Blockchain

Technology Report

Vienna,
June 2020

Dear readers,

Vienna is one of the top five ICT cities in Europe. The city contains about 6,200 ICT companies (8 per cent of all the companies in Vienna), generating combined annual sales of more than EUR 20 billion. The approximately 8,900 national and international ICT firms in the Vienna region (comprising Vienna, Lower Austria and Burgenland) are responsible for over two-thirds of total ICT sales in Austria.

According to various studies, Vienna is particularly strong in innovation, the comprehensive support of startups and its strong focus on sustainability. Vienna also features in the top places in many “smart city” rankings. The city is an impressive business location, providing a supportive climate for research and technology, geographical and cultural proximity to growth markets in the East, high quality infrastructure, an outstanding education system and, last but not least, the best quality of life in the world.

The Austrian capital has launched the Vienna 2030 strategy to focus on areas in which the city is already enjoying notable success, hoping to find solutions to the great challenges of the coming years – from climate change to digitalisation. Over the next ten years, the strategy aims to make Vienna a world leader and develop particularly powerful innovations (“Vienna solutions”) in six key areas. A key theme is the digitalisation of Vienna, in which high-quality digital solutions from Vienna will gain international recognition for fairness, transparency, security and autonomy. The plan is for Vienna to become a city known for developing and implementing digital solutions, sustainably and inclusively engaging its population in a new philosophy of digital humanism.

New technologies such as Blockchain provide opportunities to initiate new business models and optimised processes, transparent and secure in “Viennese quality”.

The Vienna Business Agency functions as an information and cooperation platform for Viennese technology developers to ensure that the city’s potential as a location is fully realised. The Agency assists companies to make connections with development partners and key customers in business, science and city administration, and supports Viennese companies with targeted funding and a wide range of consultancy and support services.

This Technology Report provides an overview of a wide range of trends and developments around the topic of blockchain in Vienna, highlighting prominent experts, actors and activities in Vienna.

Your team at the Vienna Business Agency.

Europäische Union Investitionen in Wachstum & Beschäftigung. Österreich.
EFRE
vienna business agency

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Blockchain: a new, old architecture for digital innovations

1.1. Blockchain architecture

For many years now, blockchain has been talked about as a new form of digital architecture that can be used to interact over the internet. Many sub-categories and synonyms have grown up around the central concept, and blockchains are also described as truth machines[1] or trust machines[2]. These terms derive from the fact that a blockchain operates with "zero trust", that is, no human trust is involved; the system instead works by machine consensus. Blockchains arrange blocks in rows, with each block linked to the previous one – where there are multiple options for subsequent blocks, the longer chain with the higher quality (difficulty according to hashing power[3]) survives. This process is known as the Nakamoto Consensus[4], after its inventor Satoshi Nakamoto, who used it for the first time with his creation Bitcoin (2008). Today, in 2020, many different types of blockchain have been developed, along with various approaches to consensus mechanisms that are no longer based solely on the Nakamoto Consensus.

To understand the development and significance of blockchain, it is sufficient to take a look at the history of the internet. This system developed from its originally decentralised architecture to a centralised model – and may, with the use of blockchain and the advent of the so-called Web 3.0, become decentralised once again.

1.1.1. From ARPANET to Web 1.0

The original architecture of the internet was not centralised. It was actually a US Department of Defense project to create a protocol that could withstand unpredictable events and catastrophes such as war. This meant a decentralised system was required, so that if one part of the system should fail, the rest would remain functional. The system also had to permit decentral communication using peer-to-peer connections, without the need to rely on a single computer. It all began with the ARPANET on 29 October 1969, when the first successful message was sent from a computer at the University of California, Los Angeles to another computer (also known as a node) at the Stanford Research Institute (SRI). After a period during which these developments became institutionalised, the internet took the form of the global network we know today[5]. Tim Berners-Lee invented today's "World Wide Web" in 1990, while working on the very first web browser at CERN[6]. In 1995 the current form of the "Internet" started with the distribution of the freely available browser "Netscape Navigator": the Web 1.0.

1
www.technologyreview.com/s/610781/in-blockchain-we-trust/

2
distributingchains.info/wp-content/uploads/2019/06/DisassemblingTrustMachine_Brekke2019.pdf

3
en.bitcoin.it/wiki/Difficulty

4
blockonomi.com/nakamoto-consensus/

5
hackernoon.com/the-evolution-of-the-internet-from-decentralized-to-centralized-3e2fa65898f5

6
archive.org/details/timbernerslee0000mcph

1.1.2. Web 2.0 – commercialisation, centralisation and social media

Although some critics predicted that the internet would be nothing but a temporary fad and would, like the dotcom bubble, disappear entirely by the end of the 1990s, the reality was quite the reverse: the phenomenon grew steadily, in no small part as a result of its commercialisation. As commercial interest grew in tandem with internet usage, many new channels such as social media platforms came on the scene – and so the "Web 2.0" was born. Information about internet users was collected and sold as a product, then used to target advertising materials and services offered to users[7].

The Web 2.0, which also came to be known as the participatory or social web, was based on user-generated content as well as the strong interoperability of the platforms. Darcy DiNucci first invented the term Web 2.0, but it was made popular by Tim O'Reilly in his capacity founder of O'Reilly Media – one of the best-known media houses for books on technology. The interactive Web 2.0 was now in competition with the news media as a source of information. A prominent example is the first video to appear on YouTube, entitled "Me at the Zoo"[8], which was uploaded to the platform by one of the founders on 23 April, 2005 at 8:31 pm (Pacific Time). Now, in 2020, 2 billion users are active on YouTube, 30 million of these visiting the platform daily. 500 hours of new content are added every minute[9].

There is a darker side to the commercialisation and fragmentation of the internet, however, as Greek author Zizi Papachrissi declares in her book "A Private Sphere: Democracy in a Digital Age". She describes the social change that accompanies the changing channels, including the emergence of a new kind of digital narcissism displayed by influencers, bloggers and self-promoters. The best-known example of uncontrolled growth in the Web 2.0 is the explosion of "alternative facts", often called "fake news". This is where the downsides of fragmentation, or decentralised participation, become apparent.

1.1.3. Apps: the end of the web?

Chris Anderson and Michael Wolff, in their 2010 article "The Web is Dead. Long Live the Internet"[10], pictured the end of the world wide web – the end of the "classic" internet. Video (YouTube) at that time represented more than 50 per cent of all web traffic, with the classic web responsible for only 23 per cent of usage. Apps were beginning to replace the open internet, with so-called freemium models undermining the open, free nature of the network (the generative internet).

1.1.4. From Web 2.0 to Web 3.0: from Apps to ĐApps

At the time of the Anderson and Wolff article (2010), the first blockchain (Bitcoin) was already active and online: a new system which not only demonstrated a criticism of the dominant financial system, but would also go on to critique the centralisation in so-called data silos. The first mention was made of the "Web 3.0"[11], a new type of architecture made possible by the Ethereum network[12], in April 2014. Decentralised data, smart contracts and shared communication (messaging) were discussed, along with new possibilities for organisational structures (decentralised autonomous organisations).

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If, since the time of the Web 2.0, apps were responsible for the further fragmentation of the internet, in the new, decentralised Web 3.0, ĐApps can be regarded as the answer to this loss of control. Gavin Wood, co-inventor of the Ethereum Protocol, describes the Web 3.0 in his blog[13] as the "post-Snowden web". This was the first depiction of the decentralised nature of blockchain as a means to regain data sovereignty.

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hackernoon.com/the-evolution-of-the-internet-from-decentralized-to-centralized-3e2fa65898f5

8
www.youtube.com/watch?v=jNQXAC9IVRw

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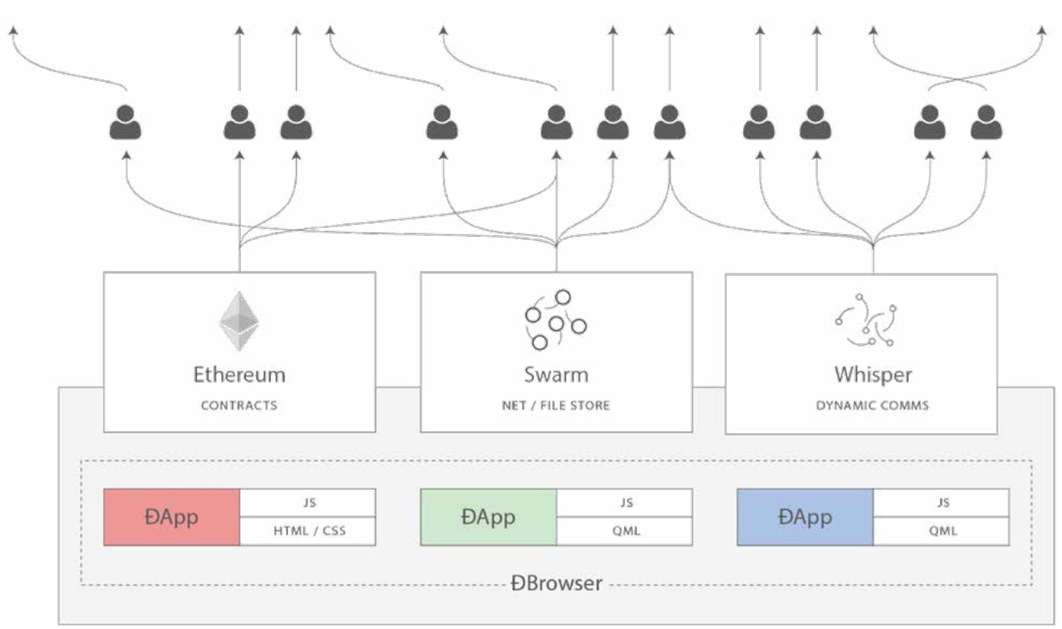
omnicoreagency.com/youtube-statistics/

10
wired.com/2010/08/ff-webrip/

11
gavwood.com/dappsweb3.html

12
blog.ethereum.org/2014/08/18/building-decentralized-web/

13
gavwood.com/dappsweb3.html



An initial representation of the Web 3.0 Source: Ethereum Blog, 18 August 2014

1.1.5. Blockchain – the backbone of the new internet

Blockchain is the major pillar of the technology behind the next generation of the internet, the decentralised Web 3.0. The distributed architecture of the truth machine allows us to trust the results of the system without having to trust individual participants in the system (keyword: zero trust). Blockchain is a collaborative, trustworthy and open transaction book that anyone can look at, but which cannot be controlled by any single user. It is a distributed database managing a constantly increasing list of transaction records, which are cryptographically protected against tampering and revision. A blockchain protocol currently functions as an additional layer on a P2P network of computers that all execute the protocol and all possess an identical copy of the transaction book. These P2P transactions are enabled by machine consensus without any intermediaries. The transaction book is constructed using an interconnected list or chain of blocks, in which each block contains a certain number of transactions (or information) that have been validated by the network within a specified time period. Instead of a single trusted third party validating transactions through its servers with authority (single vote), a peer-to-peer network of computers running the blockchain protocol validates transactions by consensus (majority vote). In this way, the blockchain protocol formalises pre-defined consensus regulations for approving transactions in the P2P network as hard-coded control rules that manage and automatically establish the transactions of all participants in the network[14].

1.2. Types of blockchain

A consensus between two or more people can be reached by a wide variety of means. There are in principle roughly three variations in blockchain: public blockchains, federated or consortium blockchains and private blockchains.

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s3.eu-west-2.amazonaws.com/blockchainhub.media/Blockchain+Technology+Handbook.pdf

1.2.1. Public blockchains

Public blockchains can be seen by anyone, anywhere. Anyone can generate, send and receive transactions. Every person is able to participate in the consensus process. Bitcoin operates on this kind of public blockchain, and its inventor (Satoshi Nakamoto) described this participative aspect of blockchain as “one CPU, one vote”. As an alternative to centralised architectures, public blockchains are secured by cryptoeconomy. This is defined by a combination of economic incentives and cryptographic verifications using mechanisms such as “proof of work” (PoW). The general principle here is that the degree to which anyone can influence the consensus process is in direct proportion to the amount of economic resources that he or she can contribute.

1.2.2. Consortium blockchains

Consortium blockchains are blockchains in which the consensus process is controlled by a pre-selected group of nodes. For example, this could involve a consortium of 15 financial institutions, each of which operates a node. To ensure a block becomes valid in this kind of network, at least ten of the network members must sign the block. The right to read the blockchain can be either public or restricted to members. In addition, there are also hybrid paths (e.g. the root-hashes of the blocks) that are public and, in combination with an API, permit members of the public to make a limited number of requests and to receive cryptographic evidence of certain aspects of the blockchain’s status. This type of blockchain can be classified as “partially decentralised”.

1.2.3. Completely private blockchains

A completely private blockchain is a blockchain in which the write permission remains centralised within an organisation. Read permission may be public or restricted to a selected group. The most common applications of this type of blockchain are database administration, revision and similar applications within a single company, in which public readability is in many cases impossible, while in other cases public verifiability may be desired[15].

15
blog.ethereum.org/2015/08/07/on-public-and-private-blockchains/

agents. Topics within this trend include open source hardware, machine agency and NFT (non-fungible token).

○ Fractional ownership

The fractional ownership method refers to the option of distributing risks and separating resources from assets such as land or artworks. Although the term has been around for some time, it is only recently that this method has been used in the context of blockchain – predominately in the real estate sector, but increasingly in the areas of art and luxury goods as well. Decentralised governance also allows for possibilities such as distributed resource management. Democratic processes can be applied to these shared resources by means of e-voting. The decentralised method provides a means of managing common property (commons). Sub-topics include decentral autonomous ownership and smart commons.

2.1 Blockchain – science, research and business

Since the creation of Bitcoin as the first blockchain, many established industry sectors (the energy sector, the supply chain sector, the finance industry, etc.) have made use of this technology to various degrees. The main trend of blockchain use lies in the finance sector, with examples such as the development of Facebook's Libra with the concept of DeFi (decentralised finance) and the Open Finance movement. The RIAT Institute for Future Cryptoeconomics[16] has identified the main trends and the following key issues for 2020 and subsequent years.

○ Data sovereignty

Data sovereignty refers to the greatest possible control and command of one's own data. This concept, also known as "digital sovereignty", involves being able to handle one's personal data in a self-determined way. The Web 3.0 enables its developers and users to achieve data sovereignty, as well as enabling companies to process personal data in compliance with the GDPR. Topics within this trend include digital identity (self-sovereign identity) and data marketplaces.

In the context of the global coronavirus pandemic, the Chaos Computer Club (CCC) and the Foundation for Data Protection in Germany warn against COVID-19 tracing apps[17]. The debate around PEPP-PT and DP3T[18] technologies has significantly increased public awareness of data sovereignty in the health sector.

○ IoT und Blockchain

The Internet of Things has been a trending topic for many years, but it has so far failed to achieve broad distribution. The IoT connects people, places and products and opens up new possibilities for added value. Blockchain could provide the breakthrough moment for the Internet of Things, especially when machines are considered to be their own economic

In 2018, the Vienna University of Economics and Business (WU Wien) established the Research Institute for Cryptoeconomics. The institute currently comprises three on-site research personnel as well as three additional researchers investigating projects on blockchain & sustainability and token engineering. The Blockchain & Sustainability project is investigating the potential of blockchain technology for overcoming social and ecological challenges in accordance with the UN Sustainable Development Goals (SDGs). The Token Engineering project is focussed on the development of taxonomies and modelling, prediction and evaluation instruments for tokens as a key element of decentralised applications based on blockchain. At this time, 16 professors from eight WU Wien departments are assigned to the research institute. In total, 28 employees of WU Wien are engaged in interdisciplinary research into cryptoeconomics.

16 riat.ac.at/projects

17 www.ccc.de/system/uploads/299/original/Offener_Brief_Corona_App_Bundeskanzleramt.pdf

18 www.coindesk.com/european-contact-tracing-consortium-faces-wave-of-defections-over-centralization-concerns

ABC – Austrian Blockchain Center

BASED	in Vienna
MEMBERS	● 21 research facilities ● 17 associated partners (public and non-profit) ● 61 commercial partners
5 AREAS	● Area 1: Cryptography, Technology & Security (lead: SBA Research) ● Area 2: Cryptoeconomic Modelling & Blockchain Applications for Business (lead: WU Wien) ● Area 3: Emerging Industries & Blockchains in Manufacturing (lead: St. Pölten University of Applied Sciences) ● Area 4: Data Science Methods for Blockchain Analytics & Predictions (lead: AIT and RIAT) ● Area 5: Legal and Political Implications (lead: WU Wien)

The Austrian Blockchain Center (ABC)[19] is a research centre in Vienna funded by the Austrian Research Promotion Agency (FFG)'s COMET programme and the Vienna Business Agency. 21 research facilities, 17 associated partner organisations from the public and non-profit sector and 61 commercial partners work together at the research centre to promote developments in blockchain technologies to be applied in financial services and energy, Industry 4.0 and the Internet of Things (IoT), administration and logistics. The research programme has been organised into five areas: "Cryptography, Technology & Security" (lead: SBA Research), "Cryptoeconomic Modelling & Blockchain Applications for Business" (lead: WU Wien), "Emerging Industries & Blockchains in Manufacturing" (lead: St. Pölten University of Applied Sciences), "Data Science Methods for Blockchain Analytics & Predictions" (lead: AIT Austrian Institute of Technology and RIAT Research Institute for Future Cryptoeconomics) and "Legal and Political Implications" (lead: WU Wien). The institute's budget totals EUR 20 million over four years.

The RIAT Institute for Future Cryptoeconomics, an institute for research, development, communication and training in the areas of cryptography, data protection and decentralisation, has been in operation since 2012. RIAT comprises a network of researchers who wish to promote the spread of open source, cryptography and data protection technologies. RIAT is primarily active in the core fields of data protection (privacy), open hardware (open-source hardware), digital identity (SSI) and medical technologies (MedTech). RIAT works closely with both international partners and local firms on research contracts. The institute also collaborates with network partners to provide auditing, code review, tech diligence and research design services.

The Vienna University of Technology (TU Wien) is a participant in the ABC as well as being involved with Security and Privacy Group topics such as data protection, smart contracts and cryptocurrencies in general.

The Decentralized Systems group at SBA Research concentrates on basic and applied research into blockchain and distributed ledger technologies. Current projects investigate the secure execution of smart contracts, alternative applications for Bitcoin and cryptocurrencies, cross-chain interoperability and blockchain consensus mechanisms. The group offers technical workshops, feasibility studies, project consultancy and contract research services to industrial partners.

The AIT – Austrian Institute of Technology's blockchain research group offers advice in applying blockchain technologies and the analysis of virtual currency systems. Their core competencies include knowledge of virtual currency systems, platforms for developing blockchain solutions and insight into a range of application areas. The research team is working on two main issues: first, determining the conditions in which it may be expedient to use blockchain technology in areas such as trade, logistics and administration, and second, developing concrete blockchain and smart contract solutions based on existing blockchain platforms, such as Ethereum.

19 www.abc-research.at

20 riat.ac.at

2.1.1. Blockchain in Vienna

The City of Vienna has been applying blockchain solutions in various pilot projects for several years in accordance with the strategic guidelines in the Wiener Wirtschafts- und Innovationsstrategie Wien 2020 (Vienna Economy and Innovation Strategy 2020) and the Digitalen Agenda für Wien (Digital Agenda Vienna). This makes it possible for the citizens of Vienna to participate in the process on an equal footing.

The “Open Data – Notarisation” project, which stored the checksum of open government data unalterably in a blockchain, was one of the first of these pilot projects[21].

Another pilot project initiated by the City required the assistance of municipal employees: a digital meal voucher[22], which was deposited in a digital wallet for each working day. The voucher could be redeemed at participating contracted restaurants, who then submitted the used voucher to the City of Vienna for payment.

Wien Energie, with the help of RIDDLE&CODE, plans to try out micro grids as a means to enable power sharing via a blockchain in Vienna’s Viertel Zwei development. This blockchain infrastructure will enable new business models to be used on the energy market. For example, electric charging stations in the Viertel Zwei will be able to draw electricity both from solar installations on rooftops in the district and from energy wholesalers in Leipzig, and use this power to charge electric cars by means of a computer protocol based on blockchain and automated contracts[23].

In a joint initiative promoting cultural affairs and environmentally conscious behaviour, so-called culture tokens will introduce the citizens of Vienna to the concept of blockchain. The culture token[24] is an innovative combination of climate-friendly mobility in the Vienna city area and a chosen cultural event. Four well-known Viennese cultural institutions are participating in the project: Wien Museum, the Volkstheater, the Wiener Konzerthaus and MuseumsQuartier. Any resident who chooses to give up their car and travel to work on foot or using Viennese public transport can earn virtual points for their token wallet.

21
digitales.wien.gv.at/site/open-data/blockchain-pruefen/

22
digitales.wien.gv.at/site/2-blockchain-pilot-der-stadt-wien-digitale-essensmarke/

23
wienerstadtwerke.at/eportal3/ep/contentView.do/pageTypeId/71954/programId/72864/contentTypeId/1001/channelId/-51313/contentId/4200521

24
digitales.wien.gv.at/site/projekt/kultur-token/

3. Services of the Vienna Business Agency

The objective of the Vienna Business Agency is the continuous development of international competitiveness by supporting Vienna-based companies and their innovative strength, as well as a sustainable modernization of the business location. To achieve this, the Vienna Business Agency provides free consultations to all entrepreneurs in Vienna on the topics of business creation, business location or expansion, business support and financing. Furthermore, networking contacts in the Viennese economy are also made available.

The Vienna Business Agency supports and helps businesses to complete their research and development projects with both individual consulting and monetary funding. Depending on requirements, they receive information about sponsorships, financing opportunities, possible development partners, research service providers, or research infrastructure.

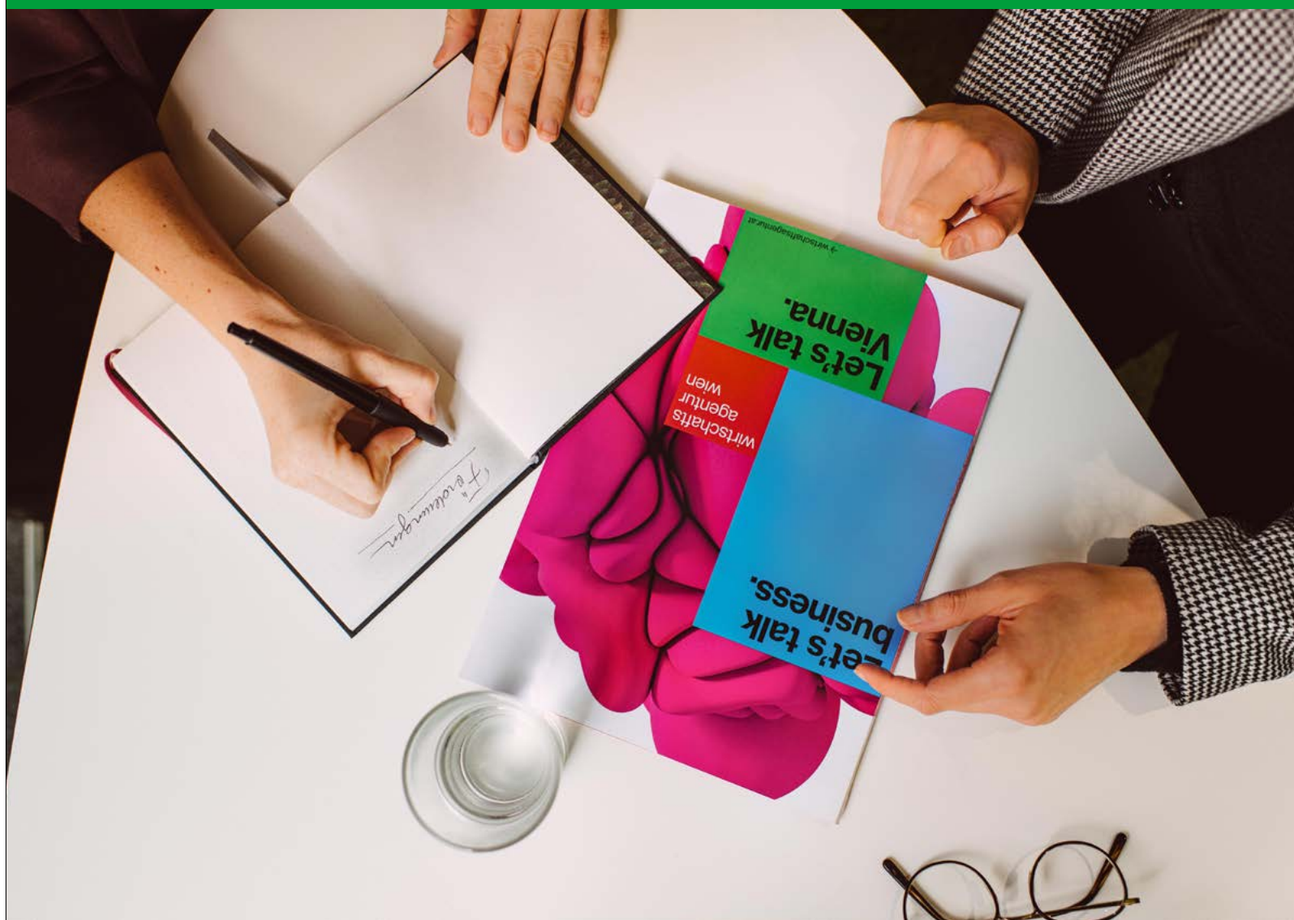
The Vienna Business Agency sees itself as a network of the Viennese ICT industry and supports businesses with consultations, as well with distribution and networking among themselves. Events and workshops on topics from the field of ICT are held regularly.

Additionally, the Vienna Business Agency helps company relocations or internationalization services. Help is also provided to business founders and young entrepreneurs in the start-up area. Free workshops and training sessions on topics of everyday business are offered as well as small, affordable office spaces.

Founders labs[25] support aspiring entrepreneurs and founders with a two-month, part-time program to help them get started.

All funding programs of the Vienna Business Agency can be found here:
viennabusinessagency.at/funding/programs

25 viennabusinessagency.at/startup-and-grow/founders-lab-future-technologies



The following company profiles describe a selection of exemplary, well-known, established or new companies in Vienna. It is not an exhaustive list.

○ Bitpanda

Bitpanda is a leading European trading platform for cryptocurrencies such as Bitcoin, Ethereum, IOTA etc. The company was founded by Eric Demuth, Paul Klanschek and Christian Trummer in Vienna in 2014. The startup intended for its services to play a significant role in the FinTech revolution – and, in the process, to supply customers with secure, trustworthy and user-friendly access to digital assets. Bitpanda has received numerous awards, including the title of Best FinTech Startup 2017, and currently has 100 employees and 900,000 customers[26].

○ Drop All Tables

DROP ALL TABLES [DAT] is the business arm of RIAT – Institute of Future Cryptoeconomics. DAT offers various stages of long/short-term mentoring and project development in the fields of blockchain and cryptoeconomics. The team consists of professional developers and consultants who work actively with and guide cryptocurrency and blockchain projects. DAT offers various methods of conceptualising technical projects, products and services, the development of proof-of-concepts and decentralised applications, and smart contract and distributed system audits.

○ RIDDLE&CODE

RIDDLE&CODE has developed its own hardware and software stacks to combine the highest levels of security with the potential of blockchain technology. With the extension of hardware in form and function, sophisticated security measures known from the credit card industry get transferred into the blockchain ecosystem.

4.1 Meet-ups and conferences

Meet-ups

Meet-ups have evolved around the world to serve as informal information hubs on a range of technological topics. The blockchain community in Vienna expanded rapidly with the advent of Bitcoin – a selection of Viennese meet-ups based on Bitcoin, other cryptocurrencies and the token economy is provided below.

- Ethereum Vienna: The Ethereum Vienna meet-up was one of the first in the world to focus on discussion of the Ethereum project. The founder of the Ethereum project, Vitalik Buterin, visited Vienna in 2014 and 2017.
- Bitcoin Austria: Founded in 2011, Bitcoin Austria aims to promote the circulation of the digital currency Bitcoin in Austria.
- Monero Austria: The Monero Austria meet-up is a group for people interested in the cryptocurrency Monero (XMR). The meetup focusses on communicating news from the Monero project and introducing XMR to a wider audience (of both programmers and non-programmers). Topics are selected for various skill-sets.
- Dogecoin Austria: This meet-up group is about the cryptocurrency Dogecoin, which was initially created as a meme currency featuring the Doge internet meme, but soon achieved worldwide recognition.
- Hyperledger Vienna Meetup: This meet-up group has an informal relationship with Hyperledger, and makes up a key part of the Hyperledger ecosystem. Participation in a Hyperledger meet-up group is open to anyone – employees of a Hyperledger member company, Hyperledger contributors and developers, and people just passionate about blockchain technology.
- Block&Wine: Since 2018, crypto and blockchain enthusiasts have been meeting in a relaxed atmosphere every Wednesday at 6:30 pm to discuss their thoughts and experiences.
- Token Engineering Vienna: This meet-up group deals with the topics of token design, token engineering and the token economy.

26 www.bitpanda.com/de/about

Conferences and events

- Anon Summit: ANON stands for Autonomous New Open Network, an expanding independent, new and public network of expertise in disruptive technologies, created by BlockExpo GmbH. The ANON Summit – first held as a pilot event in 2019 with just 1,000 participants – aims to enable networking between a wide range of companies (corporates, SMEs and startups) in the area of disruptive technologies with a focus on blockchain, and to establish a platform for discussion and the sharing of innovations and expertise in Vienna.
- Blockchain Real: Blockchain Real is a conference focussing on blockchain in relation to the real estate industry. Facts from 2019:
  - 39 lecturers from 20 countries
  - 2 parallel tracks (national and international)
  - Sold out with 200 participants
- Unblock3d: Unblock3d is an initiative of the Cryptoeconomics Research Lab, the Vienna University of Economics and Business and BlockchainHub Berlin in active collaboration with sustainability experts, policy makers and international organizations.
- DigitalCity.Wien Blockchain-Vernetzungstreffen: The project team at the DigitalCity.Wien blockchain initiative consists of SBA Research (as a supporter of the DigitalCity.Wien community), the Vienna Business Agency, the City of Vienna and Urban Innovation as a coordinating centre for DigitalCity.Wien. Regular networking events aim to promote interdisciplinary discussion between relevant and interested actors at the City of Vienna, in education and research institutions and from private industry to find synergies and initiate projects. These meet-ups concentrate on current topics such as tokens, e-identity and current research activities. Regular intensive workshops are offered to deliver specialist immersion in topics and professional discourse.

5. Companies in Vienna

The following table provides a brief overview of some innovative Viennese blockchain companies and information on associations and academic institutions with an interest in blockchain in Vienna, in alphabetic order and without any claim to completeness. Information has been sourced from the relevant websites. Are there important players who are not listed here? Please help us to complete this overview by sending your suggestions to technologieservices@wirtschaftsagentur.at

Blockchain companies in Vienna

COMPANY	DESCRIPTION	CONTACT/WEBSITE
0BSNETWORK – BLOCKSTRUCT GMBH	A public blockchain platform uniquely suited to the B2C and B2B needs of startups, established small and medium companies, as well as globe-spanning enterprises with hundreds of corporate partners and millions of users. 0bsnetwork is the right platform for you if you want to create a retail/loyalty token to tokenise ownership.	Zwölfergasse 10/8, Top 3 1150 Vienna www.0bsnetwork.com
AUTOWHALE GMBH	Autowhale GmbH is a software development company, trading desk and consulting group for startups in the crypto space.	Krottenbachstrasse 122/29/3 1190 Vienna www.autowhale.net
B.A.M TICKETING GMBH	B.A.M Ticketing delivers innovative ticketing technology services and solutions. The entire life cycle of a ticket can be controlled and secured using blockchain technology, including all relevant transactions from creation through primary sales channels to the secondary market. The SaaS ticketing system eliminates ticket fraud and black-market trade and enables control of unwanted middlemen such as scalpers, BOTS and brokers that force prices up. With this system, ticket providers retain complete control over tickets and buyers can be assured of the necessary security levels.	Zöchbauerstrasse 2 1160 Vienna bam.fan
BITFLY GMBH	Bitfly gmbH was one of the first blockchain companies to be established in Vienna, developing innovative services in public and private blockchains since 2016. The company's core competencies are the development and operation of blockchain explorers and cryptocurrency mining pools. Bitfly operates the world's second largest Ethereum blockchain explorer, etherchain.org, and the world's largest Ethereum mining pool, ethermine.org.	Landstrasser Gürtel 9/12 1030 Vienna bitfly.at

COMPANY	DESCRIPTION	CONTACT/WEBSITE
BITPANDA GMBH	Bitpanda has developed an easy-to-use wealth-building platform on which users can buy, sell, store and exchange all digital assets.	Campus 2 Jakov-Lind-Strasse 2 1020 Vienna www.bitpanda.com
CAPACITY BLOCKCHAIN SOLUTIONS GMBH	Capacity Blockchain Solutions offers professional advice, mentoring, support and the efficient implementation of blockchain technology services. The com company's main focus is on blockchain-based distributed storage. Capacity has developed software and a range of smart contracts to provide peer-to-peer data persistence and the necessary network intelligence to permit work without intermediaries. In addition, the Capacity smart contract platform offers designs and workshops on the topic of blockchain.	Bergmillergasse 3 1140 Vienna capacity.at
COBRA TECHNOLOGIES GMBH	Cobra is a software company specialising in finance and logistics applications with core competencies in blockchain, IoT (sensor technology, machine logic) and artificial intelligence. Cobra creates a symbiosis between analogue and digital and creates infrastructure for the new, digital economy of the future for customers in the sectors of finance, technology, industry and administration (including banks, trading companies, hardware productions, NGOs, government departments, etc.).	Peter-Altenberg-Gasse 3 1190 Vienna www.cobra.io
COINPANION – SMARTBYTES GMBH	Coinpanion is the world's first asset manager for cryptoassets such as Bitcoin and Ethereum. Coinpanion enables users to invest in a personalised cryptoportfolio without prior knowledge, and provides portfolio administration using an AI-optimised investment strategy. This strategy makes it possible to automatically react to market fluctuations in real time.	Seitenstettengasse 5/37 1010 Vienna coinpanion.com
CONDA CROWDINVESTING AUSTRIA GMBH	This crowdinvesting platform has branches in Vienna and Munich. The platform connects companies with investors to lay a foundation for successful business ideas.	Donau-City-Strasse 6 1220 Vienna www.conda.at

COMPANY	DESCRIPTION	CONTACT/WEBSITE
CRYPTIX LABS GMBH	Cryptix develops and provides IT services relating to blockchain and is a full-service provider of digital payment solutions.	Wienerbergstrasse 11, Tower A, 19th floor 1100 Vienna cryptix.ag
CRYPTO MANAGEMENT GMBH	Crypto Management GmbH offers comprehensive advice on handling crypto currencies. The company serves private clients, private foundations and institutional clients with their transactions in digital currencies.	Wipplingerstrasse 1/5.OG 1010 Vienna crypto-management.at
DANUBE TECH GMBH	Danube Tech is a world leader in the provision of self-sovereign identity (SSI) solutions for business (B2B) and government (B2G). Danube Tech products enable the rapid development of SSI prototypes (SSI sandbox) and production systems (SSI infrastructure), facilitating the digitalisation and secure/private use of identity data in a range of contexts. Clients include the Department of Homeland Security (USA), Government of British Columbia (CAN), EU Commission, regional governments (EU) and companies in a range of sectors (in the EU and US).	Annagasse 8/1/8 1010 Vienna danubetech.com
DROP ALL TABLES GMBH	DROP ALL TABLES [DAT] offers various stages of long/short-term mentoring and project development in the fields of blockchain and cryptoeconomics. The team consists of professional developers and consultants who have been actively working with and guiding cryptocurrency and blockchain projects since 2010. DAT offers various methods of conceptualising blockchain projects, workshops, development of blockchain technologies, as well as smart contract audits.	Neubaugasse 64–66/3/4 1070 Vienna dropalltables.com
ELOOP – CAROO MOBILITY GMBH	ELOOP is a Viennese startup company currently revolutionising individual mobility in Vienna. Eloop has developed a tokenisation model in which electric cars are tokenised and the token-holder is a live participant in journey revenues.	Siebenbrunnengasse 17, Top 7 1050 Vienna eloop.at

COMPANY	DESCRIPTION	CONTACT/WEBSITE
GRAPEVINE WORLD GMBH	Vienna-based Grapevine World GmbH is an IT-service provider operating independently of manufacturers to facilitate collaboration between private and public health and research institutes, telecommunications providers and technology companies with the aim of standardising data transfers globally and ensuring the interoperability of a wide variety of IT-systems. The company's solutions penetrate data boundaries to create a new, improved health economy. The Grapevine World ecosystem is based on a unique combination of IHE standards and blockchain technology, and is recommended by the World Health Organisation and the European Commission.	DC Tower Donau-City-Strasse 7, 34. OG, Top B 1220 Vienna www.grapevineworld.com
HERO – BYTE HEROES GMBH	Herosphere uses blockchain to enable customers to bet on eSport competitions in League of Legends, Dota 2, CS:GO and Overwatch.	Praterstrasse 1, Space 21 1020 Vienna www.herocoin.io
HOUSE OF NAKAMOTO – BIT-TRUST STORE GMBH	The House of Nakamoto has opened Austria's first retail store for Bitcoin in the centre of Vienna, where customers can quickly and easily trade euros for Bitcoin or purchase a complete starter set.	Schottenring 17 1010 Vienna www.thehouseofnakamoto.com/de
IOV42 TECHNOLOGY GMBH	IOV42 is building the global network operating system that will be the foundation for the Internet of Value. IOV42 provides scalable solutions to the most complex use-cases that benefit from decentralisation including supporting a full range of blockchains – from public to fully private – for enterprises and consumers.	Favoritenstrasse 7/DG3 1040 Vienna www.iov42.com
KURANT GMBH	Kurant GmbH was founded in 2017 as a spin-off of Coinfinity GmbH, which started operating ATMs in 2014. Today, Kurant is a market leader in Austria. Its target is to make purchasing cryptocurrencies such as Bitcoin, Ether, Litecoin and Dash both safe and easy.	Forchheimergasse 30A/4/5 1230 Vienna www.kurant.at

COMPANY	DESCRIPTION	CONTACT/WEBSITE
MORPHER LABS GMBH	Morpher provides the opportunity to trade in shares, cryptocurrencies, foreign currency and commodities around the clock with zero fees. In January 2019, word got around that investor Tim Draper had provided USD 1.25 million of seed capital to Morpher's VC funding round.	Heinestrasse 21, Top 4 1020 Vienna www.morpher.com
RIDDLE & CODE GMBH	Provider of blockchain interface solutions. RIDDLE& CODE's hardware and software stacks enable companies to master the challenges of our digital society such as machine identity, product provenance and supply chain management.	Orbi Tower Thomas-Klestil-Platz 13, 10th floor 1030 Vienna www.riddleandcode.com
SPECTOSPHERE GMBH	Spectoshere focusses on artificial intelligence, deep learning processes, mathematical modelling of complex data and software development. This expertise is applied in the finance industry to develop innovative software systems based on artificial intelligence.	Hernalser Haupstr. 35/101 1170 Vienna www.spectosphere.com
STEELBUTSMART – S1SEVEN GMBH	SteelButSmart digitises steel from raw materials to the final products. This is how companies can replace mandatory quality certificates with traceable and tamper-proof digital records for smart manufacturing and to assess CO_2 emissions, all while being more competitive.	Orbi Tower Thomas-Klestil-Platz 13, 10th floor 1030 Vienna www.steelbutsmart.com
TRIBE SMART CONTRACTS GMBH	Tribe provides the tools for anyone to create a wide variety of valuable, crypto-based limited-edition collectibles like artworks, tickets, gift certificates, and more. All products and artworks on the platform are one-of-a-kind or part of a limited edition. They can never be copied or forged. And because Tribe is powered by Smart Contracts, provenance and payments are secure and transparent.	Opernring 1, Top R 745–747 1010 Vienna tribe.finance
YOUNIQX IDENTITY AG ÖSTERREICHISCHE STAATSDRUCKEREI GMBH	YOUNIQX realises solutions in the field of secure digital identities and values. Security services such as the MICK video identification service, the MIA ID app and the highly secure Chainlock private key make companies and institutions fit for the digital future. YOUNIQX Identity AG was founded as a subsidiary of the Austrian State Printing House (OeSD) in 2017. The innovative business can thus draw on many years of experience when it comes to identity management and the highest security standards.	Tenschertstrasse 7 1230 Vienna www.youniqx.com

Blockchain associations and scientific institutions in Vienna

ASSOCIATIONS / SCIENTIFIC INSTITUTIONS	DESCRIPTION	CONTACT/WEBSITE
AUSTRIAN BLOCKCHAIN CENTER (ABC) C/O RESEARCH INSTITUTE FOR CRYPTOECONOMICS	The Austrian Blockchain Center is the one-stop-shop Austrian research centre for blockchain (and related) technologies to be developed in collaboration with partners for industrial applications like Industry 4.0 / IoT as well as financial, energy, logistics, government and administrative applications. Those new applications and business models resulting from collaborations between established players, innovative startups and top R&D institutes will be the key creating new jobs and establishing Austria among the top ten innovative countries in Europe.	Welthandelsplatz 1, D2 Building 1020 Vienna office@abc-research.at www.abc-research.at
BITCOIN AUSTRIA AUSTRIAN BITCOIN PROMOTION ASSOCIATION	Bitcoin Austria is a non-profit organisation promoting and supporting the spread of the digital currency Bitcoin in Austria. Bitcoin Austria's network of experts form the primary contact point for traders, end users and media professionals to pose technical, legal and organisational questions on Bitcoin.	Seilerstätte 24 1010 Vienna www.bitcoin-austria.at/de
BLOCKCHAIN INITIATIVE LOGISTIK ERNST & YOUNG (LEAD PARTNER)	Blockchain is driving the sustainable transformation of many sectors by introducing future-oriented technology. There is enormous potential for new business models in the transport, logistics and supply chains sectors at present. Logistics giant MAERSK is one example, currently implementing logistics and insurance solutions for 800 ships via blockchain. Auditing and advisory firm EY has worked together with transport companies DB Schenker, LKW Walter and GS1 Austria, EDI service provider EDITEL Austria, the Austrian Federal Union of Logistics (BVL) and WU Wien to initiate a pilot project to ensure blockchain is used to its full potential in the Austrian logistics branch. The collaborative Blockchain Initiative Logistik project aims to develop the first blockchain-based industry solutions for transport and logistics.	Wagramer Strasse 19 1220 Vienna www.ey.com/de_at/
DAAA-DIGITAL ASSET ASSOCIATION AUSTRIA	Association for the promotion and sustainable development of the digital assets ecosystem in Austria.	Seilerstätte 24 1010 Vienna office@daaa.at www.daaa.at

ASSOCIATIONS / SCIENTIFIC INSTITUTIONS	DESCRIPTION	CONTACT/WEBSITE
AUSTRIAN FINANCIAL MARKET AUTHORITY	As an integrated supervisory authority established in 2002, the Financial Market Authority brings together the supervision of all significant providers and functions under a single roof.	Otto-Wagner-Platz 5 1090 Vienna www.fma.gv.at
RESEARCH INSTITUTE FOR CRYPTOECONOMICS VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS	The institute at the Vienna University of Economics and Business (WU Wien), founded in 2018, aims to combine competencies with the diverse range of available specialist knowledge on the subject of cryptoeconomics.	Welthandelsplatz 1 1020 Vienna info-crypto-economy@wu.ac.at www.wu.ac.at/cryptoeconomics
RIAT	RIAT – Institute for Future Cryptoeconomics is primarily active in the core fields of data protection (privacy), open hardware (open-source hardware), digital identity (SSI) and medical technologies (MedTech). RIAT works closely together with both international partners and local firms to perform contract research. The institute also collaborates with network partners to provide auditing, code review, tech diligence and research design services.	Neubaugasse 64–66/3/4 1070 Vienna www.riat.ac.at
SBA RESEARCH GGMBH	SBA Research was founded in 2006 as the first Austrian research centre for information security by The Vienna University of Technology (TU Wien), Graz University of Technology and the University of Vienna. In recent years, the Vienna University of Economics and Business (WU Wien), the AIT Austrian Institute of Technology and the University of Applied Sciences St. Pölten have joined as academic partners. Through scientific research on information security, SBA Research develops practical and applicable solutions while focussing on current issues like cyber-security and blockchain. SBA Research employs approx. 100 people and is now the largest research centre in Austria to exclusively address information security.	Floragasse 7 1040 Vienna www.sba-research.org
THE SALT POUND PROJECT – AN ASSOCIATION FOR THE SUPPORT OF MARGINALISED COMMUNITIES IN DEVELOPING COUNTRIES AND WAR ZONES	This project strives to build, advocate for, and maintain the Salt Pound, a framework for making transparent payments and storing wealth. The Salt Pound was designed to empower individuals in vulnerable communities and to foster sustainable economic growth in developing countries. The system is designed to be fast, secure and transparent.	Sandrockgasse 4 1210 Vienna www.saltpound.org/de.html

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