharma players[1] with a HQ in USA, Boston, Bay Area North Carolina and Seattle as key regions

Europe (EU5)

13 large[1] biopharma players in EU5[2] countries – plus high density in Ireland, Switzerland and Medicon Valley

Japan

Most large players have their HQ in Tokyo

China

Shanghai and Shenzhen leading regions

Key players

Foreign players

Incumbents

abbvie, Johnson & Johnson, MERCK, Bristol Myers Squibb, Pfizer, SANOFI, gsk

Unicorns

GINKGO BIOWORKS, CARIS LIFE SCIENCES, biosplice, color

Swiss players

Incumbents

Roche, NOVARTIS, idorsia, Biogen, GALDERMA

Other players

ROIVANT SCIENCES, octapharma, VIFOR PHARMA, basilea PHARMACEUTICA

1. Sales revenue over USD 2bn in 2020
2. Germany, United Kingdom, France, Spain, Italy

Source: Evaluate Pharma 2020, McKinsey Global Institute report “The Bio Revolution”, In Vivo Outlook 2020, Failory, expert interviews, web research

«Life Sciences»

1: Life Sciences – MedTech

MedTech industry includes manufacturers of healthcare equipment and devices

Focus segments

Overall growth

MedTech industry is growing by 4-5% driven by macroeconomic trends and a new wave of innovative technologies

Growth segments

1. **In-Vitro-Diagnostic** (CAGR 7%)
2. **Dental** (CAGR 7%)
3. **Urology / Nephro-logy** (CAGR 6%)
4. **Endoscopy** (CAGR 5%)

Disrupting technologies

Material Science & Engineering

3D printing of customizable implants, replica organs, and on-site device production using materials as polymers, metal alloys, or ceramic composites

Robotics

e.g., Surgical robots

Microtechnology (Miniaturization)

Enabling new clinical applications

Molecular diagnostics:

Novel biochemical technologies, e.g., CRISPR

Connectivity and the cloud

Device and data integration is leading to an explosion of remote monitoring technologies

Data & Analytics (incl. AI)

Key enabler which is deployed across product categories (e.g., for image recognition / computer vision)

Leading geographies

USA

22 large players[1] with a HQ in the USA – leading regions are Bay Area, Minnesota and Boston

Japan

6 large players[1] with a HQ in Japan– leading region is Tokyo

Key players

Foreign players

Johnson & Johnson, Boston Scientific, Philips, B. Braun, Abbott, Zimmer Biomet, GE Healthcare, Baxter, BD, Danaher, Siemens Healthineers, 3M, Cardinal Health, Olympus

Swiss players

Roche, Medtronic, Ypsomed, straumann, sonova, Distalmotion

1. Sales revenue over USD 2bn in 2020

Source: HRI 2006 – 2020 reports, In Vivo Outlook 2020, expert interviews, web research

«Future of Food»

2: Food & Nutrition

The Food & Nutrition ecosystems comprises product and process innovations along the food value chain, from farm to fork

Focus segments

Global investments in food technologies were EUR 22.3 bn in 2020 and have grown over 137% since 2017

Growth segments[1]

1. **Food Science**
   Development of new ingredients and food products through new processing technologies (e.g., meat alternatives, supplements)
2. **AgTech**
   Solutions to improve farming output and develop new farm products, next generation farms and urban farming
3. **Consumer Tech**
   Services and devices to help consumers with their nutrition selection
4. **Supply Chain & Retail**
   Solutions improving the food supply chain

Disrupting technologies

Alternative Protein

Development of animal protein substitutes based on plant-based protein, precision fermentation and cell-based meat

Genetic Engineering & Microbiomes

The use of genetic engineering of crop traits and food animal traits, microbiome diagnostics and probiotics and microbial seed and soil treatments could potentially have an annual impact of USD 730 bn globally

Personalized Nutrition

Advances in nutrigenomics enable the development of nutrition forms tailored to each individual's genetic profile

Leading geographies

USA

7 HQs of biggest food corporations, FoodTech Hubs in Bay Area, New York, St. Louis & Boston

China

Second highest nation in terms of FoodTech unicorns and investments in local FoodTech start-ups, hubs in Bejing and Shanghai

Israel

Nearly 40% of FoodTech start-ups around the world are in Israel. FoodTech Innovation center in Kiryat Shmona, various start-ups in Tel Aviv

Europe

Strong hub in London and Food Valley in Wageningen

Key players

Foreign players

Incumbents

Cargill, JBS, Mondelēz International, BASF, AgroFresh, Bunge, DSM, Corteva

Unicorns

Farmers Business Network, Oatly!, Nxin, Nayuki, Beyond Meat, Indigo, Impossible

Swiss players

Incumbents

Givaudan, Syngenta, Nestlé Good food, Good life, Bühler, Firmenich

Other players

planted., SwissDeCode, AgroSustain, yamo

1. Based on VC investments and expert interviews

Source: Digital Food Lab, McKinsey Global Institute report "The Bio Revolution", Food Engineering Mag, expert interviews, web search

«Future of Finance»

3: Wealth and Protection

Innovation and technologies with the potential to shape the current financial industry

Focus segments

Switzerland has a very strong footprint in financial service (in particular in wealth & asset management) – The following segments will be essential in the future and can help to achieve further growth:

Growth segments

Sustainable investing and financing

Sustainable investing with high growth (~22% CAGR) – opportunity to establish an environment with deep expertise in sustainability (e.g., data management and instruments)

Financial Software

Core banking software (~8% CAGR[1]), Asset management software, and Data & Analytics software

Digital Assets

Including Non-fungible-tokens and digital currencies

Disrupting technologies

Data & Analytics (incl. AI)

Enabling many automated solutions, e.g., robo advisory, KYC processes

Distributed ledger technology (e.g., Blockchain)

Enabling simultaneous access, validation, and record updating (faster KYC processes, tokenization of assets, etc.)

Data security

Data management technologies to protect financial information e.g., secure cloud computing, encryption solutions

Further technologies

Quantum Computing (e.g., for an increased accuracy of market simulations)

Leading geographies

North America (New York)

Europe (Switzerland, London, Frankfurt, BeNeLux)

Asia (Singapore, Hong Kong, Shanghai, Beijing, Shenzhen, Tokyo)

Key players

Foreign players

Banks and Asset managers

Merrill Lynch, Franklin Templeton, BlackRock, Goldman Sachs, Amundi, Fidelity, generation, Nordea

Software

infor, Oracle FLEXCUBE, Finxact, Finastra, Thought Machine, fiserv., MAMBU, DNA, kraken

Swiss players

Banks and Asset manager

UBS, Credit Suisse, Vontobel, Julius Bär, Lombard Odier, J. Safra Sarasin, Pictet 1805

Software

Temenos, avaloq, finnova, SEBA

1. Excluding US

Source: Morningstar Direct, IDC, expert interviews, web research

«Industry 4.0»

4: Industrial automation

Industrial automation focuses on the creation and application of technology, such as robots and information technologies, to automize and control manufacturing processes

Focus segments

Industrial automation market is expected to grow at a CAGR of 9.2% until 2028

Growth segments

Value chain perspective:

1. **Machinery, robotics & control equipment**
2. **Tooling, components & sensors**
3. **Connectivity Platforms & Software**

Industry perspective:

Overall robotics market expected to grow by 13% p.a.

Service Robots (OEMs)

Warehousing & Logistics (CAGR 41% until 2023)

Medical (CAGR 24% until 2023)

Agriculture (CAGR 11% until 2023)

Disrupting technologies

Robotics
Advances in collaborative, mobile and autonomous robots are going to drive growth in these fields and enable fleet autonomy

IoT Platforms
Enables advanced use cases for robotics in the automation context, facilitate fleet management and increase data collection

Data & Analytics (incl. AI)
Enables autonomous learning and decision making

Microtechnology
Developing technologies in the nano scale is key for precision manufacturing and miniaturization

Vision & Sensing
Vision systems and sensors allow for better image interpretation and coordination of robots

Material Science & Engineering
Materials innovation enables development of soft robots, which are more adaptable and robust

Leading geographies

Japan

World's largest players in industrial automation, hubs in Tokyo and Osaka

Germany

Bavaria as hub for industrial automation companies

USA

Focus in Boston area, Bay Area and North Carolina

Denmark

Many companies located in Odense hub

China

Shenzhen as key region

Key players

Foreign players

Incumbents

FANUC, TERADYNE, KUKA, SIEMENS, OMRON, SCHUNK, UNIVERSAL ROBOTS, BALYO

Unicorns

Geek+, Horizon Robotics, LOCUS

Swiss players

Incumbents

ABB, STÄUBLI, swisslog (Member of the KUKA Group), Endress+Hauser

Other players

sevensense, AMWbotics, HUMARD, edacta International

Source: Fortune Business Insights, IHS Industrial Automation Equipment, Interact Analysis, ARC, IFR World Robotics 2013-20, expert interviews, web research

«Digital Tech»

5: Digital content

Rising tech companies focusing on the future of digital entertainment

R&D activities in Switzerland

Focus segments

Switzerland has a strong R&D footprint for underlying technologies which will be important across following segments

Growth segments

1. **Social Networking Platforms**
   (10% CAGR until 2025[1])
2. **Video Games**
   (12.9% CAGR until 2025)
3. **Search Engines**
   (8% CAGR until 2025[1])
4. **Streaming Platforms**
   Music streaming (7% CAGR until 2025) and Video streaming (9% CAGR until 2025)

Disrupting technologies

Data & Analytics (incl. AI)
Advancements in AI e.g., natural language processing and image analysis will drive growth across all segments

Metaverse
Collective virtual open space, through convergence of virtually enhanced physical & digital reality

Virtual & Augmented Reality
Creation of digital environment through VR/AR software & hardware to visualize experiences

Data Compression
Enables reductions in storage hardware, data transmission time, and communication bandwidth

Emerging Technologies

Blockchain
Potential for new social networks based on blockchain technology

Leading geographies

USA

Strong tech hubs in greater Bay Area, Seattle and Austin areas

China

Digital technology hubs in Shenzhen, Beijing, Shanghai, Hangzhou

Japan

Strong tech hubs in Tokyo

Israel

Strong tech hub in Israel

Europe

Strong tech hubs in Berlin, Dublin, London and Benelux

Key players

Foreign players
Incumbents

Unicorns

1. Based on advertising revenue

Source: Industry reports, Magna, expert interview, team analysis

Technology focus

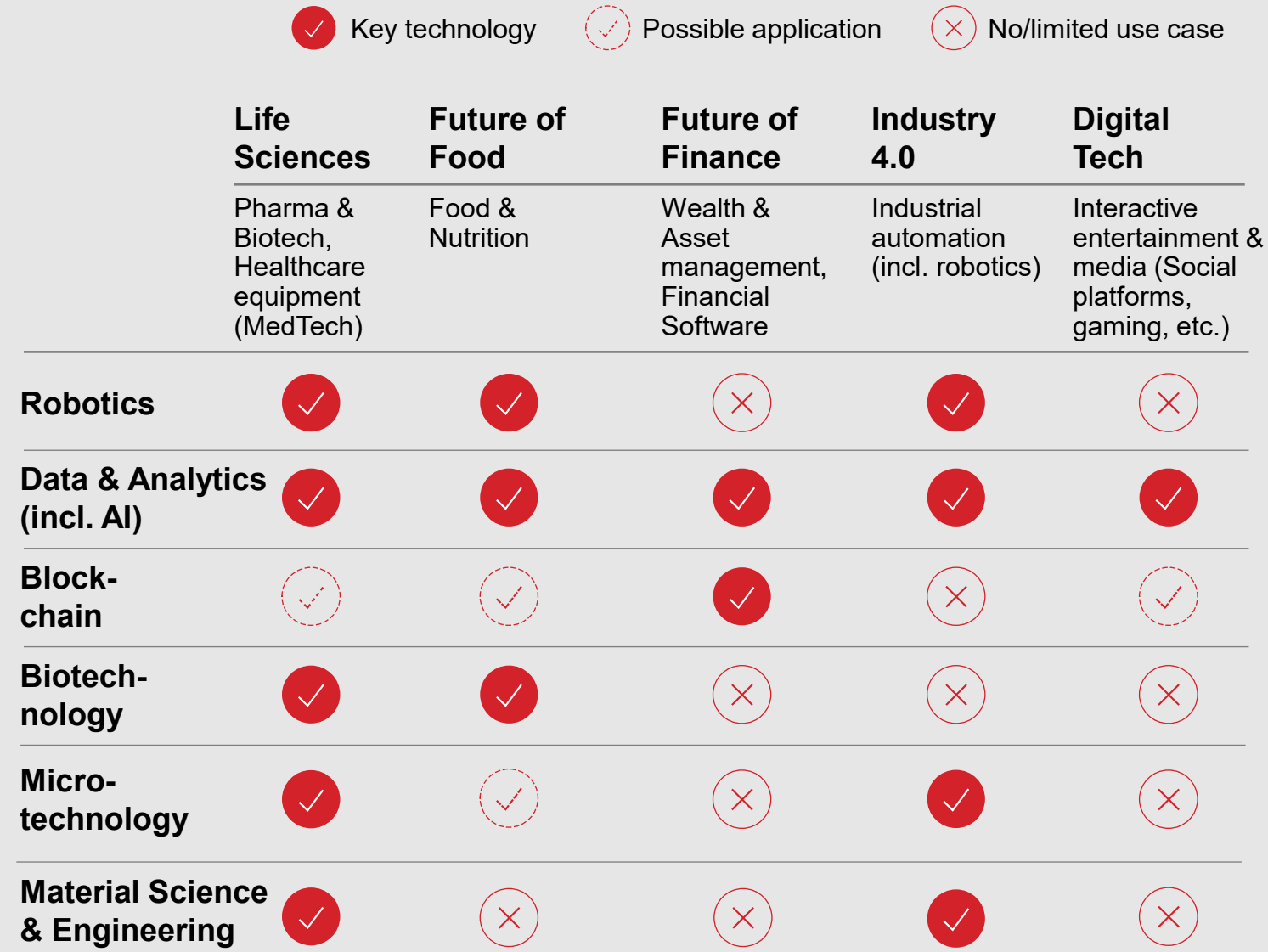
6 technologies and capabilities are cross-cutting between ecosystems and should be in Switzerland's focus

	Robotics	Data & Analytics (incl. AI)	Blockchain	Biotechnology	Microtechnology	Material science & Engineering
Description	Engineering and operation of machines that can autonomously or semi-autonomously perform physical tasks and assist humans	Conversion of information into a digital format. Management and analysis of this data to improve decision-making, business processes and outcomes and discover new opportunities and risks	Shared, public ledger of records or transactions that is open to inspection by every participant but not subject to any form of central control	A wave of innovations is being enabled by advances in biological sciences accelerated by developments in computing, data analytics, AI, etc.	Combination of connecting electronics, IT, and mechanics on a minute scale	Development of new materials and their applications. Innovations in nanomaterials, biomaterials, and energy materials as well as computational material science
Application Fields (not exhaustive)	**Industrial automation**: industrial and service robots which are applied in several industries **MedTech:** robotic process automation (RPA), surgical robots **Food & Nutrition:** food packaging, autonomous tractors, weeding robots and harvesting robots, food delivery drones	**BioPharma**: real time predictive analytics **Wealth & Asset Management:** precision targeting, debiasing investment decisions **MedTech**: across product categories, from imaging to genomics to cardiology **Energy:** intelligent energy storage and management systems	**Wealth & Asset Management**: real-time settlement models, exchange of money and value, KYC processes, automated investing, etc. **Public Service:** self-sovereign digital identity, to electronic health records **Food & Nutrition:** food traceability and safety	**BioPharma**: cell and gene therapy **Food & Nutrition:** Alternative proteins (e.g., cultured meat grown in a lab)	**MedTech**: several applications (microscopes, micro instruments in surgery, etc.) **Industrial automation:** microsensors, laser micromachining, etc.	**MedTech**: prosthetics and scaffolds, nanomaterials for drug delivery systems, prosthetic limbs out of polymers, metal alloys and ceramic composites **Industrial automation:** development of new materials to increase robustness of robots

Source: Web research, Market reports

Technology focus

6 technologies and capabilities are cross-cutting between ecosystems and should be in Switzerland's focus

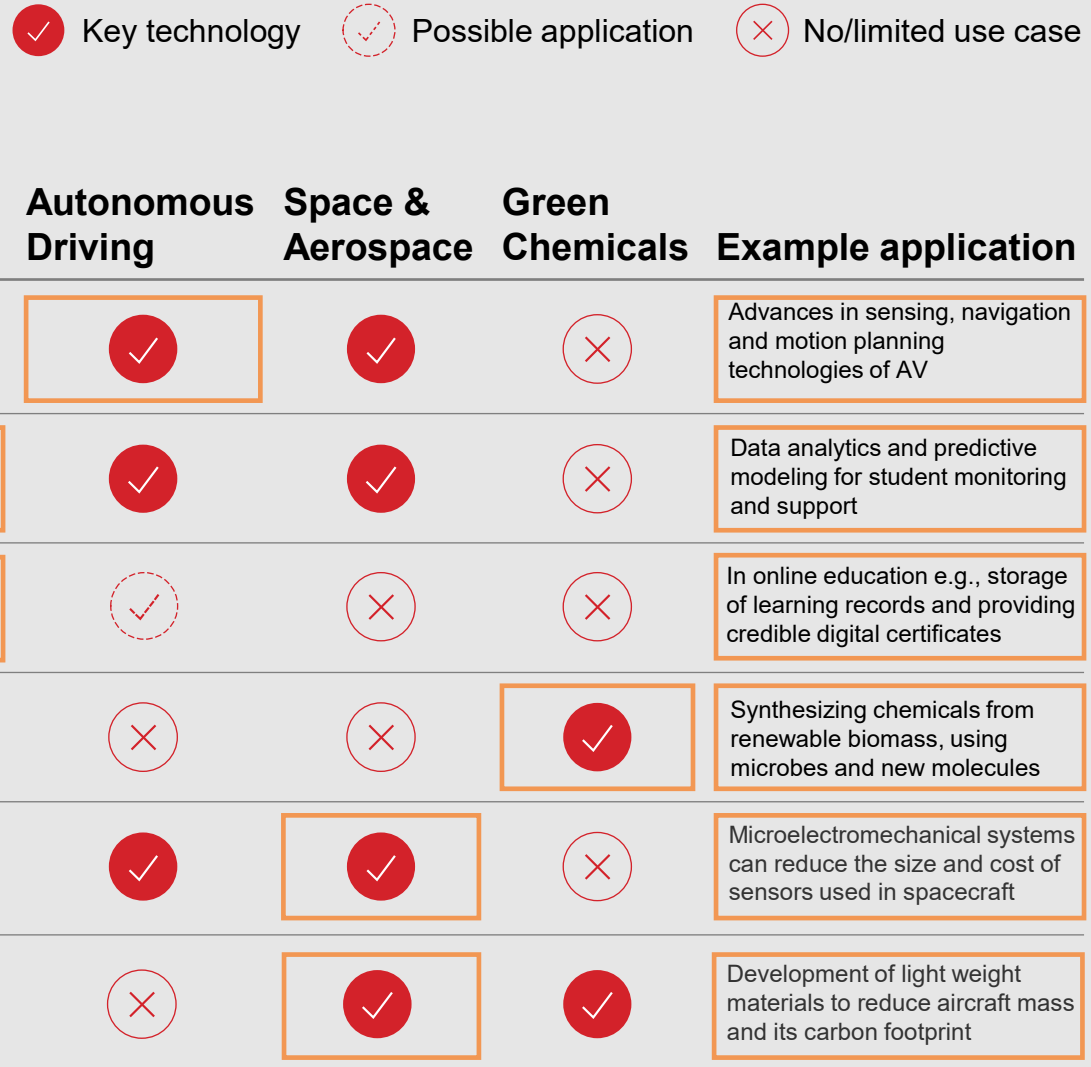


Source: Web research, expert interviews

ILLUSTRATIVE

Technology focus

Focus on the cross-cutting technologies can lead to positive spill-over effects into other non-prioritized ecosystems / sub-industries



Source: Web research, expert interviews

Content

5 ecosystems for investment promotion (Where to play)

Approach for investment promotion Switzerland (How to win)

Change in Value Chain – R&D and Innovation

Global R&D and innovation activities of multinational companies are changing significantly from closed to open innovation – significant opportunity for Switzerland

From the past…

Isolated and inhouse R&D functions: research is often not close enough to customers to understand their needs and little internal collaboration with other departments

Strong geographical home base: many companies spend most of their R&D budget in their home country

…to today and the future

Open / external innovation & co-creation: involving outside resources in innovation process 1

- Collaboration with universities
- Strategic innovation and R&D partnerships with other players or suppliers in ecosystems e.g., in form of joint innovation hubs
- Incorporating customers through co-creation
- Buying access to innovation through M&A of companies/start-ups

Building in-house accelerators: building up innovative start-ups and ideas in an entrepreneurial environment by giving them mentorship and resources

Increased outsourcing: complete outsourcing of R&D to other partners

Global innovation unit footprint: building research centers outside of home country to increase proximity to manufacturing sites, customers, and to access talent & expertise 2

Opportunity for Switzerland: International companies increasingly rely on globalized R&D strategies involving open innovation and geographically distributed activities in order to find the next “big wins” – great opportunity for Switzerland to position as leading R&D platform with outstanding talent

Source: Market research, expert interviews

Process to identify new corporate location

International companies commonly select or adjust their location footprint based on two steps

Creating a consideration set

First step: creating an initial set of options for further consideration which is based on a high-level (qualitative) assessment – **often locations that are top of mind** of the executives in their respective industry

Being top of mind of executives is highly important – Switzerland needs to become part of the consideration set within the prioritized ecosystems

In-depth analysis based on attractiveness factors

Second step: in-depth analysis of option in consideration set based on attractiveness factors which are often **assessed quantitatively** and with the support of **experts** (externally and internally)

Switzerland must continuously seek exchange with the executives from international companies to evaluate which factors are important along the ecosystems

Needs of multinational companies – focus R&D / Innovation

The significance of the locational attractiveness factors depends on the ecosystem

Low importance | Somewhat important | Important | Very important | Game changer

	Life Sciences[2]	Future of Food	Future of Finance	Industry 4.0[2]	Digital Tech
	Pharma & Bio-tech, MedTech, CDMO, Digital Health	Food science, AgTech, Consumer Tech, etc.	Sustainable investing, financial SW, digital assets	Machinery, robotics & control equipm., tooling & sensors, etc.	Social platforms, gaming, search engines, streaming platforms
Talent availability	Game changer	Game changer	Game changer	Game changer	Game changer
Quality of life	Very important	Very imporant	Very important	Very important	Very important
Promoting laws & regulation	Important	Very important	Game changer	Low importance	Very important
Access to capital (incl. venture capital)	Game changer	Important[1]	Somewhat important[1]	Important[1]	Somewhat important[1]
Collaboration with leading universities	Important	Very important	Somewhat important	Very important	Important
Presence of industry leaders and existing ecosystem	Very important	Important	Important	Somewhat important	Somewhat important
Tax environment	Important	Somewhat important	Very important	Somewhat important	Somewhat important
Access to market	Somewhat important	Low importance	Important	Somewhat important	Low importance
Infrastructure	Hygiene factor	Hygiene factor	Hygiene factor	Hygiene factor	Hygiene factor

1. Only important for start-ups
2. Differences for a production facility: Subsidies (tax incentives), infrastructure (strong supply chain) and access to market / customers are more important while collaboration with leading universities loses relevance

Source: Expert interviews

Global perception of Switzerland - strengths

Summary of major strengths based on expert interviews

Quality of life	**Quality of life in Switzerland is viewed very positively** by executives and older talent with family which is a very important attractiveness factor (e.g. quality of life is increasing attractiveness of Austin as a leading US Digital Tech ecosystem)
Tax environment	**Favorable tax environment in international comparison** with an average of 15% across cantons – however high uncertainty how the global minimum tax rate will affect Switzerland and its attractiveness
Promoting laws & regulation	**Regulatory reliability is perceived as one of Switzerland's strengths** (e.g. very strong IP protection), however it appears to be eroding given uncertainties about international agreements (e.g. relationship with the EU)
Presence of industry leaders and existing ecosystem	**Switzerland has a strong presence in all prioritized ecosystems which vary in degree** – however awareness global awareness differs significantly (very high awareness in Life Sciences and wealth & asset management vs. low awareness in Digital Tech and Future of Food)
Collaboration with universities	**Switzerland is home to leading universities –** ETH and EPFL are ranked within the global top universities and are known to collaborate closely with companies (e.g. "RobotX" - partnership between ABB and ETH in robotics)

Switzerland needs to improve its global perception by highlighting Swiss strengths

Global perception of Switzerland – development areas

Summary of major development areas based on expert interviews

Talent availability

Inbound mobility of critical Non-EU talent is very complex lowering total talent availability and increasing bureaucratic burden for companies to setup projects with an international footprint

Absolute number of STEM graduates is low (graduates per annum: ~21,000 from CH vs. ~ 200,000 from UK[2]) and cost of talent is high compared to other European markets – STEM talent pool is very critical given high demand in all prioritized ecosystems

Transparency of critical data (esp. on talent availability) is key in location selection process since international companies rely on international databases and easily accessible information – bad data transparency can lead to exclusion of Switzerland in further consideration)

Access to capital

Start-ups have higher funding challenges due to limited venture capital compared to other locations (e.g. Silicon Valley, Boston, Tel Aviv) – start-ups in the US have much more later stage funding and exit options (IPO, direct listing, SPACs, etc.) combined with a better ratio of later stage to seed & early stage investments[1]

Market access

Less important

Access to other markets within Europe is often complex due to the necessity to deal with multiple regulations (EU and Switzerland)

Switzerland needs to define targeted actions to close gaps in development areas

1. Ratio from later stage to seed & early stage investments higher in the US according to Pitchbook data from 2021 (USD 105 bn seed & early stage vs. USD 237 bn later stage in the USA; USD 2 bn seed & early stage USD 2 bn later stage in Switzerland)
2. Source: Eurostat - Figures used by "Wake up Switzerland" report

Global perception of Switzerland

Talent availability and access to capital need to be improved while strong performances in quality of life, tax environment, promoting laws & regulations, and collaborations with universities need to be promoted

Development areas | Communication areas | Importance for ecosystems ○○○ | Swiss Performance ●●○

	Swiss performance	Rationale
Talent availability	●●●●○	• Leading universities are present and develop highly skilled global talent, but absolute number of STEM graduates compared to other European markets is low • Switzerland is perceived to be very attractive for external talent because of its high quality of life, income level and diversity of career paths available • Inbound mobility of critical Non-EU talent is very complex, reducing talent availability • High childcare costs prevent female talent from pursuing own career options
Quality of life	●●●●	• Switzerland ranks among the best places to live in the world (e.g. Numbeo ranks Switzerland as #1 and usnews ranks Switzerland as #5 globally)
Tax environment	●●○	• Favorable tax environment in international comparison with an average of 15% across cantons – increasing uncertainty how the global minimum tax rate will affect Switzerland and its attractiveness • Patent box offers companies subject to Swiss taxes an attractive option to receive privileged tax treatments on income from Swiss or foreign patents when conducting R&D activities in Switzerland
Promoting laws & regulation	●●●○	• Regulatory reliability is perceived as one of Switzerland's strengths, however it appears to be eroding given uncertainties about international agreements (e.g. relationship with the EU) • Strict immigration policies hinder international projects and reduce attractiveness
Access to capital (incl. venture capital)	●○○	• Switzerland is not perceived as a start-up hot spot despite leading universities • Start-ups have higher funding challenges compared to other locations (e.g. Silicon Valley, Boston, Tel Aviv) due to limited venture capital – especially later stage investments are critical
Presence of industry leaders and existing ecosystem	●●○	• Switzerland is known to be the home base of an extraordinary number of multinational companies • Ecosystem between academia and business is strong but presence of venture capital and integration of young companies into ecosystem often limited
Collaboration with universities	●●●	• Switzerland perceived as great place for multinational companies to collaborate with leading universities – in particular ETH and EPFL are well-known for many partnerships and outstanding research
Infrastructure	Hygiene factor	• Very well-developed infrastructure in Switzerland – e.g. Switzerland is with its central European position well connected to strategic locations making it easy for international companies to sustain close ties
Access to market	●○	• Switzerland is a rather small market due to its geographical size and its number of inhabitants • Access to other markets within Europe is good but there is often an increased complexity due to the necessity to deal with multiple regulations (EU and Switzerland)
Awareness of Switzerland	**Medium**	• Switzerland is very prominent for Life Sciences, Wealth & Asset management, and partially Industry 4.0 – however, it has significant awareness opportunities for Digital Tech and Future of Food

Source: Web research, Expert interviews

The key regions for the prioritized ecosystems span across Europe, the US and Asia

Top 3 regions by ecosystem

Definition: Key regions are characterized by a high density of foreign innovation companies (multinationals, SME's and fast growing start-ups) with a potential to establish their headquarters, R&D center or high-tech production in Europe/CH

Life Sciences	Future of Food	Digital Tech	Industry 4.0	Future of Finance
				
Dublin	BeNeLux	Dublin	Bavaria	London
London	London	Berlin	Odense	Frankfurt
Benelux		London		BeNeLux
Paris		BeNeLux		
Hamburg				
Medicon Valley				
Berlin				
				
Boston	Bay Area[1]	Bay Area	Boston	New York
Bay Area	St. Louis	Austin	North Carolina	
North Carolina	New York	Seattle	Bay Area	
Minnesota	Boston			
Seattle				
				
Tokyo	Israel	China (Shenzhen, Beijing, Shanghai & Hangzhou)	Tokyo	Hong Kong
Israel	China (Beijing & Shanghai)	Israel	Seoul	Singapore
China (Shenzhen, Shanghai)		Tokyo	Shenzhen	Shanghai
Singapore	Singapore		Osaka	Beijing
Seoul				Shenzhen
Mumbai				Tokyo

1. Including Davis

Source: Expert interviews, desk & press research