TENA PROTOCOL
WHITE PAPER

A Decentralized and Incentive Payment Protocol for Daily Payments.

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Abstract

The TENA Protocol is the world's first payment protocol introducing payment mining. Payment mining is that customers and affiliates gain tokens who are payment parties by a means of mining process called payment. Until now, as the payment platform grows, easy-payment affiliates and customers have not been shared any profits. TENA protocol is designed to provide a fair return for affiliates and customers who have contributed to the development of the ecosystem.

The development of the blockchain has created a large number of cryptocurrencies (DAPP, platform coins, etc.) but a fatal obstacle is inherent. If prices for goods or services are set based on the crypto price, as the crypto price goes up, the price of the service will increase, as well. For example, in music DAPP, you can use one crypto for unlimited music-licensing service. But if the price of crypto goes up twice, that service charge should be doubled, too. To solve this problem, it should be set the price based on the fiat currency, not crypto. But it still has a problem. In order to use music DAPP, you have to buy music DAPP's crypto from the exchange store available and even transfer. This is a very complicated and inconvenient process that causes terrible inconvenience to common users.

Such a problem of blockchain can be solved by the easy-payment app service. The easy-payment app is the only service accessible to both business owners and customers. If customers make payment through the easy-payment application by credit card, cash, Bitcoin and other cryptocurrencies, business owners are to be paid by any payment means that they desire. For an example of music DAPP, if a customer can pay with a registered credit card or with a bitcoin they have, a Business owner will be paid with the same value of crypto which is exchanged through an exchange.

If an easy-payment app is universalized and solves the asymmetric currency between the. business owner and the customer, the blockchain ecosystem will grow dramatically. Crypto can be issued by online business owners and also by off-line business owners. In the future we imagine, offline companies (i.e. hamburger franchise, convenience stores, etc.) will also issue and operate their own crypto.

As mentioned earlier, the proliferation of easy-payment app is an essential prerequisite for a block-chain ecosystem. TENA protocol was born to spread the easy-payment app. If every participant in the easy-payment app ecosystem is given fair reward and thus given enough incentives, the ecosystem of the easy-payment app will grow even bigger.
In the future of TENA Protocol, people around the world will take advantage of easy-payment apps for payment. It will be possible to make payment even overseas by the app that has been used in domestic and possible to pay with any kinds of currencies.

TENA

Introduction

Problem / Why cryptocurrency is not used on the real economy

It has already been a few years since cryptocurrency based on blockchain came up, including Bitcoin. As of January 2018, the market capitalization of cryptocurrencies was $ 768 billion, as exceeding the Netherlands's GDP which is the world's 18th largest. However, we are not able to find any stores nearby where cryptocurrency is accepted as a payment method.

There are many reasons why cryptocurrency is not activated as means of payment in the real economy; processing speeds, high payment fees, and unstable value volatility. But the main reason is that the subjects of the economy have no motivation to participate. Cryptocurrencies, including Bitcoin, are in the form of digital assets, not a real currency which is visible. Therefore, in order to use a cryptocurrency, the store must be prepared in advance to utilize, and the users must have the app installed and use it for payment. But stores and customers do not pay by cryptocurrency (app payments). This is the same reason why the market of the easy-payment (app payment) is not working well in advanced countries as popular as credit cards.

The store does not accept cryptocurrency (app payment) since there are no customers who prefer to pay by cryptocurrency (app payment). And there is no much expectation that accepting cryptocurrency will lead to improve sales. Conversely, customers do not use crypto because there is a limited number of stores (affiliates) wherever they can pay by cryptocurrency. The payment method available in just a few stores is like the messenger that just a small number of people use. The payment platform is also a market in which network effects work strongly. So, the more stores are available and the more customers use them, the more stores and customers are likely to participate.

Incentive-based Payment Platform

TENA is a project to ultimately make cryptocurrency available directly in the real economy. However, it is difficult for people to change paying by cryptocurrency immediately when people are not even using app payment.

TENA has a strategy to spread app-payment as pre-step, prior to cryptocurrency payment. The basic method of payment is the same as that of Chinese Ali Pay or Korean Naver Pay. After registering existing credit card in the app, payment is made in fiat currency using Barcode. Customers can still pay card bills by fiat currency and enjoy various benefits of using credit cards.

The difference between TENA and traditional easy-payment company is whether a token economy is applied. TENA pays tokens based on the payment amount to the stores and customers using TENA protocol. As mentioned earlier, the payment platform is an industry which has strong network effects. Token payment is not only used for marketing expense to participants, but also used as the reward given for their contribution to grow the platform, and ultimately the capital as well. In the early stage, it may be inconvenient because there are few participating stores and customers. However, the earlier you participate, the more rewards you earn, driving you into an active participant. The token you receive can be exchanged for cash on the exchange. And, since it is used through credit card networks, issues of speed and safety can be resolved.

Many users mean a high volume of future sales, and all advertisements and additional services from the app are paid with TENA token. This leads to an increase of token prices. Also, due to the nature of the payment app, you can ensure a lot of usages as it can be used to pay for all goods and services. After a number of usages are secured, TENA and other cryptocurrencies will be added as a means of payment method.

TENA

Introduction

In addition, TENA has a role as a protocol. So, it is not limited to DAPP service in Korea. DAPP users can be reimbursed for TENA only if the payment providers in the world are following the TENA protocol. This is to make TENA like VISA a worldwide accepted payment method. On the DAPP apps that follow the TENA protocol, TENA can be used as a payment method anywhere in the world. For example, Korea's GOPAY customers can use TENA at 'A' pay stores in China or at 'B' pay stores in Japan.

TENA

Token Economy

Token Economy is to design roles that makes the tokens and the real economy connected organically with tokens issued by an economic subject. To put it simply, the company designs and issues their tokens that can be used in their services. The company publish tokens in accordance with established rules and manage them transparently.

Token Economy is not restricted by industry. Currently, most ICO projects are focused on Internet-based services, but beyond that, they can be extended to traditional industries such as manufacturing and distribution. Especially in the traditional industry, a token economy can play a new role in raising capital beyond stocks and bonds.

A Completely New Way of Raising Capital

So far, entrepreneurs with good ideas have raised the capital by convincing the investors with business plans. The method of investment is in the form of stocks or bonds. The stock investment can earn a high dividend, depending on the growth of the company, but it is difficult to cash in until it is listed on the stock exchange market or before M&A. Bonds are paid interest according to pre-agreed interest rates regardless of whether the company is growing or not. Bonds have better liquidity than stocks, but lower profit rate.

However, in the token economy, tokens present a completely new way of capital raise. If the inflation of the token is designed to be lower than the transaction growth rate and all transactions are restricted to be used with tokens only, the tokens are to be in the form of stocks. The tokens can be expected to have high returns, which is just like the stock. For example, if McDonald, an existing operator, develops a new menu by issuing a limited number of tokens and resulting in increased sales, the price of the token will rise according to the demand of the transactional currency. Compared to the before Token Economy is introduced, McDonald's sales and operating profits are higher and profits of shareholder get higher accordingly. As a result, if sales are increased, both token holders and existing shareholders can be in a win-win situation.

Features of Token Economy

So, is the token creating a new wealth? Where is the fundamental value of tokens created from? The fundamental principle of how token prices is shaped and its profits are created is in the exchange rate model.

Let's suppose that there are agrarian countries A and B by simplifying the exchange rate model. The amount the government A and B issued is at 100 won and 100 yen, respectively. Since it was already issued all, there is no more additional issuance. And, in 1900, the rice production of these two countries is one ton. In 1910, however in country A, passing through an agricultural revolution, its output dramatically increased to 10 tons, while country B still produced 1 ton. The price of rice from country A is reduced from 100 won per ton to 10 won per ton. On the other hand, the price of rice in country B is keeping still 100 yen per ton.

Here, the exchange rates of the two countries' currencies are shaped by 1 won : 1 yen at the beginning, and the currency value of the country A is increased by 1 won: 10 yen due to the change in production. By putting country A in McDonald described above, and country B in the fiat currency, it can be explained how token prices are formed. As McDonald's sales increases, the relative price to the fiat currency also increases.

At present, capitalist society is not merely producing only one good, but many corporations and economy subjects are providing a number of goods and services. A nation's economic power and the exchange rate are measured by combining both growing and declining corporations, then the token economy is divided into economic subjects. After ICO, if company A's sales increase, token price will increase accordingly, but B's token price will decrease or remain unchanged as B's sales was not increased.

TENA

Token Economy

Companies with high growth potential in the future will actively raise funds through tokens. Tokens is not only easier to be raised than stock issuances, but also they have more liquidity than bonds. The tokens are listed on the exchange market and then the price is formed and tokens are traded. Also, the tokens can be used directly by the company even if it is not listed on the exchange market. After listing on the exchange market and becoming tradable, it will be in the form of shares. If not, it is used by the company just like a form of bond and it will be easy for the investor to collect.

Token Economy and Network Effect

Token Economy will grow as a new model to replace stock investments in existing capitalist systems in the future. However, the reason why McDonald could raise capital with ICO and increase sales by developing new menu is only because McDonald has introduced Token economy? McDonald's ICO is just a means of raising capital and does not represent a fundamental increase in sales. The fundamental sales increase resides in the advancement of service quality.

So, isn't there any business area where the introduction of the token economy can have a direct effect? We can find the answer to that from Steem.

Designing an elaborate incentive structure in a business area with network effect can lead to a direct effect of the token economy. In a business area with a strong network effect, when comparing when there are 100 users and 1 million users, the value increases exponentially rather than merely arithmetic progression. For example, if a taxi app has only 100 drivers and 100 users, it is not easy to match when it is wanted. However, as the number of participants grows, they can be matched whenever they want and customer utility increases rapidly. This has a lock-in effect that prevents anyone from moving to another platform. Participation of users in a business with network effect improves the actual capital value of the business.

Therefore, in order to improve platform value, platform operators need to encourage people to participate. Existing platform operators can be mainly divided into three types. There is an operator like Uber who pay cash (discount coupons and subsidies) to customers and drivers, another operator who pay shares to writers like Reddit, and the other who do not pay users directly, like Facebook.

If cash is paid for participation reward, it is not possible to be paid continuously because of the financial burden on the business owners. And also, the cash value of the participant will be fixed at only the present value and the future value cannot be expected. It leads to lack of motivation to participate accordingly. For business operators, the stocks are attractive enough as it is not a financial burden and can expect future value, but it is not attractive to participants because the issuing procedure is complicated and liquidity is very low, comparing to tokens.

Tokens can be a great alternative that improves the problems mentioned before. If a reward is paid by tokens instead of cash or stocks, the procedure is much simpler and highly reimbursable, and it can be expected for the future value to grow as the number of users are growing.

For example, suppose a virtual SNS platform, 'blog blog', publishes 100 coins to launch a service and 10 coins to provide incentives. Before giving incentives, as 1,000 users used, there was an advertising effect worth 10 million won, based on fiat currency. This means you can pay for the advertising costs at 100 coins. However, after giving 10 coins of incentives, there are additional 10,000 users and the total number becomes 11,000. Then, you will have an advertising effect of 110 million won in fiat currency, and also, you can pay for advertising only with 110 coins. If the price of the coin before the incentive payment is 100 coins for 10milion won, then the coin after the incentive payment will be 110 coins worth 11milion won. In other words, the coin price will be increased from 100,000 won to 1 million won per coin.

TENA

Token Economy

Importance of Wide Usages

To token economy, there are important features besides capital raise and network effect. The share price of an existing corporation is determined by reflecting expectations of further operating profits. However, as tokens also have the characteristics of currencies added to that of stock, the price is formed with the transaction amount (transactional money demand) along with the operating profit of the service provider. This is different from stocks as stocks don't have the feature of transactional money demand for actual trading use. Tokens actually have the characteristics of the currency used to buy the goods or services, so the token price will rise if there are many usages available and the amount of the transaction is bigger. Tokens for the sound source will grow by the size of the transaction volume of appropriate as the music market, and the tokens for the game will grow by the size of the transaction suitable for the game market. However, a token for paying can grow up to the size of the world's gross product at max, which is same as the market size of the real economy.

Why Blockchain?

Does the token economy certainly have to use blockchain system? Is it not possible to record on a centralized DB server and look up? In a centralized DB system, it is very difficult for token economy to operate properly. Unless the token publisher discloses information, no one can know about the token information such as how many tokens have been issued or how many tokens will be issued additionally and in how many accounts are handling the tokens. Even if the token publisher discloses all this information, it's hard for people to trust. This is because the profit behavior between the token issuer and the token holder is inconsistent. The token issuer can raise additional capital by issuing tokens as many as possible behind the token holder, and the token holder prefers to have no additional token issued.

The blockchain consists of a non-editable, distributed ledger that allows many people to view and record on it. Regardless of the will of the token issuer, the token holder can look up information such as the token issue amount and can trust it.

Token publishers can build a token economy by issuing tokens, based on a trustable system, and token holders can do economy activities, based on transparent token issuance policy.

TENA Protocol

Introduction of TENA protocol

TENA is an incentive-based payment protocol, using block-chain technology. The name of the TENA protocol is built on the antenna motif. Antenna has a role to receive the signal of each frequency in order to represent as an image. The TENA protocol has a role to bundle each country's cryptocurrencies into one channel for paying easily. TENA Protocol plays a role to spread mobile payment system to worldwide, using token economy.

Customers and affiliates participating in the payment platform will receive TENA (cryptocurrency) as their reward for contributing to the ecosystem. All of the customer and affiliate accounts in the easy-payment app that follow TENA protocol are managed by TENA protocol. Credit card payment on TENA Protocol is fast because it is using a credit card network. Starting with a credit card, various means of payment such as cash, crypto, or foreign currencies will be available.

Incentives (Payment Mining)

$$1day\ reward\ pool\ =\ \frac{1year\ reward\ pool}{365}$$

The compensation ratio will be based on contribution activity from 00:00 to 24:00 UTC + 0. TENA will be distributed four weeks after the payment date.

TENA Protocol

Customer Incentive

$$customer\ reward = \gamma(join - weight) * \sum f(customer\ join)$$
$$+ \gamma(payment - weight) * \sum f(customer\ payment)$$
$$+ \gamma(review - weight) * \sum f(customer\ review)$$
$$- \gamma(cancel - weight) * \sum f(customer\ cancel)$$

Customers can contribute to the platform in a variety of ways and receive rewards. If you download an app and sign up or make a payment, you can get a reward. Also, if you leave a review about the payment, you will be compensated for providing information to other customers. The biggest contribution made to the ecosystem is payment made with the app. You can get compensation in proportion to your payment amount. In addition, the points and discounts you get from your credit card will remain intact and there is no reluctance to switch behavior.

Virtuous Circle
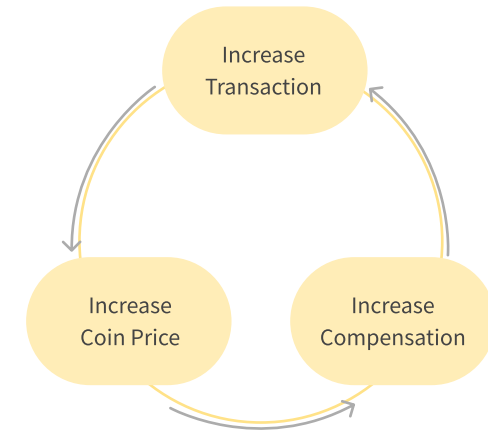
The model of granting token rewards to acquire more users creates a virtuous circle. By providing token rewards to users, people have the incentive to use the service and activate the transaction. As transaction volume of the payment service increases, the value of the token increases accordingly. If the value of the token increases, the value of the token that is rewarded increases, and as the incentive for participation becomes stronger, it makes transaction amount larger. This has the structure that the price of the token rises again.

TENA Protocol

TENA stakeholder

	Customer	Affiliate	Easy-payment DAPP	Token holder & TENA	VAN, PG, POS	Credit card Company
WANT	Benefit ▲ Many affiliates Convenient app	Revenue ▲ attract customers systematic customer management	Traffic ▲	Token usage ▲ Token price ▲	Commission sales ▲	Commission sales ▲
BEHAVIOR	Barcode payment	Barcode settlement	TENA protocol introduction Secure affiliates Attract customers	TENA protocol expansion Hold TENA	Partnership with easy-payment DAPP	Partnership with easy-payment DAPP
BENEFIT	Token rewards for each payment	Token rewards for each calculation	Traffic between numerous customers and affiliates	Numerous Token usage Increase of token value	Sales increase as trading increases	Sales increase as trading increases
OTHER BENEFITS	QR Payment without wallet whenever, wherever The existing credit card benefits remain the same	Increase sales due to systematic customer management and diversification of payment methods		The Globalization of the Tena Protocol		

GOPAY

Introduction of GOPAY

GOPAY is the first easy-payment DAPP to apply the TENA protocol. GOPAY is supposed to start the service in Korea for the first time. If you only have GOPAY, you can easily make payments anywhere, anytime, anywhere on and off-line.

Korea is a country where credit cards are used dominantly over cash. It would not be doubtful to be a credit card as the first payment method of GOPAY. Credit card payment is done by registering a credit card in GOPAY app and scanning the Barcode at the time of payment.
By introducing TENA protocol, we will surely achieve rapid expansion in Korean easy-payment market.

Furthermore, GOPAY can play a big role as the crypto wallet beyond easy-payment. At the affiliates, it enables cryptocurrency payment and even support the customers and affiliates using different currencies. (i.g. the customer pays the bill with cryptocurrency and the affiliate receives the cash / the customer pays with the credit card, and the affiliate receives the cryptocurrency)

Offline First

With the success of AliPay, a China's Easy-payment app, there are over 20 easy-payment apps have been launched in Korea. In the past, the inconvenience of Active X and Public Certificates in the Korean payment market caused complaints from users, which led to the explosive growth of the easy-payment market. In the online payment market, the portion of simple payments is getting increasing. On the other hand, the easy-payment in the offline payment market is still insignificant (less than 1%).

When comparing the size of the online and offline payment market, the off-line payment. market of 700 trillion is predominantly bigger than the online payment market of 80. In Korea, however, the volume of offline easy-payments (9.5 trillion won) is lower than online transaction volume (15 trillion won). The reason why the size of the offline easy-payment market is smaller than the online easy-payment market is linked to securing the affiliates. Existing players have focused on the online payment market, which is easy to get affiliates at the initial stage. On the other hands, off-line market has difficulties not only in securing an enough number of affiliates but also in changing its customer habits, so the market is still at an early stage.

At present, Korean off-line easy-payment market is not only at competing for early stage, but also there is no remarkably unparalleled player in the market, which means this market still has great growth potential and competitiveness.

GOPAY

Strategic Partnership

Domestic offline payment market has a very unique structure. When a customer makes payment by using a credit card in a store, two stakeholder interventions in the middle are essential. These are credit card companies and VAN companies (additional communication operator).
The affiliate enters into a direct contractual relationship with the credit card company, but VAN deals between the contracts with the affiliate and credit card companies, purchasing the statement, uses the communication network, etc. and receives a commission from the credit card company. Therefore, communication network, POS equipment, contracts, etc. that VAN companies are providing occupy absolutely large influence in the environment of current credit card payment.

Domestic easy-payment companies including Naver Pay are recruiting offline affiliates in the form of PG operators. Here are two problems.

Since there are competitive relations with VAN companies, the infrastructure already built by VAN is not available to use. As VAN is playing a big role in the off-line payment market, the market is formed mainly around VAN. So, if you ignore the existing ecosystem and enter in the form of PG, VAN companies will be infringed on incomes from the offline payment market, so VAN companies cannot help avoiding to compete against payment providers. In this case, you have to build everything new, as not be able to use the existing infrastructure such as sales network, POS equipment, and contracts that VAN has well established.

Another problem is a commission fee for small affiliates which should be set up at high cost. In the offline payment market, as an affiliate have a direct contract with a credit card company legally, the smaller the affiliate is, the lower benefit the affiliate is offered on commission.

However, the online PG provider contracts directly with the credit card company, and the PG provider pays the transaction price to the affiliate. As a result, the sales volume of the PG operators is the sum of all the affiliates. Therefore, the PG operators cannot help paying a high fee to the credit card companies. Previously, off-line operators had set different commissions according to their sales volume, but in the PG business, they have unavoidably set up a high commission to small businesses owners.

GOPAY maintains a win-win relationship with existing offline stakeholders rather than competition. If you pay by credit card using GOPAY, only affiliates and customers can get contribution reward through the app, but not require any profit share to credit card companies and VAN companies. Customers, affiliates, credit card companies, and VAN companies can expect to earn additional incomes rather than being invaded to their existing profits.

In the case of the online payment market, which is relatively easy to enter, you will access the market through the PG companies that established the infrastructure in the online sector.

GOPAY
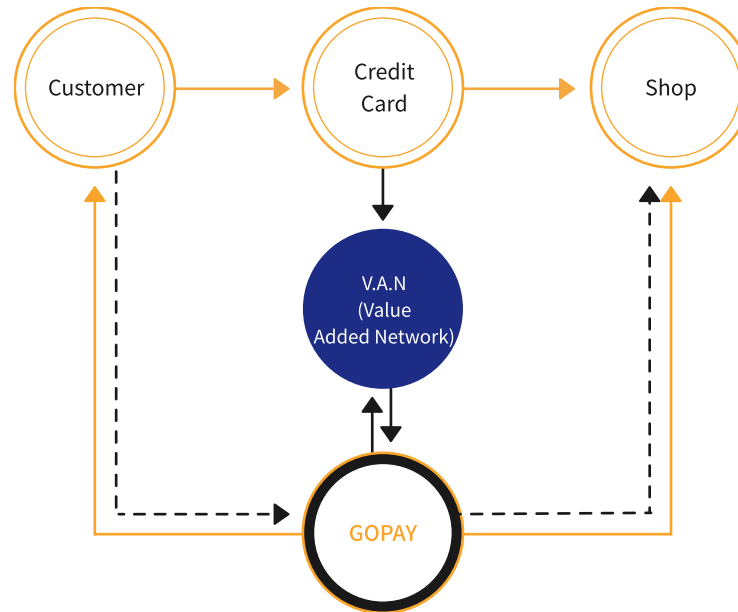
Information flow: GOPAY replaces the role of existing card terminals. When a customer requests payment by opening GOPAY, it is checked through VAN and credit card companies and sends the payment information to the affiliate.

Cash flow: GOPAY's cash flow is not much different from traditional credit card payments'. The customer pays the card bill to the credit card company, and the credit card company pays the transaction amount to the affiliate. The difference is the additional reward coin given for contribution paid to the customer by TENA protocol.

GOPAY

Competitor Analysis

There are a number of problems with coin payments in the current market. Many payment coins, including Bitcoin, are not only slow in payment speed but also have a high fluctuation of price. Also, there is a limit to being introduced into the real economy because the remittance fee is higher as coin price is becoming more expensive.

In Korea, big companies such as Naver, Kakao, and SK Planet are competing to secure a leading position in the fast-growing easy-payment app market in the future. However, existing easy-payment apps are facing on limitation to attract offline affiliates and customers. Only a very small number of franchise affiliates have been secured and most stores do not accept cryptocurrency. No one has successfully settled on the market, and the percentage of mobile easy-payment apps in Korea is even less than 1%. This is also a counterevidence that the current easy-payment model is not enough to attract users.

Existing easy-payment apps use a discount or point system to collect users. Although this may seem attractive at first, it turns out to have no such effect. A discount is limited to only a few stores and products and it takes time and energy to find affiliates for customers. Users might be collected at first, but over time, the users will leave. Points may be a better alternative than a discount as users receive points wherever they make payments. However, there are disadvantages that points are paid less, have a validity period, and have the same value decreased even over time.

TENA tokens can be acquired in any transaction and used anywhere. As ther is no validity date, it can act as an asset if the price rises over time.

	GOPAY	BITCOIN	NAVER PAY	PundiX
Main purpose	Easy-payment app	payment coin	Easy-payment app	Coin-payment app
Payment method	Credit card, Cash, Coin	Coin	Credit card	Coin
Expansion strategy for payment place	Offline to online	Online	Online to offline	Offline
Blockchain	YES	YES	NO	YES
Payment reward	Customer	NO	NO	NO
Commission	Low	Normal	High	High
Affiliate registration fee	NO	NO	YES	YES
POS mandatory use	NO	NO	YES	YES

GOPAY

How to use

GOPAY offline payment method is mainly divided into the MPM method and the CPM method. The MPM method is a method in which a customer scans a Barcode of an affiliate for payment and a CPM method is a method in which an affiliate scans a customer's Barcode and makes a payment.

MPM is a way to assign the Barcode to the unique ID value of the affiliate and recognize it. It is very low for affiliates to enter because there is no cost for bar code reader or development cost. It is the easiest payment method for any affiliate who had difficulty implementing POS machines such as street kiosks.

CPM is a method of assigning the Barcode scanning it to POS reader of the affiliate's store, which is suitable for franchises. The Barcode will change from time to time at the time of payment.

Business Model

GOPAY is forming a profit model as providing a variety of services for the convenience of. customers and affiliates to form a profit model.

1) Providing customized information, by using payment information

Based on goods that they are frequently buying and shops where they are frequently going, information that may be of interest to customers can be provided.
Necessary information can be easily provided to customers.

2) Promotion of affiliates

Discounts and promotion news of affiliates registered by customers are offered to customers. Affiliates can communicate more closely with their customers and can advertise to their target customers with no need of separate personal information or signing up for a membership.

3) Credit loan and other financial services

Like credit cards, lending credit with coins is provided. A system that pays coins for one month. and then pays on the payment date. The affiliate can receive the payment in advance of the settlement day using the credit of the affiliate. Other financial services such as savings, loans, insurance, etc. are provided.

4) Other cryptocurrencies payment

Not only TENA, but various cryptocurrencies such as Bitcoin, Ethereum can be saved and paid with. A large number of cryptocurrencies can be one of many payment methods in the future. Even if the store does not support the cryptocurrency, crypto paid will be automatically converted to fiat currency on exchange in the real-time.

5) IN-aPP platform

You can use various 3rd party services in GOPAY. In addition to payment, all app ecosystem can be put in GOPAY.

6) Affiliate solution

It provides an integrated solution for affiliates to operate their stores systematically. From a membership management solution that allows you to recognize and manage the affiliate's customer owners, you can easily create a mobile homepage for your affiliates, and offer a mobile menu billing solution that allows customers to place an order on the spot.
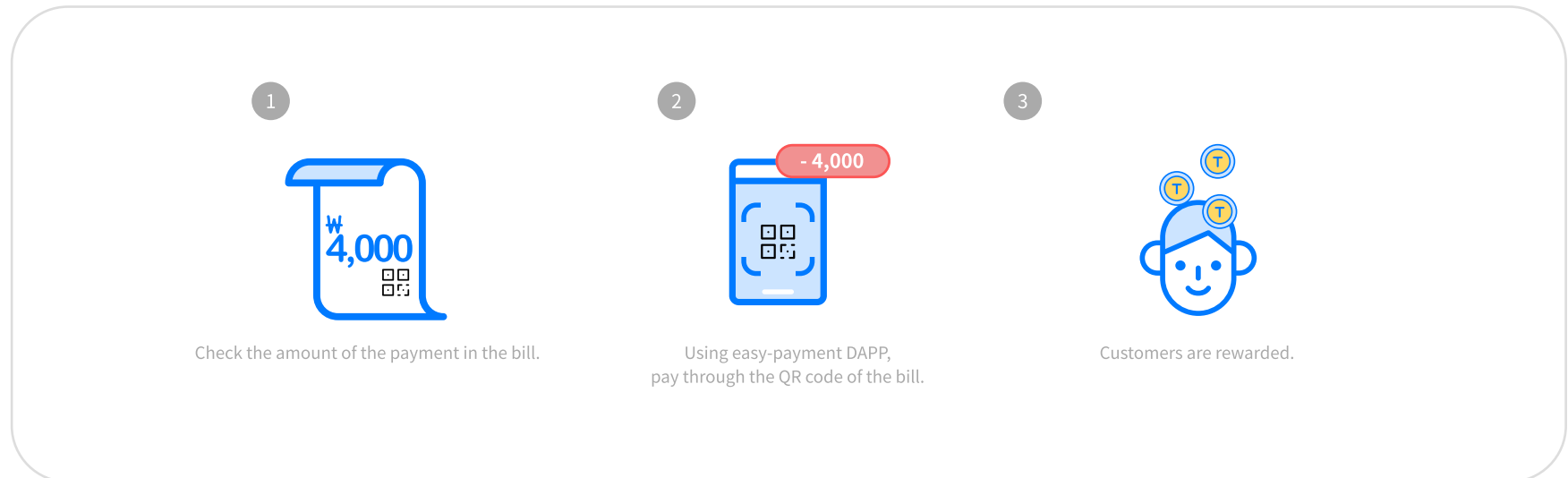
USE CASE

Case 1. Off-line payment

Today is the day when John's family decided to eat out. John, who was about to pick up his wallet, reminds him that he no longer needs a wallet and puts it back into his drawer.

He just left home with only smartphones. John has a happy dining time with his family and then takes out his smartphone to make a Barcode payment at the checkout counter.

He has been thinking for a moment whether to choose a credit card or a cash in GOPAY app, but he soon chose the credit card. John is a VIP member of the card company as he uses credit cards for all payments to get benefits credit card companies offer.

He received TENA compensation in return for the efforts of using GOPAY app, instead of the real credit card. John is more pleased with the extra compensation provided adding to the real credit card benefits. Then he comes back home with high satisfaction.

1

₩ 4,000

Check the amount of the payment in the bill.

2

- 4,000

Using easy-payment DAPP, pay through the QR code of the bill.

3

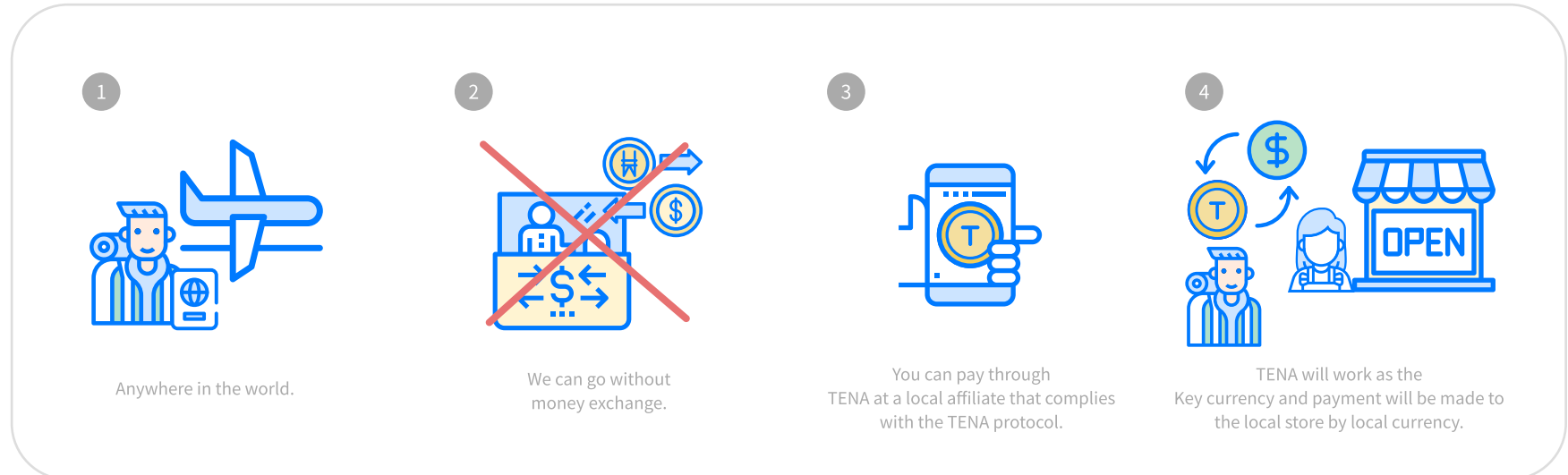Customers are rewarded.

USE CASE

Case 2. Overseas payment

Smith is preparing for a three-month trip through the world. Since his back-packing trip in school 10 years ago, he has a full of expectation for the trip.

Ten years ago, he had to stop by the bank to exchange money for each country, but he did not exchange any money at the time. This is because he only needs GOPAY app that can be used anywhere in the world.

There are no GOPAY affiliates overseas, but there are local payment app affiliates that comply with the TENA protocol. If he just pays by QR code as he does in Korea, TENA will be exchanged as a key currency and payment will be made to local stores in local currency.

Conversely, Japanese payment app users who have applied the TENA Protocol can make. payment at any GOPAY affiliates nationwide when coming to Korea.

1 — Anywhere in the world.

2 — We can go without money exchange.

3 — You can pay through TENA at a local affiliate that complies with the TENA protocol.

4 — TENA will work as the Key currency and payment will be made to the local store by local currency.
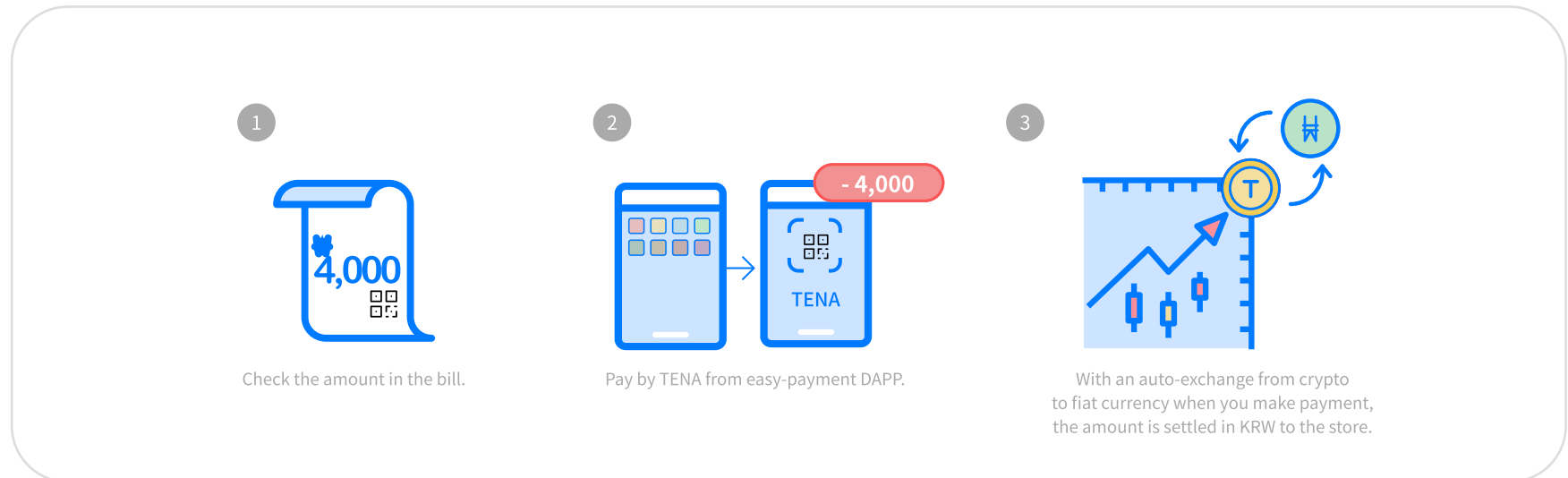
USE CASE

Case 3. Crypto exchange payment

Smith is an old Bitcoin holder. He is dreaming of paying with Bitcoin in his daily life, but there is no store that accepts Bitcoin in reality.

Tom is an old TENA holder. He can pay with TENA anywhere, anytime in daily life. Even if the store does not accept TENA, it is possible to pay TENA through the TENA protocol.

When Tom pays with TENA, it will be automatically converted to fiat currency and paid to stores. Furthermore, if Tom makes a payment by cash or credit cards, the store owner can exchange paid amount for their self-issued coin.

Customers and stores no longer need to match their payment methods to the same currency. Payments can be made with your preferred payment method at all on and offline stores.

1	2	3
Check the amount in the bill.	Pay by TENA from easy-payment DAPP.	With an auto-exchange from crypto to fiat currency when you make payment, the amount is settled in KRW to the store.

USE CASE

Case 4. Customer Management Solution

Jessica has a lot of cashback point card for stores in his wallet. He has been bringing these cashback cards to get promotional benefits from the stores. But, Mr. Heungbu has no longer need to take these cards since he started to use the GOPAY app.

She now receives points or benefits directly from the stores at the moment he pays with GOPAY.

Amy, who owns a small number of stores, has so far managed customers by issuing cashback cards. The first reason to issue this card is to know the customer, and the second reason is to increase the repurchase rate.

As Amy used the GOPAY customer management solution, he understood his customers better than when he issued an existing card and is able to promote more efficiently.

1 No longer need
of cashback cards at an affiliate.

2 Points will be saved
to one GOPAY app.

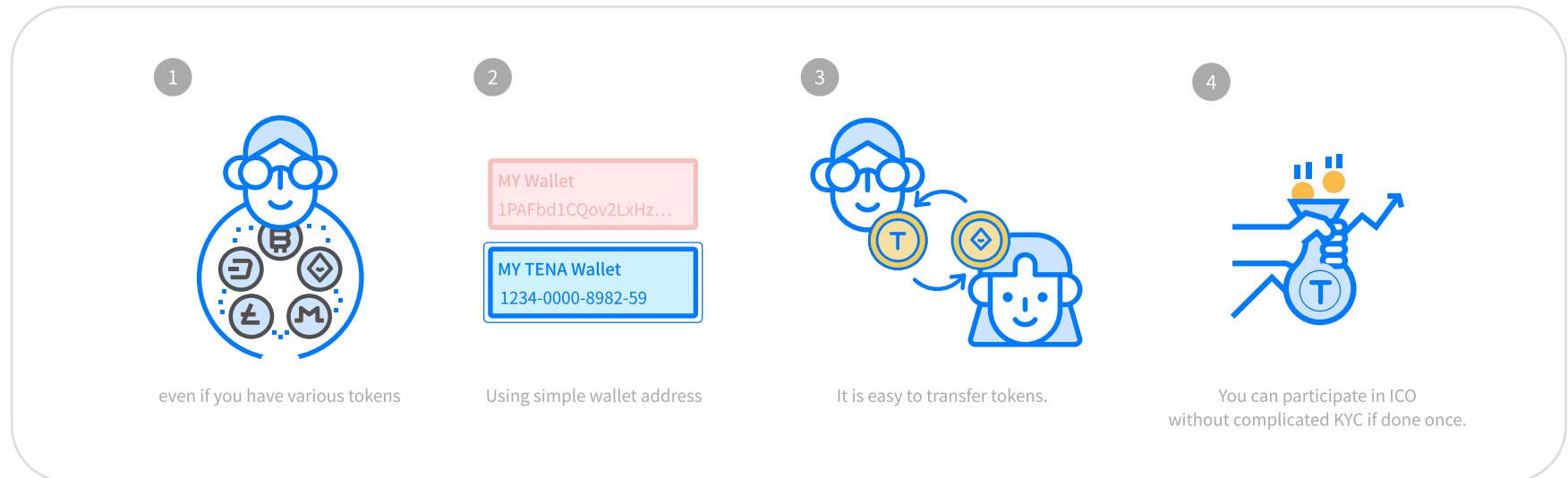3 Easy marketing and promotion pushes
from affiliates to customers.

TENA

USE CASE

Case 5. Crypto Wallet

Jason has many kinds of tokens as he already recognized potentials of crypto and started to participate in various meaningful ICO projects. He doesn't use the wallet address separately but he has unified the existing wallets into one GOPAY app.

He can use his tokens in DAPP and transfer them. He can also use his existing wallet address, but he prefers to use a simple wallet address provided by TENA Protocol.

When participating in a new ICO project, he can skip KYC for each ICO as he already went through KYC on Gopay app, which can be universally used for other ICOs.

①

②

MY Wallet
1PAFbd1CQov2LxHz...

MY TENA Wallet
1234-0000-8982-59

③

④

even if you have various tokens   Using simple wallet address   It is easy to transfer tokens.   You can participate in ICO
without complicated KYC if done once.

TENA

Technical Consideration

System Architecture

GOPAY	DAPP	DAPP	DAPP
TENA Protocol			
Token, Smart Contracts, Wallet, …			
BlockChain(ETH, EOS…)			
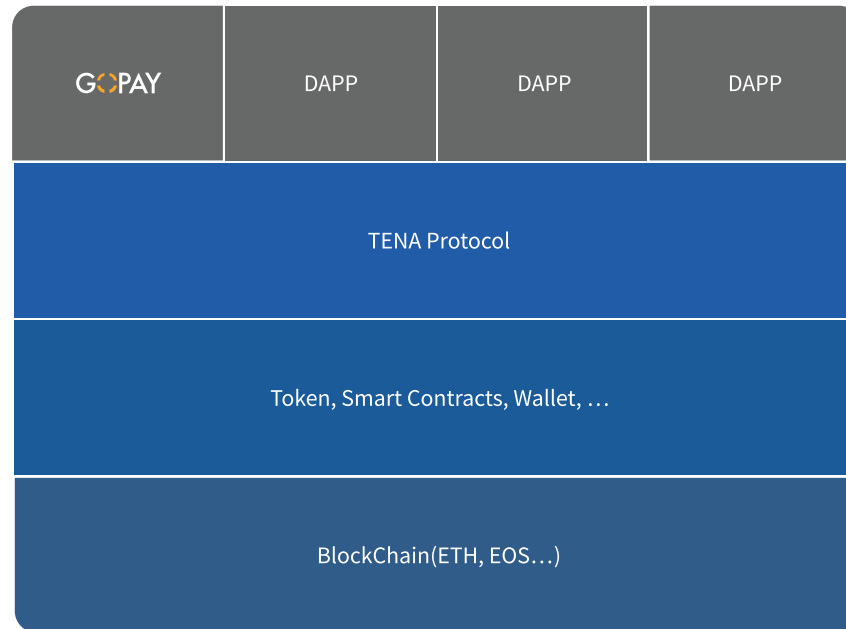
DAPP

It is the application layer that works in TENA Protocol.

GOPAY will be the first DAPP of the TENA Protocol.

TENA Protocol

It is the layer that the TENA Protocol actually works on.

This is where the company pays compensation based on the contribution of the users.

On Chain Contract

This is a layer containing tokens that TENA issues to the blockchain, smart contract for services, and user's wallet.

Blockchain

This is the blockchain environment that is the basis of TENA.

There are multiple transactions going on this blockchain.

TENA

Technical Consideration

The payment flow chart of GOPAY linked with the TENA Protocol is as follows. It will be described by breaking down into several scenarios.

Business Flowchart l MPM Payment

MPM (Merchant-Presented-Mode) is a method that a customer identifies the affiliate with the QR code presented by the affiliate and proceeds with the payment. MPM can be subdivided into fixed MPM and variable MPM based on whether QR code changes or not depending on the situation.

Fixed MPM

It works by reading QR codes printed on fixed media such as paper or kits, so real-time information cannot be contained due to the physical limitations which cannot be changed once created and placed. However, since it is easy to install and apply as no additional devices are needed, it is advantageous for distribution to small merchants or for early expansion.

Variable MPM

It is a method of reading the QR code generated by the POS installed in the affiliate or by the affiliate's app. It can relatively contain much more information in comparison to the fixed MPM. It can be implemented and applied using POS with dual screen or the merchant owner's app.

Because MPM is the way that the customer pays the affiliate as a payment agent, it is necessary to inform the affiliate through the system whether payment is complete.
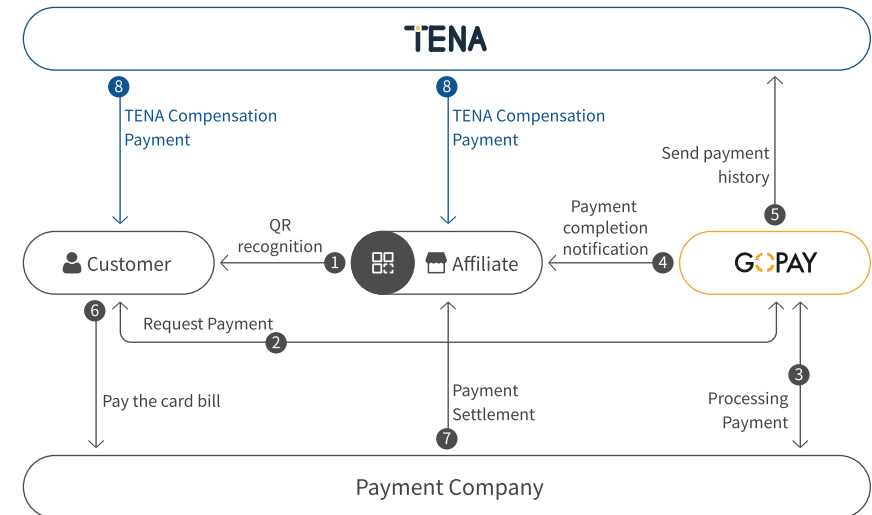
❶ Through the GOPAY app, the customer recognizes the QR code that contains the information to identify the affiliate and the payment history.

❷ Request payment via GOPAY App.

❸ Payment will be processed through the linked payment company's system.

❹ The affiliate is informed that the payment has been completed.

❺ Send the payment history using TENA Protocol.

❻ The customer pays the card bill to the payment company.

❼ The payment company will calculate and settle the affiliate's payment.

❽ TENA rewards will be paid for the users (affiliate and customer) after settlement.

Technical Consideration

Business Flowchart l CPM Payment

The CPM (Consumer-Presented-Mode) is a method of payment processed by affiliate when the customer presents their QR code. Fixed CPM methods are not accepted for the following security reasons:

The affiliate uses the customer's QR code, which is the actual payment subject, to identify the payer and proceed with the payment. It is clear that the QR code of the customer should be managed more safely than that of the affiliate, since anyone with the customer's QR code can request and proceed payment with it. Therefore, the customer's QR code should be delivered in a form that is available only for a certain period of time when necessary.
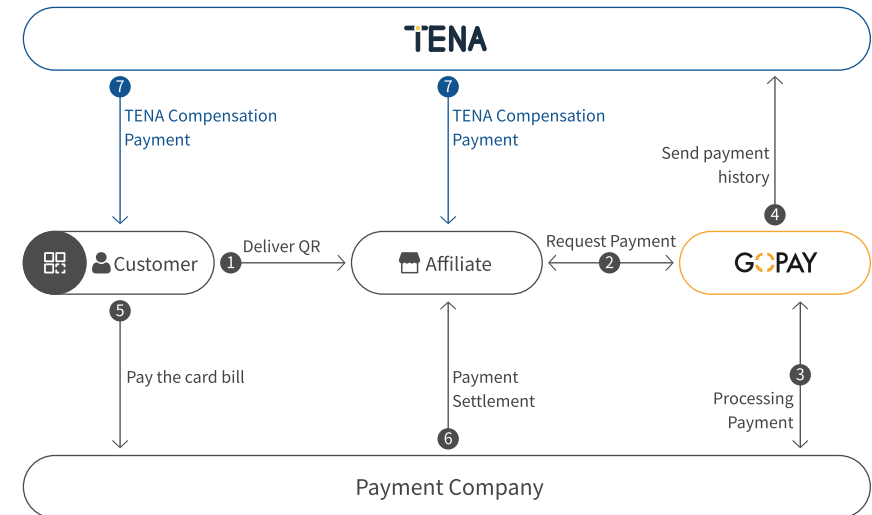
❶ The customer presents the QR code containing his/her payment information to the affiliate.

❷ The affiliate requests payment by GOPAY.

❸ Payment will be processed through the payment company's system.

❹ Send the payment history using the TENA Protocol.

❺ The customer pays the bill to the payment company.

❻ The payment company will calculate and settle the affiliate's payment.

❼ TENA rewards will be paid for the users (affiliate and customer) after settlement.

Technical Consideration

Business Flowchart l TENA Payment

With the TENA Protocol, payments can be made not only with credit cards but also with TENA. Payment will be processed with the pegged fiat amount that is automatically converted from TENA to fiat currency based on the current market price. Neither MPM nor CPM is significantly different from normal card payment flows. However, as the payment is made by the TENA Protocol, it will not use the payment companies that was linked to work. Payment (TENA withdrawal and payment) is made instantly within the TENA Protocol. The payment proceeds on TENA Protocol, so there is no need of sending payment history to any parties.

TENA MPM Payment
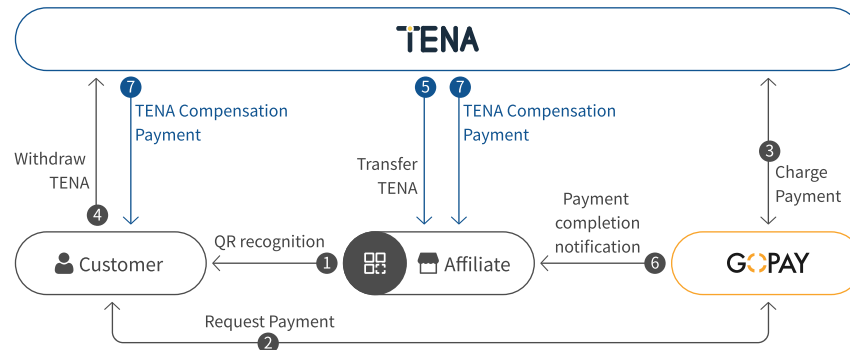
❶ Through the GOPAY app, the customer recognizes the QR code that contains the information to identify the affiliate and the payment history.

❷ Request payment via GOPAY App.

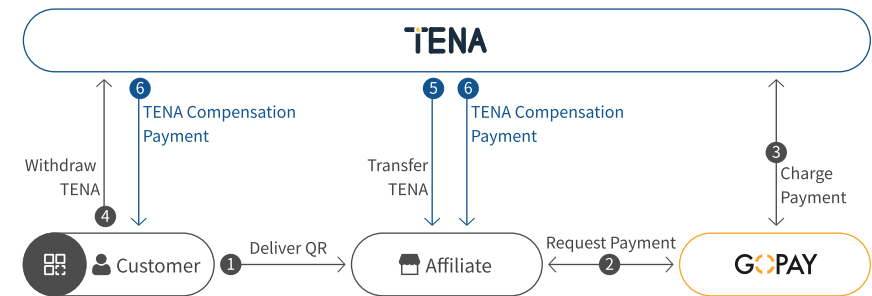❸ Requests a TENA transfer from the customer to the affiliate via the TENA Protocol.

❹ Withdraw TENA according to the payment amount from the customer's TENA wallet.

❺ Transfer the TENA that was withdrawn from the customer's wallet to the affiliate's wallet.

❻ The affiliate is informed that the payment has been completed.

❼ TENA rewards will be paid for the users (affiliate and customer) after settlement.

TENA CPM Payment

❶ The customer presents the QR code containing his/her payment information to the affiliate.

❷ The affiliate requests payment by GOPAY.

❸ Requests a TENA transfer from the customer to the affiliate via the TENA Protocol.

❹ Withdraw TENA according to the payment amount from the customer's TENA wallet.

❺ Transfer TENA that was withdrawn from the customer's wallet to the affiliate's wallet.

❻ TENA rewards will be paid for each user after settlement.

Technical Consideration

Business Flowchart l Overseas Payment

If the payment is not made within only one country, the flow is different from the one described above. Before looking at the application of TENA Protocol, it is important to understand the overseas payment flow in the currently established payment market.

### Overseas credit card payment through global card payment network

Currently, credit card companies around the world handle overseas payment through a global payment network. Payment networks are companies represented by such as VISA, MASTER, etc., which we generally know. If a store wants to accept the particular credit card brand, it can sign a contract with the card company and install a related system to link it. This is how it could be spread within a country. However, because credit card companies cannot visit all the merchants worldwide to sign contracts, they need a global card payment network such as VISA. For example, without a VISA, a customer who has received a Shinhan card in Korea cannot make a payment in Japan because Shinhan Card did not sign a contract with a Japanese store.

Instead, the store has a contract with a Japanese local credit card company. Both Shinhan Card and Japanese card companies can make payments if they are linked to VISA or MASTER. When merchants in Japan requests payment by reading Shinhan Card, both card companies approve payment through the payment network. Although it is convenient to pay by credit card without restriction of the country, the payment fee is high due to the risk the payment network take in settlement. However, using TENA Protocol, it is easy to use overseas payment that is incurred by the existing credit card payment system.

Overseas card payment via TENA Protocol

We will use a scenario where a customer travels to Japan using GOPAY of Korea and proceeds to pay at a JPAY (tentative name) affiliate linked with TENA Protocol as an example.

Overseas MPM Payment
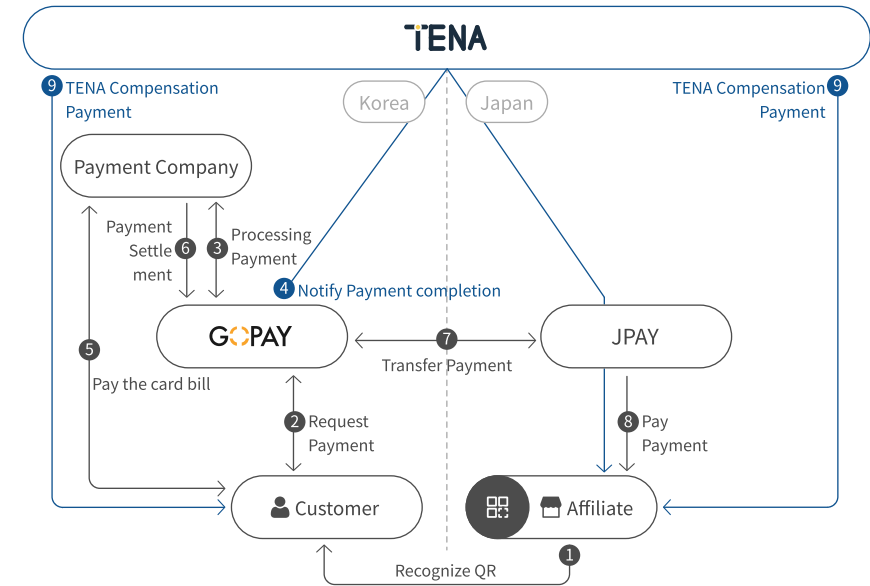
❶ Through the GOPAY app, the customer recognizes the QR code that contains the information to identify the affiliate and the payment history.

❷ Request payment via GOPAY App.

❸ The GOPAY is linked to the system of customer's payment company, so payment will proceed as same as before.
   * From this stage, the flow is different from domestic card payments.

❹ The affiliate cannot be directly connected to GOPAY because it has no contract with it, but the affiliate is informed through TENA Protocol that the payment has been completed.

❺ The customer pays the card bill to the payment company.

❻ The payment company will settle the payment by GOPAY unlike the flow introduced above.

❼ Each service company settles payments with transfer.

❽ JPAY transfer the payment amount to a Japanese affiliate.

❾ TENA rewards will be paid for each user after settlement.

Technical Consideration

Business Flowchart l Overseas Payment

Overseas CPM Payment
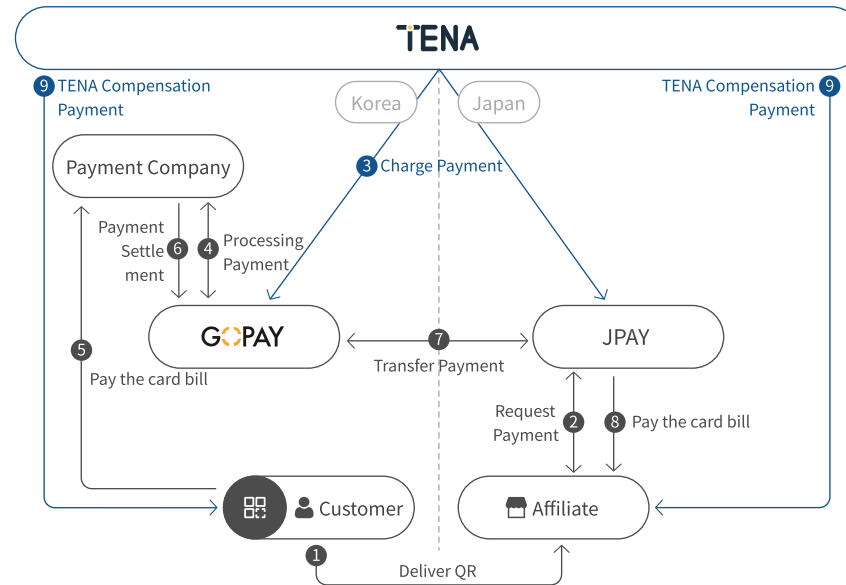
❶ The customer presents the QR code containing his/her payment information to the affiliate.

❷ The affiliate requests payment by JPAY.

❸ Unlike domestic payments, JPAY is not linked to the system of customer's payment company, so it charge GOPAY through TENA Protocol.

❹ The payment is proceeded in GOPAY linked to the the system of customer's payment company.

❺ The customer pays the bill to the payment company.

❻ The payment company settles the payment using GOPAY which is entrusted by the payment company.

❼ Each service company settles payments with transfer.

❽ JPAY transfer the payment amount to a Japanese affiliate.

❾ TENA rewards will be paid for each user after settlement.

Even in the case that JPAY user in Japan and pays at GOPAY affiliates, the payment flow would be the same.

Technical Consideration

Ecosystem
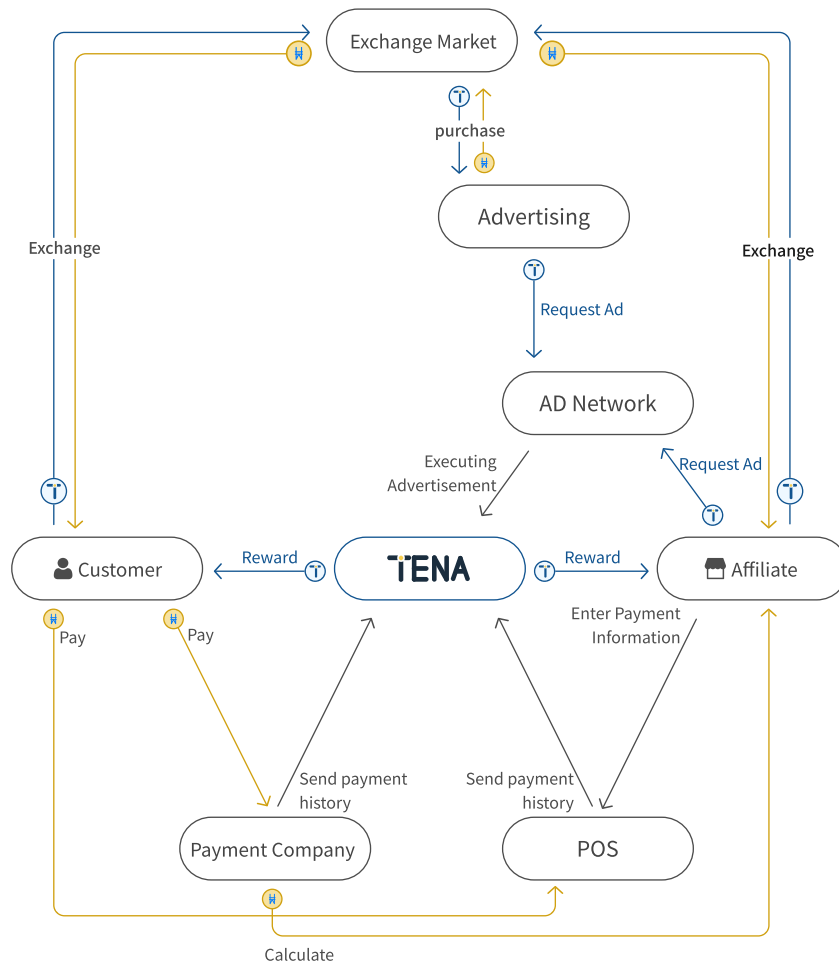
1. The customer pays with the card through the POS terminal installed at a store or through the system of payment company that is linked to GOPAY. The payment detail is sent to the TENA network via TENA Protocol.

2. The affiliate enters information about the customer's payment through POS terminal. If payment is made through the payment company's system, the payment will be settled later.

3. The affiliate pays marketing expenses to the ad network to promote their franchisee and requests advertising. The cost of the advertisement request can be paid with TENA that was paid as rewards or with TENA bought on exchanges.

4. The advertisers requests an ad on the ad network to promote their brand and service. Advertising requests are purchased and paid with TENA bought on the exchange.

5. TENA's advertising network is different from typical marketing solutions. A typical marketing solution is not cost-effective because it targets around a profiled persona, rather than based on the actual user payment history.
However, the TENA ad network analyzes the actual payment made through TENA Protocol and selects and profiles the target group for promotion. Affiliated can execute ad based on the information accumulated through actual payments, so it is highly cost-effective compared to other marketing solutions to run ads.

6. Customers, affiliates and advertisers can exchange fiat currency and TENA through the exchange market.

7. The details of payment completed are calculated and TENA rewards is paid to the customer and the merchant according to how much contribution each user made to ecosystem.

Technical Consideration

TENA Development Direction

Development and Conversion of Independent Block Chain (Main Network)

Tokens from the TENA Protocol are distributed on smart contracts following the ERC20 based on the Ethereum. This means that the token of TENA also has the characteristics and limitations of the token based on Ethereum. Transaction processing is taking more time as more users are using DAPPs and Ethereum platforms that operate on it.

In addition, when trading tokens in Ethereum, a small amount of gas will be paid in the pretext of the fee. TENA development team is aware of the limitations of the Ethereum described above and believes that it could cause further problems in the future. After deploying an ER20-based token for the transaction stability of the monetary TENA token, we are planning to build a network only for TENA blockchain. For the blockchain platforms, we are investigating the possibility of applying and relocating TENA to these bases including Ethereum, and other blockchains such as EOS.

Data that can be stored and processed on-chain in a body from a blockchain to on-chain is endless. Among them, TENA is planning to manage the following data, which can take full advantage of the characteristics of blockchain-de-centralization and reliability.

- QR code

In the TENA Protocol, the QR code acts as an important symbol that identifies each other between customers and merchants and that distinguishes the transaction. You can leave a record of the QR code you created in the blockchain and look into the blockchain when you check the validity of the QR code. Even if a malicious user reads an unintended QR code, everyone can trust it if the QR code is verified through the blockchain. In addition, when linking TENA Protocols around the world, QR codes can be shared through decentralized systems rather than with centralized system, so that they can be trusted for use.

- Market Information

The affiliates can also be managed on-chain easily. You can add information and location of the affiliate and description of the goods and products they handle. It can also be accessed through a decentralized system using blockchain.

- Review

You can obtain not only payment information but also other additional information through the connection between the customer and the affiliate. An honest review left by a customer who used affiliates of TENA Protocol will be an indicator that can be evaluated transparently. Through this review, affiliates that satisfy most consumers are more likely to be noticed. In addition, paying a certain amount of extra TENA to customers who leave a review can encourage them to make good reviews.

Payment security in TENA Protocol

Security is very important when it comes to credit card payments. The subscriber's personal information and the payment data they generate every day must be well protected. TENA will use a variety of methods to protect its customers' information and property.

In order to prevent all illegal transactions, we will detect and prevent fraudulent transactions not intended by the customer by utilizing the payer's persona, payment patterns and affiliate information. It will also monitor and prevent malicious user's abusing that cause confusion in the TENA ecosystem.

Due to the nature of characteristics of payment based on QR codes, the security of QR codes is also important. All QR codes generated in the TENA Protocol are managed by TENA and verified at each payment. If the customer reads the external neutral QR code that does not comply with TENA Protocol or the malicious user's QR code, the payment will not proceed unless the QR code is linked to TENA Protocol. Also, as noted above, managing QR codes on-chain of blockchain will increase security and stability.

Technical Consideration

TENA Development Direction

TENA Protocol Interlink Best Practices

TENA will continue to work toward the rapid expansion of TENA Protocol. As a result, we will create and distribute TENA Protocol linked SDK. Korea's GOPAY is the first case of DAPP in TENA Protocol. As a service that best understands and works with local payments companies in Korea, GOPAY will be the first best practice of TENA Protocol link.

The servers and the Android/IOS applications set and established by GOPAY will set a good example for many other payment companies who want to link with TENA Protocol. The system implemented by GOPAY will be distributed in SDK format and provided in a format that can be linked directly to TENA Protocol, such an off-the-shelf products. Not only applications but also API servers are provided as form of hosting or cloud-style to facilitate rapid linkages and spread.

Only the local payment system in a special situation will be automatically linked, and the rest can be used by SDK to quickly establish payment services that match local circumstances.

Data on TENA Protocol

TENA offers a wide range of services by utilizing the built-in payment data. First, as described in the ecosystem, the advertising platform is provided to affiliates and advertisers who want to advertise through the ad network.

Through payment data, the buyer's persona can be analyzed to enable targeted ads to be customized beyond simple exposure ads.

In addition, the company can expand to various areas such as marketing data analysis, indicator production, exchanges, personal P2P remittance, and credit business.

Token Allocation

50% ● Token sale
20% ● Foundation
16% ● Ecosystem & marketing
10% ● Team & advisor
4% ● Reward Pool
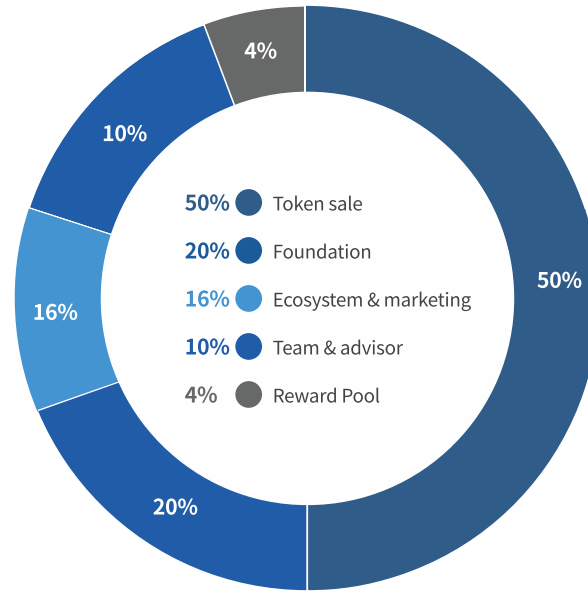
Total number of coins : 5,000,000,000 TENA

TENA