

Peerz

Creating Happy Business Relationships

Position Paper

v1.0

2018-09-25

For legal notes and our Terms & Conditions on the planned ICO for Peerz please see:
ico.peerz.one

Documentation

This is the Peerz Position Paper. If any of the details of our project are not specified in this document, please refer to our past and upcoming Peerz publications. Should none of our official documents contain the information you look for, contact us via [Telegram](#), [Twitter](#), or [Facebook](#).

Peerz Documentation

❖ Peerz Whitepaper
Peerz Technical Whitepaper
Peerz ICO & Token Economics
Peerz Legal Documentation
Peerz Example Use Case

Table 1 The Peerz Document Suite

Abstract

Our digital life has become increasingly complex and time consuming over the past years. But the digital utopia was supposed to make life easier. Still, engaging in a business relationship becomes increasingly complicated. What went wrong? The answer is as simple as it is correct: The digital world hasn't constructed its own infrastructure yet. This leads to asymmetric business relationships and a loss in business efficiency for all parties.

Furthermore, the current economic setup is undergoing substantial change which is driven by two developments: Smart Connected Devices and Access Over Ownership. We believe that, if done right, the combination of using instead of owning and devices as economic players can change the current economic situation for the better – for all parties.

In this position paper, we want to present the bases of Peerz – a community project that will enable real-world business on the blockchain. With your help, Peerz aims to become the shared standard for service providers, consumers and devices to engage in meaningful and prosperous business relations with each other. Through a combination of hardware and smart contracts, we aim to make real-life business data available for blockchain consensus. What distance did a person actually travel on the train? How much time was a car parked in the parking lot? Did the vending machine dispense the correct article?

This adds to user experience, making business more simple, reliable, and secure. Through our token model, we aim to align the interests of all parties: service providers, consumers and connected devices. Get to know the components of the environment we will build, get to know our team and experience, our marketing strategy and business philosophy. Whether you want to get involved with the project or you want to decide on your investment, this position paper is the starting point for our journey.

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Introduction

*“Digitization is challenging us to re-think the future of our economy”
– Henning Kagermann, former CEO of SAP*

Our digital life has become increasingly complex and time consuming over the past years: We spend substantial parts of our lives searching for and registering to services, configuring our IT devices and home equipment, fix technical problems, update our payment data, wait for services, read Terms & Conditions, and so on.

Big corporations gather our personal data for the sake of making our life simpler, creating personal security problems instead. Users need to be aware of different Terms & Conditions, data privacy rules, cookie policies, refund options, fare systems etc. And from a business perspective especially smaller commercial entities can also suffer, e.g. from denial of payment for a provided service when they cannot fully control the business transaction process.

The business opportunities of increasing interconnectivity are manifold. Building and supporting the technology stack for a smart, peer-to-peer economy requires substantial investment and a new set of skills. These include software development, systems engineering, data analytics, and security expertise. Businesses and service providers are often not able to execute their digital transformation successfully.

This raises an array of questions: Is this service provider trustworthy? Are they willing to deliver? Is my data being sold? Did I pay too much? Did I make a mistake? This leads to discomfort, uncertainty, and a feeling of insecurity: We often feel overwhelmed by the range of services, options, rights and obligations.

Whether we talk about a simple online purchase, the commissioning of a service, getting a coffee at a vending machine or buying a ticket for public transport, much too often there are bad user experiences that damage short- or long-term business relationships between consumers and service providers. One party has the upper hand and the other party is outplayed in the business. Asymmetric business relationships are what creates financial disadvantage, loss of trust and bad usability of digital products.

At Peerz, our mission is to supply the missing link for happy business relationships in the economy of the 21st century. We create a blockchain-based commerce layer which service providers, consumers and devices can use to engage in meaningful, fruitful and symmetric business relationships.

The Present Day – Asymmetrical Business Relationships

As early as 1997, scientists and scholars were addressing the question of whether the Internet was going to lead to a more equal global society [1]. Years later however, the United Nations found that the less optimistic voices were right. Inequality has at no point since World War II been so prevalent in the world as it is now [2], and at no time have technological advances been as fast as they have now. According to researchers of the United Nations University, however, technological innovation is not the one to blame. Rather, it is poor governance and poor entrepreneurship that have led to increasingly unequal markets in the past decades [3]. The Peerz project is dedicated to proposing a solution to the asymmetrical business relationships that dominate today's markets. We aim to do so by addressing current issues of usability of digital business models, which skew the symmetry in business models to the disadvantage of both service providers and consumers.

Digital doesn't mean simple

*51% of smartphone users do not download any apps in a month
– comScore [4]*

When a consumer gets in touch with a service provider, they are required to register, read and accept the provider's terms & conditions and disclose payment and personal information. Often times, this goes together with the download and installation of a mobile application to interact with the service provider [5]. Looking back, buying a physical train ticket at the counter did not require consumers to hand over any personal data or payment card. After all, cash is anonymous.

When asked why they don't use more apps and services 40% named one or more trust issues as the most important barrier

– Mobile Ecosystem Forum [6]

But the digital utopia was supposed to make life easier. Still, engaging in a business relationship becomes increasingly complicated. The existing infrastructure was merely amended to interface with the digital world. The digital world hasn't yet constructed its own infrastructure. The lack of simplicity in usage has led to a sheer app fatigue, manifesting itself in a decay in app installations. Over 50% of smartphone users install less than one mobile application in a month [4]. This is a strong statement from users. But it also shows how smaller service providers have trouble competing with global players, since only well-established apps are actually used by the average user.

The digital world hasn't yet constructed its own infrastructure

Hence, usability is not only a matter of comfortable use but of unequal business relationships, which lead to disadvantages for both consumers and service providers. This is for instance reflected in the complicated onboarding process for consumers. Service providers require consumers to provide a big amount of personal and payment data plus verification of identity.

Businesses nowadays struggle to achieve trustful relationships with their customers. They are in desperate need of identity information because they otherwise expose themselves to a high risk of payment default.

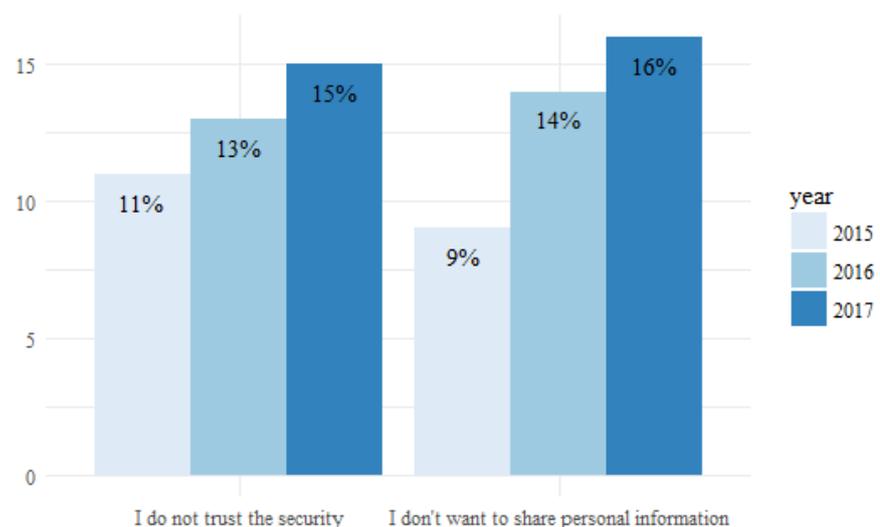


Figure 1 Percentage of responses to the question "What is the main reason for you not to download an app?" [6]

Data and Trust

*Asked why they are concerned about personal data falling into the wrong hands,
47% referred to identity theft
– Mobile Ecosystem Forum [6]*

The other way around, customers often don't trust service providers. This is illustrated by the fact that trust issues are the number one reason for users not to install mobile apps. Furthermore, 86% of the participants of the Global Consumer Trust Report 2017 have taken action against services which they didn't trust [5]. Obviously, trust between consumers and service providers is hard to achieve, when fees aren't directly payed, or when services aren't directly provided, since both consumers and service providers have to rely on the good intentions of their economic counterpart. But trust is the basis of any economic activity and hence a key aspect in the design of digital track keeping, especially in digital business relationships [6].

A corollary to this is the capitalization on consumer data and its centralization around few players. Those are needed for businesses to stay operational in the digital time. Identities are utilized with the objective of increasing efficiency in product design, marketing and tailoring goods to the consumer's convenience. The actual product being sold, however, is the consumer's purchasing power, resulting in data sales being one of the main businesses in the 21st century [7, 8].

With modern markets, and particularly data markets, being able to feed, clothe, and house almost 8 billion human beings [9], the extensive use of data can be an efficient tool to make consumers meet their needs. Nowadays however, the access to data is centralized around a few big players and no chance for consumers to capitalize on their own data [2]. Businesses are also affected by centralized data storage. The mere fact that data is centralized, even by benevolent players, is that they produce a single point of failure, where malicious attacks on centralized data will automatically result in compromised user data, and a corresponding disadvantage of the company owning the data.

By selecting the right combination of partnership models, banks and processors can achieve the potential €2.5 billion in system cost-savings faster and with higher certainty of hitting their targets

– McKinsey & Company

Many of the aforementioned problems result from the weak infrastructure that the internet has to provide fruitful business relationships. A particularly telling example is the use of outdated payment mechanisms in the 21st century. The credit card was invented in the 1950s. Since then, card transactions have seen incremental improvement in form of digitized processes. But what remains is a physical card which is tangible for exploitation. This is true for most widely adopted payment schemes today [10].

The access to a credit card for consumers goes along with everything that we have stated about asymmetric business relationships so far, that is data centralization and a complicated onboarding process. On the other hand, providing this payment infrastructure is extremely disadvantageous for business as well, as it is highly inefficient. The annual costs of processing consumer to business card transactions alone exceeds \$1 trillion [11]. The real impact of this payment infrastructure is measured in trillions of Dollars [11].

The way into Future

It is clear that today's infrastructure is not fit to be hit by the wave of innovation to come. Up to now, business is done by service providers among each other and by service providers with their customers. The future, on the other hand, yields business relationships between consumers and devices, and between consumers among each other. This is the often-acclaimed shift which takes place in the present, and which is driven by two developments: Smart Connected Devices and Access Over Ownership.

Smart Connected Devices

*The total installed base of connected devices will increase to 75 billion by 2025
–Statista [12]*

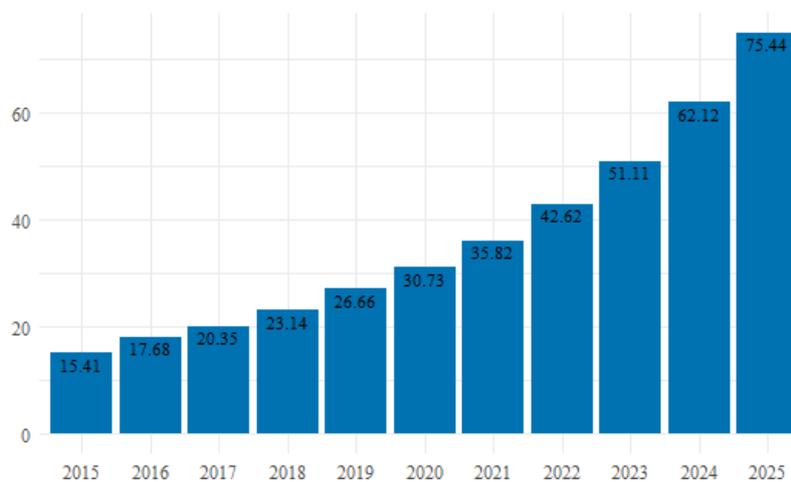


Figure 2 Increase of installed base of connected devices by 2025. The number of devices is indicated in billions. Adapted from [13].

The United Nations forecast the world's population to reach 8.5 billion by 2030 [13]. Contrasting this with an increase in connected devices to 75 billion by 2025 [12], this means that the number of connected devices will have tripled [!] seven years from now. This development will affect devices such as fridges, vending machines, digital cashiers and the like.

The sheer number of connected devices, however, is just one of many factors in determining the world's economic architecture in the future. Ongoing improvements in sensor technology and the recent advances in machine learning which makes predictions on immense amounts of data, will further miniaturize connected devices and make them more unnoticeable in our day to day activity. Furthermore, connected devices will eventually become more efficient. Businesses strive for higher performance under lower energy consumption, and succeed in their developments.

This makes the use of connected devices more desirable for consumers and service providers alike. Consumers profit from an increase in convenience, as the use of connected devices will be more reliable and provide ad-hoc access to services or products. Service providers benefit from these advances in that the employment of machines is less prone to failure, and in that capacities of the workforce can shift to higher level tasks, since low level tasks are either assisted or taken care of entirely by the connected device.

Access Over Ownership

*„We’re experiencing a significant value shift “
– Rachel Botsman*

The Access Over Ownership trend is proper to the 21st century and radically breaks with the economic setup of the 20th century. Enterprises like Zipcar, AirBnB, lyft, TaskRabbit, and Uber introduced a new business model, which is closer to the modern *zeitgeist* than former business models were; the platform economy.

Platforms, as opposed to service providers, do not actually offer a product or service to their customers. Rather, they supply an interface on which users can interact to directly do business with each other. That is, instead of renting a room from AirBnB, users can rent rooms from each other and do their match and meet on the platform. This business model, then, is about supplying match making of offer and demand as a service, and introduce a transaction cost for the established business relation, hence generating revenue for the platform supplier.

P2P economy, if done right, cannot be held back

The model works because the psychological underpinnings of socio-economic prestige is changing. People do not longer want to own, but rather use products. One aspect of that being the case is the socially increased awareness of consumers with regards to hyper consumerism in the 20th century and its scarce resources. The principle of using instead of owning has positive meaning attached to it, as it gives the opportunity to passively do good for the climate and society. That is because resorting to an underused asset is more resource efficient than buying something new.

This trend is going to impact on the way business is done. It leads mainly to the empowerment of consumers who will turn from consumption alone to offering services or products and become service providers themselves. Overall, this leads to a more broadly spread access to goods and services. But not only can and will more services and products be available. Even more so, a P2P economy will lead to better matching offer and demand. This means that demands will not only be covered by the corresponding offer. The demand is going to be satisfied the moment place it emerges, because platforms and assisting technologies allow for an instant offer and demand matching. This is a desirable improvement to efficiency in the global economic setup.

Life in the Future – The Bad Ending

Since these economic trends build on top of an overly complicated and asymmetric setup of global business relationships, they can eventually cement the lack of usability and symmetry. This entails various problems for users on account of the problems that we identified earlier.

Current macro trends are not only unfruitful for modern business relationships but can actually hinder technological development in the future.

Opposed to the increase in disposition and use of connected devices [12] stand comScore's reports of app fatigue [4] which are dramatic in their consequences. When apps, and even more so smart devices, create an obstacle for users to use them, the acquisition of customers becomes increasingly difficult. Again, this leads to asymmetric business relationships, because the only service providers that profit from this development are tech giants with already well-established app-suites. These will be able to catch users' attention due to their known brands and profit from developments in the past. This means that, overall, business opportunity will decrease for players with valid ideas, since opportunities will cluster around already existing, too-big-to-fail players.

Another beneficiary of app fatigue are media companies, since the only thing to become scarce in a world of abundance is human attention. They will continue to grow in popularity across consumers and service providers as they sell consumer attention, that is ad space. This is because the array of connected devices in the future enables to target individuals for marketing and advertising purposes. PQ Media forecasts global advertising and marketing to rise as high as \$1.3 trillion [14]. From a perspective of digitalization, this is highly inefficient, since money will be missing in the investment and development of actual products. This development might not only turn out to be unfruitful for users but actually hinder the technological development in the future.

Ultimately, the further capitalization on consumers' attention and the tracking of behavioral data will make the lives of users increasingly transparent for service providers. While it is obvious that consumers are held back from capitalizing on their data, this problem also affects service providers. With stark competition for access to data between service providers, the position of

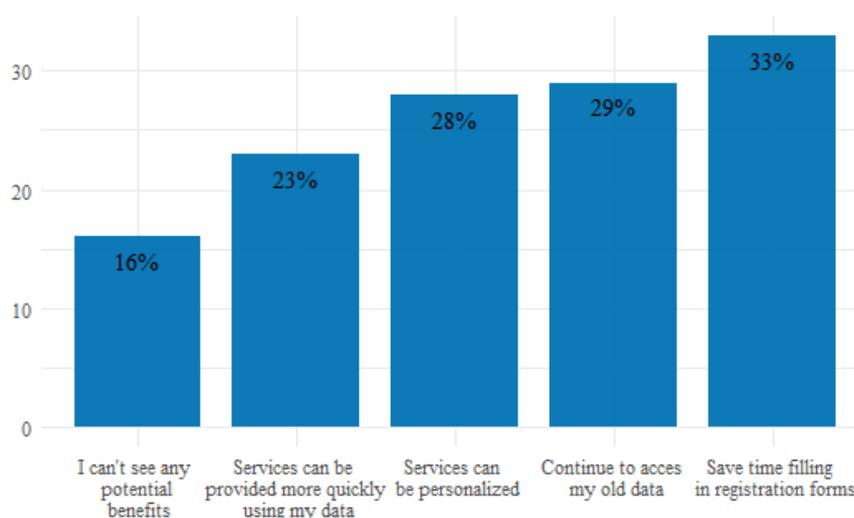


Figure 3 Percentages of responses to the question "What benefit do you see in your data being made available to companies?" Adapted from [4]

big players compared to smaller service providers is strengthened, which ultimately leads to lower overall economic power of the system.

For instance, platform-based business models collect huge amounts of data from the interactions they enable. This is necessary for services like AirBnB or

Uber to function correctly, since the service provided is to match offers and demands of players without any apparent effort. This benefit is also recognized by consumers, because just above 15% of consumers fail to see how data collection can possibly improve their user experience [5]. However, these advantages are not being readily exploited, as digital services still exhibit a tremendous disregard for user experience [4]. Consequently, consumers cease to install new apps and go with the well-established brands, which damages the overall economy.

The infrastructure of our economy is hardly suitable for an extensive adoption of the Access Over Ownership trend. We have already drawn upon the fact that the cost of transactions nowadays, with centralized service *and* payment providers, exceeds \$1 trillion only in transaction processing [11]. With a more access-based economy in place, the number of transactions to be processed can be expected to drastically increase. Consider that buying a car requires to process one giant transaction, while using a car thrice a week, without actually owning it requires payments for each time you use it.

We see that the consequences of missing usability and user experience in the digital world go far beyond the consumer's discomfort to subscribe to a new service. Until a viable, trusted, decentralized alternative to today's business models is provided we shouldn't expect major boycotts of platform services. However, it is our mission to put the user back in user experience and propose a peer to peer business architecture that allow for more symmetric business relationships.

Our Vision – Symmetry through usability

Winners will [...] enable decentralized peer-to-peer systems that allow for very low cost, privacy and long-term sustainability in exchange for less direct control of data
Paul Brody [15]

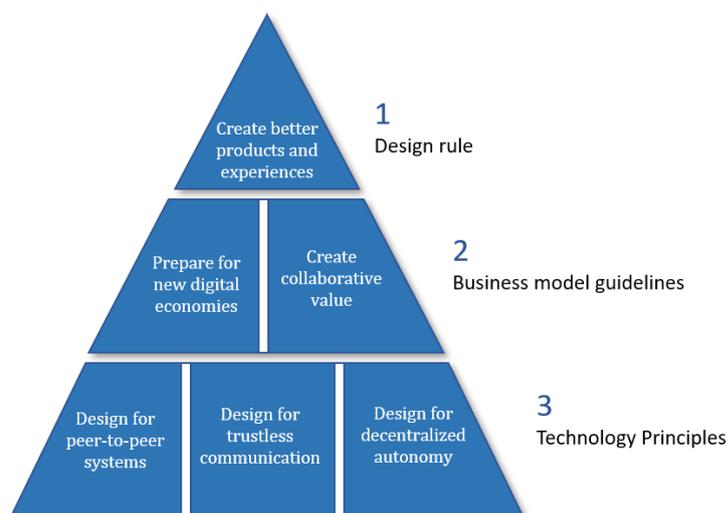


Figure 4 The pyramid of digital success: Build a strong technology foundation, guided by new business models and design for better experiences. Adapted from [15]

In response to the challenges that the future poses, we firmly believe in an alternative; if we are able to model the current macro trends to our advantage, we can make ends meet and provide a better economic setup in the pursuit of user experience. Paul Brody's work on the Device Democracy supplies principles, upon which the future economy will experience its good ending. On the base layer the ecosystem on which we construct our digital world, includes peer-to-peer structures, trustless communication, and decentralized autonomy.

Accordingly, business models will have to adapt to these technological principles in order to then enable service providers to supply users with a truly positive experience. At Peerz, we identify ourselves with the mission to supply an economic architecture that be based upon these technology principles and on which business model guidelines be symmetrical by design.

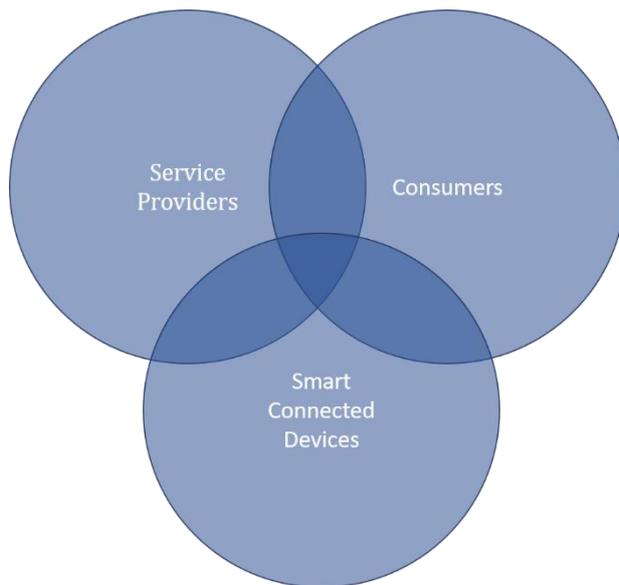


Figure 5 The three fundamental roles in the future economy. The intersection between them represents a technological setup in which the interests of all parties are aligned.

*Service Provider - Consumer - Device
three fundamental roles in the future economy*

The service provider

The service provider is probably the most antique role to consider in the triangle of modern economy. We equate service provider with providers of both services and goods. That is, everything that you would traditionally think of as whom consumers buy from. The consumer and the service provider then define each other in their mutual relationship.

For service providers, the situation is far harder than it seems to be in the current setup, and they could crucially benefit from a peer-to-peer economy. Firstly, the battle among service providers is mostly about consumers' attention. We have laid out the expenses of businesses for marketing services above. The customer's attention is mainly connected to the centralization of data around a few big companies. This means that one way of enabling David to win against Goliath is granting service providers access to tradable data, without having to recur to overly expensive services of intermediary media or marketing firms. Decentralizing data and granting access to it, is thus a crucial point in making them visible to customers and even out the relationship of power in the competition among small and big businesses.

On the other hand, service providers are crucially affected by outdated payment systems. Their missing trust in a customer's payment moral is reminiscent the fact that current payment procedures can easily be abused. That is, the payment for a supplied service or product can be denied in a relatively easy fashion with current payment methods. Service providers will thus greatly benefit from an environment in which payments are processed automatically whenever a service or product is provided to their customers.

From the perspective of the service provider, decentralizing data and modernizing payment methods are the key aspects of a peer-to-peer digital economy, and making their relationship to other economic players symmetrical again.

But this changes the way we have to think about economic activity quite drastically. In the, following we will consider three fundamental roles that need to be defined in the future economy, and upon which we have drawn briefly in the foregoing sections of this whitepaper. The service provider, the consumer, and the device. Our aim is to sketch out how the interests of these three parties can be aligned to the benefit of all in a modern digital economic infrastructure, and what has to be done in order to correct the four fundamental flaws that we see for each of them in the current economic setup.

The consumer

The situation for customers is complementary to those of service providers. For them too, anachronistic payment methods are a major drawback for a convenient, and easy to use peer-to-peer infrastructure. The difficulty lies in the fact that the use of payment methods is a threshold to partake in economic activity at all. Thus, automatized payments offer both protection for the service provider and convenience for the consumer. Automatized payments are a key element to equalize the relationship between service providers and consumers.

In the case of data centralization, the needs of consumers are complementary to those of the service providers as well. We claimed that the decentralization and accessibility of data liberate service providers from competitive pressure of bigger players, but the problem for consumers is quite obvious. Data being collected and overtly released to the service providers isn't in the best interest of consumers, unless they chose to capitalize on the data they own. Consequently, a peer-to-peer economy environment needs to regulate the relationship between service providers and consumers in such a way, that the latter have to agree to their data being used by the service provider and be able to expect a reward or additional value, if they chose to do so.

In summary, the customer deserves to be put back in control of their data and needs to be granted more convenience in the processing of payments. A ride on a local train, for instance, needs to be paid automatically including the payback on shared data, if that option is activated for that person at a specific time.

Convenience in the use of devices will furthermore foster the adoption of technologies and bring forth new applications and devices, which, in turn, leads to further convenience for the customer.

The device

When designing an ecosystem for symmetric business relationships, it might not make sense to look at the device as an independent player in the economy. From a technical perspective, however, the device is a key player in the business relationship between service providers and consumers, as increasing connectivity leads to more economic autonomy. This, in turn, allows to follow up on the degree of automation, in which devices play an important role.

The advances in data processing (AI) and connectivity of devices will turn them into technological decision makers that need to interact with service providers, consumers, and other devices alike. Consider for instance an autonomous vehicle, checking its fuel (or battery charge) status, inspection dates, etc. independently and freely interacting with charging stations and mechanics in order to be fixed before offering its service to customers again.

In our future scenario, devices are mainly in need of information, so as to interact with the world according to the tasks assigned. The extent to which data access is needed differs greatly from device to device. An autonomous vehicle requires more knowledge about its environment than a stationary parking lot pole that interacts with the autonomous cars and processes parking fees. But common to all of these is the need to access data at all and to interact with the ecosystem. Therefore, we will establish a common layer for different devices to interact, even though direct compatibility between devices might not be given at all.

The role of the device is ambiguous in that it can instantiate itself as a consumer, as a service provider, or as mediator between the two. As such, they can function as a verifying instance for an economic transaction. Consider a connected device on the train, which measures the travelled distance of each customer and ensures payment via consensus with the customer's mobile

application. In this case, the connected device is used as a trusted layer between the service provider and the consumer, further securing the relationship between the latter.

On the other hand, the implementation of devices will pose a major problem for the transformation of many service providers. In the future, they will sell less ownership and more access. For car manufacturers for instance this means to transform themselves into service providers and grant access to mobility rather than selling cars. Even if this is possible and supported through connected devices, the implementation of these systems requires organizational and technical skill that service providers often haven't acquired.

Apart from an ecosystem on which service providers, consumers and devices can interact, support will be needed to make this future available. A key challenge in the future is hence to provide service providers with the sufficient expertise in order to include devices as a symmetric player in the business relationship between themselves and their customers.

The blurring line

*"In the emerging device-driven democracy, power
in the IOT will shift from the center to the edge"*
– IBM, 2014 [15]

Finally, the dividing line between service providers, customers, and devices will blur. In a peer economy, devices will be shared, provided by businesses and consumers alike, and devices will be able to keep track of their economic activity. They will become equal business partners. A modern and usable environment for peer economy will empower consumers to also partake in the economy as service providers, either through the capitalization of their data or through the opportunity of offering their own services and products on a peer-economy platform. Consumers, service providers, and devices engage in a meaningful and prosperous journey for all parties. To make this vision a reality, we are building the future for equal business relationships. A future that is optimally efficient and usable.

Our vision is to create a world where devices, consumers and service providers interact as equal partners, where consumers interact with devices, and where devices interact with other devices. We want to welcome you to the peer economy in which smart, connected devices provide consumers the best possible user experience, benefit from improved efficiency and offers service providers new opportunities for product differentiation, thereby moving competition away from price alone.

We envision a world in which consumers do not waste time registering for services, updating payment data or configuring devices. We envision a world where service providers do not waste effort on tedious manual processes, or pay centralized platforms enormous amounts of advertising money or payment fees. Instead, we want to connect consumers' needs and provided services directly – at the right time, the right place and for the right price.

TacOS – A Blockchain-based Commerce Layer

We aim to be the initiators of a community driven, blockchain-based commerce environment. Your investment in Peerz is an investment in the creation of a commerce layer that makes the blockchain usable for businesses, consumers, and devices alike.

Using Blockchain and Smart Contract technology in the modelling of business processes adds to their automation because it allows actors to minimize the trust that service providers and consumers need to have in each other. The true innovation, however, lies in the usage of connected devices bridging over the gap between the physical and the virtual world; a vending machine dispenses a can of soda, secures the payment through micro-consensus with the consumer, and interacts with the product supplier as soon as its stock runs low.

Peerz is a commerce layer that participants can use to do their business on a Blockchain. It is a layer that enables devices to communicate and do business with each other, with service providers, and with consumers.

While this radical way of rethinking business would require companies to build and support an entirely new technological infrastructure, Peerz aims to provide a blockchain-based commerce layer which participants can use without having to reorganize their business structure. This commerce layer represents an alternative to the current economic setup and makes the adoption of novel business models more comfortable. Businesses can focus their attention on the development of services that lay within their area of expertise, as the infrastructure takes care of embedding that in a fruitful economic environment.

Peerz envisions the creation of the platform for these transactions to run on. We call this platform TacOS – a shorthand for *Transaction and Commerce Operational System*. Through our token economic design, we will align the interest of all parties and create a truly symmetric business experience on TacOS.

TacOS contains multiple layers, including new product hardware, embedded software, a product cloud of software running on remote and preferably decentralized servers, a suite of security tools, a gateway for external information sources, and integration with enterprise business systems. Our mission is to initiate this ecosystem and to incentivize businesses to plot their business onto the digital world.

Our goal is to initiate an infrastructure upon a quasi-standard for transaction processing. The way in which this ecosystem will be built, however, is going to rely on community feedback and the experience of every user. The latter can be either service providers themselves, or consumers that provide insights about their user experience. Every voice is important in order to make this ecosystem viable and to care for truly aligned interests.

Why Blockchain Technology?

Blockchain technology is the key enabler for Peerz. Together with Smart Contracts, it constitutes the core technology that makes automated commerce flows possible. Blockchain technology fits our purposes in various regards. Firstly, it enables trust-minimized and equitable track-keeping of events, decisions and transactions that happen between economic actors; Conditions for entering into a commercial relationship are clear to all actors, and upon informed consent, execution will be both fully automatic and guaranteed. No party outweighs their economic partners in their power to manipulate the execution or its underlying transaction data. In order for this to function on an automated level however, not only do we need a distributed ledger and a powerful smart contract infrastructure, but also smart devices in the real world with a secure connection to the related smart contracts.

With a combination of connected devices and smart contracts in place, a convenient and fully automatic execution of the commerce flow can be installed. This includes delivery as well as payment, both of which will not only be automatic, but guaranteed through delivery proofs and payment reservations. Both parties to a trade can be certain that the other party will be true to their end of the bargain. The devices will trigger events automatically and write them to the blockchain as soon as previously defined conditions are met.

We want to use available Blockchain tech as-is, and contribute to its evolution by co-developing it in collaboration with the community. The Ethereum platform is our choice for the base technology because it is the most mature blockchain with full smart contract capabilities. However, we will continue to monitor other technologies. Since our approach of modelling business processes is blockchain agnostic and does not depend on particular details of the consensus mechanisms, this possibility is open. Still, a shift from Ethereum to another platform will only happen if it is advantageous from a technical or economic perspective, or if the community supports this shift substantially. Instead of constructing our own blockchain from scratch, we want to add usable services and systems to promote the blockchain universe.

To solve current challenges with scalability, privacy, efficiency and transaction costs, the Plasma concept as proposed by Vitalik Buterin and Joseph Poon in August 2017 [16] will serve as the basic concept for Peerz transactions. The extension Plasma Cash shall be used to generate specific coins on Plasma Child Chains, so as to further optimize scalability and reduce the data download burden on the participants.

Components - Our Approach

Participants on the TacOS are not presumed to be tech-savvy, let alone blockchain experts. Hence, we will build a layer of hardware, software and services around the Blockchain core. The elements that onion around this core allow easy interaction with the blockchain and access to its benefits without the need for businesses to develop their own smart contracts and without the need to build their own devices.

Peerz Hardware Element

We build a Hardware Element through which devices (e.g. parking lot barriers, vending machines, tram and bus doors, etc.) will be able to connect to the Blockchain. For this sake, the hardware is implemented in the device as an add-on module that requires TacOS connectivity; that is access to the Blockchain. The hardware and the device's smart contract form a tightly coupled pair. This is to provide a secure on-board element for tamper-proof storage of the devices ID. This element is designed to work in a similar fashion as hardware wallets, storing key pairs, which instead of being linked to a person, will be linked to the device itself.

The technical design of the Peerz Hardware Element supports automatic communication between devices through local connectivity (Bluetooth-LE or NFC), enabling discovery services and thus adding to user experience. Its installation in trams and parking lots will permit users to auto-check-in on busses through sanity-checked location. If the Peerz-Hardware Device and a user's smartphone report the same time and location, it can be taken to be true, and the transaction can trustfully be written to the Blockchain. The array of use cases for this type of connected devices can range from proving that a can of soda was correctly dispensed from a vending machine; that a train is at the location it claims to be at, at the time it claims to be at; that a car was parked on a parking lot for exactly two hours as the gate claims.

The embedded Peerz Hardware Element can thus be thought of in terms of an oracle that provides the blockchain with off-chain information. Importantly, this oracle is independent from the device manufacturer which makes the device's transactions on the blockchain trustworthy.

Smart Contracts

We intend to operate our commerce layer on the basis of modularized smart contracts. This means that we intend to build an extensive smart contract library for re-use, in which smart contracts undergo thorough quality control. In the past, Smart Contracts have shown to be a weak point for several networks [17][18]. Another reason for a modularized smart contract library is the fact that our ecosystem requires different smart contracts for each device. Even multiple smart contracts can be used in one device to represent different types of commerce flows. This requires a common denominator as a technological basis. Hence, the quality of smart contracts will be ensured through curated open-source libraries.

As an example of a functional smart contract we will digital digital twins, which will enable communication between the blockchain and the embedded Peerz Hardware Element. Smart contracts can also digitize business models, templates for specific commerce flows and modules for commerce primitives such as offers, order, or payment events.

Further software will be needed in order to interact with the smart contracts and trigger aforementioned transaction events. For this sake, mobile applications will need a software library to easily and securely interact with our smart contract suite. Such an app library could be integrated in a generic consumer app, or similarly so in the service providers' branded apps, which are to be integrated into the Peerz framework.

We believe in this potential to radically redesign commerce flows on TacOS, for the benefit of businesses and users alike. The benefit for businesses lies in more efficient payments, and thus a reduction of payment transaction costs, faster speed of the transaction, and security against payment fraud. For users, convenience, speed, and security of service are the main perks.

Peerz Logo Program

To secure trustworthiness of participants, particularly those who offer services on the platform, their identity needs to be secured. Therefore, Peerz will provide identity labels to make service providers on TacOS both visible and trustworthy; meaning that the service provider functions in accordance to the platform's business principles. Since merchants will need to be registered and known to TacOS (KyB - Know your Business), engaging in a business relationship will be less of a risk for consumers, simplifying the on-boarding process. This leads to more transparent activity and will enable symmetric business relationships. As a complement to KyB, our Know your Device (KyD) is ensured by the Peerz Embedded Hardware Element and the corresponding identifier. In this manner, service providers and consumers can easily recognize devices that they can trust without being experts in blockchain technology. Think of this as similar to the WiFi logo, which promises you, as a customer, that your laptop will work with your router at home, even if you don't understand how WiFi works. In the same way, the Peerz logo will ensure that service providers on TacOS act in accordance with fair business principles.

Consumers, on the other hand, will be able to join the network anonymously. They will merely need an arbitrary identity on the platform and a balance to be able to buy. However, we expect that certain transactions can be limited to known users. With no concrete choice made on the matter, we might posit that transaction values equivalent to more than €10.000 might require to pass KyC restriction, as typically stipulated by law. The data of this process will, nonetheless, be released only for transaction of or above that size. Cheaper transactions will not require or access this data, even after the KyC process has been run.

Roadmap

For our project, we need a long-term plan to establish TacOS across multiple different industries – we are running a marathon, not a sprint. Therefore, we will need to focus our activity, and widening our scope as we grow.

Our first step is the development of the above-mentioned hardware, software, and services portfolio. The described features and functions of the platform, such as business modelling in smart contracts, need to be enabled, while partners are going to be invited to join the Peerz network.

Furthermore, our initial focus will be put on a single industry and use case. We will firstly target the mobility industry and develop our applications to the service of public transportation. The first thing to showcase on TacOS will be a case of train users being able to get on and off the train, with distance travelled being logged and payments being made automatically. The customer can simply use the service, but places no effort in the upfront purchase of tickets, or in understanding complex tariff structures.

2018 Q3	2018 Q4	2019 Q2	2020
Proof-of-Concept	Show Case	MVP	Field Trial

Table 2 Initial Roadmap of the Peerz Project

This strategy entails vertical support for the industry at hand. Trains will need to be equipped with the corresponding hardware, users have to be recruited out of our community and the service provider needs to be assisted with the implementation and administration of the corresponding software. Hence, Peerz will assist users to onboard TacOS and provide support services for running business on TacOS.

Further Phases of Project Development

The application of the Peerz project to different industries depends on the development of both technology and users' habits of human-machine-interaction. We esteem that the project relies particularly on the further development of connected devices to work autonomously.

The following table exhibits the high-level view of the different project development phases. That means that our project grows with each new step of autonomy that devices achieve. Each of these phases will affect the measures to be taken on the level of each component of the project (i.e. hardware, software, support)

Timeframe	Phase	Description
<i>Phase A</i> 2019-2021	Commerce Flows (human-to-machine)	<ul style="list-style-type: none"> Strong focus on use cases between device and user (e.g. ticketing, vending, room rental) and improvement of efficiency and usability. The user remains the transaction trigger.
<i>Phase B</i> 2021-2023	Device Automation (machine-to-machine with human supervision)	<ul style="list-style-type: none"> Addition of use cases between device and device (e.g. cars pays for gas, automatic parking payments, vending machine orders). The system prepares and executes transaction with users' passive approval (e.g. driving into the parking lot), but within tightly specified boundaries.
<i>Phase C</i> 2023-2025	Autonomous Agents (machine-to-machine)	<ul style="list-style-type: none"> Addition of use cases with autonomous devices (e.g. car-sharing with self-driving cars: car gives rides to numerous passengers, recharges and pays, gets maintenance, runs as own company and optimizes itself, files year-end reports and pays taxes). System acts autonomously (can buy and sell), and optimizes behavior based on users' goals. AI to supervise, and loosely specified boundaries as safety net.

Go-to-Market

We develop an appropriate and compelling go-to-market Strategy for Peerz and follow a detailed and structured approach which allows us to flexibly adapt to the necessities of different markets.

The target market of Peerz is characterized by a high volume of daily transactions. In a first approach, Peerz will address the public transport sector and mobility services. We will then expand into additional use cases (e.g. eScooters, ride sharing, long-distance multi-modal travel) and finally expand into additional industries such as vending, office space, and hospitality. The first applications will need full vertical support in order to be able to overcome resistance and commit themselves to the platform. The long-term goal, however, is to provide a horizontal service, a cross-cutting platform with substantial network effects for its users.

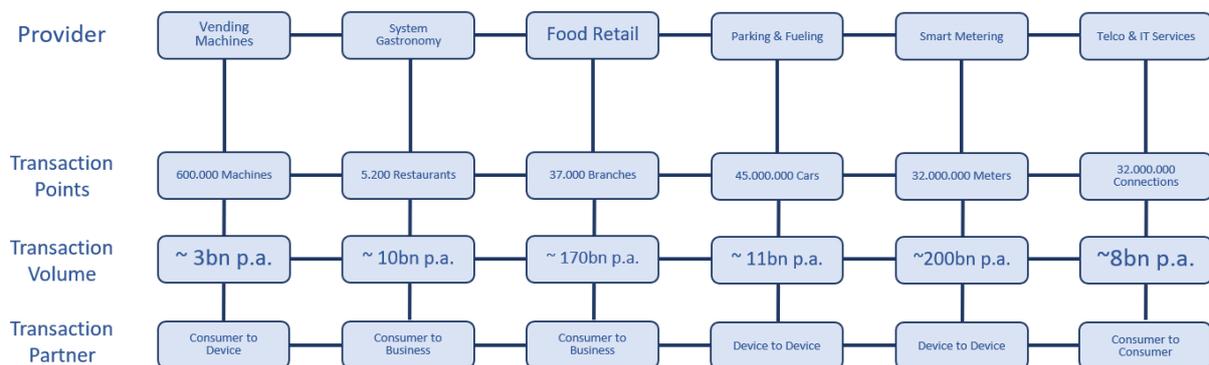


Table 3 Representation of opportunity for Peerz across different industries

Once Peerz has an established identity in the mobility industry, the same process will be applied to other industries with new use cases. Importantly, we want to ensure small incremental steps with continuous delivery of product and co-develop together with our customers, users, and the community. Based on the results of the initial projects, Peerz will soon extent the portfolio to adjacent segments. Plausible follow-up sectors are Vending Machines, System Gastronomy, Food Retail, and so on.

Customer Segment B2B

Peerz addresses B2B service providers which are looking for innovative services and are willing to disrupt existing processes, mainly to create win-win situations for the service providers themselves and their target customer base. Since Peerz will act as an ingredient brand, the customer ownership remains with the service provider. Peerz will enable service providers to expand their customer base and extend the number of accessible customer segments.

Enablement-as-a-service is the support product that Peerz sells to their business clients, while they maintain their business on TacOS. Peerz will create a new compelling customer experience for the current customer base and also attract new customers for B2B clients. Therefore, Peerz works in close collaboration with the service providers. Peerz is able to collaborate with both agile startups and leading global organizations in the named industries.

Customer Segment B2C

Depending on the use case, B2C marketing can be viable for the Peerz project. Our first target industry, mobility, and first use case, public transport, requires to co-develop our service with users directly. Hence, delivering applications addresses a direct distribution toward the end-customer as well as collaboration with the business client. We will work and test this service with our community first, then address early adopters and then gradually grow into the early

and late majorities. With the corresponding products in place, we will be able to grow applications out of this industry and into other markets. At this point the direct B2C relationship will lose importance for our immediate marketing strategy, since we aim to horizontally supply a platform service to various business segments. In the early stages however, our attention will be focused immediately on the user experiences to gain traction from an easy onboarding process.

In the same vein, a bounty program for our community and a referral program will be designed in order to make the existing user base flourish.

ICO

In order to gain development funds and to cement our community base, we will hold an Initial Coin Offering (ICO). This means that the community will be able to reserve Peerz ERC-20 tokens before they are issued. The investment will, of course, be secured via smart contract on the Ethereum platform. Most importantly, we are not seeking for mere investors. What we want are community members, who care about moving the way we do business into a new era of peer driven economy. The ICO is a way of diving into business with a broad customer base. We will maintain a very close connection to our community during the whole ICO process so as to ensure that our investors care about moving the project forward. In this Whitepaper we will abstain ourselves from a detailed explanation of the ICO. For more information on the ICO, please refer to the Peerz ICO & Token Economics paper, which will be published shortly after the Peerz Whitepaper.

Community-driven development

One of our key ideas is to disintermediate trade and making it usable, transparent, and peer-to-peer. Therefore, Peerz is not trying to build the next big intermediary of the future economy. Rather, Peerz focuses on developing a community around the Peerz project that will be in control of the platform and can be invested into with work, ideas, and money alike. Our community will hence benefit from the growth of our shared network. We are choosing this approach to decentralize the power on TacOS. We enable our community to contribute and work on this project in an open-source manner because we believe this to be the future of doing business. The best way to build something is with the help of brilliant minds from all over the world. We aim to achieve this goal by distributing tokens into different communities, hence incentivizing and appreciating the work that is done on the platform. The opportunities to collaborate with Peerz will include hackathons and community events around the world. This way we can achieve something truly inspiring.

Peerz is all about providing a better user experience and bringing back lost power to all parties on TacOS. None is better to judge whether we achieve this goal or not than you, our community. Thus, we will be constantly in touch with you. We are looking forward to hearing about your ideas, and about how we can build this new platform together – please get in touch with us on our several official social media channels!

Telegram	t.me/peerzofficial
Twitter	https://twitter.com/peerzofficial
Facebook	https://www.facebook.com/peerzofficial

Table 4 Peerz communication channels

elliptic GmbH – Peerz – TacOS

Think of TacOS as a common playground. The elliptic GmbH kickstarts its development and invites the community to play and develop on this playground. Peerz is the brand and identity that secures quality and ownership on TacOS, and represents its technical standards and rules. While the elliptic GmbH will be part of the Peerz family, we will also be able to facilitate the access to TacOS via support in the implementation of the necessary hard and software. While the elliptic GmbH is the initiator of Peerz and TacOS, these will remain open to community development and to all businesses that want to benefit from this project. The elliptic GmbH, in the end, will merely be an actor on TacOS.

Elliptic GmbH Business model

The elliptic GmbH is a for-profit organization and does, to a certain extent, act in economic self-interest. The ecosystem in which we aim to provide our services, however, does not yet exist. With TacOS, we want to create a commerce layer in which we can act as an equal economic party with the community. As a participant in the Peerz network, elliptic GmbH will interact equally with other parties; service providers, consumers, and devices.

*Our economic model aims to make profit from **Enablement-as-a-Service**. That means that we develop, market, and install the elements needed for the ecosystem of the future, supplying support for paying business customers, while TacOS as such will be free to use and free to develop once it is set up.*

TacOS aims to become a blockchain based ecosystem with the goal of bringing usability, symmetry, and autonomy to service providers, consumers and devices. Our objective is to construct a blockchain based commerce layer that enables true P2P business by establishing a shared standard for how devices can conduct commerce - with us, with businesses, and among each other.

Within the Peerz framework, elliptic GmbH will offer support services to merchants, so that they can rely on professional support. These services range from the integration of smart contracts into their business processes to integration of Peerz hardware into smart devices. Furthermore, we plan to offer identification and trust-enabling support for consumer through our Peerz logo program.

Over time, we may add additional services to our portfolio to help customers and merchants to get together and develop happy business relationships. These could include discovery support (Where is the next Peerz-enabled parking), decentralized reputation and recommendation services (TripAdvisor for decentralized Apps) or financial and insurance services (consumer credits, insurance, etc.). Peerz being an open platform, it will be possible for any other member of the platform community to offer similar services just the same.

Team & Experience

We don't want to catch you with sweet words. Our team is powered by our long experience in system design, software development and hardware product creation, B2B & B2C services, and go-to-market strategies. After all, designing a Blockchain based solution to a business problem is 80 % business and 20 % technology. When we propose a project, we mean actual business. We want to establish a project made-in-Germany that is led by some of the most experienced tech veterans around. Our team stands for experience and serious business values. All of our executives and angel investors have held positions in major consulting firms and have experience in founding enterprises. Our founding team and angel investors have occupied major positions as CEO or CTO at tech giants such as AOL Germany, Vodafone Information Systems, paydirekt, wirecard, Nokia, and more. They are all deeply rooted in the tech and business sector and make the perfect fit for this project. Get to know them.

Founders

*Dieter
Mall,
Founder
CMO
[linkedIn](#)*



Dieter has extensive experience in Business Planning and Global Business Development in the B2B and B2C sector. He is founder and former CEO of the Dipro GmbH and is a successful Business Consultant for Bluemont Consulting. His network and communication skills make him extremely valuable for our project.

*Torsten
Musiol,
Founder
CTO
[linkedIn](#)*



Torsten is deeply rooted in the tech sector and has ample experience in Mobile Edge Computing and Product Management, which he worked in for Nokia. He was a Design Engineer for Toshiba and is furthermore the founder and CEO at MECSware. His tech-savvy mind and business spirit make him the perfect Tech Strategist for Peerz.

*Torsten
Velker,
Founder
CEO
[linkedIn](#)*



Torsten is a successful business executive, entrepreneur and passionate tech innovator with over 20 years of leadership experience in R&D and business. He was a CTO at novero, and is founder & CEO at diprodi. As founding member of the Mindworks Institute, he deeply believes in diversity and has work experience in Europe, America and Asia.

Angels

<p><i>Charles Fränkl, Angel Investor</i> linkedIn</p>		<p>“Peerz proves a lot of foresight. I have seen few projects that identify upcoming challenges for businesses like Peerz does. I have no doubt that the environment Peerz is creating will flourish”.</p>
<p><i>Christian von Hammel-Bonten, Angel Investor</i> linkedIn</p>		<p>“What the finance industry needs is scalable technology. Blockchain was a good start, but getting it to scale for the purposes of our industry is what Peerz is doing such a great job at. Through an intelligent combination, Peerz combines all key trends I see in the market: peer-to-peer economy, connected devices, and decentralization. Those will disrupt the markets as we know them and create a virtuous cycle of improvement for service providers and consumers”.</p>

At a glimpse – Values of Peerz

Establishing Peerz as a Blockchain-based commerce layer is our way of responding to the necessities that today’s economy is facing. We do not aim to disrupt current economic models. Rather, we want to provide an ecosystem that enable the connection of smart devices among each other and to different services. This will lead to a variety of benefits.

User Experience

You get up in the morning, with the morning coffee already brewing and the right music playing, the fridge automatically having ordered food based on your travel schedule, and your phone informing you that the ordered autonomous vehicle will arrive five minutes early in order to protect you from the upcoming bad weather. You don’t need to register to each of these services. With TacOS as a communication layer, devices, applications, and the blockchain can conduct business transactions with each other - even when they are otherwise not compatible. The result is great simplification for every participant: from service providers down to each user.

Aligned interests of all parties

Since we are issuing a blockchain-based ecosystem, we develop a token-economic model that incentivizes all participants to support, develop, and use the platform. “Participants” ranges from users who take a ride on the train, app developers who develop the platform, all the way to companies who turn from device manufacturers to service providers. No matter your role in the economy, your interests as a participant matter. Services provided on the platform do solve consumer problems. But they also help service providers and other stakeholders solve problems

in customer acquisition, retention, price strategies, fulfilment of Terms & Conditions, etc. This is also reflected in our token economic design.

Customer Anonymity - Business Transparency

Since none of the services that are used in the process have direct access to you as an individual, the connectivity of devices and services between each other does not affect your personal data. Some services might reserve themselves the right to run a KYC process, depending on the value of certain transactions or if personal identification is absolutely necessary (e.g. for legal purposes). In general, however, the connectivity between services does not entail the outsell of your identity or your consumer behavior as an individual, unless you choose so and are rewarded for your contribution to the system.

Security

The combination of connected devices and smart contracts enables us to give guarantees to consumers and service providers alike. Service providers enjoy a payment guarantee where consumers benefit from a delivery guarantee. That means that both the consumer and the supplier are protected from fraudulent activity. For a clean security protocol, the use of smart contracts as triggers of events on the blockchain is a golden choice. And if something were to go wrong - as happens in the real world - both parties can rely on the exception handling built right into the digitized commerce flow. Hence, if your train is delayed, you will automatically get a refund. If your parcel never arrives, you won't pay for the order.

Efficiency

A more efficiently designed economic circulation will furthermore reduce the overall transaction costs and thus lead to more profitable and price worth economic interactions for both service providers and consumers. A key factor in improving commerce efficiency is disintermediation. Parties which add no value to the P2P transaction - such as payment providers - can be taken out of the loop, leaving more value for the parties to enjoy. Further gains can be had from automation, and elimination of payment defaults, to name just a few.

Since transactions on the Blockchain as such are expensive, our Plasma-based approach constitutes a solid ground for less expensive data interaction through off-chain processing mechanisms.

Scalability

Since Peerz is designed to make use of different off-chain solutions and operate on the principles of the Plasma Concept [16] the computational load is distributed widely. This makes more transactions possible, and enables scalability through further child chains when needed. At the same time, parties need to only run or monitor those sections of the overall platform which they are interested in.

Maintainability

Each industry will have their own branch in our architecture. This allows for easier maintenance and lifecycle management of digitalized commerce processes, as embodied in Peerz smart contracts. New features or fixes can be added without affecting other branches.

Access to and promotion of Blockchain Technology

We deem Blockchain Technology to be one of the main technological advances of the 21st century and to be a value in its own right. This means that we want to promote mass adoption of Blockchain technology and provide a useful and easy to access use case for this technology.

Community

Peerz cares about community beyond the acquisition of investors. We want to bring the users' and consumers' need back on the table. A symmetric business relationship relies on meeting everyone's goals. Therefore, and to ensure a truly satisfying user experience, we invite you to take part in the development of Peerz and share your comments, ideas, and critique. Your help in constructing Peerz is not only appreciated, but desired. Please visit peerz.one or contact us via Telegram or Twitter.

Expertise

Our team comprises some of the top German tech veterans, including CEOs and CTOs from the most vibrant German and European Businesses. Our experience includes Product Management, Research & Development, Business Management, System Architecture, Mobile Edge Computing, Cloud Services, IoT, Sales & Marketing and more. Almost all of our executives have held positions in major product and service companies, have advised countless businesses, and have experience in founding their own companies. Former employers of our team include Vodafone, Nokia, AOL, Clickandbuy, SmartFrog, Gigaset, Wirecard and paydirekt.

Thank you Peerzonally!

If you enjoyed reading our position paper, please do check out our remaining documentation as soon as it comes out and follow us on the social media. Take part in our journey to a more symmetric economy and become a Peer. Thank you Peerzonally!

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