Disruptive Technologies and their Impact on Switzerland

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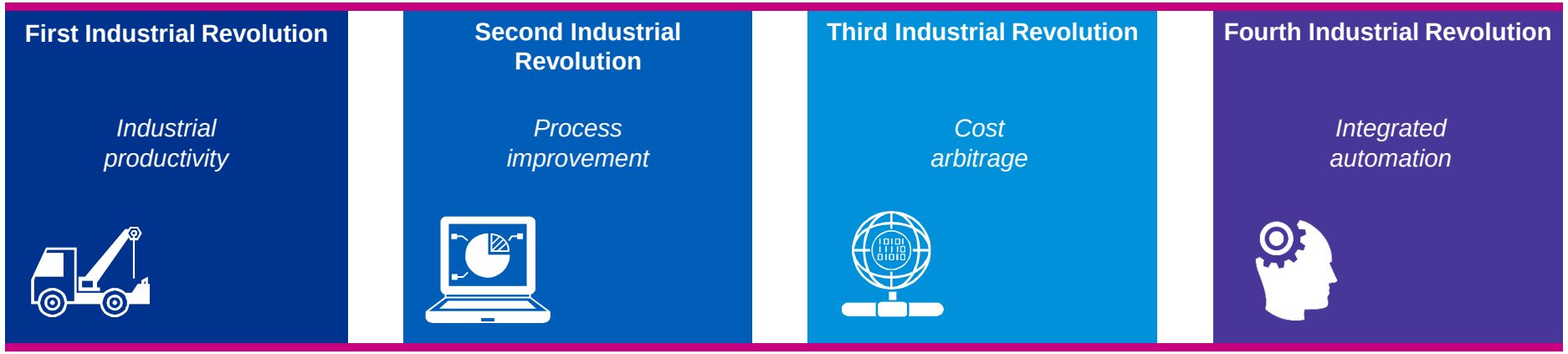
The fourth industrial revolution



Introduction of mechanical production

Using water and steam power

First mechanical loom in 1784

Division of labor and mass production

Using electrical energy

First assembly line Cincinnati slaughter houses, 1870

Systems introduced to further automate

IT- and Advanced electrical systems

First programmable logic controller, 1969

Shifting boundaries of virtual and physical worlds

Connected, self-interacting and self-adjusting systems

Happening today

Five Major Disruptive Forces

Race For The Customer 	• Changing consumer demographics, behaviors and expectations driving businesses to become more customer centric and enhance their customer experience. • *Impact:* Increasing need for businesses to elevate and differentiate their customer service and experience from competitors leveraging “Design Thinking” and evolved omni-channel methods
Digital Labor 	• Disintermediation of knowledge and expertise based professions through disruptive technologies such as cognitive systems, artificial intelligence and robotic process automation • *Impact:* New leverage models in knowledge work functions and industries
Internet of Things 	• Networks of sensors in machines and other physical objects that monitor, collect and exchange data leveraging cloud computing • *Impact:* Monitoring & securing, management and autonomous operation of “smart” devices
Platform Business Models 	• The adoption of a digitally-based business model facilitating exchanges between two or more interdependent parties by reducing transaction costs and/or enabling externalized innovation. • *Impact:* Rapid shift in business model, operations, and the redistribution, sharing and reuse of excess capacity in goods and services driven by three transformative technologies: cloud, social and mobile
Mobile Economy 	• Combination of increasingly performant and low-cost mobile computing devices, high-speed wireless connectivity and apps • *Impact:* Opportunity to uniquely rethink how consumers interact and how companies provide services and do business with them

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Insights Switzerland

Key strengths of Switzerland as a business hub

DEMOCRACY AND PEACE

- The Swiss direct democracy and its governmental system are generally regarded as being among the most stable ones in the world.
- Switzerland has not had an internal civil conflict since the Sonderbund war of 1847.
- The Swiss society has a comparatively small income imbalance.

NEUTRALITY, STABILITY AND PRIVACY

- The neutrality principle has been guiding Swiss foreign policy for centuries and provided stability.
- Switzerland has consistently remained outside international conflicts and wars for generations.
- Switzerland has a long tradition of protecting personal data. The right to personal privacy is established as part of article 13 of the Swiss Federal Constitution.

MODERN AND CONVENIENT

- Switzerland provides all the benefits of a modern society including a well maintained physical and technological infrastructure in the heart of Western Europe.
- The international airports of Switzerland provide high frequency direct flights to most relevant places globally.
- Zurich and Geneva have continuously been rated among the top ten cities in the world in terms of quality of life.

COSMOPOLITAN AND BUSINESS FRIENDLY

- Home to the European and global headquarters of hundreds of multinational companies, Switzerland provides a largely English-speaking environment and ex-pat communities in the bigger cities.
- Switzerland is renowned for its robust economy, stable legal and regulatory environment and widely respected judicial system along with competitive taxation.
- Employers find a qualified workforce and a productive work ethic, supported by flexible labor laws.

ACADEMIA AND INNOVATION

- Multiple Swiss universities and business schools are rated among the best in European and global rankings, above all ETH, EPFL and IMD, providing a supply of highly educated academic talent and knowledge transfer to the private sector.
- Switzerland ranks among the world leading countries in terms of filed patents per capita, suggesting a high level of innovation and entrepreneurial spirit.

ENVIRONMENTALLY PROTECTED

- Comparatively low environmental risks of natural disasters due to the geographic location landlocked from any ocean or major body of water, low probability of major flooding and hurricanes, and below average risk of strong earthquakes.

Key weaknesses of Switzerland as a business hub

GROWING LABOR COSTS AND STAGNANT PRODUCTIVITY

- Labor costs as one of the main challenges of doing business in Switzerland.
- Cost of mid-level positions has in recent years grown at a faster rate than labor productivity.
- Uncertainty surrounding the development of the Swiss franc exchange rate exacerbates this concern.

LABOR REGULATIONS

- Increasing labor regulations will pose a challenge to attracting foreign individuals and multinational corporations to doing business in Switzerland in the future.
- Restrictions on employees moving from outside the EU are a particular issue in regards to the most senior and most specialized individuals as these types of employees have attractive options to work in other countries as well.

COMPETITIVE TAXATION

- Taxation rules of certain cantons (particularly Zurich) pose significant challenges for start-up companies as their founders end up paying significant amounts of taxes on their shares before they have built a profitable business.
- The OECD tax regulation on base erosion and profit shifting (BEPS) will significantly impact Switzerland's attractiveness as a business location for a considerable number of multinational corporations.
- Further challenges are arising from uncertainty on the implementation of Corporate Tax Reform III.

ZERO FAILURE CULTURE

- The Swiss society has a cultural disfavor of entrepreneurs whose businesses fail, which fosters risk-averse behavior and limits the attractiveness of starting new ventures.

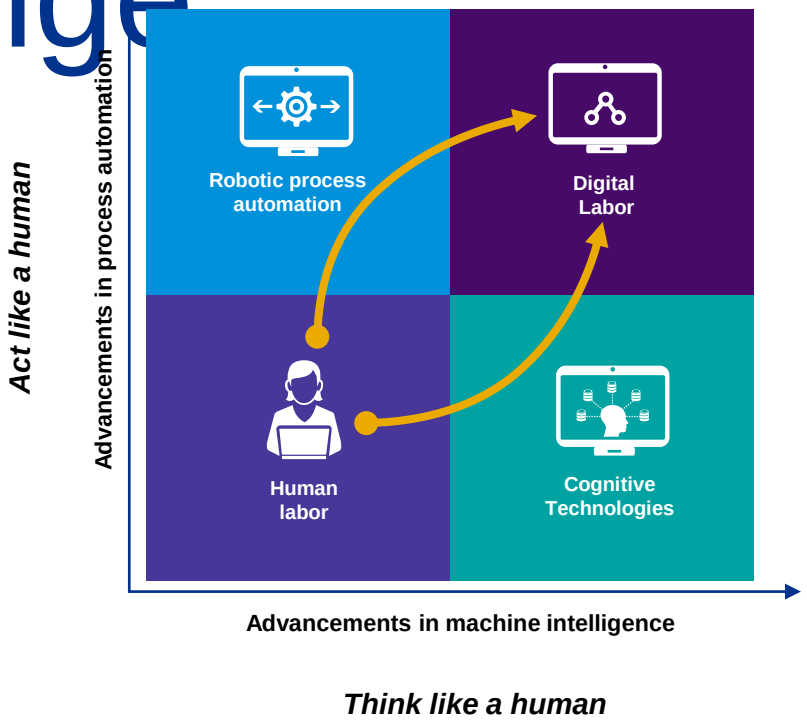
2* business opportunities for Switzerland

*** You find 5 additional business opportuntities in KPMG's publication «Shaping Switzerland's digital future»**

Opportunity #1 Digital Labor Hub

Switzerland provides the reliable and trustworthy «workforce» for the global digital economy

Digital Labor is a continuum of technologies that allows you to achieve improvement and change



700%
ROI
in robotic projects for specific tasks

12.5 billion
Generated revenue on the Digital Labor marketplace

30%
increase of productivity
Combining robots and humans

120 million
knowledge workers will be replaced by robots

The spectrum of Digital Labor can be divided into three classes

One or a combination of these three classes can, together with human capital, drive organizational transformation and meet changed or new business goals

BASIC PROCESS AUTOMATION (RULES)

- Macro-based applets
- Screen level and OCR data collection
- Workflow automation
- Process mapping
- Self executing

Potential applications: Trade entry, Service Desk Ticket registration, Reconciliations, Report generation, Copy-Paste actions

ENHANCED PROCESS AUTOMATION (LEARNING)

- Built-in knowledge repository
- Learning capabilities
- Ability to work with unstructured data
- Pattern recognition
- Reading source data manually
- Natural language processing

Potential applications: Exception handling (i.e., trade failures, escalated service requests, basic call center resolution)

COGNITIVE AUTOMATION (REASONING)

- Artificial intelligence
- Natural language recognition and processing
- Self-learning (sometimes self optimizing)
- Processing of super data sets
- Predictive analytics/hypothesis generation
- Evidence-based learning

Potential applications: Break reporting and analysis, advanced call center work, request evaluation and acceptance

Digital Labor
Better, Cheaper, Faster, Broader = death of legacy BPO

Wave 1: Labor arbitrage	Wave 2: Labor automation
15 – 30 percent Cost take out	**40 – 75 percent** Cost take out for relevant functions
Model is scalable to the extent that you can scale labor	Model is scalable, and is **largely independent of labor growth**
Custom/complex, **legacy**: “Your Mess for Less”	**Transformative** – new way of doing business
Access to **low cost labor** necessary to provide continuous value	Access to “**rocket scientists**” who can codify manual processes
Revenue/profit correlated to people	Revenue/profit **not** correlated to people

Source: The Outsourcing Institute, Three Secrets Your Traditional Service Providers Are Not Telling You, June 2014
KPMG analysis

Opportunity #1 - Digital labor hub

What are the drivers of this business opportunity?

- The advent of a digital labor “workforce” based on advances in robotics, data analytics (Big Data) and cognitive systems
- Interconnectivity and interaction with the physical world enabled by the Internet of Things
- The ability to leverage platform business models and related economy of scale

Which strengths should Switzerland build upon?

- World-class innovation capability
- Highly specialized AI workforce already resident in the country working for world-leading “early movers”
- Reliable, high-performing technology infrastructure (in particular connectivity and power)
- Trusted public and private institutions
- Political stability
- High level of data protection

What weaknesses should Switzerland overcome?

- Risk aversion and lack of thinking big
- Global access to top talent
- Preparedness for major cyber attacks on Swiss critical infrastructure

Opportunity #2 Resilient Industrial Controls

Switzerland's strong industrial competence and its ability to innovate provide the basis to build and operate Industrial Control Systems of Industry 4.0

Opportunity #2 - Resilient Industrial Control

What are the drivers of this business opportunity?

- The Industrial Internet of Things and Industrial Control systems are key technologies to enable and drive Industry 4.0
- Digital labor, robotic-process automation and cognitive systems will take ICS to the next maturity level
- Security by design will be a key differentiator for maintaining trus in an ever increasing complexity of connected system

Which strengths should Switzerland build upon?

- Critical infrastructures, which are of strategic importance to the respective countries are controlled by ICS. Switzerland's neutrality and stability enable the level of reliability and trust required to produce and operate mission critical ICS.
- An excellent technology infrastructure, which allows to operate critical systems in reliable manner.
- The ability to innovate and build industrial control systems.

What weaknesses should Switzerland overcome?

- Highly specialized engineering talent is required to build and operate industrial control systems. Switzerland's supply of this talent may not meet future demand.

Fields of action (1/2)

Education

- Align study and training curricula with emerging needs for skills in the digital world; particularly in applying emerging information technologies
- Support the improvement of digital education and readiness on all levels of the school system
- Expand the knowledge base and adoption of design thinking as well as agile and lean approaches

Infrastructure

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Enterpreneurial mindset

- Foster a climate of risk taking and thinking big – enable business plans to scale up globally
- Promote a failure-tolerant culture and change the perception of failed start-ups as a sign of incompetency
- Engage in the public discussion to promote digitalizaition opportunities for Switzerland

Fields of action (2/2)

Policy & regulatory environment

- Encourage and support the development of a pragmatic, effective and trustworthy regulatory environment, in particular with regards to emerging technologies and business models, free flow of date, date protection and cyber resilience
- Support a balanced political approach to work permits and restrictions on immigration so that Switzerland continues to attract and retain talent from around the world
- Support the change of current tax laws that hinder fast growing businesses' success in Switzerland
- Refrain from protecting disrupted businesses/industries but support a policy environment that supports individuals affected by disruption
- Foster a broad discussion of digitalization societal impact and ethics across Swiss society

Research & innovation

- Support and leverage research on digitalization societal impact and ethics
- Support funding and expansion of leading Swiss research bodies focused on data science, cognitive computing, artificial intelligence, robotics, engineering and cyber security
- Further build on strength to transfer research into commercial applications and foster collaboration among established businesses, start-ups and universities

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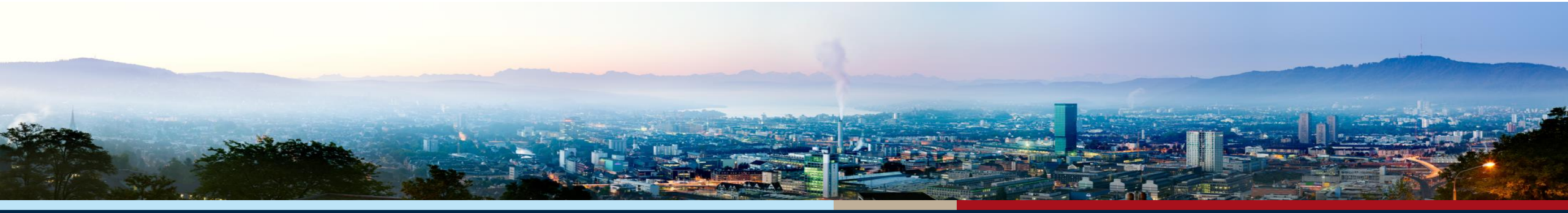


Disruptive Technologies – Legal and Regulatory Aspects

16 May 2017 – Investment Summit - Swiss Gobal Enterprise

NKF

Legal and Regulatory Framework in Switzerland

- Legal and regulatory Framework:
  - no laws or provisions relating specifically to disruptive technologies
  - statutory provisions in general formulated in a technology-neutral manner
  - some Circulars from some supervisory authorities: e.g. Swiss DPA, FINMA, etc. relating to topics such as digitalization and cloud
- But a lot in the pipeline:
  - Federal Council Strategy for a digital Switzerland
  - Smart Switzerland Initiative
  - Consultation on new Fintech Regulations

Data and Technologies

- (raw) data
- devices (sensors, gateways, …)
- software
- telecommunications
- encryption / security services
- data warehouse / analytics platform services (cloud)
- …

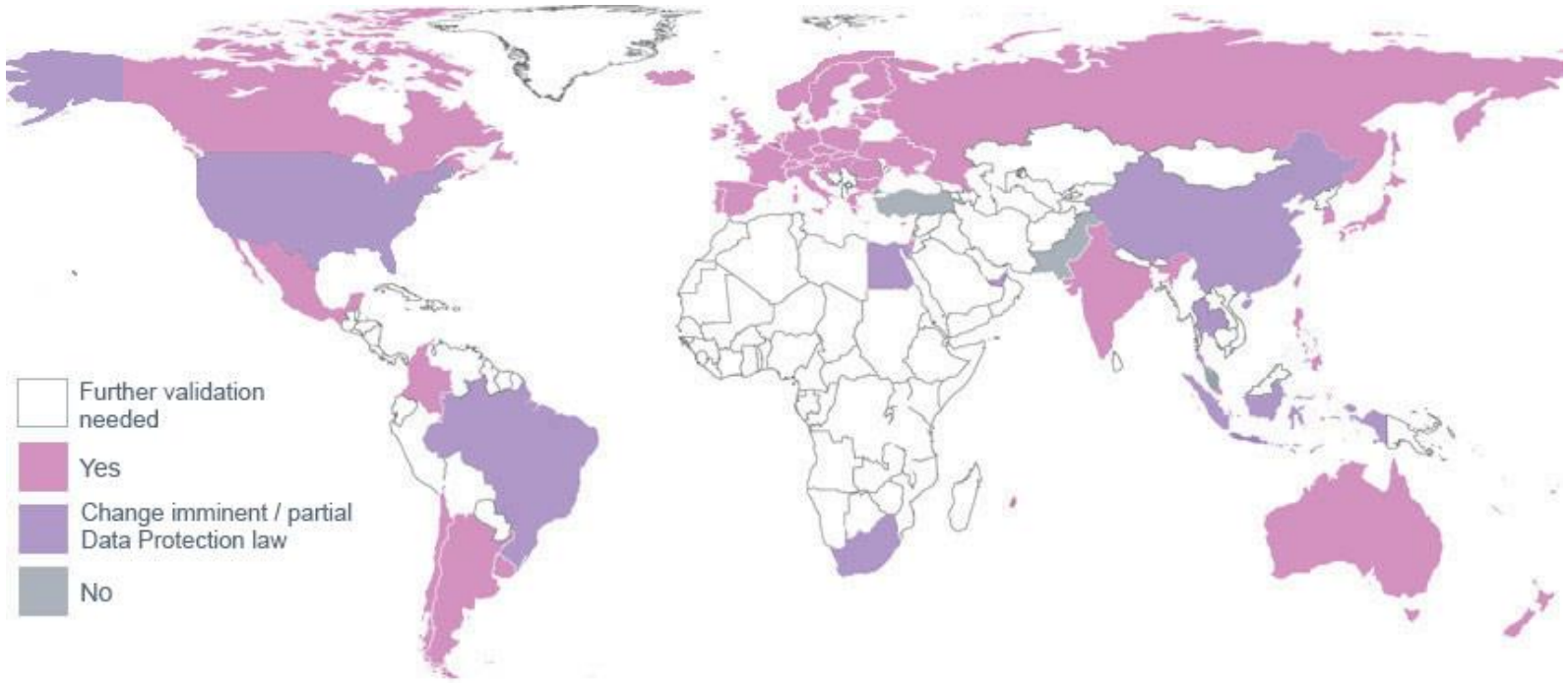
Common Legal and Regulatory Risks

- **data breach**
- **data privacy laws**
- data quality / errors
- **liability**
- device malfunctions / product liability
- IP / proprietary rights (data as an asset?)
- **regulatory hurdles**
- processing errors
- service quality
- software errors…

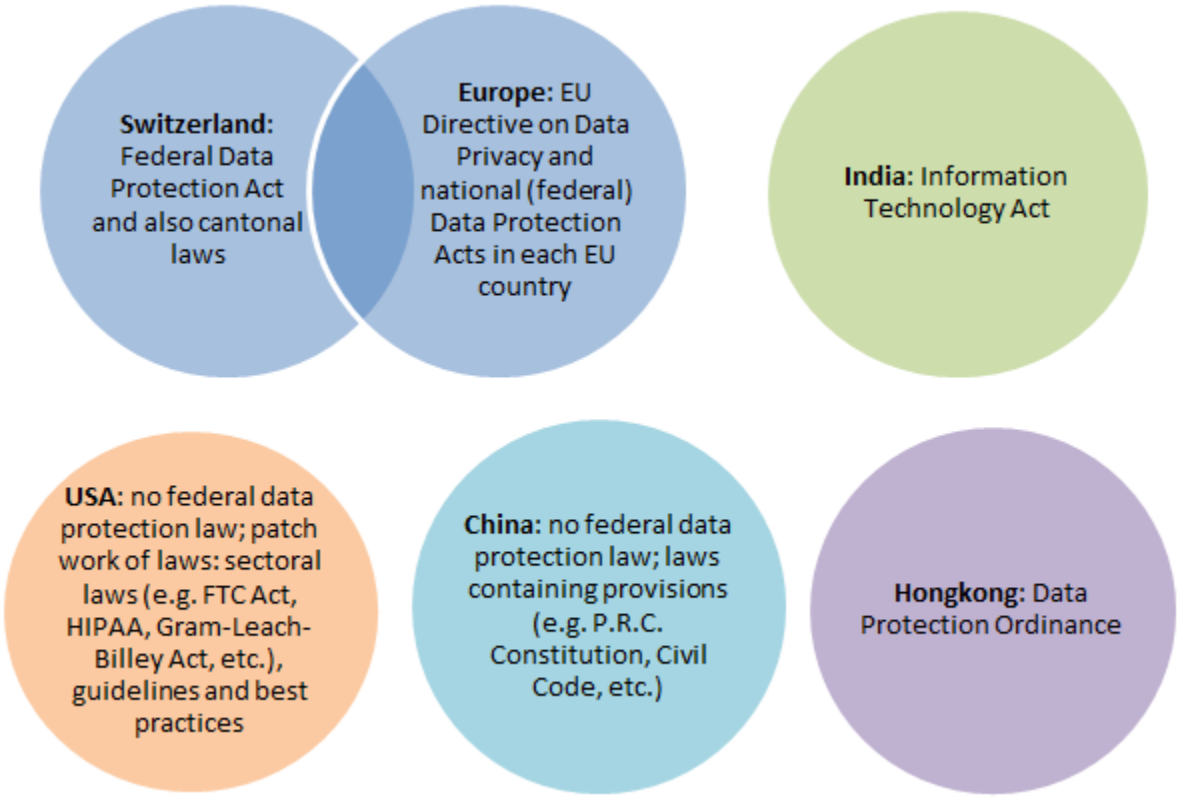
Data Protection I

- What is data?
  - any kind of information
  - created by human or machine
  - no statutory protection per se for only data
- What is personal data?
  - Personal data is any data relating to an identified or identifiable person
  - Protection of personality rights and not of the data itself
  - Accordingly anonymous data is not considered personal data
  - Federal Act on Data Protection dated 19 June 1992 (DPA)
- Questions:
  - personal data or just any kind of other data (e.g. machine data)?
  - how can data be protected?
  - strict requirements relating to personal data

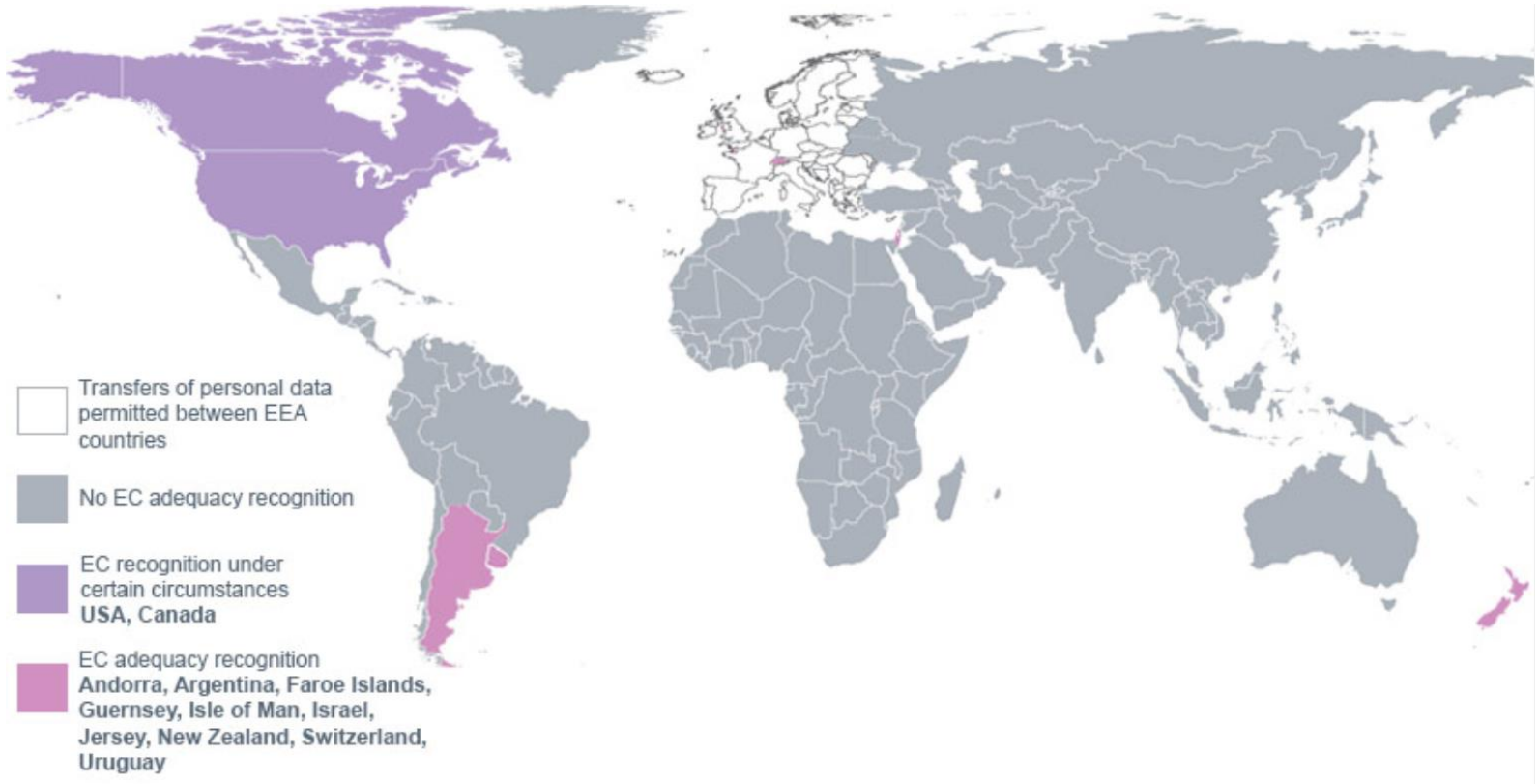
Which Countries have Data Protection Laws?



Different Data Protection Regimes Worldwide



Countries with Appropriate Data Protection Level



GDPR and Revision of Swiss Data Protection Act

- Stricter Rules and massively higher fines as from 25 May 2018:
  - Extraterritorial reach of the GDPR
  - Stronger enforcement powers
  - Transparency rules extended
  - New accountability obligations
  - Data protection by design and default
  - Stricter consent rules
  - Right of access, right to data portability, right on automated processing
  - Right to be forgotten
  - Data security measures
  - Massive fines: up to 20 million Euro or up to 4% of worldwide annual turnover
  - Swiss Data Protection Act in revision in order to achieve adequacy level of GDPR
  - In general importance of data protection compliance has massively increased

Data Security – Data Breaches

- DDos Attacks and the like
- Predicted market growth will accentuate the issue
- Financial liability for lack of security
- What is appropriate level of data security?
  - no specific act
  - state of the art / appropriateness of data security systems
  - ISO / IEC 27k family of standards
  - other useful guidelines
- Data Breaches
  - new and stricter rules under the GDPR and Swiss law
  - ongoing confidentiality, integrity, availability and resilience
  - ability to restore
  - process for regular testing
  - data breach notification (72 hours)
  - also under new Swiss Data Protection duty to inform
  - massive fines if no notification

Special Regulatory Questions

- Hurdles for regulated sectors
  - Finance (banks, insurances), Telecom, Pharma
  - Audit Right
  - Location of storage of data
- Banking Sector
  - Protection of Banking Secrecy
  - FINMA Circular 2008/7 «Outsourcing Banks»
  - FINMA Circular 2008/21 «Operational Risks – Banks»
- Telecom Sector
  - Ban for foreign providers to provide telco services in Switzerland

    > Duty to comply with employment legislation and related standards/customs

    > Duty to comply with lawful intercept and surveillance legislation

Liability I

- Issues:
  - delegation of task from operators to technology
  - humans as controllers and supervisors
  - machine intelligence and autonomy
  - challenge of complexity
  - how to maintain control, prevent and mitigate failures
- Who is responsible in case something goes wrong?
  - Providers (software, hardware, services)?
  - Users?
  - Organisations (companies, agencies)?
- Who is liable to compensate for damages to persons and goods?
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  - Providers (software, hardware, services)?
  - Organisations (companies, agencies)?

Liability II

- Legal framework:
  - Statutory provisions:
    - Product Safety Act and Product Liability Act
    - Code of Obligations – tort
  - Act on Technical Barriers on Trade
  - Standards and State of the Art
  - Criminal liability
  - Contractual liability:
    - Exclusion of liability?
    - Back-to-back liability provisions
    - Expand force majeure provisions: for hacking incidents etc.

Conclusions

- No specific law relating to disruptive technologies as such – but a lot of initiatives in the pipeline
- Swiss authorities are open minded
- Increase of investment in disruptive technologies by Swiss companies – e.g. Switzerland ranked no. 1 by EPO in filing for computer technology patents
- Data protection compliance – massively increased importantance
- Decisive to remain competitive – implementation of cyber security response plan
- Regulatory compliance – close cooperation with Swiss supervisory authorities
- Implementation of contracts dealing with back to back liability
- The future is bright for Disruptive Technologies in Switzerland!