

Blockchaining Digital Advertising

Digital Advertising as it should be - Creating value for
Advertisers, Publishers and End-Users

White Paper

August 1st, 2018

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Executive Summary

JoorsChain AG is re-creating “Digital advertising as it should be”, through developing decentralised Applications (dApps) and distributed ledgers for the digital advertising market, the “JoorsChain Protocol”. JoorsChain is striving for a transparent and efficient digital advertising ecosystem using high performance blockchain technology. Today’s digital advertising business is worth over US\$ 200 billion annually and more than 50% of this is funnelled away by intermediaries and fraudulent activities instead of benefiting Publishers and End-Users.

The project is backed by well established companies, active across the current ecosystem, who will transfer a substantial part of their existing digital advertising business (with over 50M daily ad impressions worldwide and physical presence in more than 20 countries)

onto the JoorsChain dApps and ledgers. Having this business already secured enables JoorsChain to focus on attracting additional Advertisers and Publishers onto the blockchain rather than starting a new business from scratch.

The “JoorsChain Protocol” is enabling smart contracts and dApps that will be used for transactions between nodes using JoorsChain’s JIC tokens for settlements. The JIC tokens will be traded on major exchanges and thus exchangeable for both crypto and fiat currencies.

JoorsChain’s blockchained digital advertising ecosystem will go live end of 2018 but development of user enhancing services and solutions (as well as enabling new Advertisers and Publishers) will be a continuous activity by JoorsChain AG.



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1 Why a Decentralised, Blockchained Digital Advertising System?

1.1 Today's Problem – A revenue bleeding, non-transparent, inefficient, fraud prone ecosystem!

Bob Liodice, CEO of Association of National Advertisers (ANA), stated during his opening remarks at the ANA's Masters of Marketing conference in October 2017:

"Just 25% of Chief Marketing Officers' (CMO) digital media investments reach target audiences."

This translates to a whopping \$150 billion a year of wasted advertising spend. The waste is coming from four main aspects of today's digital advertising ecosystem; **Revenue Bleed** due to many intermediaries, **inefficient processes**, **fraud** and, the root cause, **non-transparency**. On top of this, the digital ad market is very much dominated by giants like Google and Facebook.

The inefficient processes affects the whole value chain, starting with the advertising campaign setup (where creative elements and campaign parameters are transferred from one system to another along the chain, either manually or through a variety of automatic interfaces), continues with the lack of secure and accurate End-User targeting (based on research done by Bazaarvoice.com, three out of four marketers are not confident their ads reach the right people leading to wasted advertising spend), and ends with the inefficient reporting, reconciliation and payment process, where many intermediaries rely on excel data bases, inaccurate web reporting tools, fees in different currencies that are converted using currency exchange websites, etc., resulting in *"wasted resources and time consuming arguments along the whole value chain"* according to Soheil Amorpour, founder and CEO of Wiget.

To cater for these traditional players' dominance, alternative advertising networks (so called Affiliate Networks) have popped up all over the world. At best, they create an alternative market place for advertisers and publishers, but at worst they create a massive amount of fraudulent activities. Such activities range from using bots for click-through, auto subscribe End-Users to

unwanted services, emulating subscription authentication processes, blatantly claiming eye balls or click through statistics without serving the adverts, advertising services or content that are prohibited by law in certain territories, etc.

"Fraudulent affiliate network activities have caused several Mobile Network Operators in Africa to ban online subscriber acquisitions, force installation of expensive fraud prevention systems, and fine intermediaries. In some instances, online business has grind to a complete stand still and companies have gone bankrupt!" says Per Ostberg, co-founder and Chairman of Starfish Mobile International

The issues described above have their root cause in the ad tech industry's main problem: Lack of Transparency! The JoorsChain Protocol aim to solve these problems by creating transparency and traceability. This include such aspects as having one source of information, knowing who the parties to a transaction are (and who did what) as well as identifying rogue intermediaries.

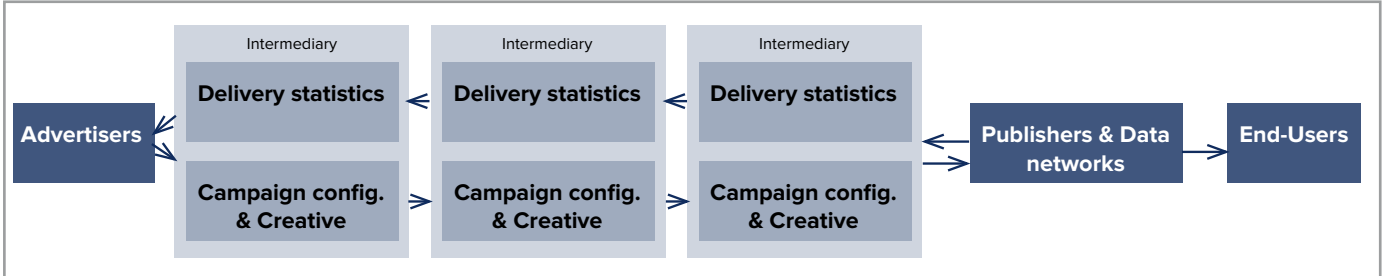


Figure 1: Today's Advertising Network

1.2 JoorsChain's Solution – A decentralised blockchain based advertising ecosystem

JoorsChain's vision and aim is to re-create "Digital advertising as it should be", through developing the JoorsChain Protocol for new and existing digital advertising ecosystems based on four core principles:

1. Advertisers shall have an **efficient, transparent** channel to their **target audience** without **fraud**. (Please see Figure 2 below for a graphic overview.)
2. Publishers shall have direct access into the ecosystem as suppliers of "advertising real-estate".
3. Create additional revenue streams for Mobile Network Operators who want to become publishers.
4. End-Users shall get a real benefit from viewing sponsored content, sharing personal information and preferences, and for allowing Advertisers to target them.

The 1st core principle is Phase 1 of JoorsChain's development of the blockchained advertising ecosystem, the 2nd and 3rd core principles are part of Phase 2, while the 4th is scheduled for Phase 3 of the ecosystem development.

Please see Figure 3 below.

In ad networks using the JoorsChain Protocol, transactions and agreements between parties will be specified in so called Smart Contracts.

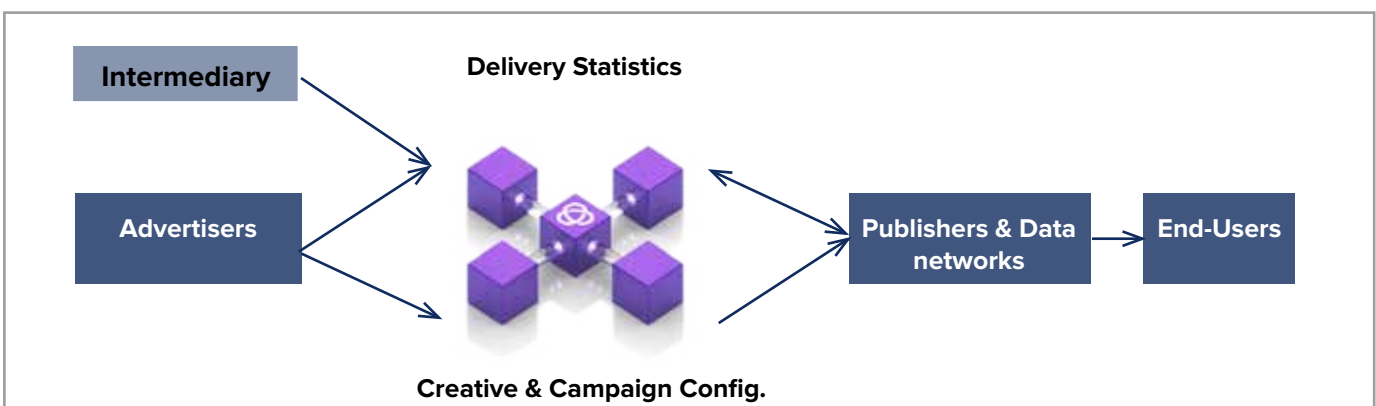


Figure 2: The Future Blockchained Advertising System

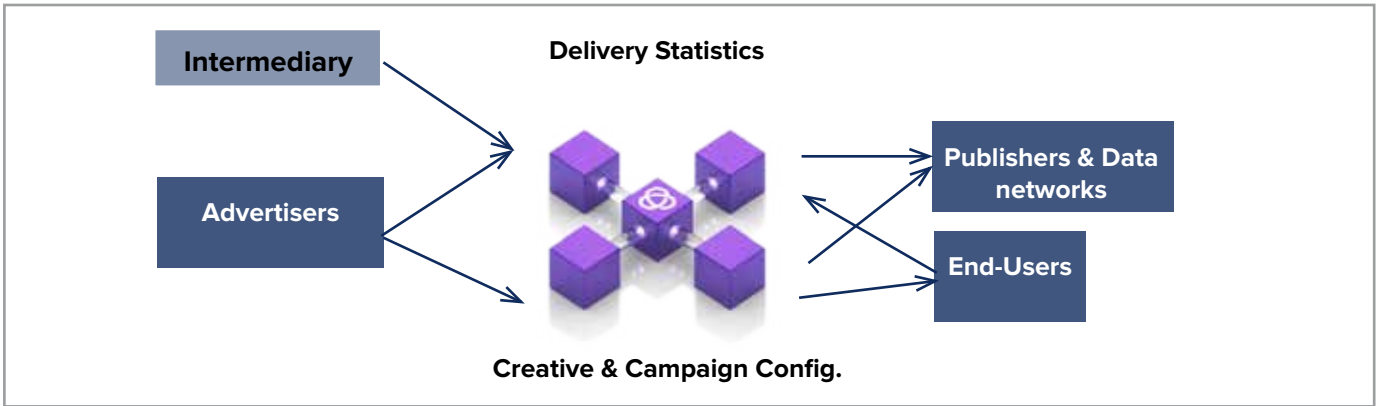


Figure 3: The Blockchain Advertising System when End-Users are connected

1.3 The New Monetary Flow

In the current digital advertising system, more than 50% of the Advertising fee goes to intermediaries, as can be seen in Figure 4 below.

With JoorsChain’s blockchain solution, the advertising revenues are distributed to the parties that add most value (Publishers and End-Users) as can be seen in Figure 5 below.

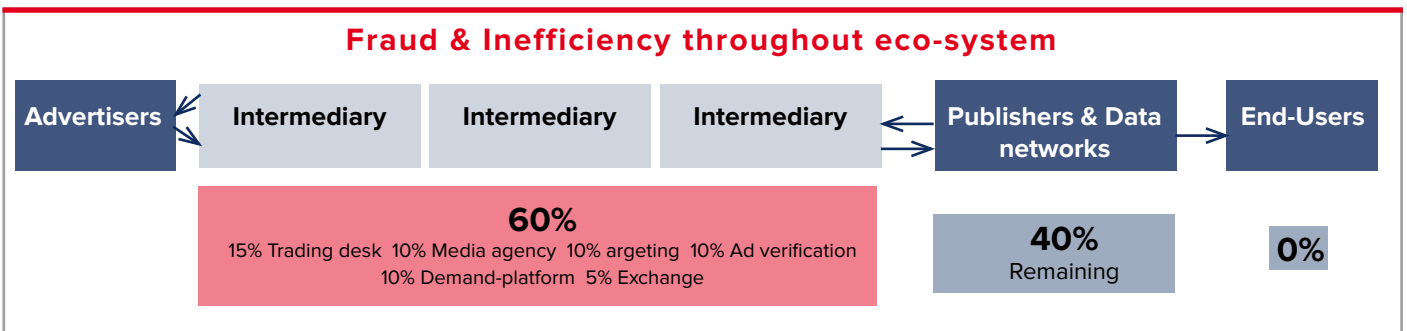


Figure 4: Traditional typical monetary flow Digital Advertising ecosystem

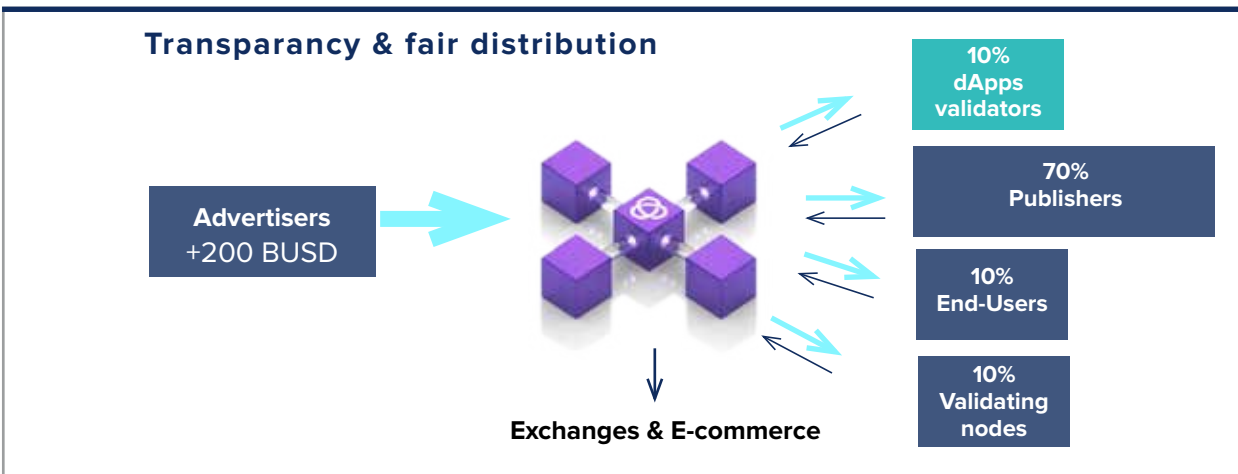


Figure 5: New envisioned monetary flow Digital Advertising ecosystem

2 Blockchaining Existing Businesses

JoorsChain does not invent or enter a new business, the founding parties are already today active and operational across the currently existing digital marketing ecosystem. This enables JoorsChain to achieve very high speed to market through transforming the founders' traditional existing digital marketing business to using the JoorsChain blockchain and the JoorsCoins as payment currency.

2.1 The Partners and where in the ecosystem they operate

The four founding partners (Joors, TalkPool, Wiget and Starfish Mobile International) are all operational in the digital advertising ecosystem, as can be seen in Figure 6 below.

Wiget covers the general online advertising space with hundreds of millions of ad viewers in their network, while Joors together with partners TalkPool AG and Starfish Mobile International are established Integrators/aggregators/tech providers on approximately 30 markets in Europe, Africa, Latin America and Asia. Please see Figure 7 on the next page.

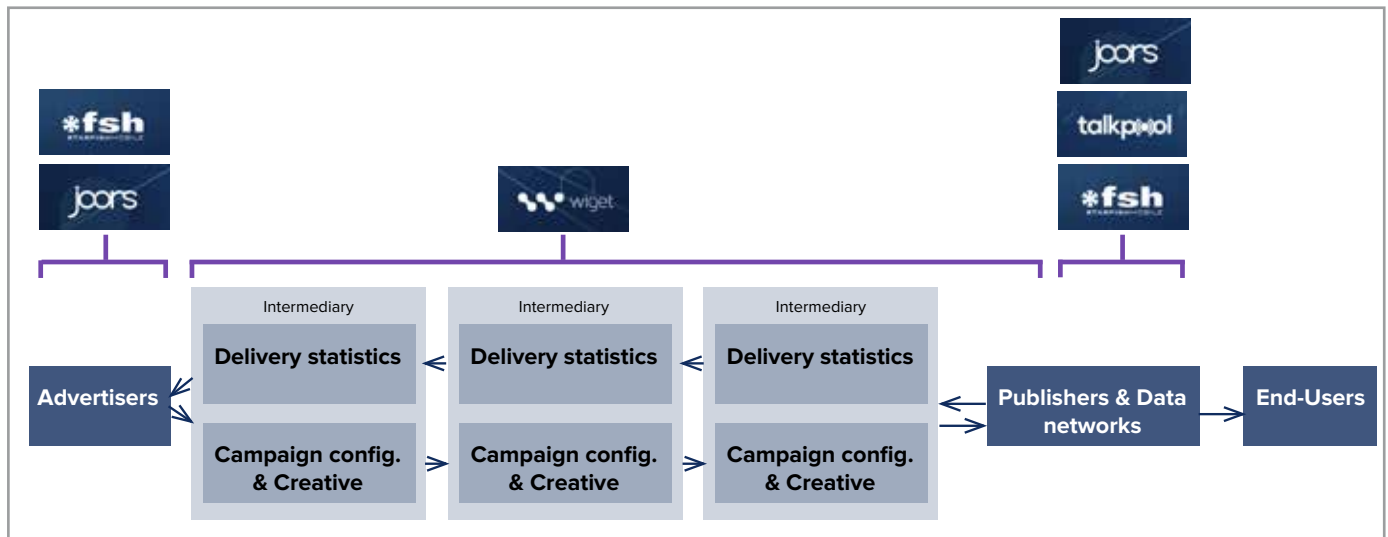


Figure 6: Visual of current partners' place in the ecosystem

The partners have more than 1300 employees and they have their respective technologies and solutions integrated to Mobile Network Operators, Advertisers, content owners and Publishers. The partners are committed to jointly market, integrate and develop the JoorsChain ecosystem throughout the partner network. The partners also have a long history with both local and global brands and they are committed to apply the JoorsChain ecosystem with these brands going forward.



Figure 7: JoorsChain's partners' worldwide presence

2.2 The user of JoorsChain's Protocol and their benefits

The JoorsChain Protocol provides benefits across the whole ecosystem, from Advertisers to End-Users, from existing players to newcomers.

Advertisers

Advertisers will reap several benefits, such as lower advertising fees due to fewer (if any) intermediaries, paying only for validated ad views, being able to reward End-Users for watching an advert and thus create a stronger bond between them, more accurate End-User profiling, etc.

Publishers

Publishers will receive a larger portion of the advertising fee due to fewer (if any) intermediaries.

Intermediaries

Affiliate networks, trading desks, dmp, dsp, ssp, targeting verification, etc. can all use the JoorsChain Protocol and be part of a transparent digital advertising network and value chain. Entities that are honest and real value contributors will prosper and evolve.

Profiling / End User Data collectors

There will be a clear demand for well-managed, highly accurate and large profiled End-User database services that Advertisers will be prepared to pay a higher price for reaching.

MNOs

Mobile Network Operators (MNOs) will gain two fold, firstly the occurrence of fraud will drop dramatically and thus protect the integrity of the MNO's End-Users and the MNO's billing systems. Secondly, they will be able to join JoorsChain and become both Advertisers and Publishers and thus add new revenue streams to their businesses.

End-Users

End-Users have much to gain! They will not be swamped with unscrupulous Affiliate Network adverts that fraudulently subscribe them to services they do not want (a very real and huge problem in e.g. Africa). They will have the option to become Publishers of their private websites, mobisites, blogs, etc. and thus add income. Finally, they will be able to earn revenue by accepting and watching adverts as well as providing JoorsChain with demographic and psychographic data.

3 JoorsChain AG – The Ecosystem Driver

JoorsChain's digital advertising blockchain is mainly an open source solution, but to ensure ever increasing usage of the blockchain and the JIC tokens, JoorsChain AG will drive Advertiser and Publisher adoption as well as new functionality development.

The JoorsCoins (JIC) will be the main payment currency within JoorsChain, ensuring a vibrant secondary market. As such, JoorsChain AG's role going forward will be to drive the adoption of JoorsChain by new Advertisers, ensure more and diverse Publishers get on board, drive the adoption of JoorsChain within MNOs and End-Users, and develop service enhancing apps and solutions. All these activities will be aimed at increasing the JIC trading volumes and thus the value. It is foreseen that a fraction of the gas paid to validation nodes is transferred to JoorsChain for maintenance of the product and to JoorsChain AG in Switzerland, thus securing JoorsChain's long term viability. Furthermore, some of the value enhancing services (like the profiled End-User database, ad viewing reward applications, etc.) will be paid for by Advertisers within the blockchain ecosystem.

3.1 JoorsChain AG – A Swiss Company

JoorsChain AG is a Swiss Company based in Zug (The "crypto valley" of Europe) and is fully compliant with Swiss blockchain and cryptocurrency legislation.

JoorsChain AG (registration number CHE-442.818.149)
Zugerstrasse 76A,
6340 Baar,
Zug,
Switzerland

4 JoorsCoins and their Value Increase

4.1 Token plan

800 million JICs has already been created. They are currently ERC-20 (18 decimals) based, but will later be converted 1:1 to JoorsChain's JIC token solution. The tokens will be allocated approximately as per below:

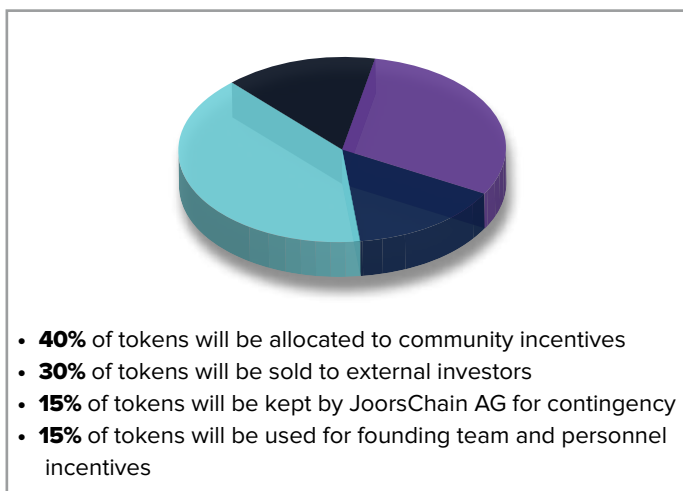


Figure 8: JoorsCoin funds allocation

4.2 Value Creation in JIC

As JICs will be traded on major exchanges, all stakeholders can use their tokens for a variety of transactions, thus driving up demand and liquidity. There are 3 main drivers for the use of JIC.

B2B transactions

Businesses within the digital advertising ecosystem, such as Advertisers and Publishers, will use the JIC tokens for transactions within the blockchain. The businesses can receive JIC e.g. in the following ways:

- Publishers are paid in JIC for adverts by Advertisers.
- Media agency, ad-exchange, targeting, ad verification and other service providers are paid with JIC tokens.

Validating transactions and calculations done in dApps

Validators and other dApps providers are paid in JIC for services rendered in the JoorsChain ecosystem. A small percentage of these fees goes to JoorsChain (as outlined in section 3 above).

End-User incentives

End-users receive JIC as rewards for the following activities:

- JIC are paid as incentives for watching adverts by the Advertiser.
- JIC are paid as incentives for providing advert preferences, sociographic and psychographic data (to enhance ad serving capabilities and targeting).
- JIC are used to buy products and services (like data, airtime, etc.) from network operators and e-commerce sites.

These End-User incentives and flow of JIC are a small amount per user, but with many End-Users in the ecosystem, the demand for JICs are driven up.

JIC demand is also increased over time as more and more JICs will have accumulated in End-Users' wallets and not being used (saved and/or forgotten, same as with various airline miles and store loyalty schemes), resulting in a decreasing amount of "floating" JICs, thus driving up the individual JIC value.

5 Some Sample Use Cases

5.1 General digital advertising

For general digital advertising the JoorsChain blockchain solution, the “JoorsChain Protocol”, can be applied in a multitude of ways. The main long-term goal is to enable smart contracts for settlements between advertisers and publishers. I.e., when an advertiser wants to display ads to a certain audience, a smart contract is created to identify feasible publishers being able to reach those audiences. Thereafter an agreement (smart contract) is created with the relevant publishers on what to show to whom, when, etc. Finally the actual publishing of the ads takes place (also monitored and managed by the blockchain) resulting in settlement as per the smart contract entered into between Advertiser, Publisher and potentially a few valuable intermediaries.

5.2 Mobile advertising

An **Advertiser** wishes to display ads, sponsored content or services to targeted mobile phone users through a **Publisher** or **MNO**. The Advertiser uses an **Integrator’s** platform/partner, e.g. Joors, Starfish - possibly in combination with an existing Adserver/DSP/SSP - and **registers** the advert content, geographical region, demographic of target marketing group and end-user incentive & actions.

5.3 End-User rewards for watching adverts

A multitude of End-User rewards can be implemented through the blockchain. For example, today, End-Users do not get any benefit from watching adverts (on the contrary, they only pay for the data consumed). In a blockchained advertising system, the End-Users will get JICs (or fractions thereof) for watching adverts, a reward granted by the advertisers and paid through the JoorsChain’s smart contracts, tokens and wallets.

5.4 End-User rewards for providing preferences

A strong negative in today’s advertising systems is the lack of end-user knowledge and segmentations. Through a blockchain solution, End-Users can earn JIC tokens (or fractions thereof) for providing demographic and psychographic data. The availability of this information will enable Advertisers to hit the right target customers which in turn will drive up the advertising fee.

5.5 Fraud Prevention

One of the Mobile Network Operators’ largest headaches is the fraudulent subscription and billing of End-Users. In the JoorsChain Protocol, a transparent blockchained digital advertising ecosystem, this fraudulent behaviour will be minimised.

5.6 Advertiser and Publisher matching

In a large decentralised advertising ecosystem, Advertisers want to make sure they find the right Publishers to reach their targeted End-Users. Joors will co-develop a JoorsChain client and a service solution that will help Advertisers find the right Publishers, with codified smart contracts for agreed terms and conditions. This type of value adding service is just one of many that Joors and other service providers will develop for the JoorsChain Protocol in the future.

6 Technology

The JoorsChain is a scalable, layered architecture supporting a high number of transactions and effective use of smart contracts between Advertisers, Publishers, Integrators and Mobile Network Operators. The technology provides

- Decentralization
- Openness
- Self-Governance
- Anonymity
- Non-Changing Database

The Smart contracts are flexible and adaptable to support local legislations and business environments. The JoorsChain is based on a scalable and resilient blockchain that supports the aforementioned transactions, data access and control flow in a layered structure.

6.1 JoorsChain, Advert contracts and Execution sub-chains

The architecture is in four layers

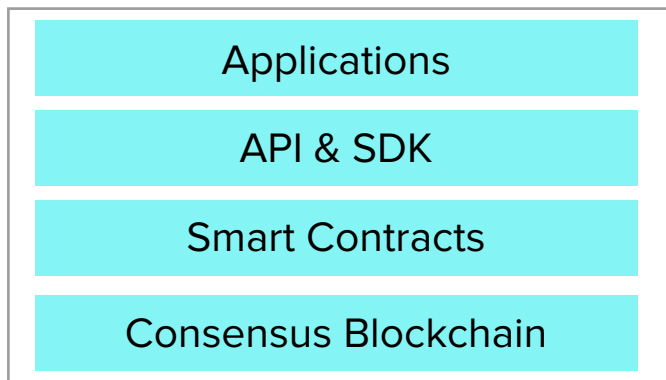


Figure 9: JoorsChain's four architectural layers

The foundation of the solution is JoorsChain, a consensus Blockchain secured by validators. The validation is secured with an improved PBFT algorithm by Validation nodes, consenting on the block. The blockchain stores transactions, Advert contracts and secures the overlying layers. The validators create blocks supporting 10.000-100.000 TPS (transactions per second), securing critical transactions and control flows.

To achieve scalability and high transaction throughput, Advert contracts (smart contracts) and execution sub-chains are used. They work on top of the JoorsChain and inherit the security and robustness from the JoorsChain.

6.2 Validation nodes and Advert Contract Servers

Trust in the JoorsChain is created through validation nodes. The validation nodes can either be a core validation node (with high computing capacity securing new blocks and executing contracts) or light nodes with limited computing capacity verifying blocks and executing sub-chains. The core validation nodes are elected by all validation nodes through delegation contracts.

6.3 Advert Contracts (Smart Contracts)

The Advert contracts are smart contracts where contract details are specified in program code.

The Advert Contracts are flexible and adaptable, to support the diverse need of transaction speed, level of trust and involved parties. The contracts' details are secured in the JoorsChain. The execution and settlement of the Advert contract is controlled by the Core Validation nodes. The validation nodes executing a contract are incentivized with JIC.

Each Advert contract has a unique public address as identification, same as a normal wallet. Each address has its corresponding secret key, to sign the contract. The contract's secret key is discarded after contract creation, so only the consensus protocol can update the information and balance of the contract.

A contract holds four basic elements: {code, state, [call], balance}. Code is generated by the user defining contract conditions such as target group, compensation per view etc. State holds current internal information.

Calls are defining the full functionality for the sub-chains. Balance is the digital currency the contract has.

The work flow related to a contract is triggered by transmission TX. There are three basic transmission types: Payment Transaction TXp, Data Store TXs, Control Flow TXc. They are processed in the underlying validation nodes. All nodes agree on the same global state.

1) Payment TX: {sender->receiver:amount}

Basic transaction to move funds from one to another. Sender will need to sign the transaction using a secret key. The signature is verifiable by anyone.

2) Data Store TX {sender->contract_address: data to store}

This transaction type processed in a Validation node will not validate any balance related operation.

3) Control Flow TX1

a) Contract deploy TX

User sends the init TX to start a new contract. In the contract, user will need to specify the contract code, init fund, execution type.

b) Contract call TX

Run-time interaction with the contract.

6.4 Contract execution sub-chain

The detailed transactions related to an Advert contract are stored in a contract execution sub-chain. The transactions can be ad views, clicks, subscriptions, app downloads, type of mobile phone user, rewards, etc.

The Advert contract defines the sub-chain properties (a percentage of participant nodes, consensus protocol, policy, state storage, etc.) through Control flow TXc.

Once a sub-chain is established, each participating Advert Contract Server (ACS) will adopt the pluggable protocol in its execution. Any following requests on the sub-chain will be validated by the selected percentage of ACS.

A new block is generated on the sub-chain on-demand to save resources and enable scale. The sub-chain inherits the secure and robust underlying Blockchain properties. The sub-chains can be upgraded through updated algorithms in the ACS, without affecting the underlying JoorsChain functionality.

All the transactions can be validated by the contract parties or by algorithms to detect contract violations, e.g. bot views instead of real mobile phone users. The sub-chains details can be purged or anonymized to comply to the General Data Protection Regulation (GDPR).

Data that requires privacy is encrypted. Access to encrypted data between different parties is ensured with proxy re-encryption.

6.5 Incentives and transaction Fee

There are two types of compensation payments that nodes can receive from contributing their computational power. Firstly, the Validation nodes will get rewarded for each block they contribute to. Secondly, the ACS server will be rewarded for their participation in sub-chains and their processing work of Advert contracts. Note that this kind of service may not be power-intensive.

This is a big incentive to regular PC users or even mobile users. For a POW (Proof of Work) network, there is almost no chance for regular users to benefit from mining. However, in Joorschain's setup, a user can set up an ACS node and gets rewarded for the work it provides. This will encourage more users to join the consensus system and provide more ACS processing power. On the other hand, the Advert Contract owner or sub-chain creator will need to pay the fee for all ACS working, but it is very cost-effective considering the benefit and low startup costs. The whole process will promote a more distributed ecosystem and benefit all parties.

7 The Road Ahead

In November 2017, JoorsChain AG was founded, and, having successfully assembled a strong and internationally experienced team, it is now transitioning into the development phase with the design of tokens (JIC), wallets and smart contracts. The next 12 months will be focused on launching the blockchain, transferring the founding partners' digital advertising business onto it and getting new Advertisers and Publishers on board.

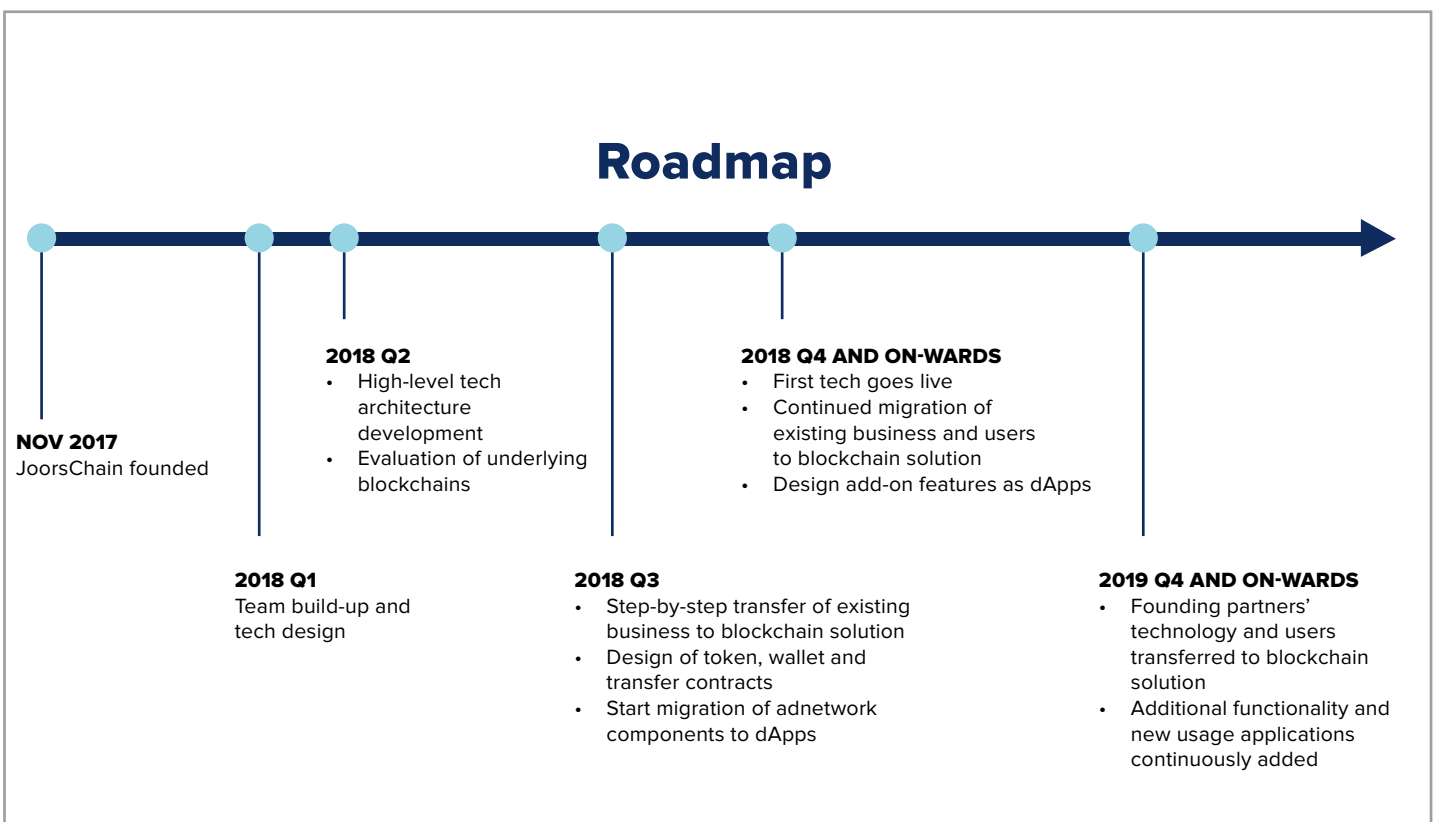


Figure 10: JoorsChain's 12 months road map

8 The Founding Parties

The JoorsChain project involves the below initial partners, who will contribute to the success of JoorsChain's digital advertising ecosystem by transferring their current digital advertising business onto JoorsChain's blockchain.



IntJoors Holding AB
(www.joors.com)

Joors is a Swedish mobile advertising solutions company who provides software that enables mobile network operators (MNOs) and media companies to leverage their existing infrastructure and consumer data in a unique and innovative way. As the main advert discovery channels will be via smartphones and tablets, the demand will rapidly increase for new innovative business models, such as (but not limited to) sponsored apps, JoorsCoin rewards for ad viewing, etc.

Joors will develop a variety of applications on the JoorsChain blockchain.



TalkPool AG
(www.talkpool.com / www.talkpool.io)

TalkPool is a global IoT solutions and telecommunication network service provider. Talkpool was founded year 2000 and is listed on Nasdaq First North Stockholm. Headquartered in Chur, Switzerland, it has around 1 300 staff in more than 20 countries. Through its cutting-edge technical expertise, long experience and agile business model, TalkPool offers industrial companies and telecom operators high-quality services on short notice no matter the location. Moreover, TalkPool is one of few companies with IoT networks, solutions and contracts in place in the exciting IoT-market.

TalkPool will contribute with the JoorsChain client development and become a Validator. The JoorsChain technology enhances TalkPool's integration offering, leveraging on TalkPool's Mobile Network Operator relations and geographical footprint.



Wiget Media AB
(www.wigetmedia.com)

Wiget Media is a global digital performance agency with a variety of products such as a proprietary real time digital ad exchange (an RTB-exchange). The RTB compatible ad-platform is built in-house and has fuelled over 150 billion impressions/unique hits across the globe over the past 6 years. Wiget Media has since 2008 worked with thousands of partners to increase advertisers' performance and drive revenue to their publishers.



Starfish Mobile International
(www.starfishmobile.com)

Starfish Mobile International is one of Africa's leading Mobile Value Added Services providers with a wide range of services, spanning from mobile content, FMCG (Fast Moving Consumer Goods) marketing campaigns, Trivia Promos, running MNOs' content services, and conducting research through the mobile phone.

Since 2002, Starfish Mobile International has run thousands of client campaigns across a wide spectrum of clients, ranging from Newspapers, Media Houses, FMCG clients, Individuals and Mobile Operators.

8.1 Some Prominent Current Clients

The JoorsChain consortium's partners are working with several prominent advertising clients, some are pictured in Figure 10 below.



Figure 11: Sample of current advertising clients

9 An Experienced Team

The development of the JoorsChain's Blockchain and the JIC is led by a strong and highly experienced international team.

9.1 The Core Team

Carl Aspenberg

Co-founder and Chief Executive Officer (CEO) JoorsChain

Mr Carl Aspenberg has held several senior positions at Ericsson headquarter in Sweden, including vice president responsible for marketing and sales in EMEA, Asia and Europe. Carl is a global serial entrepreneur and investor with focus on IoT, E-health and digital advertising and has been part of starting up Agada, Joors among others. Carl has helped several companies with public listings and is a board member and director in many start-ups and listed companies, e.g. C-security system.

Cecilie Chen

Co-founder JoorsChain

Ms Cecilie Chen is a digital content and ad-tech executive with a history including being a senior manager in Acast, the world's largest audio-on-demand platform, driving its international expansion among other tasks. She has helped companies such as Atlas Copco to build and scale their talent retention and student hiring processes. Cecilie has several entrepreneurial experiences within Sweden's and China's tech scenes, including digital advertising and content. Ms Chen has a journalist background from China and a Master in General Management from Stockholm School of Economics.

Stefan Lindgren

Co-founder and Chief Technical Officer (CTO) JoorsChain

Mr Stefan Lindgren is CTO and member of the board at Talkpool and has a long experience from telecommunications, standardization, Internet-of-Things (IoT) and international business. He holds seven (7) international patents and has a Master of Science in Engineering Physics from Uppsala University, Sweden, and has a deep knowledge of IoT, blockchains and distributed ledgers.

Stefan Arenbalk

Co-founder and Chief Strategy Officer (CSO) JoorsChain

Mr Stefan Arenbalk is an experienced international business builder who combines McKinsey strategy perspectives with hands-on tech understanding. He combines international business activities with roles as Deputy Head of Business Sweden (former Swedish Trade Council) in China and Consul of Economic Affairs in Guangzhou, China. Mr Arenbalk holds both an MSc in Engineering Physics from The Royal Institute of Technology in Stockholm and an MSc in Economics from the Stockholm School of Economics.

Per Ostberg

Co-founder JoorsChain

Chairman of Starfish Mobile International, one of Sub-Saharan Africa's largest Mobile Value Added Services companies. With an MSc in Computer Science & Technology, Mr. Ostberg spent five years in South East Asia for Ericsson Radio System's restructuring supply chains, he has built mobile networks in 6 African countries before co-founding Starfish Mobile in 2002. He is an author, speaker and received his Executive MBA with Honours from IMD in Switzerland 2018.

Soheil Amorpour

Chief Visionary Officer (CVO) JoorsChain

Mr Soheil Amorpour is the founder and CEO of Wiget Media Group with over 12 years of experience as an entrepreneur. Soheil grew the Wiget Media's ad-network to roughly \$25 million in yearly revenue without any external investors. Mr Amorpour has a vast experience from working with early stage start-ups as an investor in a variety of industries and he holds a BSc in Psychology from Southampton Solent University.

Armin Eftekhari

Chief Architect Officer (CAO) JoorsChain

Mr Armin Eftekhari is CTO of ad platform Wiget Media with 7 years of Adtech experience and responsibility of growing and managing a team of developers, data analysts and system engineers. Armin is experienced in full stack development including distributed services and high performance / high transaction distributed system architecture.

David Sandgren

Mr David Sandgren handles business development at Wiget Media and has almost 20 years of experience as an entrepreneur, CEO, investor and investment manager. As an entrepreneur, David founded Hitta.se (today one of the strongest brands in Sweden which challenged and later grew larger than the former monopolist Eniro.se) and Mortgageloan.com. Mr Sandgren holds an MSc in Economics from the Stockholm School of Economics, and a major in Finance from Hochschule St Gallen in Switzerland.

Boris de Bruin

Marketing and PR Manager JoorsChain

Mr Boris de Bruin studied business administration at The Hague University, Netherlands, and has FMCG industry management experience from Ahold Netherlands. Being a specialist in branding and communications in technical markets, Boris handled marketing and sales for Talkpool's IoT business.

9.2 Advisor

Jimmy Zhao

Mr Jimmy Zhao is a venture partner at Y investment, co-managing a 100 million USD fund. Jimmy is a true serial entrepreneur and crypto investor in Europe and has been CEO and founder of start-ups, such as Lunchback, Guanxi, Manto networking, to mention a few. Mr Zhao's story has been featured on various international media, including NBC news, Irish independent, breakit.se, the local Europe, as well as arctic start-up. Right now Jimmy is focused on building a fully regulated crypto exchange in Europe.

Appendix 1 – Glossary & Abbreviations

Advertisers – Any person, organisation or company who wants to promote its products and services to End-Users

Affiliate Network – An advertising network aggregating a variety of Publishers and taking a cut from the advertising revenue as fee

ATC – Advert Contract Server

BTC – A digital currency widely traded, used as payment currency and controlled by the Bitcoin block chain.

Bitcoin – See “BTC” above

Block – A time stamped part of a blockchain containing every recorded transaction up until the time it is published, where after it cannot be altered

Blockchain – A decentralised ledger or distributed database across several nodes composed of concatenated blocks

Bots – Computers (programs) acting e.g. as End-Users clicking on adverts; i.e. use for fraud

Cryptocurrency – A blockchain based currency or token

Cryptographic Key – A “password” used to unlock encrypted data. In the blockchain universe, users hold two keys; one public allowing anyone to see what is in a wallet in a read only mode, and one private allowing a user to write into the wallet and thus enabling transactions between users

Digital Wallet – A software application used to store a digital currency (e.g. Cryptocurrencies). All wallets are unique and only accessible through a public and a private Cryptographic Key

DSP – Demand Side Platform

End-User – An individual who is targeted for an advert and/or is viewing an advert

ETH – The Ethereum Cryptocurrency

Ether – See “ETH”

Ethereum – See “ETH”

Fiat Currency – Traditional currencies such as USD, EUR etc. controlled by sovereign reserve banks

Gas – The remuneration paid to Validators for validating a transaction on the blockchain

GDPR - General Data Protection Regulation

Hashing – Means producing hash values for accessing data or for security. A hash value (or simply hash), also called a message digest, is a number generated from a string of text. Widely used in Blockchain technology

Intermediaries – middlemen performing different services in the advertising value chain

IoT – Internet of Things, a concept where machines are

connected and communicate with each other through defined interfaces without human interaction

JIC – JoorsChain Coin, the Token used in JoorsChain

JoorsChain Protocol – A Protocol used for accessing the ledgers and dApps produced by the JoorsChain and its community

JoorsCoin – See “JIC”

Miners – Servers run (by individuals, organisations or companies) to verify that transactions within a Block are legitimate. This is e.g. done via solving mathematical problems of ever increasing complexity

Mobile Network Operators – An operator of a mobile telephone network enabling End-Users to perform transactions, such as calls, data surfing, payments, etc.

MNOs – See “Mobile Network Operators”

Node – Members of a blockchain network that can share blocks and transactions

Off-Chain – Transactions recorded outside the blockchain with the option to be published on the blockchain at a later stage to create a permanent record

On-Chain – A transaction recorded directly on the blockchain

Payment Rail – An established connection between a Fiat Currency and a Cryptocurrency

Publishers – Anyone who has a website allowing Advertisers to place adverts on it, typically attracting the relevant target End-User audience

RTB – Real Time Bidding. A common expression in the ad tech world referring to the real time matching between selling Publishers and buying Advertisers

Smart Contracts – A codified self-executing agreement between two or more parties, communicated and executed on a blockchain

SSP – Supply Side Platform

Tokens – Custom coins created on a blockchain for the purpose of storing and transacting value between Digital Wallet holders

Validators – Checks the different transactions being processed in the network