Qulix

How to create a P2P crypto exchange platform?

qulix.com

Disclaimer

The information shared in this whitepaper does not provide exhaustive data on the topic and does not form the basis for any contract for the user of the information. The primary purpose of this document is educational so that the readers can make better informed decisions regarding the subject matter of this whitepaper.

For online publications, please include a reference link to the original whitepaper.

Table of Contents

Introduction

Alexander Arabey

Director of Business Development at Qulix

Alexander has over 15 years of experience in the rapidly evolving fintech industry. He helped more than 200 clients from 30 countries to design and build their digital transformation journeys.

The portfolio of our latest projects includes MintWhale.ai — a comprehensive investment platform that helps ordinary users effectively earn on existing crypto assets. Also, we have developed successful solutions for such financial giants as UBS, Raiffeisen Bank, Elinvar, and others.

On October 31, 2008, a person or a group of people under a pseudonym of Satoshi Nakamoto published a whitepaper dedicated to Bitcoin. They described the functionality of the Bitcoin blockchain network. The idea of a decentralized financial system with peer-to-peer payments and cryptography to combat fraud was revolutionary. Thus, the finance community met it with mistrust, and the concept took its time to ascend. The first Bitcoin was sold only in 2010, and it wasn't until 2017 when it became a household name.

However, today, both Bitcoin and blockchain have become integral parts of the finance industry:

- In 2022, there were total 83,434,000 blockchain wallet users. (Buy Bitcoin Worldwide)
- The global blockchain market is predicted to be worth $1,431.54 billion by 2030, growing at a CAGR of around 85.9% from 2022 to 2030. (Buy Bitcoin Worldwide)
- 65% of all cryptocurrency users are Bitcoin owners (Buy Bitcoin Worldwide), but its popularity in recent years paved the way for more digital currencies.
- As a result, now, there are over 10,000 cryptocurrencies worldwide. (Statista)

All the points above indicate that crypto continues to captivate the attention of business owners and consumers globally. As a result, the issue of where it is best to buy and sell digital coins is burning like never before.

There are several types of crypto exchanges. However, if you want to enter the industry and start one, a P2P platform would be the perfect choice since it is significantly easier to build in comparison to its competitors.

As a result, we face two questions: what else makes such platforms stand out, and how can you create one? The whitepaper focuses on these exact topics.

Thus, we will share with you the insights on the following aspects:

1. What types of crypto exchanges are there, and how do they differ in terms of functioning and peculiarities?

2. What are the benefits of P2P marketplaces for selling and buying crypto?

3. How to choose the optimal tech stack and architecture for such platforms?

4. What steps should you follow to develop a P2P crypto exchange?

This whitepaper will be helpful for startups that would like to offer the options of buying and selling cryptocurrencies to their users. It will also provide insightful information that derives from our extensive expertise in the fintech field to those who take interest in digital coins and want to learn more about how P2P crypto exchange platforms operate.

Types of crypto exchanges: CEX, DEX, and P2P

Let us start the conversation with the definition of a cryptocurrency exchange. According to Forbes, a **crypto exchange** is

> *"a marketplace where you can buy and sell cryptocurrencies, like Bitcoin, Ether or Dogecoin. Cryptocurrency exchanges work a lot like other trading platforms that you may be familiar with. They provide you with accounts where you can create different order types to buy, sell and speculate in the crypto market."*

There are three types of crypto exchange platforms: centralized, decentralized, and peer-to-peer. To see how they differ from each other in functioning and peculiarities, and why it is a good idea to build a P2P exchange, we invite you to learn more about each of the marketplaces.

1. Centralized crypto exchanges

A centralized exchange, or a CEX, is similar to a traditional stock exchange:

> *it is a platform that acts as an intermediary between a buyer and a seller and charges users transaction fees and commissions for their services.*

What makes centralized platforms more convenient is that you can buy crypto with **both fiat money and digital coins**. Apart from selling and buying the coins, CEXs allow users to leverage, borrow, participate in spot and futures trading, and engage in other trading activities.

The examples of CEXs are Coinbase, Kraken, Gemini, and Binance.

- **Functioning**

CEXs are based on an order book system. That is a list of sell and buy orders organized by the intended sell or buy price. In practice, this means that after a user places an order, the exchange searches for a counterparty whose offering matches it. This system also helps to achieve liquidity.

- **Peculiarities**

A platform is centralized if it is overseen **by one authority**. It establishes the rules of how that marketplace functions, secures data, and maintains control over the transactions and customers' accounts.

To buy and sell crypto, users of any crypto exchange platform have to get digital wallets. Those are protected with private keys. In the case of CEXs, they are the ones that manage the wallets, which means that **centralized exchanges own all private keys** and **store the funds** of their users. That is how such platforms are similar to regular banks: customers entrust both these financial institutions with their assets.

On the one hand, this is very convenient: if the keys are forgotten, access to the wallets, i.e., the money, will be denied. This indicates that with a CEX, your money is safe from your own forgetfulness. On the other hand, crypto owners never get an actual hold of their finances since they don't have the keys to get into the wallets. Roughly speaking, coins of traders belong to the exchange, while the traders merely use the coins under the terms it provides. If a CEX decides to play its users, they will find themselves in a tricky situation because centralized platforms are r**egulated depending on the jurisdiction in which they operate**, and these regulations vary.

Additionally, although CEXs are **user-friendly** and might be more attractive to beginners due to a familiar, bank-like structure, they are a gold mine for hackers: these platforms don't store transactions on a blockchain, **they record all the data on an internal database**. This means that centralized exchanges constantly struggle with security breaches and keeping customer data safe.

We'd also like to note that similarly to traditional financial institutions, most CEXs do not hold the space for privacy: to set up an account, all users need to go through the **identity verification process**. This includes the Know Your Customer (KYC), Anti-Money Laundering (AML), and Counterterrorism Financing (CFT) checks that aim to prevent financial crimes. Thus, with these platforms, anonymity is eradicated.

To summarize, CEXs offer the following:

Advantages	Disadvantages
user-friendly environment for crypto exchange with a familiar structure	custody of digital assets
fiat payments	lack of privacy, security, and transparency
high liquidity	risk of fund mismanagement

2. Decentralized crypto exchanges

A decentralized exchange, or a DEX, is the embodiment of the philosophy behind crypto: it erases the concept that a third party, i.e., a central authority, is a necessary element of financial operations. Instead, it promotes the idea that a person's money belongs exclusively to them and not to financial institutions. Thus, that person should be the only one who controls it. That is why on decentralized exchanges, trades happen between two parties only, which are a buyer and a seller.

In other words, DEXs work on the basis of **peer-to-peer trading**, which is

> *an act of two users selling and buying crypto directly to and from each other, with no intermediary to oversee and control the deal.*

** We will discuss how P2P crypto exchanges differ from DEXs that utilize the P2P approach later on in this whitepaper.*

With most DEXs, it is possible to perform the standard operations like buying, selling, lending, and earning an interest on digital assets. As to the exchange itself, such platforms do not accept fiat currencies and **work exclusively with digital coins**.

• Functioning

Decentralized platforms, unlike CEXs, are stored on a blockchain. The most popular exchanges — like Uniswap and Sushiswap — are built on the Ethereum blockchain. According to IBM, a **blockchain** is

> *"a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network."*

Decentralized crypto exchanges work on the basis of **smart contracts**. Those are pieces of code written on top of blockchains. Their responsibility is to automatically execute transactions if certain conditions have been met. Simply put, their job is to arrange a match between a sell order and a buy order and ensure that each deal is secure, reliable, and transparent.

• Peculiarities

Since there is no central authority, DEXs neither act as custodians of users' funds nor do they store their personal data. Therefore, customers of decentralized crypto exchanges have **full control over private keys** to their digital wallets. This eliminates the risk of mismanagement on the part of the platform and thus **boosts security**. Additionally, in contrast to CEXs, the usage of DEXs **requires more technical skills** and **deeper knowledge of crypto** because the functioning of such platforms differs from traditional banks.

Another point to highlight here is that such platforms do not act as financial intermediaries; therefore, they do not have to meet the KYC and/or AML standards. This results in **privacy** and **anonymity** for their users. A smaller number of regulations also leads to a **higher number of digital coins** that DEXs work with in comparison to centralized platforms. However, there's a downside: because decentralized exchanges do not require users to go through the KYC and AML procedures, they can be used for malicious activities.

As to liquidity, DEXs struggled to achieve it for some time. However, they introduced liquidity pools. According to Gemini, **liquidity pools** are:

> *"a mechanism by which users can pool their assets in a DEX's smart contracts to provide asset liquidity for traders to swap between currencies. Liquidity pools provide much-needed liquidity, speed, and convenience to the DeFi ecosystem."*

Nevertheless, if decentralized exchanges deal with larger investors, they are not as efficient as CEXs.

To summarize, DEXs offer the following:

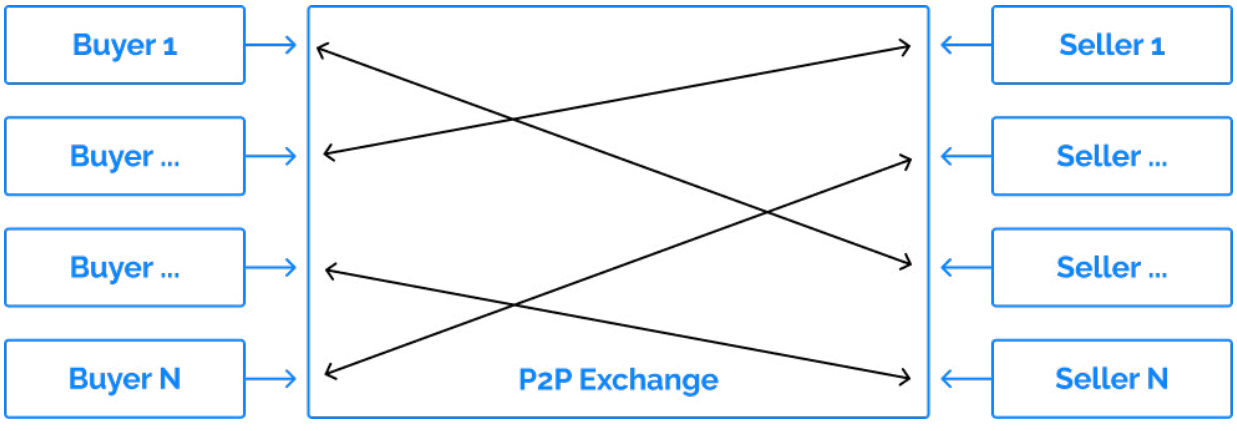
Advantages	Disadvantages
privacy	complex functioning that might be difficult to navigate
personal control over assets	no support of fiat money
numerous digital coins	liquidity
	no KYC and/or AML to protect the platforms from financial crimes

3. P2P crypto exchanges: essence, benefits, and features

Finally, we invite you to talk about P2P exchanges.

Transactions on P2P marketplaces happen directly and anonymously between buyers and sellers, and the funds are in custody of the traders, not a third party. The sign-up process is quick and simple (it takes under 5 minutes), and it is easy to get started with the exchange process. This approach resembles the one of decentralized platforms. At the same time, people are the cornerstone of each trade. Thus, the platform should make the exchange process user-friendly and provide guidance. This refers us to the concept behind CEXs, i.e., how much effort they put into making sure their customers get positive financial experiences.

Nevertheless, P2P exchanges are neither a subtype of decentralized platforms nor a hybrid of DEXs and CEXs. They are a separate, unique way to trade digital coins. While they preserve all the values of the crypto philosophy (i.e., custody over personal funds, security, and privacy) and aspire to make the user experience seamless, they deny both central authority and smart contracts and rely on something entirely different to execute the deals.



With all that in mind, let us turn to five benefits that form the essence of P2P crypto exchanges and make them stand out:

1. P2P crypto exchanges are similar to how **bulletin boards** look and function. Such **transparency** and **simplicity** allow users to browse freely all buy and sell orders to find and contact a perfect exchange counterparty.

2. Similarly to DEXs, these platforms offer a **wide variety of digital coins**, and, like CEXs, they support **both fiat and crypto**, which is a major advantage. They also offer **various payment methods**, which makes transactions more convenient.

3. These platforms allow you **to buy and sell large volumes** of crypto **without affecting its price**. On CEXs and DEXs, such actions usually make exchange rates collapse or skyrocket.

4. In contrast to both centralized and decentralized platforms, on a P2P crypto exchange, deals are made through **an escrow system**. That is a type of contract where a trusted third party locks up buyer and seller funds. An arbiter releases the money only after both sides agree that certain conditions of the trade have been met. The arbiter is not a central authority; rather, it's an outsider, an independent person or an entity (like a bank), that makes deals safe. Such an approach to the exchange process **reduces the risk of fraud, facilitates trust** between traders and towards the platform, and **improves security**. The absence of the central authority also makes **trading faster** and **smoother**. In comparison to DEXs, the escrow system is better because **transaction fees** there are **minimal**, whereas with smart contracts, users have to pay gas fees. That is a commission that Ethereum-based exchanges charge for money transferring.

5. P2P crypto exchanges offer **very user-friendly experiences**, and it's not just about web and mobile applications that have a clean design and are easy to navigate. With P2P platforms, traders can:

a) communicate with each other through a live chat;
b) choose the best partner for the deal depending on the desirable digital coin, payment method, rating of the seller/buyer, etc.;
c) **receive 24/7 customer support**. A live chat, an online community, and a knowledge base are three tools that such platforms provide for a smooth exchange journey.

That said, P2P platforms offer the following:

Advantages	Disadvantage
transparency	liquidity (it is lower than in CEXs due to relative newness of P2P exchanges; thus, they have a much smaller audience and lower trading volumes)
simplicity	
security	
personal control over assets	
numerous digital coins	
support of both fiat money and crypto	
user-friendly environment for crypto exchanges	

As you can see, P2P crypto marketplaces managed to craft a new, creative approach on how to protect users' money from theft during deals and make the exchange process fast and convenient. It is quite a self-explanatory way of trading coins, so it does not come as a surprise that these platforms have been gaining increasingly more attention.

Thus, if you decide to build a P2P crypto exchange, here are the **features** that are good to implement:

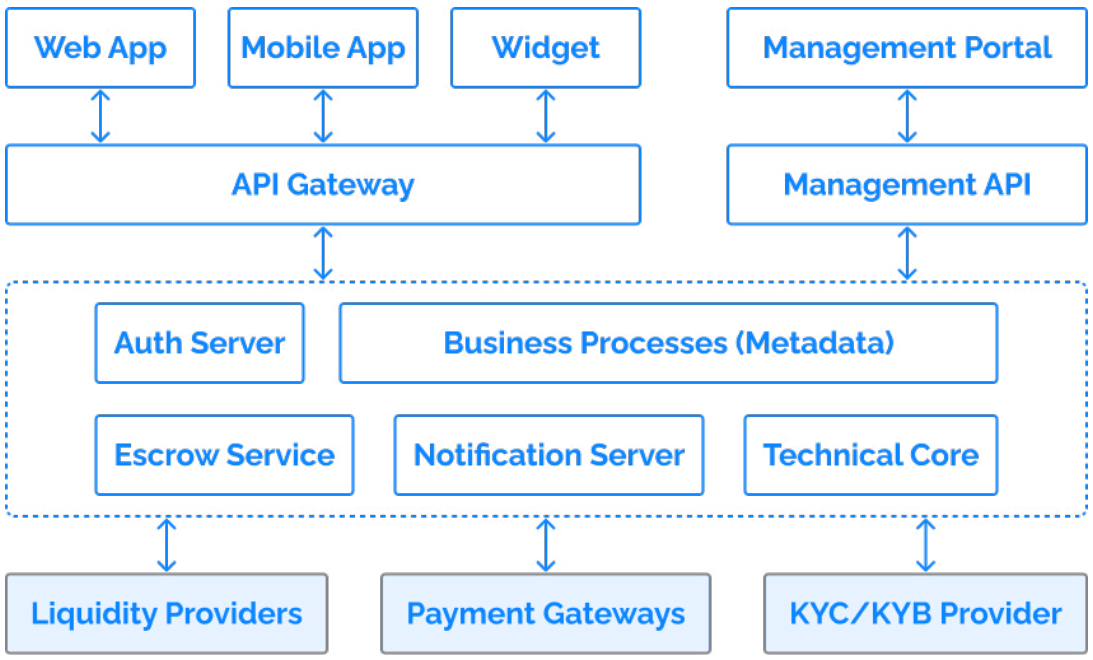
- A quick and simple **registration process**;
- A **search engine** that allows users to find the best buyers and sellers;
- A multicurrency **crypto wallet** (outside or inside the platform) to start trading;
- Support of **multiple cryptocurrencies**;
- **Display of market value** in a real-time;
- **A payment gateway integration**. According to Forbes, it's "the mechanism that reads and transfers payment information from a customer to a merchant's bank account. Its job is to capture the data, ensure funds are available and get a merchant paid.";
- **Multiple payment methods** (fiat money and crypto; support of numerous banks);
- **Escrow services** to complete the deals;
- **A management portal** to oversee the platform's operating processes (we'll talk about the portal in the next section);
- **24/7 customer support**;
- **A chat** with a trading counterparty to discuss the terms of deals and any arising questions;
- **Localization**, i.e., support of multiple languages, for the worldwide crypto exchange;
- **Two-factor authentication** for extra protection of users' accounts;
- **Instant KYC** (ID check) and **profile verification** (phone number verification, usage of an anti-phishing word) to make the platform more trusted and secure.

** Although KYC is associated with centralization, its implementation does not mean that a central authority has to perform it. As IDnow reports, "DeFi [decentralized finance] protocols could create the mechanisms to allow trusted third parties, like identity providers, to perform the KYC and verify the holder of a crypto wallet. Based on the successful identity verification and AML screening, a wallet address could be whitelisted. This way a DeFi protocol could remain decentralized, but the trust and security would increase tremendously."*

Since you are now familiar with the features that a P2P crypto exchange platform should have, it is time to talk in depth about the architecture and the tech stack of such a project.

Architecture and tech stack of a P2P crypto exchange

To users, P2P crypto exchanges look quite simple. Nevertheless, as always, the architecture consists of several complex components. Below, you can see the operating principle of such platforms:



Now, let us draw your attention to the main components of the architecture and talk about the technologies that you would need to build a full-fledged P2P crypto exchange.

• **Web application**

Usually, it is implemented on any JavaScript framework, e.g., React.

• **Mobile application**

There are two types of mobile apps – native and cross-platform.

Native apps run on a certain operating system (iOS or Android). That is why if you develop an app for Android, users with iOS devices will not be able to access it through the App Store. You can build native applications on Swift (for iOS) or Kotlin (for Android).

Equally, it is possible to develop a mobile app on the basis of cross-platform technologies such as React Native or Flutter. Cross-platform applications run on various devices using the same codebase.

As a rule, cross-platform apps are faster to develop and easier to maintain, whereas native apps have better performance since they are optimized for a specific platform.

• **Widget**

It is an application that can be integrated into other systems at the front-end level and allows the user to interact with both the app and the OS.

• **API Gateway**

That is a gateway to the back-end services of the platform. You can utilize the concept of open API and provide different partners with different services depending on their level.

• **Management portal**

This is a control interface for platform operators. As a rule, it has role-based access and implements such functions as:

- anti-fraud and security audit;
- user account management;
- content management;
- customer support (taking care of technical issues and disputes);
- manual transaction execution;
- connection and verification of new customers and partners;
- reporting, and much more.

• **Middleware/back-end**

The server side of the platform is usually deployed in the cloud, e.g., in AWS. Generally, there are no restrictions in terms of technology, that is why you can use Java, Go, .NET, or Node.js.

Architecturally, the back-end looks like a set of microservices on the basis of Kubernetes or Docker. The main ones are:

- escrow service;
- auth service;
- notification service;
- payment service (transaction).

Depending on the business model of P2P exchange implementation, you might also need:

- integration with the KYC/KYB provider that allows you to verify users, e.g., Jumio;
- liquidity providers;
- fiat-crypto gateways (Advcash, Mercurio, etc.);
- AML systems.

Stages of P2P crypto exchange development

The technical aspect of building a P2P crypto exchange platform prompts us to discuss four consecutive stages of its development. For this guide, we relied on our hands-on experience in the industries of fintech and banking. These four stages cover all aspects of product development and will help you plan your project efficiently.

Stage 1. Preparation

The first stage of product development is dedicated to the business analysis and design of the technical architecture.

The business analysis part includes such steps as:

- Conducting research to define the **target audience** and their **unique needs**
- Deciding on the **positioning** and **user acquisition**: thinking through the **key functionality** of the product that would correspond to the needs of the target audience, and how that idea can be delivered to potential consumers
- Defining the **user channels**, i.e., if the product is going to be single-channel or omnichannel
- Estimating the **budget for product development** (maintenance team, solution development team, user acquisition expenses, and more)
- Dealing with the **legal framework** to match regulations and guidelines
- Determining the **operating costs** (lawyers, accountants, taxes, etc.)
- Settling on the **UI/UX design** concept

The technical architecture part includes such steps as:

- Thinking through the **functionality** and creating an **MVP scope description**, i.e, defining the minimum set of core features of the exchange platform
- Creating a **high-level architectural vision** that includes a developed scheme of integrations for the platform (biometrics, personal finance management, chatbots, etc.) and APIs
- Analyzing the **KYC requirements** (to implement them, you need integrations with third parties that are located in crypto-friendly jurisdictions)
- Deciding on the **tech stack**
- Settling on the **team**. As a rule, it includes:
  - product manager
  - system analyst
  - lawyer;
  - technical lead
  - QA specialists
  - developers
  - DevOps engineer
  - UI/UX designer
  - chief security officer

** A project manager is an optional role that can be executed by a product manager.*

Stage 2. PoC implementation

At this stage, the team works on the Proof of Concept (PoC). It is dedicated to rapid prototyping: the goal here is to make sure that developers can realistically implement the critical features of the exchange.

The PoC is a significantly smaller project than an MVP, and it is created before the full-fledged development process begins. The PoC stage is especially critical for startups since on such projects, the budget is usually tight, and it is vital to ensure that the concept is cost-effective, secure, and feasible.

- It is best to develop and implement one or two features that would involve all layers of the product. The design here is insignificant: the PoC is about how the product works rather than what it looks like;
- The next step is to test how APIs work and check the speed of transactions.

Stage 3. MVP implementation

Earlier, we briefly introduced the MVP. Now, we invite you to take a closer look at its meaning and characteristics. According to Techopedia, an MVP, or a minimum viable product, is a development technique where a new product:

> *"has enough value that people are willing to use it or buy it initially; demonstrates enough future benefit to retain early adopters; provides a feedback loop to guide future development."*

If the MVP stage is on your timeline, then the release of the final product with the complete set of features takes place only after gathering and processing early adopters' reviews and making necessary adjustments. Business owners often neglect this stage due to their wish to deliver a product with both core and additional features right away. However, market feedback is crucial. Only users can tell businesses if their products are going to perform well after delivery.

Thus, this stage includes three steps:

- Implementation of the remaining functionality from the MVP scope;
- Implementation of the UI/UX design;
- Testing in sandbox, pre-prod.

Stage 4. Initial release

Here, the product is ready to hit the market. Thus, you need to do the following:

- Submit the product for reviews on relevant websites;
- Decide on the release plan;
- Monitor progress by gathering feedback and make necessary adjustments.

Conclusion

A quick summary of the topic, final estimates, and strategic recommendations before you go.

In this whitepaper, we have talked about different types of crypto exchanges, delved into the peculiarities of P2P platforms, and shared with you our insights regarding the technologies and architecture that allow to build them. We have also revealed four crucial stages of product development.

Please note that the project roadmap discussed here is just one of the possible options. The final solution depends on your specific case.

Since we've approached the finish line, we would like to highlight three questions.

1. Are exchanges with no central authority worth it?

Our answer is yes. Crypto exchanges that do not utilize a third party as a money keeper correlate with the crypto philosophy that money should belong to those who make it, and owners should be free to use it at their own discretion. Thus, if you want to get pure experience of using cryptocurrencies, you should opt for either DEXs or P2P crypto exchanges. We suggest going for the latter, as this option provides better security and more user-friendly experience than decentralized exchanges.

2. Development costs

The costs vary depending on the features that you choose to implement, their complexity, the rates of the development team, and other factors. Thus, it is difficult to provide even an approximate cost. For a detailed answer on the subject, please contact us.

3. Strategic mindset

It is essential to remember that even after the product has been released, it still demands continuous improvement. Maintenance and support require financial resources, so you have to decide on how you're going to fund the project once it hits the market.

Additionally, you will need to go through the process below regularly to ensure that your P2P crypto exchange platform stays relevant and cost-efficient:

- Keep gathering customer feedback;
- Support the product through bug fixes, security improvements, implementation of the new features in accordance with the changes and trends of the market;
- Adjust marketing and outreach plans.

To achieve success both during product development and after the release, make sure you have a reliable team of experts at your disposal.

About Qulix

Custom software development company operating globally

Qulix is an international custom software development company delivering quality software solutions. Since 2000, we have been rendering top-notch development and QA services to our 200+ clients from all over the world. Our expertise covers all the stages of the SDLC, which include concept design, architecture design, code development, quality assurance, support, and more.

Qulix delivers turn-key and custom software projects for banking, finance, insurance, multimedia, IoT, and other areas. The list of services that we offer includes back-end and web app development, mobile and cloud app development, QA services, UI/UX design, and DevOps.

Find more of our best practices by visiting our blog or website.

Please contact us, and we will help you define the goals and requirements for your project. Let us together discuss its functional features, split it into stages, and create a perfect P2P crypto exchange platform.

tel: +44 151 528 8015 **email:** request@qulix.com

UK:
Oakwood, Dunstan Lane, Burton, Neston,
Cheshire, United Kingdom, CH64 8TQ

Poland:
Braniborska 40, 53–680
Wrocław, Poland

Uzbekistan:
130 Mustakillik Avenue
Mirzo-Ulugbek District
Tashkent, Uzbekistan, 100077