QUIXXI CONNECT
A Smart Crypto Payments Based Ecosystem

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At Quixxi Connect, we aim to remove some of the barriers faced by global Crypto-Commerce and blockchain adoption, by securing and simplifying the user-experience whilst trading in crypto-payments. In effect, this will help to foster a newer and larger blockchain based economy or ecosystem. With Quixxi Connect's platform, we provision smart payments, where one can transfer crypto currency amounts via inputting a recipient's email address without knowing their actual public hash addresses ('pay-to-public-key-hash'). Further to Smart Payments, the Quixxi Connect platform's Smart Wallet has a unique private key sharding mechanism as a security feature that can assist individuals to secure their assets on the blockchain, and further enable businesses to safely integrate this smart payments system into their existing platforms and applications (web and mobile).

Further on, we envision a growing crypto-commerce marketplace on Quixxi Connect's platform for people to list their own goods and services to be traded via smart payments, including blockchain related applications (e.g. Decentralised file sharing, identity management platforms) for easy integration of blockchain services into business models and process operations.

Any person can load and share their blockchain applications with the world via the Quixxi Connect crypto-commerce platform for minimal fees, rendering the way to a decentralised web.

This paper will provide a technical overview of this new smart payments system and crypto-commerce platform called Quixxi Connect, which aims to benefit non-tech-savvy users & the whole of society by providing a simple way to interact with blockchain technology.

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1. Introduction

Recent years have seen a rapid rise in technological advancements. In particular, blockchain technologies have revolutionised the way in which value is created, stored, and transferred, in addition to offering a myriad of new organisational possibilities. The introduction of decentralised autonomous agents represents a fundamental change in the way that information can be stored and delivered. Crypto currencies such as Bitcoin [2] and Litecoin [3] revolutionised the world of financial transactions by introducing trust-free decentralised transactions, and are increasingly being adopted by mainstream financial institutions.

Blockchain is the next major evolution of the internet, often termed as the decentralised web or the web of everything (Web 3.0). Powering the key areas of security, predominantly establishing trust among untrusted peers, anonymously transferring currency and assets, secure sharing of resources, and most importantly ensuring immutability, auditability and transparency of record, this distributed ledger technology is storming the wide range of businesses and traditional centralized processes.

With the Quixxi Connect service, the aim is to lower the barrier of expertise for non-tech-savvy users & blockchain application developers, helping them to access easier crypto payments, state-of-the-art security implementations, and cutting-edge technologies. Quixxi Connect proposes a smart payments and security conscious crypto-commerce platform which will reward all users and contributors to the ecosystem (easier crypto transactions for end-users, QXE token payouts to private key shard holders, and cheaper costs for developers, publishers and sellers). This ecosystem is visualised with the following essential services:

- *Smart Wallets*: A secure wallet to store and retrieve information/transactions with hack-safe and forget-safe features. Instant Ethereum account creation at email signup, and automated sharding of a user's private key (essential for fund recovery if a device

with your quixxi account credentials is lost or forgotten) is a thoughtful feature.

- *Smart Payments*: A crypto-payment service to send or receive crypto-currencies via email addresses, User ID or mobile phone number with low fees and theft-tolerance features

- *Smart Commerce:* The Quixxi Connect platform allows crypto-commerce, and the listing of products or services for both individual and business at very low fees. Additional blockchain related services could be published by developers alongside regular goods and services listings. In the future, application developers can integrate these plugins into their applications, without the burden of acquiring expertise in back-end blockchain processes.

These technologies are poised to radically change the user experience for the next wave of crypto currency and blockchain adopters (the early majority) who have yet to embrace crypto currencies due to their inherent complexity and steep learning curve. In particular, we envision a need to utilise these technologies without acquiring a detailed technical understanding of the underlying service and associated security considerations. Although we cannot predict the full extent of the revolution that will be unleashed by blockchain technologies, one thing is clear - customer needs and expectations are changing, and businesses and individuals who wish to engage with this new crypto-commerce economy will need a user experience that remains inherently secure and simple in a rapidly changing marketplace.

The Quixxi Connect Platform will be a smart payments ecosystem for Ethereum that will keep users crypto and blockchain assets secure and will further assist the community to stay abreast of the latest technologies by making it easier for them to incorporate cutting-edge services into their applications. The platform will provide the ability to list and consume all types of legal products and services, as well as a range of blockchain-specific services and

software libraries that abstract-away the detailed operation of the underlying systems, allowing client developers to enhance their applications through interactions with blockchains such as Ethereum and Bitcoin, [11]. It will also offer customized application-specific services to meet the growing demand for other blockchain-related applications.

Interacting with the aforementioned decentralised technologies requires payment of fees, usually in the native currency of the platform. To facilitate abstraction of these payments away from users, the Quixxi Connect Platform will rely on a new internal token, named the *Quixxi Token (QXE)*. Furthermore, Private Key shard receivers will be paid in QXE for holding private key shards, and client developers will use QXE to pay ongoing usage fees or subscriptions for static libraries and/or dynamic services offered on the platform. Developers will pre-pay and maintain a balance of QXE in order to utilise features of the Quixxi Connect Platform, with the option to "top-up" when necessary. In this way, the Quixxi Connect Platform will abstract-away transaction costs, inter-blockchain complexities, and various operational fees into a consolidated, exchangeable token (i.e., QXE). This proposed model of payment would initially supplement the existing Quixxi subscription model with the potential to completely replace it in future.

In addition to helping client developers and businesses incorporate blockchain technologies and services into their applications, the Quixxi Connect Platform will also contribute to the broader blockchain ecosystem by assisting with plasma scaling research and rewarding community blockchain developers that contribute blockchain related services to the platform. Publishers can submit Blockchain services to Quixxi, which will be vetted in detail by the Quixxi team, before being added to the Quixxi Connect Platform as endorsed community services. These community-developed service modules will be available to all client developers using the platform. As client developers use community service modules, Quixxi will remunerate the author of the community service a portion of the fees collected from module users, in the form of QXE. This will incentivise publishers to contribute to both the Quixxi Connect Platform and the blockchain ecosystem as a whole. In particular, experienced blockchain developers will be incentivised to help other less experienced developers benefit from their unique knowledge and skills. This approach allows Quixxi to support blockchain product publishers with expertise in emerging technologies by providing a platform for them to publish their work and ensuring they are rewarded for services they develop and sell.

We can foresee that, The Quixxi Connect Platform will have a positive impact on the blockchain ecosystem by advancing blockchain services and facilitating the trade of a wide range of other goods and services via simplified crypto-currency transactions.

2. The Quixxi Connect Platform

In this paper we refer to the Quixxi Connect Platform as the overarching system, which enables simplified crypto-commerce, with an easy user experience for transactions with email, id and mobile payments, which can be used to pay for a wide range of goods and services on the platform. Further to that, we envision the Smart Wallet will take care of security without the user having to be technically savvy or aware of the processes underlying the wallet, providing peace of mind and an easy user experience.

As the platform progresses, we anticipate contributors will begin to list blockchain related services in addition to the regular goods and services listed on the platform. The project Quixxi Connect Platform would be open source and contributors are incentivised to participate as it is an ambitious project and also they are offered rewards in terms of QXE. Publishers can use the Quixxi Connect Marketplace to create specific plugins that can be offered for QXE payment to people who list services.

2.1. Smart Wallet

All users who register on the Quixxi Connect system with their email address, will automatically have a wallet and address created for them on the Ethereum Network. This reduces the need for users to know how to create a wallet on the Ethereum platform, which can be a

lengthy process for newcomers to cryptocurrency. As the Quixxi Smart Wallet runs on Ethereum, it can hold, send and receive Ether as well as ERC-20 based tokens such as Quixxi. QXE token holders can use the smart wallet service to hold their ether or QXE and ERC-20 tokens, or they can send them to other Ethereum wallet addresses on the network.

This Wallet is based upon a BIP 44 Hierarchical Deterministic Wallet, which will support more than two hundred crypto currencies. It is intuitive and supports multi-signature security. Backup of wallets are typically facilitated through mnemonic phrases, and this design makes our wallet both secure and accessible.

Future implementations of this smart wallet may support other currencies such as Bitcoin, Bitcoin Cash or NEM.

- Paper Wallet support
- Synchronous access across all major mobile and desktop platforms
- One-time backup

2.1.1.   Private Key Sharding

Private Key sharding is an extra level of security that will underlie the Quixxi Connect Smart Wallet. This process is usually undertaken by advanced users of cryptocurrencies to prevent the loss of access to their funds either by losing or forgetting their private key or mnemonic seed. Knowing ones private key is essential to accessing funds on the blockchain, and for authorising the sending of cryptocurrency transactions. Without knowing or losing one's private key is similar to losing access to their funds on the blockchain. Quixxi Connect recognises that if a user's private key is automatically sharded for them by the Smart Wallet, then a major step in security and fund recovery has been achieved, and can help advance crypto-currency adoption as users will be less likely to lose access to their funds in their cryptocurrency wallets.

The underlying feature of this Private Key Sharding is based on Shamir's Secret algorithm, developed in the 1970's [6].

In this algorithm, the secret of a user is divided into 'n' pieces, and it is decided beforehand that 'k' out of 'n' pieces would be required to reconstruct the secret, where 'k' is the *threshold* for recovery.

If unfortunately user has 'k-1' pieces then the secret is impossible to retrieve.

In Quixxi, we utilize this secret sharing scheme to overcome the losses faced by users forgetting or losing their private keys.

As an example, say we input the key 'secret' into the Shamir Secret sharing algorithm, to produce 'n=5' number of splits/shards, where the maximum threshold, 'k=3'. The different key shards can be as displayed in the following table.

Key shard 1	AcqqbjlVIUlLXqOR3r7+Ec3du3+1eOzg7MtwSw==
Key Shard 2	Aox1A9boAmnyUHpx1cySfjxaeqNqVQ9DHyBvbA==
Key Shard 3	A0c6hBWmgD50FDGvfrjGKL69p+Pa2ZDGkJl6Uw==
Key Shard 4	BB7g40RBJrMLocF1o1mgWxwMiGqTAerteiLxwQ==
Key Shard 5	BdWvZIcPpOSN5YqrCC30DZ7rVSojjXVo9Zvk/g==

The beauty of this algorithm is that even though the input message "secret" has been split into 5 different pieces or shards , the original message "secret" can be found by re-combining only 3 of those different key shards. The number 3 was chosen in this example to be the threshold for recombining a key secret, but typically an arbitrary threshold amount in the algorithm can be selected by setting a minimum number of keys needed to re-combine a secret. The quixxi connect system automatically inputs its users Private Key (Ethereum format hexadecimal private key) into the algorithm. The biggest advantages of this algorithm can be seen in overcoming the shortcomings of a single point of failure. So, someone wishing to avoid a private key printed and stored in a sock draw and then being stolen, could split those key shards to 5 different trusted locations. These can

be friends and family, other hidden places around the house, electronic devices etc.

Printing and storing a private key on paper and hiding it somewhere is open to theft, fire or other forms of damage. If a user's private key is left on one laptop device, and it is somehow deleted or lost then access to ones funds on the blockchain is blocked. Thus this sharding of one's private key to have a persistent and resilient copy of their private key is a concept that is imperative to understand for all users of blockchains and various crypto-currencies.

Securing ones private keys is a vital part of securing assets on the blockchain and using the Smart Wallet can facilitate the process automatically without a user being aware their assets are being secured automatically.

With the private key sharding integrated in the wallet, Ethereum users can rest assured their private key will remain distributed, hidden and safe, and they will always have access to their cryptocurrency funds on the Ethereum blockchain.

2.1.2. Plasma Research and Integration

Future additions to the smart wallet will include:

- *Plasma research and integration* for enabling higher transactions per second on the Ethereum network and thus the Quixxi Connect platform. In order for blockchain and cryptocurrency payments to be a viable alternative to the current financial system, higher transactions per second must be achieved. This is another essential cutting-edge technology aspect to be integrated to Quixxi Connect as we endeavor to see Crypto-Currency payments take over benchmark transactions per seconds set by traditional payments platforms such as Visa.[*https://plasma.io/*]

2.1.3. Smart Payments

The smart payment feature allows you to transfer any of the currencies integrated into the Quixxi Smart Wallet, crypto currencies (starting with Ether, QXE, Bitcoin and XEM) via email or phone number id, for a small transaction fee for the ease of service. For example, once registered, you could send an ethereum payment to another quixxi registered users email instead

of a hash address. When sending the payment, one only has to enter the amount of ether they wish to send, and the receivers e-mail address. If using the quixxi token to transfer value on the platform, the fee on the transaction will be lower than if using any of the other integrated cryptocurrencies. It integrates well with our commerce platform, and identity theft protection is guaranteed via biometric or two-factor authentication and allows multiple signatures for signing transactions.

- Multi-layer protection
- Handling transaction history
- Easy spending proposal flow for shared wallets and group payments

2.1.4. Smart Commerce

Quixxi Connect's Smart Commerce services enable a true blockchain ecommerce solution where small businesses are able to set up an e-commerce store in the matter of minutes to sell goods or services in exchange for crypto currencies such as Ethereum, Quixxi or Bitcoin. The Smart Commerce services will be integrated with Quixxi Connect's Smart Wallet functionality, where users can have secured wallets, and make payments directly to an email address. The smart commerce feature will allow Quixxi users to list services like any other e-commerce platform. Smart commerce will be facilitated via smart payment services. The services listed will capitalise on the best features of the blockchain (low cost and relatively fast cross-border transactions) and shows the end user genuine reviews, number of times purchased and original quality.

2.1.5. Distributed Storage services

SWARM [7] is a distributed storage platform and content distribution service, designed to provide de-centralised data storage and allow platform users to efficiently pool their bandwidth and storage. SWARM showcases the power of blockchains to radically change the business model for existing technology service providers. Instead of paying centralised storage providers to house large amounts of content, or host popular content, as is common today,

SWARM provides a decentralized service that allows users to take advantage of storage capacity on network nodes while simultaneously incentivising nodes to host popular content, as required to meet network demands. Furthermore, decentralised storage and distribution means content producers need not transfer content ownership to a centralised entity in order to meet their service needs.

The SWARM Resolver allows client developers to in-corporate SWARM's decentralised storage services into their applications. Client developers can offer application users the ability to distribute popular content or satisfy their storage needs, safe in the knowledge that their data is not housed by a centralised entity, free from censorship, and that they retain ownership of their content. The SWARM Resolver brings breakthrough blockchain technology to developer's fingertips and into the mainstream.

SWARM is not the only organization developing de-centralized blockchain data storage services. Organizations such as *Sia* and *IPFS* also aim to use blockchains to provide new ways of storing and retrieving data. The SWARM Resolver service provides a concrete example of a blockchain-specific service module that offers data storage and retrieval features, however, we emphasize that the Quixxi Connect Platform will be compatible with service modules offering alternative data storage solutions.

2.1.6. Identity Management services

Another potential blockchain related service that could be listed on Quixxi Connect for purchase could be Identity Management. Consistent and manageable identity on the blockchain is somewhat of a "holy-grail" technology. The Identity Management module doesn't aim to address all identity-related issues via the blockchain, but through the integrated collection of services is capable of mitigating some problems. This service may also include KYC services, a common issue in the blockchain application space. This could be useful in the quest for financial inclusion, where unbanked people in remote regions need to establish identity usually by traveling by expensive and long journeys to a central authority in a major city to enter themselves into an official and trusted database that institutions can reference. An Identity Management portal on Quixxi Connect could allow remote farmers for example to input Identity data without having to travel long and costly distances. A loan could be approved without any of the identification document issues associated with traditional banking. Furthermore, Identity Management on the blockchain could also restore identity in war torn areas when identification documents are lost or destroyed. As Ethereum blockchain nodes are spread around the world, a user's Identity Documents would be preserved on the blockchain, and their identity could be easily restored by referencing the blockchain. Access to these life sustaining services via Quixxi Connects services could easily facilitate all of the above identity management scenarios.

Where appropriate, the Identity Management service (or an alternative service within the Quixxi Platform) will support established blockchain identify platforms such as uPort [13].

2.1.7. Future Services Summary

The above service modules exemplify the power of the Quixxi Connect Platform to make blockchain technologies accessible to businesses and the general public. Service modules such as the Token Creator, the ERC20 Agent and Identity Management draw on existing blockchain services and illustrate the potential for blockchain technologies to radically expand the possibilities available to application developers. Modules such as the ERC223 Agent rely on upcoming blockchain developments but serve to illustrate the power of the Quixxi Connect Platform to incorporate emerging blockchain technologies and applications.

The Quixxi Connect Platform is not localised to current technologies or even to current blockchains. As new chains are adopted, Quixxi will implement services and features to accommodate the needs of users and developers, ensuring they have access to the latest technologies. For example, as services of interest to developers appear on new blockchains, Quixxi will operate or support nodes for the new blockchain, along with an API

that allows developers to interact with the chain. When individual blockchains add new features or complexities, Quixxi will add support for these and, if possible, abstract or distil them into an easy-to-use API for developers that can later be integrated into apps that can be shared with all consumers wishing to purchase those apps and services.

3. Services Marketplace

The Quixxi Connect Platform hosts service modules that provide users with simple tools that increase application functionality and improve the end user's experience. In order for the Quixxi Connect Platform to meet the rapidly evolving needs of blockchain users, the development of services to be sold must be decentralised. Quixxi believes that many great innovations arise from the community. The Quixxi Connect Platform not only accepts external contributions but also actively encourages and incentivises their development. While Quixxi will develop a range of service modules in-house, external developers who contribute services to sell like an Identity Management service on the Quixxi Connect Platform will be rewarded with Quixxi tokens (QXE) (see Section 4).

Developers first submit their service modules to the Quixxi team, who scrutinise the code and ensure the proposed product is tested and deemed sufficiently secure to be included on the Quixxi Connect Platform. Here, Quixxi will leverage its expertise in application security to vet products and ensure platform users are only offered high quality, secure service modules. Once a module has been approved it will be added to the platform as an endorsed community service. Quixxi clients can access the community service module in exchange for QXE as usual, however, a portion of the fees paid will be directed to the development team for that service module.

3.1. Service Fee Structures

The fee for the use of services listed on Quixxi Connect is charged according to one of two methods, depending on the type of service:

Subscription: Some service modules will be offered via a subscription fee, whereby clients pay a regular fee to access the service for a designated period of time. Services offered under the subscription payment structure can be used an unlimited number of times within a designated period - QXE payments ensure un-limited access within the allocated time frame.

Per-use: A per-use payment structure is required if a service makes regular calls to blockchain applications that incur fees on the blockchain. Customers pay Quixxi in QXE for use of the service, and the acquired QXE are used, in part, to fund payment for the service on the blockchain.
` For example, The decentralised Storage Service Swarm allows users to store data via the decentralised SWARM storage platform. Access to the SWARM platform incurs a small on-chain fee on the Ethereum blockchain, payable in ether. Quixxi will charge client developers a usage fee for access to the SWARM Resolver, payable in QXE, and will use the QXE to fund on-chain expenses incurred by the service on behalf of clients. Similarly, on-chain expenses incurred by service modules contributed by publishers will be covered by the usage fee paid by client developers for service access.

3.2. Rewarding Blockchain Service Publishers

Service Publishers can charge client developers a set subscription or usage fee for access to their service module. This fee is payable in QXE. After the below expenses are subtracted by Quixxi, all remaining QXE received as payment for use of the community developer's module will be passed on to the developer as reward for their contribution.

Publishers must choose whether their service module is offered under a subscription fee structure or a per-usage fee structure, depending on whether the service involves static libraries or regular blockchain calls that incur on-chain fees.

Publishers should also take the following expenses into consideration when determining the fee structure for their modules:

- Quixxi will charge publishers at a time percentage fee of the total payment they receive for service modules offered on the Quixxi Connect Platform. This fee is estimated at ten percent. The fee allows Quixxi to maintain and develop the Quixxi Connect Platform in accordance with both publishers' needs and client developers' needs.
- Quixxi will vet service modules provided by publishers to ensure they are secure and of sufficiently high standard to appear on the Quixxi Connect Platform. Expenses incurred by Quixxi during the vetting process ("vetting costs") will be recovered by charging community developers an additional fee.
- Publishers will have the option of paying the vetting cost upfront but may, in some instances, be offered to pay the "vetting fee" in an ongoing manner. The vetting fee would be set at a fixed percentage of the service module fee and would be subtracted from QXE payments received for the given service module. The vetting fee would only be charged for a fixed number of service uses, until the vetting costs were recovered.

3.2.1. Payment Structure Example

As a concrete example, for the case of a Service listing on Quixxi Connect charging client developers a per-usage fee, the above fee structure is succinctly summarised by the following equation:

$R_n = P - F_q * P - B_c - F_V * [Symbol](C_V - n * F_V)$; (1)
Where:

R_n is the reward received by a community developer when their service module is used for the nth time.

P is the per-usage payment made by an application developer to use the service module.

F_q is the fraction of the payment amount P that Quixxi charges publishers to host their service module on the platform. The Quixxi fee is estimated at 10%, giving F_q 0:10.

B_c denotes any on-chain expenses incurred by the service module. If the service module does not incur on-chain expenses then $B_c = 0$.

$F_V = F_q * P$ is the vetting fee, charged as a fraction F_V of the per-usage payment P.

$C_V = (V_c - V_u)$, where V_c is the total vetting cost and V_u is the amount of the vetting cost paid upfront by the community developer. Thus, C_V is the portion of the vetting cost outstanding when the service module is added to the platform.

(x) is the Heaviside step function, defined as:
$$x = 1, \quad x > 0 (2)$$
$$0, x < 0$$

Thus, the vetting fee F_V is charged for each use of the service module, until the number of uses satisfies $n > n_V$, $C_V = F_V$, at which point the vetting cost is recovered and the final term in Equation (1) vanishes (i.e., the vetting fee no longer applies).

In cases where the full vetting cost is paid upfront, $V_u = V_c$, the final term in Equation (1) vanishes for any $n > 0$ (i.e., no vetting fee applies).

As evidenced by the above payment structure, the Quixxi Connect Platform can also provide a bridge between client developers, who want to offer application services to Quixxi Connect customers, and publishers, who seek to benefit from their expertise in the latest blockchain technologies. Quixxi believes the platform will inspire client developers to produce high-quality blockchain applications to sell on Quixxi Connect and simultaneously incentivize publishers to expand the forefront of blockchain services.

4.The Quixxi Token(QXE)

Quixxi Connect Platform services are accessed by the transfer of QXEs to Quixxi. There are three main reasons for introducing Quixxi Tokens:

1. *The Quixxi Connect Platform will include both blockchain-related services and non-blockchain products and services*. Some services will require interfacing with blockchain networks and may incur on-chain expenses payable in various tokens or crypto currencies. QXE is readily used for

this purpose. Combining blockchain and non-blockchain service modules under a single payment structure simplifies payment dynamics and introduces accounting efficiencies.

2. *Users of the Quixxi Connect Platform will be rewarded with QXE tokens for authorising the storage of another users Private Key Shard on their own storage device*. As noted in the Smart Wallet section of this white paper where Private Key sharding is discussed at length, a private key is split into many shards, and distributed to other Private Key Shard stakers (other registered users on Quixxi Connect). These shards can then later be recombined to re-form the secret or Private Key in the event of loss of a private key. People who hold or stake another users Private Key Shard will receive a QXE token which can be held in their own smart wallet or traded for other crypto or fiat on exchanges where QXE is listed.

3. *The Quixxi Connect Platform is not bound to a particular blockchain ecosystem but can instead in-corporate service modules that interface with arbitrary blockchains and also may create QXE staking nodes on its own quixxi protocol.* Accordingly, it is appropriate to introduce a payment token that can be employed across blockchain ecosystems, rather than wed the platform to a particular pre-existing crypto currency/token. We aim to create our own protocol with quixxi staking nodes, similar to masternode coins such as Dash, PIVX to slow the velocity of our token. As people hold quixxi tokens in order to gain guaranteed interest from the Staking of quixxi, this will encourage the staking of quixxi thus reducing the token velocity of QXE. We aim to implement this during the year after releasing our ICO. Although technologies such as Ethereum and Bitcoin offer the most-promising blockchains at present, it is unclear which technologies will come to dominate this space in the future. The Quixxi Connect Platform will therefore be constructed on the basis of present-day blockchain technologies, while retaining a conceptually independent existence as an entity that is blockchain-agnostic, as far as the branding, marketing and user-experience is concerned. This is important, in terms of future platform, as it allows the platform to readily incorporate new technologies in the future, while maintaining consistency across established branding and marketing strategies.

4. *Publishers will be rewarded for contributing service modules to the Quixxi Connect Platform.* Issuing rewards in QXE ensures a homogeneous accounting structure for the payment of service access fees and the incentivization of external contributions to the platform. Homogeneity of accounting services permits additional accounting efficiencies.

To access blockchain-related services that incur on-chain expenses, client developers (or users of their applications) will be required to pay ongoing per-usage fees. The precise details of this fee structure will be dependent on the service structure and, accordingly, will be determined as services are developed by either community developers or Quixxi. On-chain expenses are determined by the blockchain protocols and are largely beyond the control of both publishers and Quixxi. A per-usage fee is preferable to ensure that client developers whose applications make infrequent on-chain calls can offer their services at cheaper rates than developers whose applications require frequent on-chain services.

A consequence of this fee structure is that it automatically creates a floor price for QXE. Platform users transfer QXE to Quixxi Connect for access to regular crypto-commerce goods and services listings, or for services that use on-chain services. Quixxi must therefore hold a reserve of crypto currencies such as ether, bitcoin, or Zcash to pay for on-chain services on the corresponding blockchains, such as Ethereum and Bitcoin.

As just mentioned, services that incur on-chain fees will be offered under a per-usage fee structure on the Quixxi Connect Platform. In general, on-chain fees are payable when a

transaction is included in a block by a miner. *For example,* computational services provided on the Ethereum blockchain incur an expense in \gas", an on-chain concept that provides the \fuel" for computations, similar to the use of fuel by a motor vehicle. The amount of gas required to fuel a given computational process is fixed by the design specifications of the Ethereum blockchain [8]. However, blockchain users can incentivise miners to include their transactions in the blockchain by offering a larger ether/gas price, in accordance with market demands.

Services that incur on-chain costs will similarly involve a QXE/use price that accounts for the QXE/gas price. Modules may include service features that allow users to select the price they are willing to pay for gas, reacting the urgency/importance of their transaction. *For example,* during a period of high network activity, when supply and demand forces tend to elevate the gas price, users may be willing to pay an elevated gas price to incentivize prompt processing of an urgent transaction. For a less urgent transaction, on the other hand, users may accept a delay in processing time, in exchange for the lower gas price that succeeded to incentivize transaction processing after peak network-activity subsides. Services modules can be designed to meet these needs by offering discrete choices of QXE/gas rates, continuous choices of QXE/gas rates, or simply offering a fixed QXE/gas rate for all usage of the service. Depending on the sophistication of the service user, the service developer may provide detailed service features for the user or account for these matters behind the scenes, perhaps merely requesting basic user-input to indicate the user's preferences and adjusting the usage fee accordingly. Service users hold a wallet of pre-paid QXE tokens, which are used to fuel on-chain computations or fund subscriptions.

4.1. QXE implementation

While QXE tokens are designed to be blockchain agnostic, it is a reality that these tokens must exist on a particular blockchain in order to exist as a decentralized crypto currency. QXE tokens will be deployed on the most appropriate blockchain as the requirements of the platform evolve.

At the time of writing, the Ethereum blockchain appears to offer the greatest flexibility and security for issuance of tokens, therefore the first iteration of QXE will be implemented as an ERC20 [12] smart contract on the Ethereum blockchain. As the ecosystem evolves, it may be possible that Ethereum no longer remains the most suitable platform for QXE, at which time Quixxi tokens will be migrated to an alternative platform or our own protocol. *For example*, to enable a slower or if the cost of QXE transfers on the Ethereum blockchain becomes too great (measured in ether or time-to-confirmation), then a transition from ERC20 tokens to a native blockchain may become appropriate. Such a transition would not result in the creation of additional tokens, tokens would be removed from one system and re-issued in the alternative.

On our own network, we can slow the Token velocity of QXE, using the same

Since transfers of QXE on the Ethereum blockchain cost "gas", denominated in ether, this could present an unreasonable cost overhead for service payments on the Quixxi Connect Platform. To avoid excess gas expenditure on Ethereum while still paying incrementally for use of service modules in the Quixxi Connect Platform, off-chain payments mechanisms will be implemented so that fees can be paid without the overhead of blockchain confirmation. In this way, fee payments can occur rapidly and without costing ether, followed by regular on-chain settlement.

5.Conclusion

The Quixxi Connect Platform is the platform that community and society are looking for. It offers a simplified and secure user experience when transacting in the crypto world which will grow the crypto-commerce economy. With wallet accounts automatically created, and security taken care of under the hood, it requires minimal prior understanding of crypto transfer on user's end. Quixxi Connect will enable a new wave of crypto-commerce and adoption to take place due to this drive for a simpler user experience. With lower technical barriers to crypto adoption, a simplified crypto payments experience (e.g. E-mail id payments) is a chance

for crypto adoption to spread. Advanced wallet security and backup features will be taken care of automatically under the hood reducing complex security considerations, eliminating barriers associated with crypto-commerce as a payment channel.

As user adoption grows for our Quixxi Connect smart payments crypto-commerce system, the variety of goods and services listed on the marketplace will grow. Quixxi users will be able to access the latest payment and security features in a simple and user friendly manner. People will be transacting any type of goods and services on our Quixxi Connect crypto-commerce platform. Adoption will reach a point that it will be beneficial for anyone to list blockchain related services to sell and they will be rewarded for doing so in QXE token or ether.

User friendly smart payments and smart wallet features will facilitate Ethereum based trade while people who list and contribute services to the Quixxi Connect platform, will be rewarded by Quixxi token incentives to reward them for their contribution.

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