SUMMARY

INTRODUCTION

Christian Marchand, Co-organisator, GlobalTech Summit Lausanne

"THINK GLOBAL(TECH) AND ACT LOCALLY"

In the last edition we were looking forward to seeing you at the 2nd edition of the GlobalTech Summit Lausanne. This will finally take place on April 7, 2020. By then the new technologies will continue to impact not only our professional lives but also *our private ones*. Therefore we will have an Arena entirely dedicated to the theme **"GlobalTech in daily life"**. With dedicated topics, as surprising as it may seem, like **artTech**, **SportTech** and **FoodTech.** We will also talk about possible addictions to these new technologies.

But first, a little flashback. Without going into a definition of the Blockchain or more generally of DLT (Distributed Ledger A foretaste in this supplement with a first popularization of artTech thanks to the article by Caroline Coquerel Kokocinski that I invite you to discover.

I recently participated to the launch of a SportTech platform that aims to bring supporters of a large European football club with their club and especially these star players. Where is the technology in this process? The platform in question is not just an application to download. It issues "utility token" based on a reward system. To do this it was necessary to fulfil all the criteria of the regulator.

Closer to home, University of Lausanne is hosting the ThinkSport platform, which aims to facilitate the emergence of new partnerships, knowledge sharing, creative thinking and *innovative* projects, thereby promoting progress in sport.

Who does not eat several times a day? this is another favourite terrain for what is now called FoodTech. Whether for food traceability (solutions on the Blockchain already exist), the composition of new foods, packaging, food waste, user behaviours, the FoodTech is looming. Just Fashion or real Trend? Surely a trend, as proof a swiss private bank creates a FoodTech Investment Fund and one of

After a banking education quickly supplemented by an IT training, **Christian Marchand** has evolved for over 30 years with "one leg" in the bank, and the other one in IT Banking Industry at various positions.

In 2009, he became an independent consultant, first in the field of "Sustainable ICT", but also in the field of new financial technologies (Fintechs), which combine his initial orientations.

Advice, fundraising, organization of events, editorial contributions are now his daily.

He is also certified for GDPR since 2018.

> *We base on clear principles and the strong intention to improve the world by creating a digital investment platform to help invest money more ethically*

the 2 largest Swiss banks has just devoted a report titled "The food revolution and the challenges we face"!

At the time I write these lines, the news in all the media brings us its share of new topics, such as climate change (CleanTech), sustainable finance, etc ..., that new technologies will not miss to impact in terms of innovations and solutions.

The "stable coin" Libra who has made headlines since his announcement doesn't aim to help the 1.7 billion of unbanked people? Not to mention all the other existing financial inclusion projects.

A European Wealthtech also posted on its website: "The company provides customized, intelligent / highly automated and cost-effective investment *platform focused on Socially Responsible Investing* to Banks, Asset Management firms and Financial Advisors. We base on clear principles and the strong intention to improve the world by creating a digital investment platform *to help invest money more ethically*." Maybe a new generation of robo-advisors oriented on Impact Investing proposals!

Finally, in this new supplement you will continue to follow the exponential evolution of the cryptos world. From simple bitcoin to other crypto currencies, then from ICOs to STOs, here we are today at the IEOs Initial Exchange Offerings. What is it? Me Fabien Gillioz in co-signature with Me Alexandre de Boccard initiates you in their article.

In conclusion, while wishing you a good reading, I cannot resist to resume and somewhat adapt a well-known sentence but more relevant than ever **"Think Global (Tech) and Act locally"**! ∎

BLOCKCHAIN

Pierre Kauffmann, Blockchain Leader for IBM Switzerland

10 YEARS OF BLOCKCHAIN OR THE AGE OF REASON?

Blockchain, another buzz like computer marketing manages to give us every 2-3 years, or a real revolution? Let us explore some developments on this subject and try to answer this question.

But first, a little flashback. Without going into a definition of the Blockchain or more generally of DLT (Distributed Ledger Technology), there are enough of them on the Net, let us say in a few words that technologically there is nothing new. It is only an encrypted (Julius Caesar was already doing so) database (concept from the 50s and 60s) that is copied identically (concept from the 80s) on the servers of several organisations. The novelty, because there is one, is twofold, the first one is related to the sharing of information between organisations and the second one is related to inter-organisation governance.

> **"** *The Blockchain offers not only security on the storage of information but also a prior validation of this information which is stored in an unmodifiable way* **"**

At this point, one will argue that the Blockchain is not limited to organisations but to anyone who wants to exchange information without centralised control in the same way that Arpanet (the precursor of the Internet) wanted to do so to avoid machine failures during the Cold War. I would tell them that this is indeed the case, but the use cases that interest us here are linked to business-to-business exchanges because this is where a source of value resides. I wouldn't talk about crypto-currency or anything else here,

but about use cases that will allow any organisation, regardless of its size, to get value from the Blockchain.

The Blockchain offers not only security on the storage of information (through encryption and distribution) but also a prior validation of this information which is stored in an unmodifiable way (through encryption and chaining).

Use Cases

Blockchain is about sharing information between organisations so that no one can change it later, what's the point? Let us take a few examples.

Example 1 - The Transactional aspect: Suppose that a company is in a relationship with a supplier and a customer. The production of the good by the supplier can be recorded in the Blockchain, its transformation by the business as well (by linking the two pieces of information (hence the idea of a chain)) and distribution to the customer as well. One benefit: the customer, the company and the supplier immediately have a view of the major events in the process. There is therefore a use case for traceability another for auditors, one for transparency for third parties, another for intermediaries such as carriers, regulators, financial exchanges etc.

But why is that? The reason is simple: each participant in the Blockchain has all the information (the copy of the Blockchain) and can without much effort (with current technology) access the same information as each other actor. The interest therefore lies in sharing information: everyone sees the same truth. This type of use case is

Pierre Kauffmann,
Blockchain Leader for IBM Switzerland.
Pierre Kauffmann helps your business deliver
tangible benefits by making Blockchain easier.
Pierre work on the strategy for the Swiss market
and creation of client ecosystems
and technological platforms.
Pierre is also an Enterprise Architect that covers
the Suisse Romande Market by establishing
and developing of trusted relationships
with the main decision-makers of major clients
in French-speaking Switzerland.
Pierre is also a recognized speaker.

most valuable when there are manual verifications, controls, settlements or other manual tasks between companies or between divisions of a company where the information exists in each of the two involved parties' systems. It is therefore a question of digitising parts of processes, in a nutshell the Blockchain helps companies in their Digital Transformation.

Example 2 - The Guarding aspect: We saw that there is an advantage having a set of transactions that are not modifiable. But the Blockchain goes further since each transaction is validated by a sufficient set of participants, we speak of consensus. So naturally, the storage of information related to an identity or certificates makes sense. We are currently seeing the emergence of Blockchains in this direction: commercial register, land register, diploma records, intellectual property, primacy of rights, etc. More business opportunities for existing and new players.

Taking only these two examples, we see that value does not lie in technology but in the business model. This is generally valued by simplifying processes by the simple fact that all participants have exactly the same information, can verify this information themselves and exchange goods and services with partners in whom they do not necessarily have confidence in.

Moreover, today any computer scientist with some basic skills can create a Blockchain in a few hours, if not minutes. Business models are invented or reinvented around the Blockchain almost every day, particularly for the ones related to provenance, payments, asset tracking and identity management in all industries.

Another point that is particularly important is governance. Indeed, the primary goal of being able to trust each other via the Blockchain implies that the participants operate for the same purpose. Although there are different business models, they all have in common the desire for each party to benefit from something. Sometimes visibility on a Supply Chain, sometimes the provision of services, or a competitive advantage of first mover. We see that organisations that are competitors manage in collaborating to make life easier for each other, rarely at the expense of others but generally for a common good that is greater efficiency in processes that have not or only slightly evolved over decades. We note that the greatest benefits come from the processes that have evolved the most and require an increasing number of controls. The ones subject to regulations or a multitude of actors are the most likely to benefit from the Blockchain. According to the adage "It is not the continuous improvement of the candle that brings us electricity" there is a time when a radical change gives a competitive advantage and even short-term gains.

The challenge is to get several competitors or providers-suppliers to collaborate to initiate the process of setting up a Blockchain. As such, the Blockchains that succeed in passing this milestone become de facto standards for the industry from which they originate. It is not a question of IF it is a question of WHEN.

For example, there is the IBM Food Trust (tm) Blockchain, which offers traceability, origin and the possibility of recalls for products sold in large distribution chains. There is almost similar model: the Blockchain TradeLens resulting from a

Maersk project that combines CMA-CGM, MSC cargo (in fact 8 of the 10 largest ocean carriers) covering more than 60% of ocean container freight alone. If you have goods transported by this mean, there is a greater chance than three-fifth that your goods will pass through TradeLens.

I was talking about the visibility of transactions. Indeed, some Blockchains such as Hyperledger allow only participants in a transaction to see the details. There is no way that a competitor or even an auditor can have access to information that does not concern them, this is the bare minimum in a business environment.

A short technological paragraph

Gartner produced an analysis in early 2019, and it appears that among 600 Blockchain projects 34% used Hyperledger, 25% Ethereum and the rest was distributed in more than 50 different technologies.

There is an increasing number of bridges between these different technologies.

A common criticism is its scalability. Well, it depends very strongly on the algorithm set up to validate a transaction (the consensus), it is true that Hyperledger-based Blockchains are better equipped to meet this demand, for example, TradeLens supports 10 million events per week.

This point is critical because there is a myriad (in the strict sense of the word) of Blockchain on the market, and if you dig a little deeper behind the marketing presentation, you can see that some Blockchains have not even had one thousandth of these transactions since the beginning of their existence. So what can be their value be? A marketing stunt? A niche solution? Caution should be observed.

To answer the initial question, on the revolutionary aspect of the Blockchain: It brings value to any company that decides to transform itself more or less. The greater the interactions with its partners and the more trust will be required, the greater the value. You have to take the step of talking to your customers, suppliers and competitors, as well as a neutral partner whose experience is well proven can help you take this journey. ∎
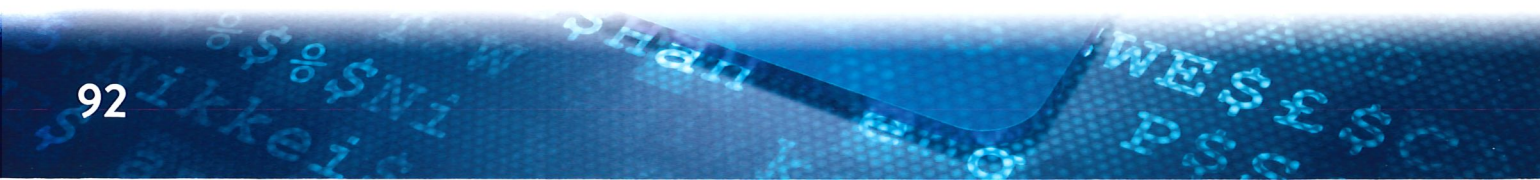
INCUBATOR

Stéphane Mingot, Innovation Engineer at AdNovum and **Matthias Loepfe**, Head of Incubator at AdNovum

The Alchemy of Innovation

Innovation arises when an emerging technology meets a deeply rooted need. The AdNovum Incubator wants to understand, model and support innovation with a three phases process so that AdNovum and its customers can continue to play their pioneering role in the future.

The wind is blowing strong from the east. Snowflakes are swirling in the sky as the airplane slowly rolls toward the runway. You've really been looking forward to this vacation! In just a few hours, you will be sitting and relaxing in the warm sun. Thanks to technology. But what is now an everyday process is the result of centuries of research. Because it was not until scientists had understood the basic mechanisms of flying – the special wing profile that gives the vehicle the necessary lift – that the "birds" actually stayed in the air.

> **"** *The alchemy of innovation,*
> *it consists of the three phases*
> *observe,* incubate
> *and* convert **"**

If you look back at the social and technological development of the last few centuries, you will see that real and lasting innovation always arose when an emerging technology met a deeply rooted need. Just like the alchemists who tried to convert base metals into gold in the Middle Ages, we want to create added value by merging innovative technological capabilities and core customer needs. The AdNovum Incubator wants to understand, model and support the mechanisms of innovation with one method: the alchemy of innovation. It consists of the three phases "observe", "incubate" and "convert".

Observe

Every day we consume a flood of information from different sources. We read the newspaper, listen to conversations on the train, surf the Internet, read e-mails, etc. We are always "on" and that gives rise to ideas. To prevent us from going crazy, our brain helps us to process this flood of information. It filters out what is unimportant or already known, and only lets what is important or challenges our current mind-set access our consciousness.

This separation of what is the same and what is different is key to being able to abstract or generalize. It is a question of immediately realizing that this animal we are seeing right now is a dog because it looks very similar to other dogs we know. However, we also notice that this dog is special in his own way.

Something very similar happens in what is referred to as deep learning. Just like in our brain, neural networks are also hierarchically organized in deep learning. Every layer represents a specific level of abstraction. The lower layers recognize patterns at a deep level of abstraction, the upper layers at a high level of abstraction. The more information that is learned or processed, the greater the quality of the abstractions. And that is also true of our brains. For everything new we learn, generalization takes place without our knowledge and provides us with a multilevel classification of what has been learned. We use this to order the information in our inner knowledge tree, referred to as a knowledge graph. Everybody has their own unique knowledge graph – their personal view of what is referred to as reality. If we want to explain something to other peo-

Matthias Loepfe, Head of AdNovum Incubator since its inception in 2016, has always been fascinated by emerging technologies. After earning a degree in electrical engineering, he significantly influenced the development of AdNovum as CTO and co-owner in the pioneering years of software engineering. After the turn of the millennium, he sold his share in the company and focused on cybercrime investigation and digital forensics until his return to AdNovum.

Stéphane Mingot works as an Innovation Engineer at AdNovum Incubator. He earned a master's degree in civil and environmental engineering from the EPFL and supplemented his management skills with a Diploma of Advanced Study (DAS) at University of St. Gallen.
For over 20 years, he has been unlocking the potential of bright ideas in various consulting and management positions, helping his clients make the most of their digital potential and innovative power.

Matthias Loepfe and Stéphane Mingot.

ple, we are always trying to make them understand a part of our knowledge graph.

Innovation is about extracting ideas from observations and applying them to new areas. To do this, we primarily need to fully understand the basic idea, the basic mechanisms of a process. Only then are we able to benefit from it. That is why it is helpful to ask ourselves, for example, "What makes this topic special?" or "How does it distinguish itself from similar topics?". This triggers an automatic "matching". In other words, once we have understood the basic idea of a cool solution, we think about a problem that could also be solved using this idea. This results in a hypothesis for an innovation. You cannot make an idea and its matching happen. Sometimes the inspiration comes when you are in the shower; at other times nature may provide the decisive clue.

Incubate

So how does idea incubation work? In the first step where an idea has emerged in the "observe" phase, it has to be given a form as a hypothesis in a way that others can understand it. Whether the idea is viable or not can be gauged from the response it receives. A certain momentum is generated when people like the idea and start spinning their own ideas or variants thereof. When substantial responses have been generated, we validate the idea with experiments. Is it practicable? Were the assumptions made realistic? Validation usually takes place in the form of a proof of concept or a prototype – and most effectively with an existing or potential customer in what we call the co-creation phase, where we pursue a common goal at eye level.

In the simplest case, the hypothesis is confirmed and the phase is concluded. Often the result can look promising, but the hypothesis has not yet been fully confirmed and needs to be adjusted because we have gained new insights. It is also possible to land a "lucky punch": At first sight, the experiment seems to have failed, but once we understand exactly what has happened, we discover a completely unexpected result that has great benefits. Naturally, a hypothesis might be wrong. The more courageously we pursue an idea, the more often this occurs. And this is just as important as a confirmed idea. Because a hypothesis which cannot be confirmed will nevertheless still provide valuable insights.

Convert

Once a hypothesis has been confirmed and there are specific application possibilities, we examine whether an offering can be crafted from it. To this end, we develop a classic business case that focuses on the added value for the end user. If added value and market potential are proven, we define the organizational and financial framework conditions for successful design, implementation and marketing. A promising business case is implemented in different ways to suit the situation.

If the solution can be used as a product – while being aligned with AdNovum's strategy and offering – and can be developed in good time with our own resources, we implement it internally. A multidisciplinary agile team with members from different business and support units is re-

> ❝ *Innovation is not a science which takes place systematically in accordance with defined principles.* ❞

sponsible for product design and development as well as the marketing of the first MVP. What is crucial to success is that the team members all work together at one place and concentrate on the task at hand. And it must be said that an agile approach has proved its worth. If the solution is successful on the market, it is assigned to an existing business unit or transferred to a new business unit.

If the framework conditions for internal implementation are not met, the solution is developed externally and, if necessary, together with partners. This may involve the foundation of a separate start-up or joint venture.

Individual software development is also an option if the solution meets the needs of a customer or if the customer is interested in developing the solution themselves but needs a technology partner. This is the classic approach of AdNovum, for which various models, for example shared risks / shared revenue, are possible.

Innovation culture and constraints

Innovation is not a science which takes place systematically in accordance with defined principles. Rather it is a mental state, a culture that needs to be cultivated to bring forth, capture and substantiate new ideas. This culture is distinguished by a number of aspects: Those involved have the time and the freedom to familiarize themselves with new topics. They can experiment as even failed experiments reveal new insights which could possibly lead to new ideas. The environment is one of trust, openness, exchange and collaboration as well as one where risk taking is allowed.

At the same time, it is important to define targets and constraints, which is effectively the validation process of an idea. Furthermore, adequate, but by no means unlimited resources should be available so that the team has to concentrate on the essential. In other words: Innovation is a balancing act between freedom and structure, individual work and teamwork, breadth and depth as well as too many and too few resources – and it is precisely these areas of tension that make innovation so incredibly exciting. ■

AdNovum Incubator – Unlocking the potential of bright ideas

AdNovum Incubator is the innovation lab of AdNovum. As a trusted partner, we help companies unlock their digital potential. We uncover matches between clients' needs and technology trends and validate use cases in close collaboration with market players. This results in new customer experiences, solutions and business models which lead our clients to pioneering innovation.

> More about AdNovum Incubator:
> https://www.adnovum.ch/incubator

CLOUD

Jan Seffinga, Partner, **Beat Burtscher**, Risk Advisory Director, Deloitte Switzerland

GETTING CLOUD RIGHT

How can banks stay ahead of the curve?

Cloud is not the future or an emerging trend anymore: it is the present and is a critical tool for financial institutions to stay competitive in today's challenging business environment. Banks' digitalisation or innovation success using emerging technologies such as artificial intelligence are depending on cloud computing.

The cloud has become instrumental for businesses to thrive in today's fast-evolving competitive marketplace. Technology providers are increasingly moving to the cloud, while on-premise deployments decline.

While cloud has become the pillar of IT across industries, banks have been reluctant to exploring cloud options. Deloitte dives into six areas of cloud that are particularly relevant to the financial services sector.

Cloud's benefits and value for banks

Cloud enables banks to improve their agility; drive innovation by tapping into cutting-edge technology; leverage industry-specific solutions; and shift their spending paradigm from CapEx to OpEx.

> *Cloud is not the future or an emerging trend anymore:*
> *it is the present and is a critical tool*
> *for financial institutions to stay competitive*
> *in today's challenging business environment*

Why have banks been reluctant to use cloud?

Concerns around regulatory compliance, data security and risks associated with outsourcing of critical processes, have led many financial corporations to stay away from cloud. We recommend a structured approach, including a thorough risk assessment and vendor management processes to mitigate third-party risks and pave the way for a smooth cloud journey.

Key success factors for cloud transformation

Moving to cloud means a complete cultural change within the organization. Organizations need a strategy that is in line with the business's broader objectives, followed by a definition of risk management and governance requirements, and a financial analysis to build a case justifying the cloud investment.

Compliance with regulatory requirements

Deploying cloud services also involves legal aspects, since processing sensitive information or client identifying data (CID) falls under strict regulations.

Cloud cyber security

Cloud services expand the IT footprint of organizations, which in turn, increases the attack surface. Robust cyber security processes must be implemented to combat threats across all cyber domains including network and infrastructure security, identity and access management (IAM), data protection, logging and monitoring, resilience, DevSecOps, governance, risk, and compliance.

How to select the right cloud service provider

Identifying the right cloud service provider depends on your current and future operating models and offerings, and the delivery model you intend to have (IaaS, PaaS, or SaaS). Deloitte recommends a framework to assess your cloud needs from different standpoints like regulatory aspects, compliance, cyber security, and technology requirements.

The case of Switzerland: How do Swiss banks cope with regulations around cloud?

The Swiss Bankers Association (SBA) published a set of guidelines on cloud banking, containing recommendations designed to increase legal certainty and help Swiss banks make more extensive use of cloud services.

Google Cloud Platform has been live in Zurich since March 20 giving companies doing business in Switzerland more opportunities with lower latency access to their data and workloads.

IBM, Swisscom and other providers offer private cloud services to banks, in addition to the before mentioned hyperscale cloud services from Google and Microsoft. ∎

Leben und lebens lassen

Unser Korrektorat überprüft Ihren Text orthografisch wie auch inhaltlich.

INTERVIEW

Serge Kassibrakis, PhD, Director, Member of Senior Management Head of Quantitative Asset Management at Swissquote

Die Roboter werden die künstliche Intelligenz einbeziehen

Robots will incorporate artificial intelligence

Vor 3 Jahren äusserte sich an gleicher Stelle Paolo Buzzi, CTO und Mitbegründer von Swissquote, zum Kommen der Robo-Advisors (elektronische Vermögensberater) und sah eine Zukunft voraus, in der jede grosse Bank seinen Algorithmus besitzen würde.

Wie sieht die Situation heute aus, inwiefern hat sich diese Sparte der FinTech weiterentwickelt? Wir wollten uns mit Serge Kassibrakis, dem Leiter von Quantitative Asset Management bei Swissquote, über den aktuellen Stand unterhalten.

BSL: Der Begriff «Uberisation» wurde 2017 unter folgender Definition ins Wörterbuch aufgenommen: «Umstrukturierung (eines Geschäftsbereichs) mit einem innovativen Wirtschaftsmodell unter Nutzung der Digitaltechnologie…» . Ist Swissquote mit der Einführung seines Robo-Advisors also zum Uber des Finanzwesens avanciert?

SK: Jlch würde sagen, dass Swissquote – geleitet von der Vision seiner beiden Gründer – seit seiner Gründung ununterbrochen ganze Bereiche des Bankgewerbes verändert hat: Sofortiger und kostenfreier Informationszugang, direkter Börsenzugang und dank seines Robo-Advisors seit einigen Jahren direkter Zugang zu Algorithmen, die bisher nur Fachleuten vorbehalten waren. Trotzdem muss man feststellen, dass der Begriff «Uberisation» oft negativ behaftet ist. Mir wurde dieses Wort regelmässig von Fachleuten vorgehalten, während ich versuchte, Verbindungen herzustellen und Synergien zu nutzen, die mir selbstverständlich schienen.

Ich bin zu dem Schluss gekommen, dass dieses Misstrauen seitens zahlreicher Fachleute, Vermögensverwalter und Privatbanker auf die Diskrepanz zwischen ihrer Wahrnehmung eines Robo-Advisors und der Wirklichkeit zurückzuführen ist.

Three years ago in this very magazine, Paolo Buzzi, CTO and co-founder of Swissquote, discussed the rise of robo-advisors and predicted a future where every large bank would have its own algorithm.

So now, in today's world, what progress has been made? How has this aspect of fintech evolved? We wanted to get an update from Serge Kassibrakis, Head of Quantitative Asset Management at Swissquote.

BSL: The term "uberisation" was included in the dictionary in 2017 with the following definition: "To transform (an industry sector) with an innovative business model based on digital technology…". Has Swissquote become the Uber of finance with its robo-advisor?

SK: I would say that since the very beginning, and guided by the vision of its two founders, Swissquote has continually transformed entire swathes of the banking industry: free and instant access to information, direct access to the stock exchange, and as of a few years ago with its robo-advisor, direct access to algorithms that were previously only available to professionals. However, it must be pointed out that the word "uberisation" often has a negative connotation. I often find that using this word puts me at odds with professionals, whereas I'm trying to create connections and benefit from synergies that seem obvious to me.

I realised that this wariness from many professionals, asset managers and private bankers came from a disconnect between what they thought a robo-advisor would be and what it actually is. No, the robot doesn't do everything itself! It needs to be told what to do, based on objec-

Nein, ein Roboter kann nicht alles und auch nicht allein! Es muss ihm gezeigt werden, was er tun muss, in Abhängigkeit der jeweiligen Ziele, Anforderungen und sogar der Marktsicht, so wie es der Roboter von Swissquote ermöglicht. Nachdem diese Parameter festgelegt sind, kann der Roboter alle diese Daten besser als jeder andere in einem Portfolio umsetzen. Etwa wie ein Autopilot in der Luftfahrt – die versierten Piloten Marc Bürki und Paolo Buzzi würden diesem Vergleich zustimmen: Ein Autopilot ist unglaublich hochentwickelt, doch wenn man ihm nicht sagt, wo es hingeht und wie man dort ankommt, dann fliegt er gar nicht erst los.

BSL: Worin besteht nun die Revolution, sofern es eine gibt?

SK: Es gibt tatsächlich eine Revolution, das ist sicher, aber nicht dort, wo man sie erwartet! Die Revolution liegt nicht in den Algorithmen zur Portfolio-Optimierung, die alles in allem seit Langem bekannt sind, auch wenn sie unaufhörlich verbessert werden. Die Revolution besteht darin, dass diese Algorithmen vor nur zehn Jahren ausschliesslich von den grossen Finanzeinrichtungen genutzt werden konnten; man benötigte leistungsfähige und sehr teure Rechner, IT-Wissen, worauf letztendlich nur Fachleute zugreifen konnten. Heute habe ich über meinen PC oder mein Smartphone Zugang zu dieser Rechenleistung und zu diesen Algorithmen, insbesondere bei Swissquote, wo den Kunden die Gesamtheit der Algorithmus-Parameter zur Verfügung steht. Die «Retail-Kunden» mit einigen Kenntnissen können dadurch sehr leicht eine massgeschneiderte Strategie erarbeiten. Für diejenigen, die dafür weniger Zeit haben, gibt es vorgegebene und somit weniger personalisierte Strategien. Schliesslich stellt es für einen Vermögensverwalter oder einen Privatbanker ein wunderbares Instrument der Automatisierung dar, das nennen wir das Hybrid-Modell. Wir haben darüber hinaus Partnerschaften mit mehreren professionellen Vermögensverwaltern geknüpft, die den Nutzen dieses Tools verstanden haben.

BSL: Worin bestand also das Interesse für Swissquote, seinen Roboter, dazu noch als «White-Label», auf den Markt zu bringen?

SK: Das macht Sinn aus folgendem Grund: Im Gegensatz zu so gut wie allen unseren Konkurrenten bieten wir nicht eine Gruppe von zehn vorbestimmten Portfolios an. Die Parameter sind frei wählbar und ermöglichen theoretisch eine maximale Personalisierung.

Das öffnet die Türen für die bereits erwähnten Partnerschaften, denn wer sonst als eine Fachperson sollte den Personen helfen, die keine Zeit haben, um sich mit der Festlegung dieser Parameter zu beschäftigen? Unabhängig von der Anzahl

tives, constraints and even market perspectives – as the Swissquote robot does. Once these parameters are set, the robot will know better than anyone how to implement all this data within a portfolio. It's a bit like an aeroplane autopilot – seasoned pilots Marc Bürki and Paolo Buzzi would agree with this comparison. An autopilot is incredibly sophisticated but if you don't tell it where to go and how to get there, it won't go anywhere at all.

BSL: So where are we in the revolution, if there is one at all?

SK: There is indeed a revolution, but not where we think! The revolution doesn't lie in the portfolio optimisation algorithms that we've all known about for a long time, even though they are continuously improving. The revolution lies in the fact that only ten years ago, only large financial institutions could operate these algorithms; they needed very powerful and expensive machines and IT knowledge, so only professionals had access to them. Today, I can access the processing power and algorithms on my PC or my smartphone, especially with Swissquote, where all of the algorithm parameters are available to clients. For "retail" clients with specific terms, it means it's very easy to create a bespoke strategy. For people with less time to spend on their portfolios, pre-determined and less personalised strategies are available. Finally, for asset managers and private bankers, this is an incredible automation tool – it's what we call the hybrid model. We've also partnered with several professional managers who recognise how useful this tool is.

BSL: So why did Swissquote decide to put its robot on the market, even as a white label?

SK: It makes sense for this reason: unlike almost all of our competitors, we're not offering ten pre-defined portfolios. The parameters are completely open and clients are able to customise their portfolios entirely.

So that opens doors to the partnerships I just mentioned, because who better than a professional to help people who don't have the time to actually set these parameters? Regardless of the number of partnerships, the portfolios generated will all be different because they will incorporate the specific requirements of each client, as well as input from partnering asset managers and private bankers.

What's more, remaining in constant contact with these professionals helps us to envision future projects. Finally, the power of automation helps our partners to expand their client base, as they can now accept assets under management that are below the old model's profitability threshold.

© Swissquote

der Partnerschaften werden sich die generierten Portfolios unterscheiden, denn sie berücksichtigen zum einen die Besonderheiten jedes Kunden und zum anderen auch die Einschätzung von Partner-Vermögensberatern oder Partner-Privatbankern.

Darüber hinaus hilft uns der permanente Austausch mit diesen Fachleuten dabei, die zukünftigen Weiterentwicklungen zu planen. Schliesslich bietet die hohe Automatisierungsleistung unseren Partnern die Möglichkeit ihren Kundenstamm zu vergrössern, indem sie mit einer Verwaltung, deren Rentabilitätsschwelle niedriger als beim alten Modell ist, grosse Mengen an Kunden akzeptieren.

BSL: Wie werden sich die Roboter in naher Zukunft noch weiterentwickeln?

SK: Eindeutig werden die Roboter mehr und mehr die Module der künstlichen Intelligenz einbeziehen. Dieser Trend wird so schnell nicht nachlassen. Mit diesen Modulen können die Kunden besser bei der Festlegung ihrer Parameter und auch bei deren Änderung unterstützt werden, zum Beispiel durch die Vorhersage, dass die Risikoscheue eines Kunden sich umfassend ändern könnte. Auch auf Seiten des Portfolio-Managements, indem die aktuellen, als «regelbasiert» eingestuften Algorithmen erheblich ausgebaut werden. Dies wird mehr und mehr Daten und Rechenleistung erfordern. Zu diesem letzten Punkt gibt es zahlreiche Ansätze und um nur ein Beispiel zu nennen: die semantische Analyse von Finanzdaten oder jeder anderen Textquelle. Durch die Analyse einer riesigen Textmenge kann ein Eindruck eines börsennotierten Unternehmens oder eines Sektors herausgearbeitet werden. Viele Start-ups haben sich dieser Herausforderung gestellt und langsam kommen die Ergebnisse zum Vorschein. Dank der Partnerschaften mit der EPFL sind wir selbstverständlich an all diesen Forschungsarbeiten beteiligt. ∎

BSL: So what developments can we expect from the robots in the near future?

SK: I can say without hesitation that robots will increasingly incorporate artificial intelligence modules. This trend isn't going to stop any time soon. These modules will be able to better assist clients in choosing and updating their parameters, by predicting for example that a client's risk aversion might change significantly. Robots can assist with the management part of the portfolio as well, by considerably strengthening current "rules-based" algorithms. That will require more and more data and processing power. On this last point, there are many potential avenues. One example I would give is semantic analysis of financial information or any other text-based sources. It can identify an overall impression of a listed company or an industry by analysing an enormous amount of text. Many start-ups have been working on this, and the results are starting to come to light. Thanks to partnerships with EPFL, we're closely involved in all of this research. ∎

SERGE **KASSIBRAKIS**

Serge machte seinen Abschluss am Institut Supérieur de l'Aéronautique et de l'Espace, erlangte an der Ecole Normale Supérieure de Lyon seinen Master in Astrophysik und promovierte an der Université de Provence im Fachbereich Theoretische Physik. Er arbeitet seit 2001 bei Swissquote und ist seit 2009 Leiter der Abteilung Quantitative Asset Management, Direktor, Mitglied der Geschäftsleitung der Swissquote Bank, wo er eine Gruppe von 5 Mathematikern und Physikern anleitet, die u. a. für die Entwicklung des Robo-Advisor Services zuständig sind.

Serge graduated from Institut Supérieur de l'Aéronautique et de l'Espace, obtained a master degree in Astro Physics from Ecole Normale Supérieure de Lyon and received a PhD in theoretical Physics from Université de Provence. Working at Swissquote since 2001, he is since 2009 Head of the Quantitative Asset Management department, Director, Member of senior management of Swissquote Bank, leading a group of 5 mathematicians and physicists who are in charge of developing among others, the Robo-Advisory service.

PRIVAT

- **Eher Frühaufsteher oder nachtaktiv?**
  Eher Frühaufsteher

- **Eine berühmte Persönlichkeit als Vorbild?**
  Richard Feynman, Physiker

- **Meer oder Gebirge?**
  Alles ausser Flachland

- **Ein Sprichwort?**
  «Wissenschaft ohne Gewissen bedeutet den Untergang der Seele», *Rabelais*

- **Welches Buch würden Sie auf eine einsame Insel mitnehmen?**
  «100 Jahre Einsamkeit» von Gabriel Garcia Màrquez

- **Sind Sie im Leben eher Grille oder Ameise?**
  Grille

- **Eine Qualität, eine Schwäche**
  Impulsiv

- **Ein Hobby?**
  Gitarre

AN INSIDE LOOK

- **Are you a morning person or a night owl?**
  Morning person

- **What famous person do you admire?**
  The physicist Richard Feynman

- **Ocean or mountains?**
  Anything but prairies

- **Do you have a favourite quote?**
  "Science without conscience is but the ruin of the soul"
  Rabelais

- **What book would you bring with you on a desert island?**
  One Hundred Years of Solitude by Gabriel Garcia Màrquez

- **Are you more of a cricket or an ant?**
  Cricket

- **What is one of your qualities or shortcomings?**
  Impulsiveness

- **Do you have a hobby?**
  Playing guitar

INITIAL EXCHANGE OFFERINGS

Fabien Gillioz and **Alexandre de Boccard**, Partners at Ochsner & Associés

Security Token Offerings ("STO ") and Initial Exchange Offerings ("IEOs")

In the last edition of BSL, we discussed about the emergence of STO's explaining its advantages and its limits in comparison to ICOs. In this article, we will discuss in more details what kind of Security Token Offering may be launched in Switzerland and the benefits and limits of raising funds through an IEO.

As you may know, the definition of the FINMA guidelines on Asset Tokens (security tokens) is quite large and includes securities such as equity (voting and non-voting shares), bonds as well as physical (i.e. hard) assets. We will address below the legal framework for each category of security tokens, being specified that the categories of security tokens below are not exhaustive.

a) Shares

i) Description

Shares (art. 622 CO) are a transferable securities conferring to its holder economic and voting rights within the company. In the digital world, it is complicated to trade shares as under Swiss law, the transfer of shares requires a written instrument.

In order to tokenize shares from a legal point of view, the shares should be issued in a form of uncertificated securities (meaning that the shares are not incorporated in physical certificates, and are issued in the form of so-called "droits-valeurs" or "Wertrechte" within the meaning of Article 973c of the Swiss Code of Obligations). Such issuance requires excluding in the articles of association of the issuing company the right of shareholders to request the delivery of physical certificates. In this regard, the Swiss Federal Council's preliminary project on the amendment of the Swiss Code of Obligations suggests the introduction of a new type of uncertificated securities on distributed ledgers (Article 973d aCO).

The tokenization of shares may be performed on all or part of the shares of a company. Tokenization may done at various stages of the company's life, such as at the incorporation of the company, following a capital increase, or as a conversion of existing shares.

From a technical perspective, the share issued in the form of token will most often require the implementation of a "smart contract" that will govern the functions and attributes of the token. In this regard, there are quite a few standards, most often set by private organizations, in particular the Capital Market Technology Association (CMTA). The CMTA, a non-profit association created in Geneva, has adopted standards in order to systematize good practice in the context of the treatment of digital assets by financial intermediaries. To this end, the association issued a blueprint for the tokenization of shares of Swiss corporations.

ii) Pros and cons

The advantage for STO issuers is that the tokenization of shares will increase the number of possible investors at a global Internet scale, rendering the title more liquid as tokenized shares will be traded more quickly and more efficiently. The tokenization of shares will allow the democ-

Fabien Gillioz

ratization of private equity for any type of investors, even the smallest ones.

That being said, STO issuers may face a large number of different shareholders having the power to vote at the shareholders' meeting of the company. The issuer should thus analyze whether it would be appropriate to tokenize voting shares or non-voting shares before structuring its STO.

b) Participation rights certificate (non-voting shares)

i) Description

Participation right certificates (art. 656a CO) consist in transferable securities that provide to its holder only economic rights within the company. Its particularity is that it does not confer any voting rights. In a nutshell, participation right certificates are non-voting shares. The tokenization of participation rights certificates is similar to the one of shares described above and the CMTA standards are fully applicable to this type of securities as well.

ii) Pros and Cons

One of the major benefit of issuing non-voting shares for STO issuers is to raise capital with a large number of investors who will benefit only from the economic rights of the company but without voting rights. This will ease the corporate governance of the company and the project as a whole. This being said, the participation capital may not exceed an amount equal to the double of the share capital (Art. 656b CO). Nevertheless, the price of each participation certificate that may be sold to investors can be differentiated.

c) Bonds

i) Description

Bonds are transferable debt securities (Article 1156 ff. CO) issued simultaneously allowing the company to obtain long or medium term credits. A distinction should be made between bonds offered for subscription publicly or privately. When issuing bonds offered by public subscription, a prospectus is mandatory by law (current Article 1156 §1 CO). Under current Article 1156 §1 CO, the second category of bonds includes those only available to a limited number of selected persons, in which case the law does not require a prospectus.

Under Article 31 §1 let. b of the upcoming Financial Services Act (FinSA), no prospectus will be required for instance in case the issuance is targeting less than 500 investors. However, one has to make sure that the issuance activity does not fall under the Swiss Banking Act.

Bonds are generally issued to guarantee a loan or renew an existing debt. They produce a fixed interest rate and are redeemable at maturity on a pre-determined date (Article 966 CO).

Similarly to shares, tokenizing bonds consists in issuing them in the form of uncertificated securities and wrapping them into digital tokens. A tokenized bond issuance will also most often require the implementation of a "smart contract" governing the functions and attributes of the token.

ii) Pros and Cons

One of the advantages of issuing bonds for STO issuers is the use of smart contracts that will allow them to issue financial instruments corresponding exactly to the modalities of the loan they wish to finance and to automate the implementation of the related interest or loan payments.

One should be aware that when bonds with uniform conditions are offered directly or indirectly for public subscription by a borrower, the creditors form a community by law. Said community shall elect about one or more representative(s). This election process could be more complicated with numerous creditors scattered around the globe. However, one could decide to set up an online election process to mitigate this difficulty. It is also possible to authorize the representative to assert the creditors' rights in order to avoid individual creditors having to exercise their rights independently.

d) Physical (Hard) assets

i) Description

Swiss law does not prevent the tokenization of physical assets, including in the form of a security. However, the Financial Market Infrastructure Act contains some requirements applicable to derivatives and the upcoming Financial Institution Act (FinIA) contains requirements applicable to the issuer of derivatives.

Indeed, an entity creating a derivative on a professional basis and which offers them to the public on the primary market, for its own account or for the account of a third party, is considered as an issuance house (maison de titre / Wertpapierhäuser) according to Article 44 § 1 let. d FinIA.

Derivatives are "financial contracts whose value depends on one or several underlying assets and which are not cash transactions. More specifically, derivatives are deemed to comprise financial contracts whose price is derived specifically from:

a. assets such as shares, bonds, commodities and precious metals;

b. reference values such as currencies, interest rates and indices."

The common element among these underlying assets is that they are all fungible. In other words, they can be replaced by another asset of the same nature (characteristics).

If the underlying asset of a token is a fungible asset, one has to make sure that such token will not be considered as a derivative. One solution to avoid such qualification is to grant to the investor the title of ownership of the physical assets instead of providing an "option" to buy or receive the physical assets, as mentioned in § 2.2.2 of the FINMA supplement of September 11, 2019 to the Guidelines on ICO.

To our knowledge, FINMA has issued a few rulings on non-action letters for such tokens in relation to precious metals, confirming that the concerned tokens (conferring an ownership title) were not derivatives. This being said, it is highly recommended to address non-action letters to FINMA, given the potential regulatory consequences should the token be qualified as derivative.

IEOs

As an alternative to ICOs and STOs, the crypto community has come up with an Initial Exchange Offering. The main difference with the IEO is the appearance of a third party: the exchange platform.

In order to participate in an IEO, both parties have to create accounts on the relevant exchange platform as it will serve the distribution of the relevant tokens.

The main advantage of an IEO is the fact that the exchange platform takes care both of the transaction's reliability and marketing of the project. Before allowing the IEO to start, the exchange will verify the credentials and evaluate the chances of the project of becoming successful.

The exchange experts will regulate the IEO, creating a high degree of security for investors. The key security offering is the direct exchange of funds and tokens. The exchange will ensure that the coin matches the requirements to keep the risks at a minimum as well as, somehow, a certain level of liquidity.

The downside of using an IEO lies in high investment minimums, a small choice of IEO platforms, and the necessity to create accounts on the exchange platform.

The current trend for DLT project issuers is to list their tokens with an exchange platform and to raise funds through an IEO. In Switzerland, several major players, including SIX, are working on building an exchange for listing security tokens which will definitely contribute to the democratization of ICOs, STOs and IEOs. One would need to seek advices in order to choose the right path depending on its timing, resources, and potential risks. ■

Alexandre de Boccard

INFRASTRUCTURE

Yannick Zehnder, Specialist Blockchain and DLT, QUORUS

Finanzmarktinfrastruktur für das 21. Jahrhundert

Financial Market Infrastructure for the 21st Century

Der erste Anwendungsfall der Blockchain-Technologie, die Kryptowährungen, verknüpften diese unvermeidlich mit den Finanzmärkten. Im Vergleich zu den globalen Aktien-, Devisen- und Rohstoffvolumina stellen sie jedoch immer noch eine kleine Nische dar. Die althergebrachten Märkte erkannten jedoch schnell, dass die Technologie auch für sie interessant ist. Vor allem die schlanke Infrastruktur und die blitzschnelle, irreversible und leicht zu überprüfende Abwicklung ist attraktiv. Unter anderem SIX und Nasdaq beschlossen, ihre Marktinfrastruktur auf Blockchain umzubauen.

Blockchain technology's first use case, cryptocurrencies, linked the technology inevitably to financial markets. Compared to global stock, forex, and commodity volumes, they are still a tiny niche. However, the "old-school" markets quickly realized that the technology holds something interesting for them as well, mainly the lean infrastructure and lightning-fast, irreversible, and easy to verify settlement. SIX, Nasdaq, and Overstock famously decided to rebuild their market infrastructure on blockchain.

Blockchain: Ein neues Paradigma

Blockchain und Distributed Ledger Technology (DLT) haben einen entscheidenden Einfluss auf die globalen Märkte. Bitcoin, brachte die erste zuverlässige Version einer dezentralen Währung hervor, unabhängig von jeder Zentralbank oder zentralisierten Geldpolitik. Kurz nach den ersten Erfolgen bei technologischen Innovatoren weckte Bitcoin das Interesse der Finanzindustrie.

Die Legacy-Infrastruktur ist nach wie vor Grundlage für die meisten Marktinfrastrukturen. Einige von ihnen reichen bis in die 70er Jahre des letzten Jahrhunderts zurück. Komplexe, verschränkte Ebenen verursachen erhebliche Ineffizienzen und unnötige Betriebskosten. Blockchain ist kein Allheilmittel, aber sie birgt ein erhebliches Potenzial, um Probleme zu lösen, die verhindern,

Blockchain: A New Paradigm

Blockchain and distributed ledger technology (DLT) have a massive influence on global markets. Bitcoin, the reference implementation of a blockchain, brought forth the first reliable version of a decentralized currency that is independent of any central bank or centralized monetary policy. Soon after bitcoins rising success with technological innovators, it also attracted the financial industry.

Legacy infrastructure is still the foundation for most market infrastructures. Some of them date back as far as the seventies of the last century. Complex, entangled layers cause significant inefficiencies and unnecessary operational overhead. Blockchain is not magical fairy dust, but it holds considerable potential to disentangle the problems that are hindering market infrastructures from truly stepping into the 21. Century.

dass Marktinfrastrukturen wirklich ins 21. Jahrhundert vorrücken.

Viele marktbeherrschende Infrastrukturanbieter sehen in Blockchain-Technologie ein grosses Potenzial. Es würde ihnen erhebliche operative Kostensenkungen, Effizienzsteigerungen, eine 24/7-Marktverfügbarkeit sowie neue Finanzanlagen und -instrumente bringen.

Startup-Initiativen an vorderster Front der Innovation

Da die Blockchain mit einer echten disruptiven Bewegung ihren Ursprung nahm, gingen die meisten Ideen von innovativen Experimenten im Start-up-Bereich aus. Die Entwicklung fand in drei Phasen statt: Tokenverkäufe, Aktien-Stellvertreter-Token und schliesslich die direkte Tokenisierung von Aktien. Der Start der Ethereum-Blockchain weckte grosses Interesse an der Verwendung von Smart Contracts, um die Geschäftslogik in der Blockchain darzustellen und lästige Prozesse zu automatisieren.

" Da die Blockchain mit einer echten disruptiven Bewegung ihren Ursprung nahm, gingen die meisten Ideen von innovativen Experimenten im Start-up-Bereich aus. "

Im Herzen von Genf, Schweiz, begann ein Startup namens Mt. Pelerin, die Möglichkeiten des Einsatzes von Blockchain im Bankwesen zu erforschen, mit der Absicht zukünftig eine komplett tokenisierte Bank zu gründen - befreit von allen Legacy-Systemen. Die Vision einer voll lizenzierten Bank auf der Blockchain mit integrierter Compliance und einfach zu bedienenden Funktionen (einige davon sind normalerweise für institutionelle oder HNWI-Kunden reserviert) war geboren. Andere Merkmale, wie Vollreservebank und Marktplatzbasierten Dienstleistungen, sind Teil der Basis der zukünftigen Bank, inspiriert von der Finanzkrise 2008 und der libertären Philosophie. Mt. Pelerin hielt Ende 2018 den ersten öffentlichen Verkauf von tokenisierten Aktien in Übereinstimmung mit dem Schweizer Recht.

Das US-amerikanische Startup Ripple ist das bekannteste Unternehmen, das erstmals zu bedeutenden Schritten bei der Einführung der Blockchain-Technologie in Banken

A blockchain consists of a shared database (ledger), similar to a spreadsheet, saved on many computers simultaneously. They synchronize all data between each other, following a set of code-based rules instead of a centralized authority. These systems can be open source and available to everyone, a public blockchain, or controlled by a select group of participants, so-called private chains or distributed ledgers.

" As blockchain started with a real disruptive movement, most of the ideas emerged from early movers and bleeding-edge experiments in the startup sector. "

Many dominant market infrastructure providers see great potential in this technology. It would provide them with significant operative cost-cuts, efficiency gains, 24/7 market availability, and new financial assets and tools.

Startup Initiatives at the Forefront of Innovation

As blockchain started with a real disruptive movement, most of the ideas emerged from early movers and bleeding-edge experiments in the startup sector. The evolution of the efforts began in three phases: token offerings, proxy for share tokens, and finally, the tokenization of shares on the blockchain. The release of the Ethereum blockchain sparked broad interest in the use of smart contracts to represent business logic on the blockchain and automate cumbersome processes.

From the heart of Geneva, Switzerland, a startup called Mt. Pelerin began exploring the possibilities of the use for blockchain in banking and even creating a new bank on it very early on - freed from all legacy systems. The vision of a fully licensed bank on the blockchain with built-in compliance and easy to use features (some of them usually reserved for institutional or HNWI clients) was born. Other characteristics, such as full reserve bank and marketplace by design, are part of the foundation of the future bank, inspired by the 2008 financial crisis and libertarian philosophy. Mt. Pelerin held the first public sale of tokenized shares compliant with Swiss law end of 2018.

The US-based startup Ripple is the most prominent company that first contributed to significant steps in bring-

beigetragen hat. Eine Reihe von Tools ermöglicht es Banken, Geld fast in Echtzeit mit einem Blockchain-ähnlichen System zu senden. Namhafte Institutionen wie Santander, American Express und Standard Chartered sind bereits Teil des RippleNet. UBS und andere Banken prüfen Möglichkeiten, zukünftig die Vorteile des Netzwerks zu nutzen.

Unternehmensinitiativen

Bald nachdem die ersten erfolgreichen Startup-Initiativen, begannen Unternehmen, die Möglichkeiten von Blockchain- und Distributed-Ledger-Technologie zu untersuchen. Mit dem Markteintritt grosser IT-Unternehmen wie IBM mit maßgeschneiderten Blockchain(-ähnlichen) Infrastrukturen wurden die Chancen, in einer hoch regulierten Umgebung zu arbeiten greifbarer. DLT-Technologien wie Hyperledger Fabric von IMB und Corda von R3 ermöglichen es den Nutzern, auszuwählen, wer welche Berechtigungen auf dem gemeinsamen System hat. Sie integrieren sich besser in eine traditionelle Unternehmens(infra)struktur als die öffentlichen Blockchains.

Berühmte Anbieter und Börsen von Finanzmarktinfrastrukturen (FMI) haben Initiativen gestartet, um die Entwicklung einer Blockchain-basierten Handelsinfrastruktur voranzutreiben. Der Swiss Digital Exchange SDX, ein Projekt des führenden Marktinfrastrukturanbieters SIX, leistet beachtliche Pionierarbeit. Als ersten Schritt in Richtung zukünftiges Trading hat die Börse Stuttgart kürzlich eine App für den Handel mit Kryptowährungen veröffentlicht. Die Nasdaq, teilweise in Zusammenarbeit mit der SIX, untersucht den Einsatz von Blockchain für ihre Infrastruktur.

In Zusammenarbeit mit R3, einem Unternehmen, das Blockchain-Software anbietet, nahm die russische Alfa Bank an einem weltweiten Test für ein gemeinsames KYC-System zusammen mit 38 anderen führenden Banken teil. Das System ermöglichte den Banken und Kunden Zugriff, Aktualisierung und Genehmigung von Daten und Anfragen.

Eine weitere bemerkenswerte Zusammenarbeit zwischen R3 und der Alfa Bank ist eine Blockchain-basierte Plattform für die Zahlung von Versorgungsleistungen, die die Transparenz fördert und den Rückgang unbezahlter Versorgungsrechnungen begünstigen soll. Zudem patentierte russische VBT Bank (als erste Bank in Russland) ein "Multi-Emittenten-Blockchain-System", das den Aufbau von Peer-to-Peer-Zahlungssystemen ermöglicht. Die intelligente, vertragsbasierte Plattform bietet grenzüberschreitende Zahlungen und Treueprogramme für institutionelle und private Nutzer.

ing blockchain technology to banks. A set of tools allows banks to send money almost in real-time with a blockchain-like system. Notable institutions such as Santander, American Express, and Standard Chartered are part of the RippleNet already. UBS and other banks are exploring opportunities to use the advantages of the network in the future.

Corporate Initiatives

Soon after the first startup initiatives showed success, corporates began to investigate the possibilities of blockchain and distributed ledger technology. With big IT companies such as IBM entering the market with customized blockchain(-like) infrastructures, the chances to work in a red tape environment was made more manageable. Distributed ledger technologies like Hyperledger Fabric by IMB and Corda by R3 allow the users to select who has what permissions on the shared ledger. They integrate better with a traditional company (infra)structure than the public blockchains.

Famous financial market infrastructure (FMI) providers and exchanges have started initiatives in moving towards a blockchain-based trading infrastructure. The Swiss Digital Exchange SDX conducts notable efforts, a project launched by the leading edge market infrastructure provider SIX. Börse Stuttgart recently released an app for trading cryptocurrencies as a first step in the direction of future trading. Nasdaq, partially in cooperation with SIX, explores the use of blockchain for their infrastructure.

In collaboration with R3, an enterprise blockchain software firm, the Russian Alfa Bank participated in a world trial for a shared KYC system alongside 38 other top tier banks. The system allowed the banks, and customers to access, update, and approve data and requests.

Another noteworthy collaboration between R3 and Alfa Bank is a blockchain-based utility payment platform fostering transparency and driving the decline of unpaid utility bills. Russian VBT Bank patented (as the first bank in Russia) a "multi-issuer blockchain system" that enables the creation of peer-to-peer payment systems. The smart contract powered platform offers cross-border payments and loyalty programs for both institutional and private users.

Jurisdictions: An Arms Race

Switzerland moves atypically fast in the current emerging technologies environment. Hundreds of blockchain-centric companies have settled in Switzerland. National legislation is blockchain- and crypto-friendly and allows for
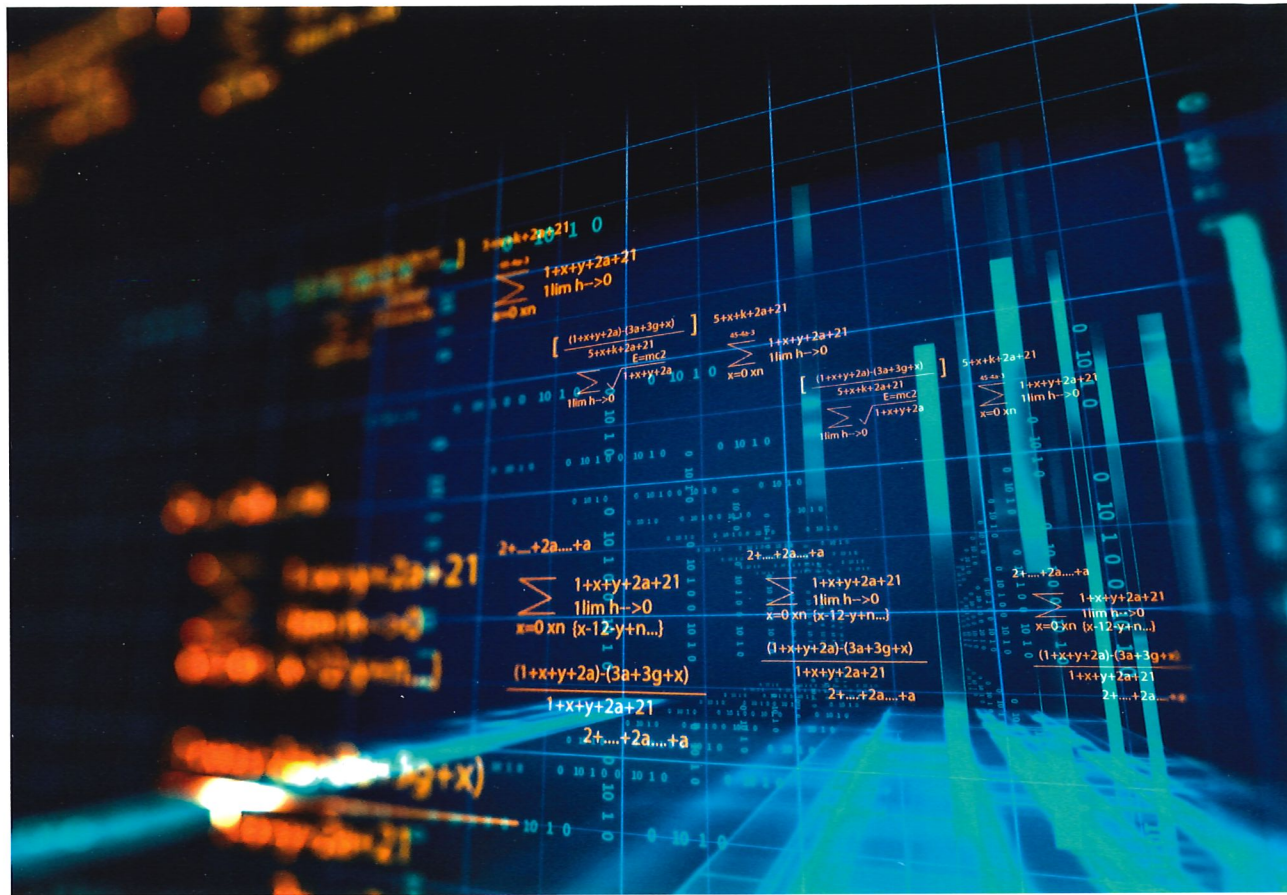
Rüstungswettlauf der Rechtssprechungen

Die Schweiz bewegt sich im aktuellen Umfeld der aufstrebenden Technologien atypisch schnell. Hunderte von Blockchain-zentrierten Unternehmen haben sich in der Schweiz niedergelassen. Die nationale Gesetzgebung ist Blockchain- und Krypto-freundlich und ermöglicht ein ausserordentliches Wachstum in diesem Sektor. Dies veranlasste die russische Wertpapierverwahrstelle (NSD), die Gründung des FMI-Projekts D3Ledger in der Schweiz bekannt zu geben und mit dem Schweizer Early-Mover Lykke zusammenzuarbeiten, um ein dezentrales Digital Depository zu schaffen. Blockchain macht die Finanzmärkte nicht nur kostengünstiger, effektiver und weniger umständlich in der Wartung, sondern auch die Welt zu einem kleineren und besser vernetzten Ort und fördert die internationale Zusammenarbeit. Kleine Jurisdiktionen wie die Schweiz gewinnen an Dynamik, indem sie sich schnell auf den schnelllebigen, hochinnovativen aufstrebenden Technologiesektor einstellen.

Alle Marktteilnehmer, vom Anbieter bis zum Endverbraucher, werden vom technologischen Wandel profitieren. Die Blockchain ist für sie nicht unbedingt sichtbar, dient aber effizient ihrem Zweck unter der Haube. Die Finanzmärkte kommen endlich im 21. Jahrhundert an. ∎

extraordinary growth in the sector. This lead the Russian Securities Depository (NSD) to announce the incorporation of the FMI project D3Ledger in Switzerland and to collaborate with the Swiss early-mover Lykke to create a Decentralized Digital Depository. Besides rendering financial markets less costly, more effective, and less cumbersome to maintain, blockchain also makes the world a "smaller place," a better connected one, and fosters international cooperation. Small jurisdictions like Switzerland gain new momentum by quickly adapting to the fast-moving, highly innovative emerging technology sector.

All market participants, from the provider to the retail user, will profit from the technological shift. Blockchain is not necessarily visible to them, but serves efficiently its purpose under the hood. The financial markets are finally arriving in the 21st century. ∎

TAXING ROBOTS

Xavier Oberson, Professor at the University of Geneva, Attorney-at-Law, Oberson Abels

Towards a taxation of robots

The development of Artificial Intelligence (AI) and, in particular, of robots has become an issue of global significance. The use of robots is becoming increasingly frequent in all aspects of our lives, first in industry and more recently in the service and entertainment sectors. Increased use has positive impacts as robots can now replace difficult, repetitive or even dangerous activities (such as cleaning polluted sites) and encourage efficiencies. New generations of robots are now capable of engaging in increasingly sophisticated activities and are able to learn and improve their skills in a practically unlimited fashion. This in turn leads not only to significant ethical problems, but also to social, economic, and legal issues and, of course raises concerns as regards employment.

As robots are gradually able to replace most human activities and, to a certain extent, more efficiently, a quest for a new type of separate legal identity has begun to surface. On 1st January 2017, the Parliament of the European Union approved a report with various recommendations based on the idea of the emergence of an 'electronic personality' for robots[1]. We, for our part, among others, have developed the idea of taxing robots[2]. Indeed, a new form of fiscal (taxpayer) capacity could attach to robots in line with the growth of their autonomy.

The concept of a new form of fiscal capacity for robots also stems from a double perspective. First, robots could,

ultimately, replace most human activities and thus have a major impact on employment. This in turn may lead to tax losses while increasing the social security deficit. Secondly, and simultaneously, the need for additional financial resources will increase to match the growing number of unemployed. At the same time, due recognition should be given to the benefits resulting from the widespread take-up of robots. Their growing use, encouraged by innovation, will increase efficiency and global growth. And yet, it may prompt demands for additional financing, particularly to meet social security requirements.

Proposing to tax robots or their use requires prior agreement on three fundamental issues: (i) an adequate definition of the taxable entity; (ii) a delimitation of the taxable base; (iii) an analysis of the type of tax to be applied. These questions trigger a vast array of issues which are beyond the scope of the present analysis. Addressed here are simply the grounds justifying the (direct) taxation of robots.

To be taxable, robots must be clearly legally definable. This task is in fact rather tricky. Some legal definitions have, however, already been suggested. They all tend to concentrate on the autonomy of robots and their decision-making process. From a tax standpoint, attention should perhaps, be paid to the use of AI that enables robots to take decisions, to act autonomously and to learn in a manner far and away surpassing the abilities of a simple machine. In this context, the shape of the robot (i.e. whether it has a human appearance or not) seems, to us, to be irrelevant.

Introducing a new form of taxation of robots is the consequence of the recognition of a new specific tax identity. In fact, this latter aspect is not new: more than a century ago, the concept of a separate legal personality was first

---

[1] See European Parliament, 'Report with Recommendations to the Commission on Civil Law Rules on Robotics' (A8-0005/2017).

[2] See Xavier Oberson, Taxing robots. Helping the economy to adapt to the use of artificial intelligence. Elgar Publishing (UK/USA), 2019; by the same author "Taxer les robots?", Bilan, 6 July 2016, p. 16.

developed. At the time, the purpose was to encourage entrepreneurship and to offer people the possibility to create a limited liability entity. As new needs arose, other specific tax identities were also introduced. For example, investment funds which have direct holdings in real estate are considered to be legal entities under Swiss tax law. This demonstrates that legislators can very well – if the need arises – consider creating a new fiscal identity for robots, insofar as they can be adequately defined and the legal basis for this definition is constitutionally sound.

Be that as it may, for the time being the robot replaces an otherwise remunerated activity (labour or a service) without itself possessing the corresponding financial capacity. It does not have its own funds as would a traditional legal entity. As a result, in our opinion, at this stage, it is not the robot itself which should be taxed but, at least initially, its use. Thereafter, at a later stage, one could even recognise a taxpayer capacity specific to robots, if the technology allows them to be attributed a payment capacity (electronic liquidities, capital, etc.).

As robots are recognised as having some kind of a taxpayer capacity, several types of taxation can be envisaged. Based on the premise that a robot will replace a human being, including the salary which the latter would receive, a tax could be envisaged on the hypothetical salary imputable to robots, corresponding to what the robot would receive for equivalent work carried out by humans. This concept is clearly based on the legal relationship between the undertaking or company having or using the robot and the robot itself, considered as a legal entity – in much the same way, for example, as in the case of an employment contract.

The idea of introducing a tax on a hypothetical imputable income is not a new one in tax systems. For example, some States such as Switzerland have long collected from landlords a tax on rental value. This taxation corresponds to the hypothetical income which the landlord would have had to pay to occupy the property. Similarly, a tax on the hypothetical salary imputable to robots could be based on the fact that the robot replaces, without any compensation, the salaries paid to humans. It results therefrom that this notional income (salary) should also be liable to social security contributions.

If a tax were to be levied on the income (profits) imputed to the robot's activities, the question of double economic taxation could arise. In most cases, robots will be held by limited companies, already subject to corporation tax, in which case the income, or at least part of it, would be taxed twice: first, on the robot, and then on the company. However, this situation is not without precedent. Compar-

ing robots to workers, their salary is a tax deductible expense in the company's accounts, thereby avoiding double economic taxation. Robots, meanwhile, are considered in most States as depreciable assets. This is particularly so since technological development will render them rapidly obsolete. Another logical solution would be to introduce a deduction of an imputed salary as an expense in the books of the company using the robot. In this case an adjustment would be needed to avoid cumulating the deduction for depreciation with that for the imputed salary.

The issues raised in this article will certainly transcend national frontiers. They will need to be considered globally, taking into account recent developments in international tax law at the OECD and the UN. The debate on the taxation of robots is just beginning. Given the dizzying progress in AI, the debate is timely. For once (if not the last time), a future taxpayer may be programmed into the system without his assistance... ∎

TECH-4-GOOD

George Atalla, EY Global Government & Public Sector Leader

How AI can be a force for good in government?

Around the world, companies are using artificial intelligence to automate mundane tasks, make better decisions and improve the customer experience. But AI isn't the unique preserve of the private sector. Governments also recognize the potential of these technologies to transform the way they organize themselves and run their processes. And they're waking up to the fact that citizens expect the same revolution in services that they've experienced from the private sector.

That means governments having a single view of citizens' data, and sharing it in a relevant way across departments while protecting their privacy. It also means using that data to create new services, anticipate what citizens will need next and take action to prevent crises.

AI offers governments two big opportunities that don't apply to the private sector:

1. **It allows them to structure and analyze the huge amount of data they hold on citizens – and use it for social good.** This means they can quantify and reduce inequalities in outcomes as well as opportunities. They can also share the data with third parties, who can create apps or services that improve life for citizens, while making sure those parties keep the data private.
2. **It gives them a unique chance to drive how citizens use and benefit from these technologies.** That's because governments are also responsible for role-modeling the ethical use of AI, regulating how companies apply it and educating citizens to be ready for its challenges.

But by deploying AI, governments expose themselves to the same risks as companies – such as building bias into algorithms. And because of their regulatory role, it only takes a big data breach, such as the recent compromise of personally identifiable information of 30,000 US Department of Defense personnel, to damage trust in government irreparably.

This complex picture is why we recommend that governments use a "trusted AI" framework. This will make sure they not only consider how an AI-based system performs, but also identify and mitigate the risks inherent in every stage of the solution. For example, they can make it clear to citizens that they're dealing with an algorithm as a service, so they can opt out or transfer to a human.

What exactly is AI and how can it help governments?

The growing expectations of citizens is just one of the challenges facing governments today. Rapid urbanization, an aging population and complex socio-economic problems are putting public services under strain. And with low economic growth keeping budgets down, governments need to find solutions that are both efficient and sustainable.
AI is a set of technologies and capabilities that can help governments to solve these challenges. It does so by supplementing certain human competencies or, in some cases, replacing them.

It consists of three main areas:

1. Sensing. AI can augment or replace human sensory capabilities, speeding up simple tasks such as visual detection. For example, AI software can automatically analyze street and traffic cameras in real time. So governments can make the best use of public transport, reduce pollution and manage the flow of traffic.
2. Thinking. AI and related technologies, such as machine learning, deep learning and natural language processing, can analyze and process large volumes of data much faster than humans, and in some cases, more effectively. Some governments are already using these technologies to help teachers fill the gaps in teaching and learning – for example, by carrying out admin tasks and tailoring learning to different pupils' needs.
3. Acting. AI and related technologies such as intelligent automation (think virtual assistants or chatbots) can

take simple decision-making tasks off humans. This frees up time for front-line workers to focus on activities that improve services and the citizen experience. During the Winter Olympics in South Korea, for example, several humanoid robots, equipped with AI-powered translation software, were used to provide information to visitors and athletes.

What will AI mean for jobs?

Applications such as these will help to build citizens' trust in governments and overcome any public perceptions that they're difficult to deal with. But to maintain that trust, governments will need to make clear to both employees and citizens that AI won't spell the death of all jobs. In fact, in its recent report, the World Economic Forum noted that AI technologies could displace 75 million mundane or repetitive jobs. But they could also create 133 million new jobs, which would be more skilled or creative.

For example, AI technologies can recognize, understand and draw insights from vast amounts of unstructured data. As a result, government officials, particularly in planning, HR, customer service and procurement, will effectively become the managers of AI models – monitoring and adjusting them when needed. They'll also be able to use the insights they gain to make more informed decisions and allocate resources better.

So while AI may remove the need for routine or manual labor, overall, it'll augment human intelligence – not replace it.

AI in action

It's our view that governments that use AI wisely can overcome current challenges and transform life for citizens. Over a series of articles, we'll look at six areas in which they can do this. We'll also cover the need for governments to regulate AI, and how they can roll out AI-based systems effectively.

We've listed the six areas below and provided a real-life example for each.

Improving public finance management
The UK's Department for Work and Pensions has tested the use of algorithms to identify and crack down on criminal gangs defrauding the benefits system. The algorithms have been able to detect cloned identities among billions of items of data. By rolling them out across the whole benefits system, officials hope to prevent the loss of millions of pounds.

Building the cities of the future
Singapore is working hard to get self-driving taxis on the road as part of its Smart Nation initiative. It's even built a mini town as a test park for its driverless buses. The aim is to lower people's dependence on cars, reduce greenhouse gas emissions and make it quicker and easier for citizens to get around.

Making life safer for citizens
The Kanagawa Prefectural Police in Japan plan to trial predictive policing before the 2020 Tokyo Olympics. Their AI-based system will analyze big data to see if the same perpetrator is behind several crimes. It'll also predict where crimes are likely to happen and when. By acting on its insights, officials will reduce crime and make Tokyo safer.

Improving national defense and security
Researchers at Massachusetts Institute of Technology in the US have worked with a tech start-up to develop an AI system that can detect 85% of cyber attacks. The system will help officials to prevent security leaks by making decisions early. In the long term, they'll also be able to improve their security systems and prevention strategies.

Giving citizens a better experience
Local governments in Denmark are using AI to analyze posts by citizens on their social networks and identify the biggest issues they face. This allows them to respond to issues proactively and use predictive analytics to address problems before they emerge.

Helping vulnerable citizens such as children, the homeless and substance abusers
We've worked with a London borough to pilot an AI-based system to identify children in need of safeguarding. The system had an 85% success rate, and in just seven months, it identified 1,700 families that would benefit from targeted services.

Are you ready to adopt AI?

Before your organization and citizens can start reaping the benefits of AI, you need to answer some fundamental questions. These include:
- Do you store and manage your data in the cloud?
- Can you integrate data from diverse agencies?
- Have you created relevant roles in your organization, such as chief data or digital officer?
- Do your employees understand what AI technologies you're introducing, why, and how the change will affect them?

Answering these questions will help your organization have a clearer understanding of its current capabilities and the type of work needed to move ahead. ∎

AMAZING ARTTECHS

TO DEMOCRATIZE & ENHANCE
ARTS & CULTURES, TECHNOLOGIES & EXPERIENCES

Caroline Coquerel Kokocinski, startup Coach & artTechs Promoter

What are artTechs?

artTechs are a huge trend, existing for more time that usually considered. This trend is accelerating, in Switzerland and abroad, gaining more and more traction. Finding no official definition, I like to share, with usually very enthusiastic feedbacks, that artists have always been explorers of techniques and technologies, entrepreneurs, explorers of innovation; when these two worlds meet, what raises is amazing and outstanding, generating a huge diversity of possible applications. We can consider artTechs as new structures or realizations at the intersection of the worlds of arts & cultures, innovation & technologies. It lets the freedom to get inspired, be creative and to interpret artTechs with a wide diversity of possible interpretations.

An old and arising new paradigm

artTechs are somehow an old paradigm, which is raising again. Indeed, since recently arts & cultures and sciences & technologies where not so opposed. As Leonard de Vinci, several geniuses or explorers of innovations, where versed in both arts & sciences, these two disciplines being closely interrelated, inspiring each other & driving to outstanding realizations.

Afterwards, a paradigm raised enhancing sciences & technologies as main topics driving to successful education, as a distorted image of artists completely apart from these worlds. However, to perform arts, artists learn deeply a wide variety of sciences, as anatomy to represent the bodies, chemistry to prepare pigments or ceramics, physics & waves to perform music, and they have always been investigating new techniques & technologies. We can consider Yves Klein developing his International Klein Blue, the Delaunays exploring painting in relation to music vibrations. Therefore, and after discussions with several artists, artistic world has always kept his link to scientific & innovation worlds, which is not always the case on reverse.

But this is evolving, removing again the frontiers between these two worlds, for the best of both.

Why now? There can be a diversity of factors, from seek for meaning of our humanity apart from a pure scientific point of view, new sources of information with exponential content available to everyone on every topics which inspires people & enhances knowledge & creativity, as developments of new technologies & data and decreasing of their cost, giving the opportunity to reinvent more easily all worlds.

This makes artTechs concern all dimensions and types of arts and all types of technologies, with very impressive results and new experiences. Here are some examples among others.

All arts & technologies! For you

In music world, to enhance your practice experience, Tomplay invented a unique interactive music sheet. You can play your music instrument accompanied by other instruments or a full orchestra. Showing great success, Tomplay announced recently above 400'000 users.

As outstanding experience, more and more people discover the Carrières de lumières which exhibitions about Klimt and currently Van Gogh, are among the most celebrated. Experiences and relations to pieces of arts is just amazing and success so huge that it was recently announced that similar projects will be developed in different cities.

In gaming, Opticale develops a unique game to let us discover the astral world, a world parallel from ours. Its existence is being attested by the fact that a lot of creatures are the same in a lot of religions & cultures. The game uses the latest technologies as Augmented Reality asso-

ciated with impressive designs, to let you detect in your everyday life, astral creatures around you.

All arts & technologies! For professionals

Professionals for arts & cultures are also concerned by artTechs. As art-recognition which targets the market of art forgery, collaborating with and offering to experts and authorship of artwork, new tools to help identify fake pieces of art, combining specific algorithms, artificial intelligence, data and a dedicated ecosystem.

In the movie world, LargoAI develops a unique solution combining artificial intelligence & data analytics to help assess the potential of a movie, analysing precisely emotions as well as several parameters to predict audience responses. LargoIA recently won first-ever San Sebastian Film Festival Zinemaldia & Technology Startup Challenge!

Democratizing arts & proposing new dimensions

By my collaboration since years with these organizations, I identified some interesting learnings.

artTechs organizations usually aim at democratizing arts and create new experiences, while raising interest & create new entry doors to new publics to arts & cultures. Thus, more and more cultural institutions propose interactive experiences to attract non-usual visitors, as interactive pieces of arts, virtual or augmented reality experiences, until gaming & escape rooms, collaborating with artTechs organizations.

Open new doors to the arts & art market and make is more accessible or transparent to the public: some consider that art market is dedicated to an elite and quite opaque. Different artTechs initiatives aim at changing this, as Expertiz which proposes accessible and rapid authentication of a piece of art, or all the initiatives around Blockchain or digital certification of pieces of arts, as ARTMYN and the first biometric art passport.

artTechs also open new doors to professionals to technologies, providing them new tools & the latest innovations for performing their activities.

Great potential of Switzerland already with international recognition

The Lemanic area, as all Switzerland, is a perfect location for developing artTechs, with a unique mix of cultural, academic and public & private ecosystem, internationally recognized.

Indeed, Switzerland have an extensive representation of well-known cultural, musical & museal institutions, while proposing a great combination of academic organizations & internationally recognized schools on both arts & cultures and technologies & innovation. On innovation side, Switzerland is considered among the most innovative place in the world with an impressive ecosystem for start-ups. Few knows that this ecosystem considers artTechs organizations. And more and more Swiss start-ups are internationally recognized.

Moreover, very interesting initiatives are raising, as Numerik Games in Yverdon or the recent call to gaming projects of Canton de Vaud. A trend which can be observed in several Cantons, however not yet sufficiently federated & recognized.

A huge trend not yet sufficiently recognized

Fascinated by arts, illustrating myself, I naturally started to coach artTechs startups around 6 years ago. Step by step, meeting and collaborating with more and more artTechs organizations, and fascinated by these organizations & personalities, somehow different from the other topics, I realized that there were much more organizations in Switzerland that is usually considered. Today, more than 40 organizations take part to the artTechs platform, much more are identified, up to 2 to 3 new organizations per week!

Observing the trend of initiatives in relation to artTechs within all types of organizations, which is now accelerating, I also realized that these where not sufficiently recognized. They until recently did not know each other, are just starting to be visible, generating recent but growing interest.

These structures have an impressive potential, concerning all arts & technologies, Switzerland being a perfect place for these to emerge, and these organizations enhancing Swiss image abroad. They represent a huge market, as the exponential gaming one. After the SuperData review in 2018, only the video game industry generated worldwide revenues of $ 120 billion in 2018, with an increase of 13% in 1 year.

A lot of focus is put on topics as Bio-MedTech, FinTech and PropTech. This is the right time for artTechs to become one of the next topics. To raise awareness on these fascinating artTechs, show its exciting diversity, generate collaborations & recognition. And more generally, to make be recognized this exciting and super dynamic artTechs.
I invite you to discover all these organizations and fascinating personalities, and in some months the results of a new & ongoing study on artTechs. ∎

> www.arttechs.io

SANDOZ FOUNDATION HOTELS

Aside from a keen sense of upholding legacy, with their overwhelming love for the arts nobody could have imagined that the Sandoz Family or the Family Foundation founded in 1964 by Edouard-Marcel Sandoz would make their mark in hospitality. And yet fuelled by ethics and love for Swiss values, the Sandoz Family Foundation now runs six exceptional establishments which each fly their own flag for a tradition for hospitality, authenticity and classic Swiss excellence which they intend to keep alive.

Edouard-Constant Sandoz (1853-1928), the Basel businessman who founded the dynasty, spent a lot of time at the Lausanne-Palace following his wife's death and invited his son Edouard-Marcel, a renowned painter and sculptor, to enjoy the Beau-Rivage Palace's lake setting with his family every summer. The artist turned shareholder and manager cherished this gem of Swiss hospitality until he passed away and it naturally became part of the Sandoz Family Foundation's legacy. The collection expanded with the acquisition of Lausanne Palace, a luxury villa in a prime city centre location.

Edouard-Marcel Sandoz had loved Ouchy, the locals' favourite lakeside area, since his childhood and avoided the destruction of historical buildings such as the Hôtel d'Angleterre and Château

d'Ouchy, threatened by a real estate project which would mar the charm of this former port area in the early "60s". These two architectural gems joined the Sandoz Family Foundation a few decades later in a nod to Edouard-Marcel Sandoz's work. The expansion of the Sandoz empire ties into the encounters and friendships that were made and flourished. As long-standing friends of the Seiler hotelier family, together they took on the Zermatt heights to turn a mountain hotel into a "Five Star" paradise in Riffelalp (2222 m above sea level). The acquisition of the Hôtel Palafitte, a one-of-a-kind stilt construction on Neuchâtel Lake paid tribute to the family's Neuchâtel roots.

The Sandoz Foundation Hotels emerged in 2016 with its slogan **"Six hotels, six stories, one soul."**

BEAU-RIVAGE PALACE *****

This renowned palace with over 150 years of history is a real haven of peace nestled deep in some of Switzerland's most incredible scenery amidst the lake, mountains and terraced vineyards. The exceptional 168-room hotel believes that good hospitality, rest and exploring Swiss heritage make for an unforgettable stay.

The Beau-Rivage Palace is a famous temple to gastronomy in Lausanne with a wide array of cuisines to tantalise guests' tastebuds. It has had the honour of playing host to the French chef with the most Michelin stars in the world, Anne-Sophie Pic, for 10 years.

Home to almost a thousand archives, the hotel's highlights include the opulent glass-domed Sandoz ballroom and the stunning pure white La Rotonde function room. The unique setting also has a dozen little function rooms ideal for meetings and intimate celebrations along with a steamboat for private functions. The crowning glory of the Beau-Rivage Palace experience is the 1500 m² Cinq Mondes spa where guests are taken on a unique journey through the world's treatments.

© Beau-Rivage Palace