MVL TOKEN ECONOMY & RELATED BUSINESS MODEL

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Introduction

As mentioned in the previous White Paper, MVL's main services can be broken down into mobility services and car services.. Mobility services are services related to driving such as Uber, Kakao Taxi etc. and car services are services related to non-driving life cycle such as a mechanic service, used car dealer, and insurance.

In order to connect them to a single ecosystem, MVL team plans to proceed with the following strategies.

I. Strategy of MVL Team's Project

MVL team will first apply blockchain based incentive systems to existing mobility services. It is because the MVL protocol can be effectively implemented to a mobility service platform which is accessible to many people in a short period of time.

* The MVL protocol refers to the whole communication protocol that can combine MVL blockchain system and token economy to already existing mobility and car related services. It includes all forms of techniques that can implement and apply MVL protocol such as SDK and API. The MVL ecosystem with the MVL protocol allows users to receive incentives in return for data sharing and to use MVL Coin as means of payment for mobility and other affiliated services.

Our team plans to implement the MVL protocol to mobility services such as TADA which our team operates on our own in Singapore and also to existing mobility services of affiliated companies later in the future. As such a large number of users starts to utilize the MVL protocol, our team plans to incorporate various business models where the MVL Coin can be used.

The reason for implementing the MVL protocol to mobility services first is because the project will take too long if we start with car management business with devices such as OBD. OBD is difficult to supply to many people in a short period of time.

This paper mainly describes the token economy where the MVL protocol is implemented to mobility services and illustrates the TADA economy where the MVL protocol is implemented to TADA for example.

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Body

I. Analysis and Improvement of Existing Mobility Services

1. Various Social Problems due to Increased Number of Vehicles

Since the introduction of Benz Patent Motorwagen invented by Karl Friedrich Benz in 1885, automobiles have become a necessity. It is predicted that the number of cars in the world will surpass 1 billion before 2020 and will increase to 2.4 billion by 2050.

This is equivalent to ratio of 6.5 people owns 1 car in the world.

Due to rapid increase in the number of cars, major cities in the world are suffering from a traffic congestion. Not only social cost but also fuel consumption, environmental pollution, and car accidents are becoming serious problems due to extreme congestion.

In order to solve these social problems, the governments of each country are making various efforts. However, in reality they have no substantial effect compared to the fact that the enormous expenses such as the construction of new roads are put into use.

2. The Emergence of Mobility Services and Changes in Car Industry

Because of needs of more convenient services and solutions to solve congestion issues, we are experiencing a shift of paradigm from ownership of cars to sharing rides. These types of sharing economy services are based on a mobile application that allows people to get arrangement for sharing car rides both as drivers and riders.

Over the past few years, the growth of such ride hailing mobility apps has been explosive. Uber, a leader company in ride hailing service, has already surpassed 60 trillion won in enterprise value, and a major Chinese ride hailing company, Didi Chuxing, has achieved 20 million calls a day.

Therefore, the major car companies are also investing in the mobility service business.

Since 2008, Daimler has started a car sharing service in major cities in North America and Europe, using a two-seater vehicle, ‘SmartFortwo’, and has surpassed about 1 million members.
BMW established Drivenow in 2011 with Sixt and Volkswagen and Audi have also started similar services.

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< Major Car Companies' Entry into Mobility Service Industry >

Car Company	Investment Company	Investment Year	Content
GM	MAVEN	2016	· Chevrolet Vehicles for $6/hour · Service in Michigan · Smartphone-based Platform
	Quikr	2015	· 200 Volkswagen Golf Vehicles in Hannover, Germany · 12,500 Members Joined · Now Greenwheels
	DriveNow	2011	· Cofounded by BMW and Sixt (Rental Car Company) · Approximately 40,000 fleets in Europe and North America
DAIMLER	car2go	2008	· 13,000 Smart Fortwo Vehicles · 1M Members Joined in 29 Cities in Europe and North America
PSA GROUPE	FREE2MOVE emov	2011	· Service in France and Spain · All Car Sharing Apps Combined in One App · Multimodal Transported based Platform

Source: Companies' Websites, Media News, and LGERI data

Although mobility services with ICT technologies such as smartphones are rapidly expanding, the problems of the existing ecosystem is still not resolved. Even though, issues with user experiences of waiting for a taxi on the street have been resolved by using smartphone calls, but issues such as traffic congestion, speeding, unkindness are still not resolved.

Furthermore, new problems arise as the mobility service industry is matured. There are complaints from the customers related to abuse of market power such as excessive brokerage fee and monopolized value of data. Since it becomes difficult to objectively evaluate the quality of big data from mobility services, market prices are tend to be formed according to the monopoly of giant platform companies. Therefore, for buyers who have no alternative, they have to purchase data at a high cost. The profit from the data only belongs to the company and it is not distributed to individuals who have provided their mobility data.

As these new issues arise, there are movement against monopoly. In some countries, the services have become illegal. It is also pointed out that mobility services based on monopoly platforms are only new forms of brokerage and are still far from sharing economy which is supposed to share added value with participants in their ecosystems.

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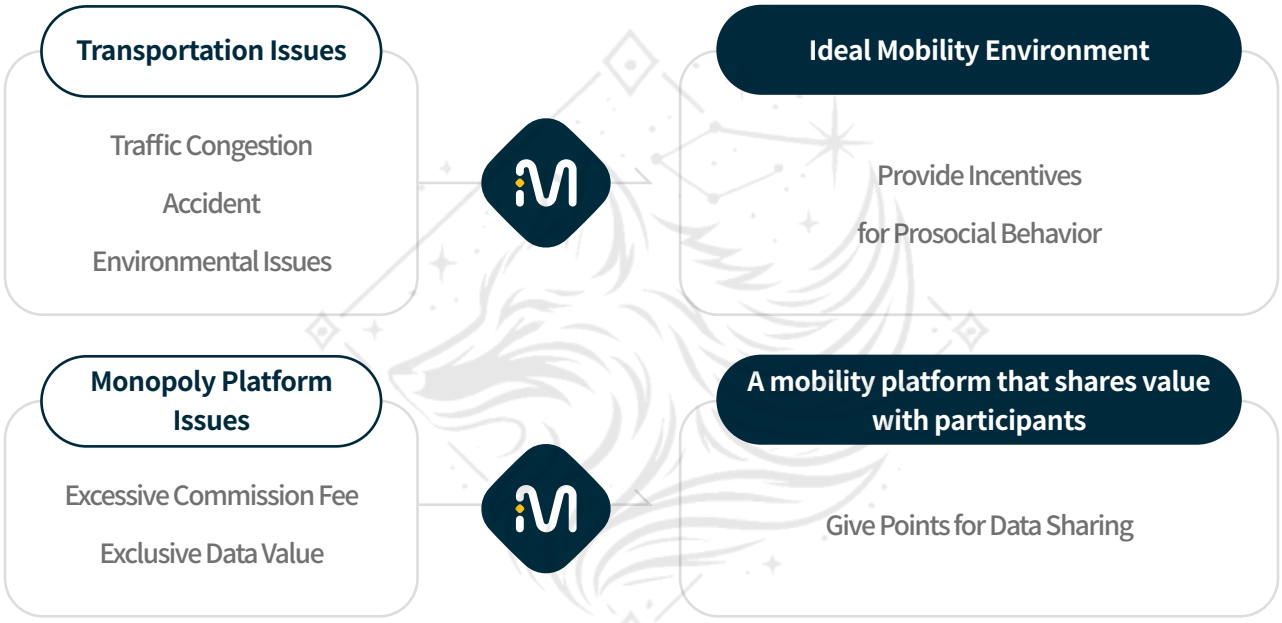
3. MVL Team's Improvement Plans for Mobility Services

The problems that have not yet been solved or newly emerged in the mobility service are like the following.

- Traffic congestion, car accidents, and increase in environmental problems(lead to increase in social costs)
- Excessive fees due to the advent of proprietary platforms and monopoly of data value

Our team seeks to lead the change in mobility ecosystem paradigm by combining blockchain technology and token economy together.

< MVL Team's Mobility Service Industry Improvement Plan >



3.1 Improving Social Value of Mobility Service through Participants' Voluntary Behavior

Our team plans to encourage participants to voluntarily change their behavior. We seek the way to move from the 'User Equilibrium(UE)' which seeks the mobility ecosystem that only looks to one's own interest to the System Optimum(SO)' which pursues the benefits of the mobility ecosystem as a whole.

User Equilibrium means optimizing individuals' selfish utility value. For example, a driver tries to maximize the mobility value by speeding to a destination. System Optimum is a ideal traffic condition for everyone to drive safely.

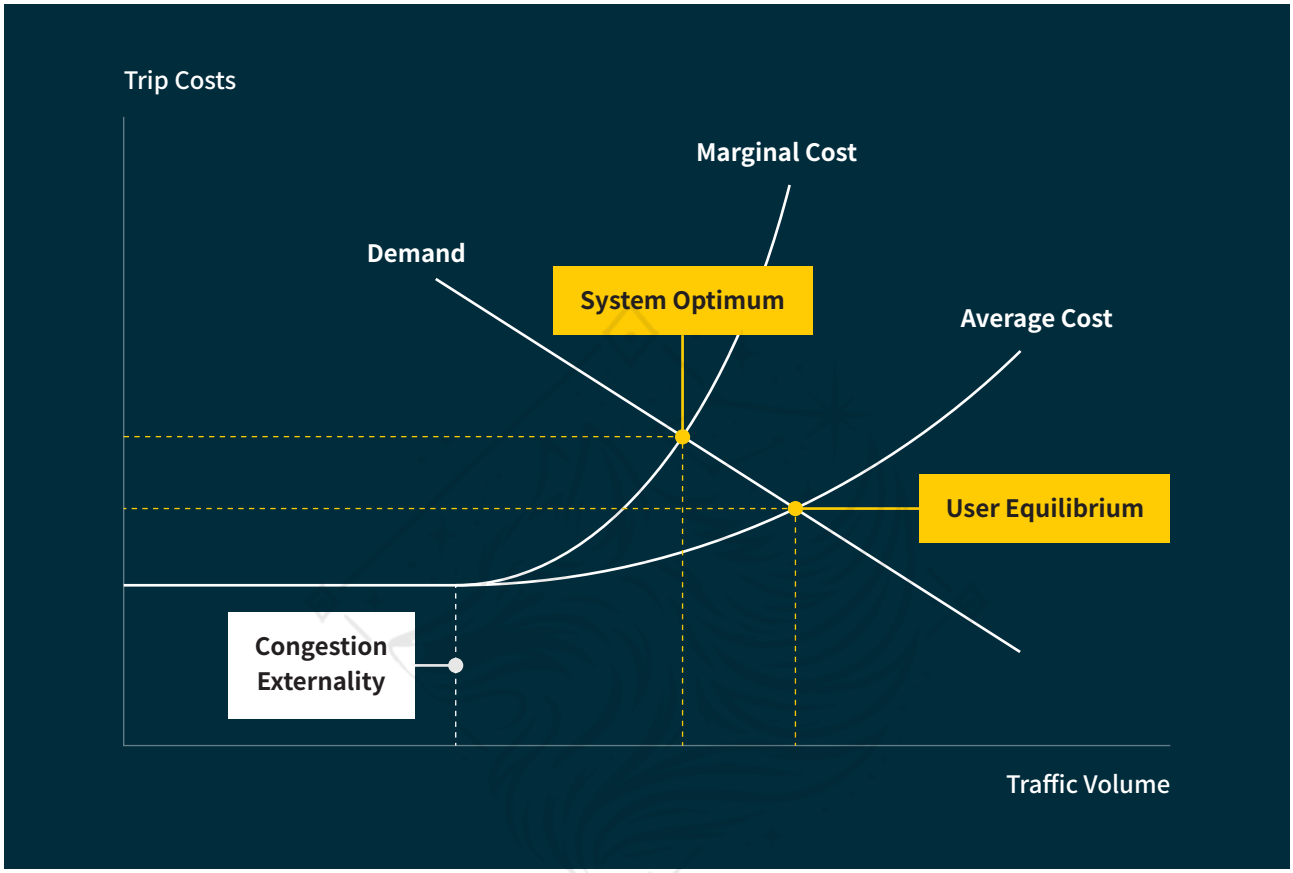
If all drivers pursue User Optimization, all drivers are likely to overspeed and cause a traffic congestion and car accident, which will take life in the worst case scenario.

This will lower the mobility value of most of the drivers. As a result, all drivers must drive at a defined speed limit to optimize the mobility system as a whole.

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(As you can see in the figure, the marginal cost of System Optimum is higher than the average cost of User Optimization. It means that additional costs are needed to make the traffic conditions from User Optimization to System Optimum.)

< User Equilibrium → System Optimum >



출처: David Levinson(2008)

Therefore, traffic experts and policy scholars have been considered about strategies to maximize System Optimum while reducing User Optimization.

For now, a negative approach is used such as setting up speed bumps or charging speeding fines to force drivers to drive in a System Optimum manner.

However, our team plans encourage drivers to stop speeding and to act in System Optimum manner with a positive approach such as incentivizing drivers in a prosocial manner.

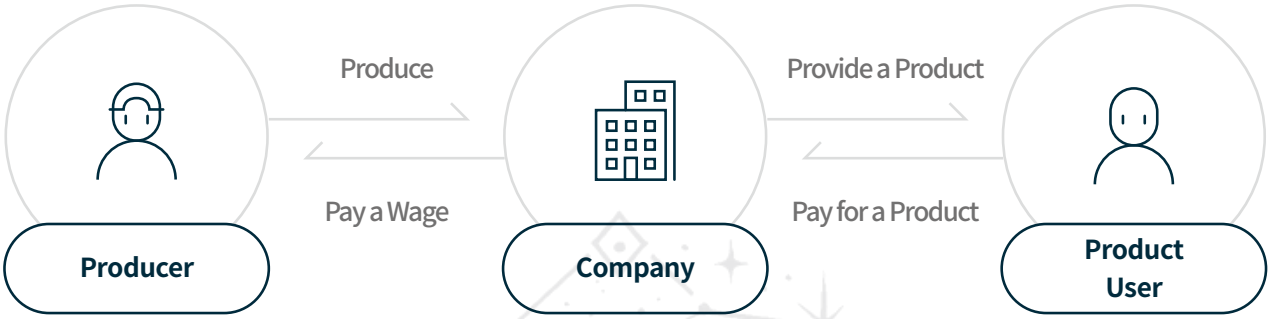
The government tried to resolve the social problems such as traffic congestion, excessive fuel consumption, and environmental pollution through regulation and policies. However, our team plans to solve those problems through the MVL incentive ecosystem which encourages prosocial behavior.

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3.2 Mobility Platform to Share Value with Users

When we look at traditional industrial companies such as manufacturing and agriculture companies, the distinction between a capitalist, producer, and user is very clear. A producer works in a factory, participates in the production, and receives a wage for the value of his labor, while a user pays for the product.

< Traditional Manufacturing Companies >

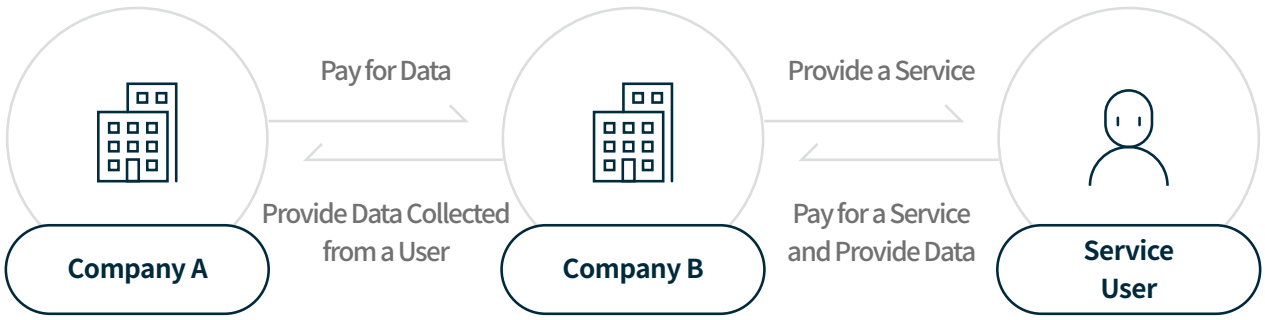


However, in the case of rapidly growing mobility platform companies, the roles of a producer and a user coincide. For this reason, the companies should give service users(data producers) a share in the profits, however, the profit only belongs to the companies for now.

Many people use mobility services based on smartphone applications for a navigation, car sharing service, taxi service, map service, etc. As mobility apps get more popular, the values of the companies like Uber, Grab, and Kakao T rise.

However, the value of a platform company is increased due to a structure in which a platform company takes all data collected from users. Since data is collected when users use the service, not only a platform company but also contribution of users is important for a business to grow. For example, in the case of navigation, a user of the service plays a role of a producer at the same time providing data of travelling.

< Existing Platform Companies >

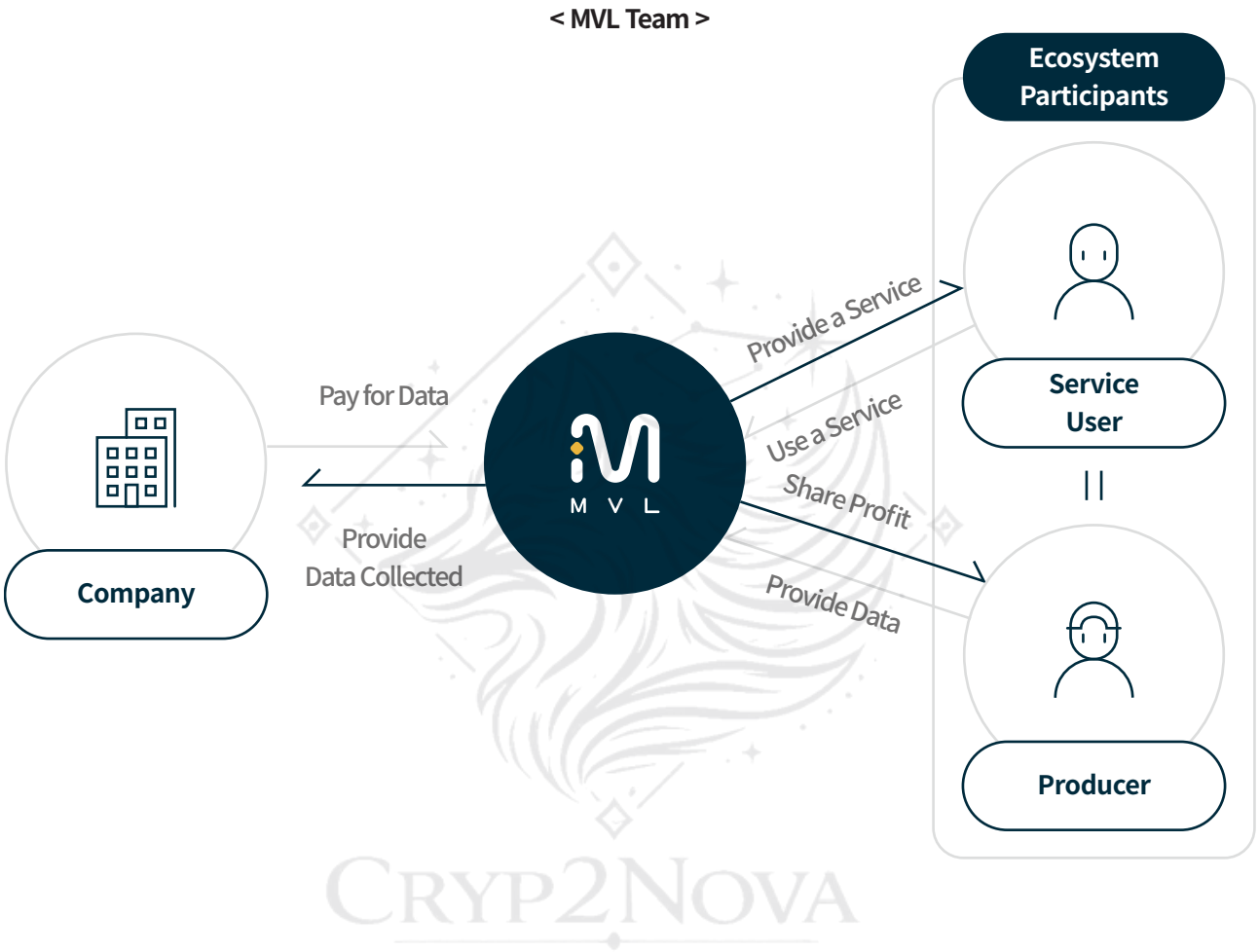


Therefore, our team plans to share the value of data which has been monopolized by mobility service platform companies.

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Our team has defined a producer in mobility platform business as 1) a developer who makes and provides a service, 2) a business operator who runs a service, 3) and a platform user who generates data. Every producer needs to be compensated for providing data.

In the MVL Ecosystem, each individual who generates data is a producer, consumer, and capitalist at the same time.



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II. MVL Mobility Ecosystem and Token Economy

1. MVL Mobility Ecosystem

As described in MVL White Paper, MVL Mobility Ecosystem is where 1) many different mobility services using the MVL Protocol are linked to each other, 2) all kinds of participants such as individual drivers, ride hailing drivers, and passengers get the MVL Point, and 3) participants with high level get various benefits in everyday life and are able to exchange the MVL Point to the MVL Coin.

Participants can join MVL mobility Ecosystem through the MVL app. Participants are able to check their balance of their MVL Point and MVL Coin at the MVL app. They can pay with the MVL Coin to use various mobility services where the MVL protocols are implemented and to purchase goods from the marketplaces.

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It is expected that millions of participants will join our Ecosystem when users from TADA, a ride hailing service in Singapore, and users from other global mobility companies affiliated with our team start to use the MVL app.

The idea is that when participants are able to exchange their MVL Point to MVL Coin and able to use the MVL Coin in many different places, all users from each mobility service will gather in the MVL app and create various values.

This is similar to VIP rewards system of credit card companies. The difference is that the MVL point system can be customized for each mobility service. MVL point system is unique in a way that it is based on blockchain technology which can give points according to level of contribution at our Ecosystem not to the amount of money they spend.

For mobility service companies, they can implement the MVL protocol to their existing services to improve customer satisfaction. Initially, it may require a certain amount of initial cost for companies to implement the MVL protocol but in the long run, it will allow more customers to join, activate financial transactions, and generate new revenue through various business models such as advertising. In addition, companies can earn some additional profit as they act as nodes to play a part in the verification process and consensus algorithm when we launch our Mainnet.

Our system also has several other advantages such as the facts that 1) MVL team cannot monopolize data because coin transactions are transparent and 2) it is safe from hacking becuase data is stored in a blockchain system.

We also plan implement ways to incentivize MVL Coin holders who do not participate in the MVL Ecosystem. In order to maintain coins within our ecosystem, we plan to give many different benefits related to mobility services and to have services that the MVL Coin transaction is available. In addition, we plan to implement various business models linked to our ecosystem for the MVL Coin holders to use their coins.

Therefore, a mechanism for a sound MVL Coin circulation and benefit delivery is needed. We plan to put revenue from our ecosystem to the MVL Pool and use it for rewarding miners and exchanging points to coins. We will also lock up some part of profit and help 30 billion MVL Coins be continuously circulated.

Below is the MVL Ecosystem Conceptual Model. Other mobility companies can build various business models through the MVL app just as how TADA plans to.

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< MVL Ecosystem >

Inside the Ecosystem

TADA APP

Functionality
- Ride Hailing

Business Model
- Advertising Revenue
- Coin Transaction Fee
- Protocol Fee

Mobility Companies

- Taxi Company
- Rental Car Company
- Mechanic Shop
- Used Car Dealer
- Insurance Company

Non-Mobility Companies

A B C D E

MVL APP

Functionality
- Travelling Data Collection
- Wallet(Point ⟷ Coin)
- Navigation
- Mining
- Marketplace
- Mobility Service Affiliation

Business Model
- Advertising Revenue
- Coin Transaction Fee
- Protocol Operation Fee

Ways to Maintain MVL Points inside the Ecosystem
- Point ↑, Level ↑
- Various Benefits according to the Level
- Points Deduction according to the Point Validity Period

Ways to maintain MVL Coins inside the Ecosystem
- Point-to-Coin Exchange
- Coin Payment
- Benefits to Companies holding Coins
- Seperate Market for Direct Exchange

Revenue ⓒ ↓↑ ⓒ Operation Costs

MVL Pool

Sell ⓒ ↓↑ ⓒ Purchase

Outside the Ecosystem

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1.1 MVL Incentive Protocol Implementation

Our team plans to 1) implement the MVL incentive protocol to TADA(Refer to Chapter IV) and 2) expand the MVL protocol implementation around the world by cooperating with other mobility companies in many different countries.

The way in which how the MVL protocol is implemented to TADA is described in this document; however, it may be different when the protocol is customized according to the needs of many different mobility service companies in the future.

The way in which the MVL protocol is implemented to the mobility services(TADA in this case) and how mobility service users and the MVL Ecosystem participants interact with the MVL Coin and MVL point is like the following.

1.1.1. Mobility Service Drivers and Riders Participating in the MVL Ecosystem

MVL protocol will be firstly implemented in a ride hailing service. Ride hailing service users are drivers and riders. Drivers get points by driving for long time, driving a short distance, driving at peak hours, and providing friendly services.

Riders get points by using a ride hailing service and writing a review about drivers.

As points are collected, users can reach higher level in the Ecosystem and get various benefits accordingly.

Furthermore, riders will be able to use the MVL Coin as a payment method and drivers will be able to accept the MVL Coin as a payment method. However, since cash and card payment are being in use for current mobility services, it must not be easy to change such payment method in a short period of time.

Therefore, we plan to make options of paying only part of the fee with the MVL Coin and the rest with cash or credit card. Since the value of the MVL Coin may not be high enough and the number coin holders may not be as high as expected, we plan to introduce it step by step. When coin value rises and number of coin holders continue to increase, a full payment with the MVL Coin will be available.

Since drivers can reach a high level with coins and points and get various benefits through the MVL Ecosystem, they will be willing to take the MVL Coin as a payment method.

* Note
To encourage payment with coins, our team first discussed that we should start with micro- transactions such as tips to the driver. However, with the current situation of the Ethereum blockchain, the problem exists where the transaction fee is too high compared to the amount transferred. In this scenario, we will need to minimize the transaction count on the blockchain by only having a ledger in our ecosystem, or the transaction fee must be paid by our team itself.

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In the latter case, there is a high probability that payment with coins will cause the MVL Ecosystem to lose more than it earns. Therefore, we are planning to implement micro-transactions after establishing our own Mainnet.

Even after we establish our own Mainnet, we must find a reasonable balance for the transaction fees on micro-transactions and transfers to and from outside of our own blockchain. Therefore, we are conceptualizing a model where the role of the master nodes and regular nodes is divided, allowing different incentive models where the master nodes earn a fixed ratio while the regular nodes earn a user-decided commission fee creating a mixed incentive model.

In order to lower the the transaction fee, our team may act as the middleman or open a payment gate with affiliated exchanges for coin holders to buy and sell coins.(Omisego and several domestic exchanges are planning to act as crypto payment gateways.)

1.1.2. Mobility Companies Participating in the MVL Ecosystem

< Implementation of MVL Incentive Protocol >

For mobility companies participating in the MVL Ecosystem, they can implement the MVL protocol to their services and form customized incentive structures for their own benefit delivery.

However, the mobility companies have to pay a certain amount of fee to implement the MVL protocol to their services.

* This is similar to how MVL team(Easi6) provided a vehicle management tool to small and medium-sized rental car companies and received monthly fee in the past.

The basic idea is that a company should have a certain amount of MVL Coins to implement the MVL protocol and have to pay a certain portion of the MVL Coin the company owns as fee every year.

However, since it is expected that most of the companies will pay with cash in the early stage, our team plans to purchase and manage coins on behalf of those companies. It is also possible for the companies to purchase the MVL Coin directly from the market. In this case, the company can act as nodes and participate in staking.

Only the amount equivalent to annual MVL protocol implementation fee will be put into the MVL Pool and the rest of the MVL Coin will be locked up. If the mobility companies decide to stop using the MVL protocol, we can either clear the lock up and return them as cash or let them just hold as an investment asset. In this way, the market price of the MVL Coin will not be affected.

< Use of Advertisements >

If the companies implement the MVL protocol, they can run on an advertisement on our app. There are two types of advertisement. One is to provide vouchers to high level users, the other one is to put up an advertisement of nearby services such as a restaurant, mechanic, and gas station based on location data.

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Many companies have used location-based advertising models, however, they have not achieved significant results. The MVL protocol will allow companies to collect drivers' travelling data and favorite places of visit which will let them provide customized discount coupons to drivers.

The mobility company will receive some of the advertising revenue and MVL team will receive the rest. This revenue will be put into the MVL Pool and be used for purchasing the MVL Coin.

< Commission Revenue from the Payment with Coins >

Our team plans to share commission revenue from the payment with coins within services by affiliated mobility companies with the companies. Our team's commission revenue will be put into the MVL Pool and share it with ecosystem participants and the MVL Coin holders.

MVL Pool will be explained in later chapter in this document. (Refer to 1.3 MVL Pool)

Revenue from MVL protocol implementation to mobility services will be managed through the MVL Pool and it will be used to increase the coin value.

1.2 MVL App

The most important part of the MVL Ecosystem is to invite all kinds of users who use various mobility services with MVL incentive protocol implemented. In order to gather all users together, we need to build the MVL app.

Our team plans to let users exchange the MVL Point to the MVL Coins and to withdraw coins to outside our ecosystem only through the MVL app.

The MVL App will be a gigantic platform where all individual participants of our ecosystem gather, many kinds of business models are implemented, and great value is created.

The services provided by the MVL App are as follows.

< MVL App >



Initial Stage
- Wallet

Middle Stage
- Navigation
- Marketplace
- Links to Affiliated Mobility Apps

Late Stage
- Mining
- Car Management

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< Initial Stage>

The MVL app will initially feature wallet functionality as described in White Paper.

To use these features, a user should create an MVL app account and log in.

When a driver drives with the MVL app logged in, travelling data will be collected by the MVL Team. A driver will receive the MVL Point for sharing data, and he can check his balance at the MVL Wallet.

Furthermore, a user can also check the MVL Point collected from using various mobility services at the MVL Wallet. Since the MVL app user point system and other mobility services' point systems are linked to each other(same point systems since they are all part of the MVL Ecosystem), a user can receive benefits depending on the level.(For example, a level 5 driver driving with other mobility apps can start from level 5 as well with the MVL app. When a driver drives with the MVL app logged in, a driver's points will get deducted for having a car accident or reckless driving. This is the same for mobility service riders.)

In the Wallet, a user can check the MVL Point balance, exchange the MVL Point to the MVL Coin, check the MVL Coin balance, check level, deposit and withdraw the MVL Coin, and be linked to exchanges.

In case of point-to-coin exchange functionality, our team plans to differentiate point-to-coin exchange rate and exchange time. This can work as a mechanism that encourages the MVL Coin to be used at marketplaces rather than being withdrawn to exchanges.

< Middle Stage >

In the future, the MVL app will be equipped with navigation, links to apps of affiliated mobility companies, and marketplaces.

Even when driving with navigation, same point systems for other mobility services will be implemented so that users can receive points and be placed in a higher level.

Many different affiliated mobility companies will be introduced to the MVL app and links to those companies will be implemented. This will allow affiliated mobility companies to be able to constantly advertise their services to many MVL app users.

Marketplaces are planned to be implemented as well and they are expected to be much profitable. Marketplaces will be where users can sign up for a car insurance, use a mechanic shop service, purchase auto parts, and receive vouchers for a gas station and car wash.

In the future, marketplaces will be much more diversified where users can purchase various products such as food, goods, and gifts.

In particular, our team plans to provide various ways for affiliated companies to accept the MVL Coin as a payment method. Our team plans to give benefits to the companies such as placing banner ads on top of the page based

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on the amount of the MVL Coin they have or letting them give discounts on purchase with the MVL Coin.

However, it may be difficult to encourage payments with the MVL Coin since the value of coin is volatile. Therefore, the company will be allowed to offer a price within certain range of cash price(eg. +30% - -30%). If the company offers cheaper coin price than the cash price, it can encourage payment with coins and strategically have more coins than competitors. If the company wants to receive cash since they already have many coins, they can offer cheaper cash price than coin price.

There are few more ideas, but they will not be disclosed this time. The key is that users and affiliated companies can utilize the MVL Coin at the MVL app so that coins can be circulated within the MVL Ecosystem rather than withdrawn outside the ecosystem.

< Late Stage >

Later in the future when the Mainnet is launched, our team plans to allow users to mine cryptocurrency and manage vehicles on the the MVL app.

The reason why implementing cryptomining and vehicle managements are long term subjects is as follows.

In the case of cryptomining, it needs time since the token economy must be tested first.

Verification on data from the actual mobility service is important because appropriate utilization ratio between point and coin must be determined.

It is also important to decide the optimal commission payment model after running token economy implemented in mobility services.(A commission payment model needs to be designed based on the nature of mobility service and large-scale remittance to outside the ecosystem.)

Therefore, our team plans to launch the Mainnet in the first half of 2019 after the test period of the token economy by the end of 2018.

The reason why implementing vehicle management is a long-term subject is that there is user barrier against installation of OBD(On-Board Diagnostics). Having OBD installed in the early stage before the MVL Ecosystem is properly settled can possibly lead to user dissatisfaction.

In the past, many large companies have failed to distribute OBDs since cars with OBD are often excluded from free-of-charge repair benefits. Therefore, our team plans to 1) gather as many MVL service users as possible and 2) implement vehicle management with OBD after token economy is stabilized.

When the MVL incentive protocol becomes familiar to many users, we plan to give free-of-charge repair benefits to cars with OBD and give benefits within our token economy in order to expand OBD installation.

Our team also plans to link existing OBD products in the market rather than producing one in order to supply

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OBDs at fast pace, let them link to the MVL app, and affiliate with OBD companies as many as possible.

1.3 MVL Pool

Revenue from the MVL Ecosystem such as advertising revenue and commission revenue from the payment with coins will be put into the MVL Pool. Revenue put into the MVL Pool will be used to be returned/distributed back to ecosystem participants by rewarding miners, exchanging points to coins, and operating our ecosystem.(Our team plans to continuously adjust the point-to-coin exchange rate so that a certain level of coins can be maintained in the MVL Pool.) This will enable a continuous circulation of the MVL Ecosystem. However, due to the following considerations, our team decided to add the reservation functionality to the purpose of the MVL Pool.

First, there was a concern that the MVL Coin holders may be left out from being rewarded. Since the value of the ecosystem and value of the coin are linked to each other, it is possible for coin holders to be indirectly rewarded. However, our team have decided that there needs to be more direct way to reward the ecosystem participants as to reward the miners.

Secondly, there was a concern about circulation of the MVL Ecosystem due to limited number of coins issued which is 30 billion. Since the revenue from the ecosystem may not be high enough at first, the MVL Coin in the Reserve Pool(16%) will be used in line with the ecosystem growth rate. However, there may be other types of problems when the revenue is generated, the coin circulation is improved, and 30 billion MVL Coins are all in the market. Since the number of issued MVL Coin is limited and it is not an inflation coin, it is important to have a sound circulation system.

To solve this problem, our team has decided to have a reservation pool. We will lock up part of the revenues generated from the ecosystem. It is similar to a buyback.

With a reservation pool, 1) the amount the MVL Coin in circulation can be reduced for a certain period for time until the lock-up is expired and 2) stable and continuous circulation of the MVL Coin is possible.

If the number of issued MVL Coin is limited to 30 billion, all MVL Coin is distributed in the market, and the revenue for rewarding miners and exchanging to the MVL Coin is not continuously generated, no coins will be left in the MVL Pool. In this case, point-to-coin exchange cannot be achieved and the MVL Ecosystem may suffer from crisis. In order to prevent such cases from occurring, a part of the revenue should be locked up for coins to be issued later in the future. Thus, our team will continue to reserve a certain amount of the MVL Coin from the time the revenue is generated and lock-up period for a certain period of time.

In order for the MVL Ecosystem to be maintained, not all 30 billion MVL Coins must be circulated and a part of the revenue should be locked up for a long period of time for later in the future. Therefore, it is important for our team to carefully verify the trend of the coin circulation.

If cryptomining, coin-to-point exchange, and coin circulation from the inside to the outside the Ecosystem and vice versa are not stable, unlocked coins will be used first. If the initial ecosystem operation is stable, some of the

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reserved coins will be disposed or be returned to the MVL Coin holders as a bonus.

In other words, the revenue put into the MVL Pool will be used to reward miners, to exchange the MVL Coin to MVL Point, and to operate our ecosystem, and to be reserved(10%) as the ecosystem fund. A certain amount of the MVL Coin will be locked up every month for a certain period. Part of the MVL Coins will be unlocked and disposed or will be used to operate our ecosystem in many ways such as rewarding miners.

Our team plans to open monthly revenue to the public from the time of the revenue is generated and to open the Wallet addresses to the public from the time the token economy is implemented.

< MVL Pool >



2. Increase in the Value of the Ecosystem

2.1 Increase in the Value of the Ecosystem based on the Implementation of the MVL Protocol

The MVL Ecosystem is to deliver various benefits to mobility and car service users and gather all users together at the MVL app. The purpose is to connect many different mobility services in one with the MVL protocol and gather ‘ecosystem participants who utilize the MVL Coin’ and ‘the MVL Coin holders’ together and share the revenue and the value of the company.

The more services implement the MVL protocol and the more participants join our ecosystem, the more revenue is generated and the value of the ecosystem rises. This is similar to the value creation strategy of existing platform companies.

In general, the value of the service rises proportionally to the number of users. On the other hand, the value of the platform companies rises exponentially in proportion to the number of users. This means that the efficiency of the company is maximized according to the number of users compared to that of the non-platform companies.

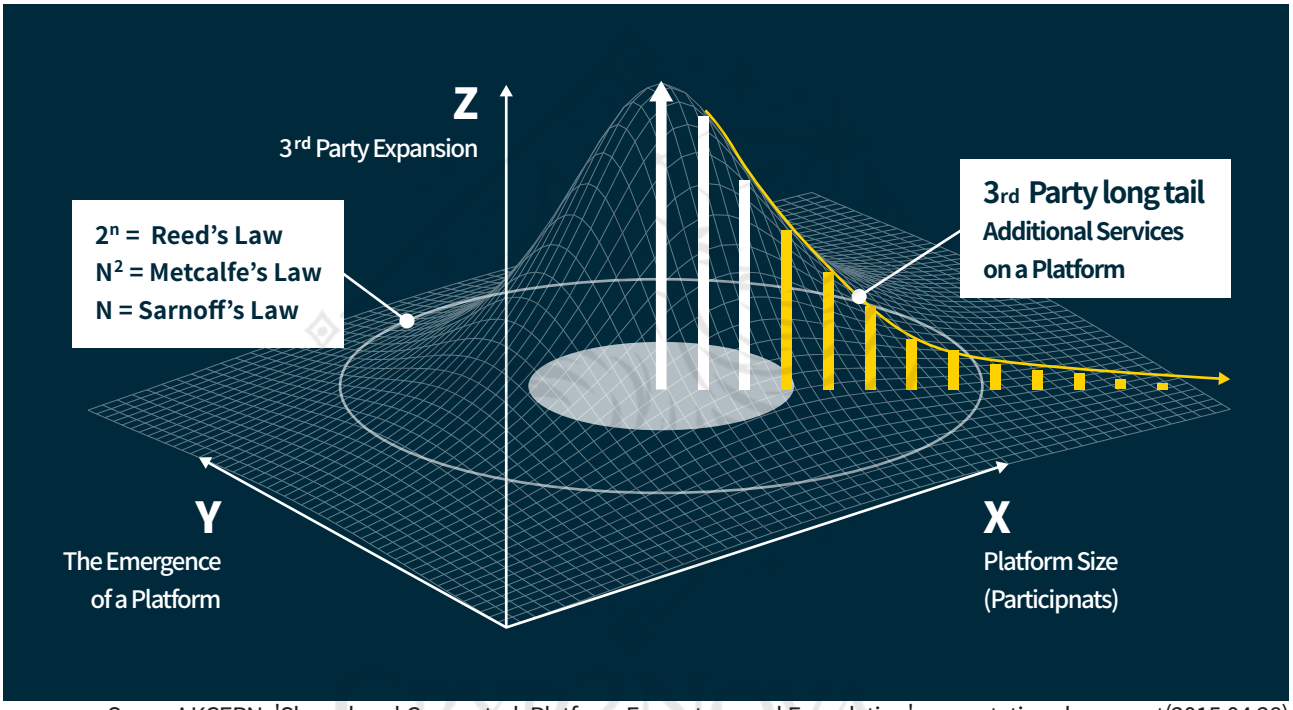
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$$S = aX_1 + bX_2 + cX_3 = (a + b + c + d...)Y$$

Service Total **General Companies** **Platform Companies**

The following is presented by KCERN(Korea Creative Economy Research Network) in 2015 to explain the value of the platform. The value of the platform is determined by the platform size, emergence, and the third party participation. The platform size is related to the number of the MVL Ecosystem participants. Emergence is from the theory of self-organization in which an ant has no ability to build house but group of ants has one.

< Platform Value >



Source: KCERN, 'Shared and Connected, Platform Ecosystem and Foundation' presentation document(2015.04.28)

* e.g.) Assume that XY plane is the KakaoTalk Messenger platform and Z axis(3rd party expansion) is the emoticon business. A platform company(KakaoTalk Messenger) shows exponential growth with a new value-added business(emoticon business)

2.2 Issues in the Existing Token Economy and MVL Team's Differentiation Strategy

Blockchain based token economy refers to a system where tokens can be exchanged within an ecosystem. It is established to reward the ecosystem participants for prosocial behavior, to exchange incentive points to tokens, and to exchange tokens to other valuables. The value of the token can grow in proportion to the growth of the ecosystem. In order to create such a structure, sufficient benefits(point incentives) need to be delivered, exchange ratio from points to coins needs to be logical, and the inside and the outside of the ecosystem needs to be balanced.

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In the case of our token economy, token itself has a monetary value and the price will be set in the market. In other words, tokens will gain the value of convertibility and liquidity depending on how much participants are active in the ecosystem. Accordingly, the participants can hold, purchase, and use tokens.

However, the problems with the most of the blockchain based token economies are as follows.

(1) Due to irrational token-to-cash exchange rate, the ecosystem participants do not mind if they receive tokens or not.
(2) Due to nontransparent issuance/supply/record of the token, the participants are not able to know how many tokens they have received.
(3) Due to inconsistent rate of token-to-cash exchange, token economy is not fair.
(4) Due to uncertainty about the growth of the ecosystem, the participants only sell the tokens.

*Note: https://blockinpress.com/archives/5394

The biggest problem from the above is that the participants are indiscriminately selling coins to the outside the ecosystem not using them for affiliated services. As a result, the value falls compared to the growth rate of the ecosystem and it has become difficult to ensure the sustainability of the ecosystem as a whole.

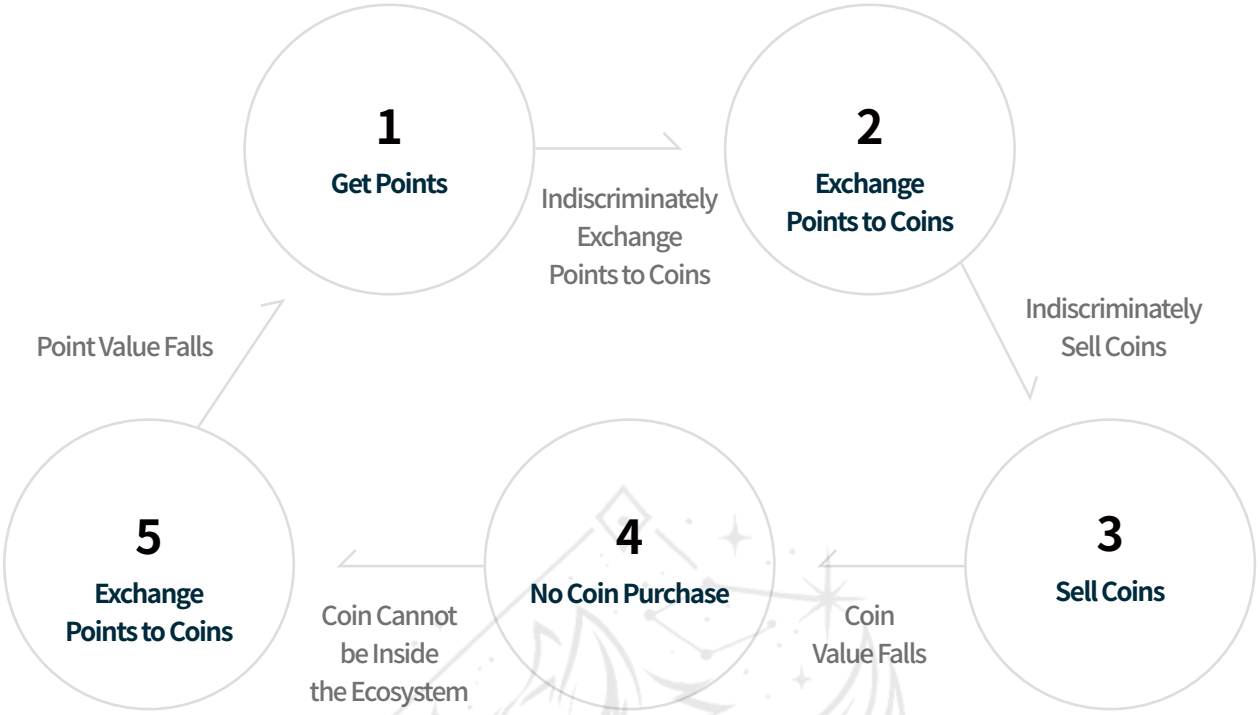
Like the diagrams below, if the value of the points falls, the number of users who want to earn points decreases and the value of the coins eventually falls.

Our team was concerned about the possibilities that the participants indiscriminately exchange points to coins and sell coins because if the number of coins for sale increases, the value of coin will fall and the MVL Ecosystem will collapse.

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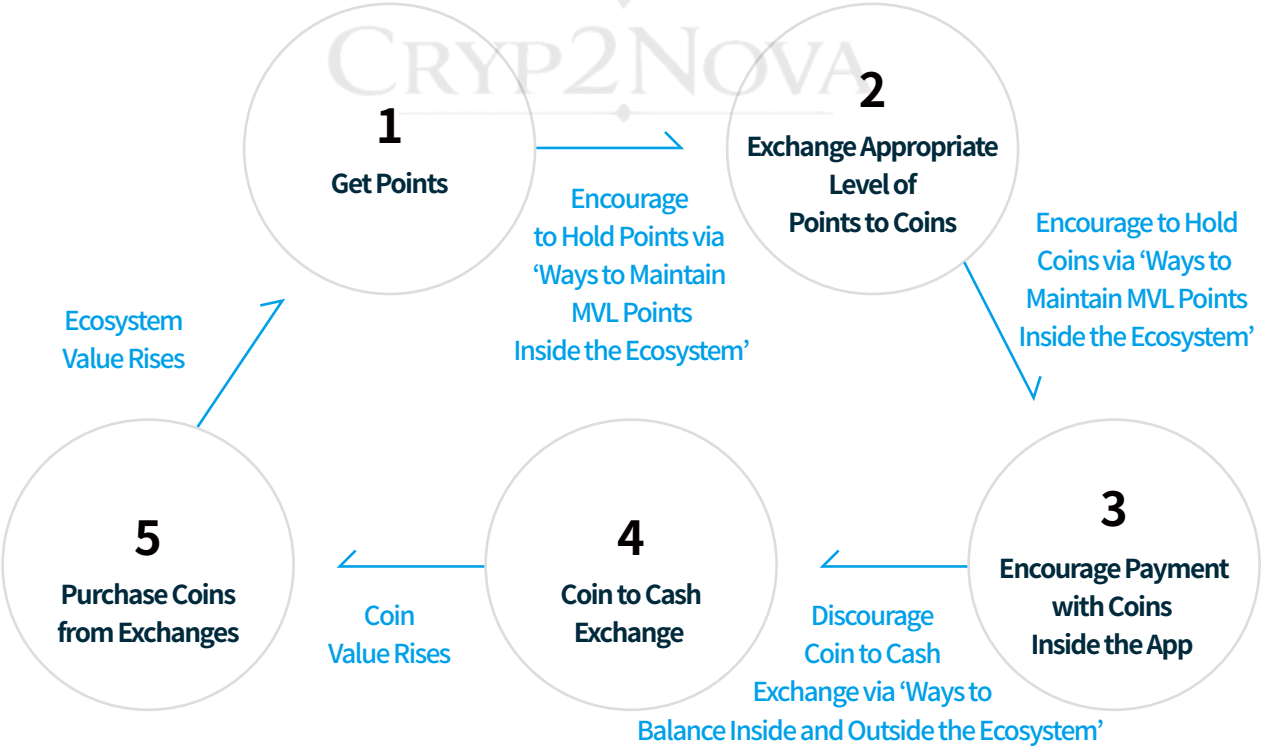
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< Problems Faced by Other Existing Ecosystems >



In order to prevent the problems from occurring, our team has decided to introduce various devices throughout the ecosystem. We devised the ways to maintain the MVL Point inside the ecosystem, the ways to maintain the MVL Coin inside the ecosystem, and the ways to balance inside and outside the ecosystem. These ways designed for sustainability of the ecosystem are described as follows.

< MVL Team's Solution to Maintain MVL Ecosystem >



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2.2.1 Ways to Maintain the Value of the MVL Point via Mobility Services

When the users use the mobility service with the MVL protocol implemented, users will receive the MVL Point(exchangeable to the MVL Coin) and are able to use the MVL Coin as the payment method.

The problems with many other existing projects with token economies based on point and coin utilization are that the service users indiscriminately exchange points to coins and sell these coins in the market. In such a case, the value of the token falls and the number of users decreases. The value of token will never get recovered even after the number of service users increases.

To prevent these problems from occurring, the value of the point itself must be increased. In other words, earning the points should not be only the way to earn coins but the way to receive everyday life benefits. Therefore, our team has devised ways to 1) place participants with many points rewarded in a high level and 2) bring benefits to participants according to their level. The differentiated benefits are point-to-coin exchange and time, faster matching voucher, etc. Moreover, points will be deducted according to the point validity period.

< Ways to Maintain MVL Points inside the Ecosystem >
- The higher the points, the higher the level in the MVL Ecosystem.
- Differentiated benefits are provided to participants according to their level, so that the drivers and riders to use the mobility service very often are advantageous for having higher level in the ecosystem rather than exchanging points to coins.(e.g. If the level is low, the point-to-coin exchange time is relatively late and the exchange rate is low.)
- Points get deducted according to the point validity period.(for participants who do not use our affiliated services for long time.)

* The MVL Point-to-MVL Coin exchange system will be described in detail in Chapter as IV as it is the most important part in the MVL token economy. It is designed based on TADA service in Singapore for now, but will be revised as the MVL protocol is implemented by other mobility services in the future.

2.2.2 Ways to Maintain the Value of the MVL Coin inside the Ecosystem via MVL App

Users of many mobility services with the MVL protocol implemented are able to exchange points to coins through the MVL app. MVL app. is where users from many different mobility services and their asset gather together.

At the MVL app., users can transfer the MVL Coin to exchanges, pay the MVL Coin to use the services, and pay the MVL Coin to purchase products at the marketplaces.

In order to encourage users to use the MVL Coin as a payment method, ways to have convenient payment system, low commissions, and low coin prices are needed.

In order for the companies participating in the MVL Ecosystem, coin payment should be advantageous rather than cash payment. However, even when the coin payment is settled, it will cause another problem such as a decrease

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in the value of the coin if the companies only sell the coins in the market.

In other words, our team needs ways to encourage the users to purchase the products at a cheap price at the marketplaces and the companies not to indiscriminately sell coins at the exchanges.

1) Our team has designed a way to provide benefits to the companies to place banner ads on the top of the page based on the amount of the MVL Coin they have. The companies will be encouraged to hold many coins as possible since a large number of users will be gathered together in the MVL app. For the companies to increase the amount of the MVL Coin, they may purchase coins from the exchanges or implement a system for users to pay with coins. For the companies that already have much amount of the MVL Coin, they may want encourage paying with cash rather than with coins. In this case, they would like to lower the cash price than the coin price.(However, they should be informed that they may lose a chance to place banner ads on the top in competing with other companies holding more coins.)

By encouraging the companies to compete each other to place banner ads on the top and have payments systems with coins and cash at the same time, many companies will have many coins as possible. In this way, we believe that we will be able to prevent problems of indiscriminately selling coins in the market and also be able to increase the distribution of the coin and value of the ecosystem at the same time.

2) Also, our team plans to have a separate market for users to directly exchange the MVL Coin within our ecosystem.

This is a way for 'the companies that have much amount of the MVL Coin through the coin payment and have made effective advertisement already' not to immediately sell coins in the market and trade with 'the companies that need to increase the amount of the MVL Coin to make effective advertisement' instead. There will be no effect on the market price since such a large amount of coin will be traded within the ecosystem.(Currently our team is discussing a deal with few exchanges.)

< Ways to Maintain MVL Coins inside the Ecosystem >

- It is possible to exchange the MVL Point to MVL Coin only through the MVL app.
- Users are able to use affiliated services and purchase products at the marketplaces with the MVL Coin.(The companies are able to encourage a payment with coins by lowering the coin prices than the cash prices.)
- The more coins the companies have, the higher level in the ecosystem with better benefits.(The companies with more amount of coins can place banner ads on the top of the page.)
- A separate market will be implemented for users to directly exchange the MVL Coin with each other within our ecosystem.

If the number of users of the MVL app is increased as we have planned, the places to use the MVL Coin will be variable. However, it will take some time to gather the users and the companies at the MVL app. Meanwhile, our team will implement other many ways to use the MVL Coin in other variable places. However, we are not able to describe all here in this document, but we plan to implement them step by step.

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2.2.3 Ways to Balance between the Inside and Outside of the MVL Ecosystem

We have designed ways to prevent the outflow of the coins from the ecosystem via ways to maintain the value of the points and coins. Our team plans to adopt various policies to keep the value of the ecosystem and prevent it from being damaged due to reckless selling of coins.

However, for the smooth circulation of the token economy, more devices are needed. We have to make sure that the MVL to flow from the inside the MVL Ecosystem(mobility services and MVL apps) to the outside the ecosystem and vice versa.

In other words, we need to balance the ratio between 'the number of users who earn coins within the ecosystem and exchange them into cash in the market' and 'the number of users who purchase coins in the market and use them in the ecosystem' in order to create a desirable token economy.

At this time, there may be an increase in the amount of unused coins in the ecosystem and those that are not exchanged in the market, but this can also contribute in increasing the value of the ecosystem by controlling the increase in total volume of the coin and encouraging more users to purchase coins from the market.

We have come up with 5 strategies that will encourage coins to flow into the ecosystem from the external market and maintain the ecosystem. This can overlap with some of the strategies mentioned before and but it will be explained again for further clarification.

< For Individual Participants: Participants such as Drivers and Riders to Hold the MVL Coin >
Our team designed a way to encourage users such as drivers, riders, and individual drivers who use the mobility services with the MVL protocol implemented to have a certain amount of coins. We will design a system for individual participants to have a certain amount of coins to be placed in a higher level, so that they can be provided with various benefits using the services. This will increase the amount of coins reserved in the ecosystem and encourage each participant to have coins and actively use them to pay for services.

However, there will be a limit on the amount of coins that can affect the holder being placed in a higher level. This is to limit participants from being indefinitely promoted to a higher level making participation in the ecosystem more important than financial strength.

< For Mobility Companies: Companies Implemented with the MVL Protocol to Hold the MVL Coin >
As mentioned above, the mobility companies must have a certain amount of the MVL Coin to implement the MVL protocol. Our team plans to differentiate standards of the amount of coins to hold for each companies in proportion to the the number of mobility service users.

When the companies are not allowed to purchase coins with cash, our team will purchase on behalf of the companies. A certain portion of the coins the companies own will be paid as an implementation fee every year. These coins will be managed in the MVL Pool and be used for mining commissions and exchanges and be stored as reserved to be eventually shared with the participants. As more mobility companies implement the MVL

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protocol, the amount of the coins in the reserve pool and the value of the coins will be increased.

< For Companies Participating in the MVL Marketplaces: Companies in the Marketplaces to Hold the MVL Coin >
Our company plans to encourage companies to allow payment with coins when they sell products and provide services to users in the MVL app. The more coins the companies have, the higher level they can be placed in. As the companies have many points, they are able to put up an ad on the top of the page. (When companies need to pay entrance fee with cash instead of coins, our team is able to purchase on behalf of the companies.)

< The MVL Coins to be reserved in the MVL Pool >
Our team plans to operate the MVL Pool from the point of the revenue is generated and lock up a part of revenue(10-20%) for about 2-3 years. By having the coins reserved in the pool, we also expect that 30 billion of the current issuance amount of coins to be circulated within the ecosystem without extra coins to be issued.

< More coins to be reserved in the pool after the Mainnet is established >
When the token economy is settled, our team plans to utilize a separate blockchain system with our own Mainnet in 2019. For anyone to participate our own Mainnet, we plan to develop a consensus algorithm. Our team will also participate in mining on our own and part of it will be locked up as reserved for the use in the future.

*Note: Our team is in concern with few as follows
1) Developing a consensus algorithm that utilize both coins and points
2) Developing a consensus algorithm for small transaction not to be less important than huge transaction out from the ecosystem
3) Preventing from a decrease in payment with coins due to high commissions
4) Coordinating coins and points with transaction data and mobility data

Our team is in consideration about various ideas such as managing transactions from the inside the ecosystem and outside the ecosystem separately, introducing master nodes, having private nodes and public nodes at the same time, and dynamic commission system and fixed commission system at the same time. We will discuss about the Mainnet later in a separate document.

The summary of the places where the MVL Coin can be used are as follows.

< Many Different Places to Use MVL Coins >

MVL Mobility Services
- Pay with Coins for Rides
- Pay with Coins for Extra Options such as Emergency Rides, Best Drivers, Female Drivers, etc.
- Pay Tips with Coins
- Pay with Coins for Optional Services such as Events, Item Purchase, etc.
- Pay with Coins for Services of Other Companies with MVL Protocol

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MVL App

- Mobility Market: Pay with Coins to Purchase Auto Parts and Repair Parts and Make Insurance Payments
- Non-Mobility Market: Pay with Coins to Purchase items other than Mobility related items
- Other Affiliated Company Services: Pay with Coins when Using Various Services such as a Gas Station, Mechanic, Used Car Dealer, etc.
- Companies May Pay with Coins for MVL Ecosystem Entrance Fee
- Pay with Coins to Put Up an Advertisement
- Pay with Coins when Using Additional Services such as Car Related Games, Item Purchase, etc.

More

- Pay with Coins for a Particular Service of Affiliated Companies(Other than Mobility Services or Product Purchase)
- Pay with Coins for Various Services Related to Mobility Outside the Ecosystem

III. TADA Economy with MVL Incentive Protocol

1. Overview

The MVL team launched the TADA ride-hailing service in Singapore on July 26, 2018. The TADA app collects car data of drivers and riders in real time, and this data will be used to implement the System Optimum pursued by the MVL Ecosystem.

Therefore, we have designed a new mobility economic ecosystem by applying a blockchain technology based the MVL protocol to the TADA app for the first time. This allows the MVL Ecosystem participants to earn points based on participation contributions and exchange them for coins to use as a means of trading like cash.

The core of the MVL mobility economic ecosystem is to provide appropriate incentives.

The ML team with a number of mobility experts designed the incentive logic in the following ways to provide appropriate incentives and maintain its incentive value:
1) Estimating mobility data value
2) Allocating the estimated data value
3) Introducing MVL point logic design (mileage point, behavior point) and rating system
4) Providing benefits to participants according to their level

The details are as follows.

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2. Estimating Data Value

First, we have evaluated the value of mobility service data based on the TADA service and discussed how to share it with users.

Mobility-related mobile application users produce large amounts of data. In particular, mobility data generated through applications such as maps, navigation, mobility services, and data on public transportation have high value for time and space as big data.

Mobility data is generated in the process of overcoming the physical space separation between the place and the place needed for daily activities. Not only this data is used in the public sector, such as the evaluation of various mobility policies/ the policy formulation of social infrastructures/ the development of appropriate rates and settlement mechanisms/ subsidy policies/ traffic demand management/ and traffic control and management, but also in civil and academic fields such as preemptive response to future smart city environment/ commercial analysis through forecasting future activities/ analysis of place value/ and other technology development.

Our team looked into the value of similar existing businesses before estimating the mobility service value. Similar companies can be classified into two types: 1) major mobility companies operating in a traditional enterprise manner; and 2) non-mobility companies that reward users based on blockchain technology. Although the best comparison company is a mobility company that compensates users based on blockchain, there are currently no companies that have tried this approach aside from our team. Inevitably, we looked at the two types of companies mentioned above.

Classification	Company	Company Value	No. of Users	Company Value for User	Note
Mobility Company	A	$70 billion (Unlisted / plans IPO in 2019)	7 million Drivers (50 million Users)	approx. 10 million won/ Person	Driver Standards
	B	$6 billion (Unlisted)	2.6 million Drivers	approx. 230,000 won/Person	Driver Standards
	C	$1.6 billion (Unlisted)	17 million Users	approx. 90,000 won/Person	User Standards
Non-Mobility Company	D	$360 million (Market Cap)	1 million Users	approx. 360,000 won/Person	User Standards

When the value of each company is calculated per user, there is a great difference as shown on the table above. It can be seen that mobility companies may be different depending on the company assets and market valuation. In the case of our team, the value of the mobility service operated is likely to vary greatly depending on the degree of the ecosystem in the future.

Next, we examined the data transactions of Korean companies that are trading mobility data to find out the actual

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market price of mobility data.

Company	Trading Company	Data	Transaction amount
A	C	Travelling Data from 195,000 Cars For 6 Months in 2015	40 million won (205 won/Car)
B	D	Travelling Data from 1,550,000 Cars For 1 Week in 2017(in Suwon)	16 million won (10 won/Car)

Not only is it difficult to say that the usage of mobility data being traded on the market is limited, but it is also hard to say that it lies in a perfectly competitive market. Data transaction prices differ greatly between companies that sell each data and those that purchase data. The market equilibrium price for mobility data has not been created yet.

As a result, the MVL team conducted a survey to estimate the value of mobility data. The survey was intended to predict the 'Willingness to Accept' of how much the mobility data produced by an individual can be provided for. The survey was conducted on 543 Korean mobility service users. The estimation was conducted using the Contingent Valuation Method(CVM).

In CVM, the user's 'Willingness To Accept' is defined as the area of the cumulative probability density function(BID) for the user's response as follows.

$$WTA = \int_0^{\infty} [1 - g(BID)]dBID, \; when \; WTP > 0$$

The mean and median are estimated as follows. Here, Bk is the user's socio-economic variable related to mobility data.

$$Mean\ WTA = \frac{1}{B_1^{*}[\ln\ (1+exp\ (B_0+B_i(Z_i))\ )\ )}$$

$$Median\ WTA = \frac{B_0+B_i(Z_i)}{B_1}$$

As a result of the survey, the value of a user's mobility data was estimated to be 5.94% of the direct payment cost of the users engaged in mobility activities such as fuel expenses. For example, if a driver uses 1L of fuel for a distance of 10km and provides the generated mobility data for social contribution, the 'Willingness To Accept' is 6% of about 1,500 won, which is about 90 won.

We plan to test and set a lower rate of point-to-coin exchange for Singapore's TADA service considering that an untested Testnet has been applied. After setting the point-to-coin exchange rate arbitrarily, the actual point logic will be designed and redesigned based on the data provided by the service provider.

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3. Allocating Data Value

Our team was concerned about how to return the estimated mobility value to the users.

In order to make the mobility ecosystem sustainable in a System Optimum manner, we thought we should provide incentives to users for prosocial behaviors.

* Prosocial behaviors include helping others or in a broader sense behavior that involves benefiting others such as sharing, empathizing, comforting, altruistic behavior, moral behavior and more (Korean Society for Learning and Performance, HRD terminology dictionary, 2010.09.06)

The data value distribution method has been designed so that users who have gotten many incentives can get more benefits and earn more goods from the MVL Ecosystem. The details are as follows.

4. MVL Point Logic Design

There are two types of incentives in the MVL Ecosystem: 1) MVL Mileage Points (MMP) that rewards users that uses the services in the MVL Ecosystem often; and 2) MVL Behavior Points (MBP) that rewards users who has had a high level of prosocial behavior within the MVL mobility ecosystem.

If a user has a high contribution level(many MVL points) in the MVL Ecosystem, it means that the user has used many MVL mobility services(quantitative) and has carried out many prosocial behaviors(qualitative). Therefore, the point rating system was designed to provide different benefits according to the user's contribution to the MVL Ecosystem.

The two types of point correlation for determining the MVL Level Point are as follows.

MVL Level Point = α * MVL Mileage Point(MMP) + β*MVL Behavior Point(MBP)
(α<β, the proportion of Behavior Point is greater than that of Mileage Point in determining the level;
α and β values will be revised according to the data analysis from Singapore Testnet.)

4.1. MVL Mileage Points(MMP)

MVL Mileage Points(MMPs) are earned on the basis of the following formula as the basic points for distance travelled for the drivers and riders as they provide personal data using MVL mobility services. This mileage point is very important as it can be exchanged to coins, the currency of the MVL Ecosystem.

MVL Mileage Point(MMP)
Driver Mileage Point = 7.5 won(5% of travel expense)*distance(km)*distance adjustment factor
Rider Mileage Point = 1.5 won(1% of travel expense)*distance(km)*distance adjustment factor

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The value of the travel data analyzed above is 9 won/km, which is about 6% of the direct expenditure (e.g. fuel cost) (1,500 won/L for the fuel price and 10 km/L for the fuel consumption), 5% for the driver and 1% for the rider. This value is estimated according to the response from a survey carried out in Korea, and it may vary depending on economic condition, income level, fuel price, and public transportation costs in each country and city. This may continuously change as the MVL Mainnet launches and the ecosystem expands globally.

We also set distance adjustment factors for long-distance driving based on the average distance of Singapore(10km/day/user/trip). This is a device that prevents the revenue from the MVL Ecosystem from being shared only to specific users who are primarily engaged in long-distance trips.

Distance Adjustment Factor

0~10km : 1, 10~20km : 0.7, 20~30km : 0.6, 30km~50km : 0.5, 50km or more : 0.3

(Value will be revised according to the data analysis from Singapore Testnet.)

4.1.1 Point Maintenance Plan

As described in the introduction of the MVL Ecosystem, there are various ways to protect the ecosystem from the risk of ecosystem collapse. It can be said, it can be said that it is necessary to have a device that discourages users to exchange the mileage points recklessly. If all the points are exchanged to coins, the coin value will fall, the MVL Ecosystem will collapse and the value of the point will eventually disappear. Therefore, we designed different exchange ratios according to 1) point-to-coin exchange time, 2) points deduction according to the point validity period and 3) various benefits according to the level.

a. Different Mileage Point-to-Coin Exchange Rate

The mileage points that can be exchanged for coins will be implemented differently depending on the desired exchange time period, the percentage of exchangeable points, and the exchange rate to coins.

The exchange rate below is low according to the initial stage of Testnet. Therefore, our team plans to continuously adjust the rate according to the amount of profit generated and the growth of the MVL Ecosystem.

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MVL Mileage Point	Exchange Time	Rate of Exchangeable Points among all Points(%)	Exchange Rate (Point-to-Coin)
1	Immediately	20 %	0.1
	4 weeks after	30 %	0.15
	6 weeks after	50 %	0.2
	8 weeks after	60 %	0.4
	10 weeks after	70 %	0.5
	12 weeks after	80 %	0.6

e.g.) For having 100 MVL Mileage Points, immediately exchangeable points are 20 points(100*0.2=20), exchanged coins are 2 coins(20*0.1=2)

* Note: In the early stage, the volume of the MVL Pool may not be large due to low profit generation. Therefore, the reserve pool will be used to exchange the points into coins. In the future, if the token economy becomes systematic and the amount of revenue increases, it will be able to handle the point-to-coin exchange through the profits in the MVL Pool in proportion to the volume of participants in the ecosystem.

b. Points Deducted According to Mileage Point Expiration Date

MVL Mileage Points are awarded to the MVL Ecosystem participants who continue to use the service. There is a validity period like airline mileage and it is gradually deducted if not used for a certain period. These points must be earned by connecting to the app at least once a month after earning points. If there is no connection for more than 3 months, α will be subtracted every day 3 months later. (α = MMP Daily average)

c. Benefits According to Level

Mileage points are a factor that distinguishes levels and users will enjoy various benefits within the MVL Ecosystem depending on the amount of points they have. (Refer to 5. MVL Levels section)

Therefore, we sought various ways to maintain the value of the points to sustain the ecosystem.

4.2. MVL Behavior Point(MBP)

The MVL Behavior Point(MBP) is awarded to users who has frequently behaved in a prosocial manner in the MVL Ecosystem. The behavior point cannot be directly exchanged to the MVL Coin but it is a point that has a large influence on the level and is calculated according to the following formula.

MVL Behavior Point(MBP)=
b1*Prosocial Behavior Point(PBP) - b2*Antisocial Behavior Point(ABP)

* b1 and b2 will be continuously adjusted based on the real Testnet data and the parameter values for the initial

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point allocation will be explained later.

Behavior points can be earned through prosocial behavior, but are reduced with antisocial behavior. Prosocial Behavior Points(PBP) and Antisocial Behavior Points (ABP) are defined as follows.

* The definition of prosocial behavior and antisocial behavior are based on domestic and global case study results and the AHP evaluation of transportation experts. Our team has selected feasible indicators and decided to combine the opinions of our team's transportation expert group in a technical manner.

4.2.1. Prosocial Behavior Points(PBP)

In the MVL Ecosystem, prosocial behavior characteristics of the drivers are introduced as follows: Review from riders (safety, kindness, and cleanness), short-distance driving, and driving at peak hours/to congested area. The Prosocial Behavior Points(PBP) will be provided based on the sum of the three items above and the weight of each item is as follows.

*** TADA Driver**

Item	Weight	Note
Review from Riders	55%	See below for details
Short-Distance Driving	25%	Get Points for Travelling less than a Certain Distance or Certain Amount of Time
Peak Hours / Congested Area Driving	20%	Get Points for Travelling at Peak Hours and Driving to a Congested Area
Total	100%	

**** Riders Review Evaluation**

Item	Evaluation
Safety	Evaluations score for each menu is 5 points. The average of the evaluation scores from three menus will be calculated. If the average score is 2.5 or more, the score is given according to the acquisition score compared to the 5 points scale. If the average score is 2.5 or less, no point is given. (Example: average points 3 => get 60% of points, average points 2 => get 0 point)
Kindness	
Cleanness	

In the case of riders, the behavior of leaving a ride review itself is defined as a prosocial behavior. To create a healthy MVL mobility ecosystem, it is important to assess mobility services properly. Prosocial Behavior Points (PBP) for riders are designed so that they receive 100% of the points for reviewing the three items above and not get any points if they do not.

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4.2.2 Antisocial Behavior Points(ABP)

Antisocial Behavior Points(ABP) of the MVL mobility ecosystem only applies to drivers. Antisocial behaviors were defined as reckless driving behaviors that cause traffic accidents and environmental pollution while driving. Minor driving patterns such as speed driving, acceleration, and deceleration have a great impact on traffic safety and the natural environment. According to the WTO World report (2017), the risk of getting injured from a collision increases by 3% and the risk of death increases by 4 ~ 5% whenever the average speed increases by 1 km/h. Moreover, if if a driver starts moving rapidly 10 times faster, they tend to waste about 100c(2,000cc) of fuel. In the case of rapid acceleration, fuel consumption increases by more than 30% and pollutants such as NOx are created up to 50% more.

To limit these antisocial driving behaviors, the six major reckless driving behaviors(speeding, continuous speeding,rapid acceleration, rapid start, rapid deceleration and rapid stop) defined by the Korea Transportation Safety Authority are considered as dangerous driving behaviors and applied to antisocial behavior points.

Antisocial Behavior Point(ABP)
= 100 total
(Speeding, Continuous Speeding, Rapid Acceleration, Rapid Start, Rapid Deceleration, Rapid Stop)

*** Reckless Driving**

Item	Definition
Speeding	For driving 20km/h faster than the speed limit for 3 minutes or more
Continuous Speeding	For accelerating more than 11km/h per second
Rapid Acceleration	For accelerating more than 11km/h per second
Rapid Start	For suddenly start driving from no motion state for more than 11km/h per second
Rapid Deceleration	For decelerating more than 7.5km/h per second
Rapid Stop	For suddenly stopping from driving for more than 7.5km/h per second

The scores of each item is calculated based on the AHP evaluation of the transportation expert group of our team.

Item	Weight
Speeding	20%
Continuous Speeding	20%
Rapid Acceleration	13.5%

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Rapid Start	16.5%
Rapid Deceleration	12%
Rapid Stop	18%
Total	100%

The reason for applying the Antisocial Behavior Point(ABP) is to achieve System Optimum of the of the mobility ecosystem that our team intends to achieve as described above. Drivers are encouraged to get as many MVL Behavior Points(MBPs) as possible by earning incentives through safe driving and minimizing the deduction of points due to reckless driving. We want to create a healthy and sustainable car mobility ecosystem that can reduce accidents and environmental pollution and maximize social benefits.

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5. MVL Levels

As mentioned above, the MVL point system will be introduced in order to provide benefits according to the user's contribution to the MVL Ecosystem. The MVL level is determined as follows based on the point formula mentioned before.

MVL Level Point = α*Mileage Point(MMP) + β1*Prosocial Behavior Point(PBP) – β2*Anti-social Behavior Point(ABP)

α, β1, β2 values will follow the ratio below.;

α*Mileage Point(MMP) : β1*Prosocial Behavior Point(PBP) : β2*Anti-social Behavior Point(ABP)=1:2:4

Values will be revised after Testnet.

For now, α=0.124, β1=1, β2=2

MVL levels are categorized into 5 levels according to the amount of points a user has and the standard number of points(level points) can change according to the results of the Singapore Testnet data and it will continuously be adjusted as the MVL Ecosystem becomes more active.

Level	0 (Tutorial)	1 (Metal)	2 (Bronze)	3 (Silver)	4 (Gold)	5 (Diamond)
Level Points	Below 1,000	1,001 ~2,000	2,001 ~4,000	4,001 ~10,000	10,001 ~50,000	50,001 or Above

Latecomers in the MVL Ecosystem may be at a disadvantage compared to the users who have joined the ecosystem earlier in terms of their level. To alleviate this, users who do not have a lot of points can be upgraded to the second level if they have a certain amount of coins. The reason why users are only allowed to boost their status to level 2 is to prevent a phenomenon where a capitalist dominates the MVL Ecosystem.

Also, in order to encourage users to keep their coins in the ecosystem, users can only be upgraded to level three or above by maintaining their coins at a certain level as well as earn a certain amount of points.

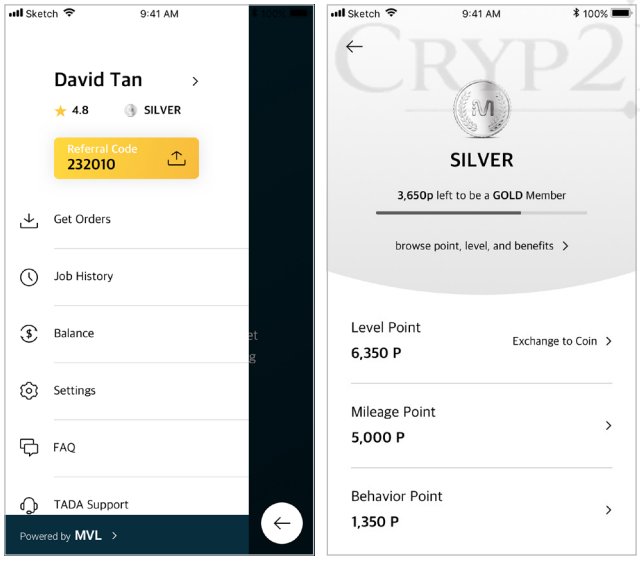
The benefits provided to the users will vary according to the user's level. This level-based incentive system is just an example of how it will be carried out. This incentive system will be designed in detail through data analysis and expert consultation collected through the Singapore Testnet in the future. Our team is currently focused on the benefits that are technically possible and we are unable to comment on the specific incentives due to the security of our affiliates. We are also considering the ability to customize the apps by purchasing or decorating features (e.g. a certain percentage of the MVL Point will be awarded if you purchase a daily booster), similar to a game. The key is that not only will users be able to benefit from point incentives, but they will be able to get vouchers and experience the joy of connecting with diverse digital content.

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In the TADA app, various incentives are provided according to each level. Some of these incentives include Token Economy Benefits(point-to-coin exchange rate, point-to-coin exchange time, commissions, etc.), Mobility Service Benefits(faster matching voucher, items, etc.), Everyday Life Benefits(vouchers for a gas station, mechanic, restaurant, etc.).

Level / Benefits	Token Economy Benefits			Mobility Service Benefits	Everyday Life Benefits
	Point -> Coin Exchange Rate	Point -> Coin Exchange Time	Commi-ssions	Faster Matching Voucher, Faster Call Voucher(will be added more with suggestions and opinions)	Vouchers for a Gas Station, Mechanic, Restaurant, Car Wash, Coffee Shop, etc.
1 (Metal)	basic	basic	-	**Faster Matching Voucher** - Drivers with high level will be matched - Drivers with high level can ask for fast matching **Faster Call Voucher** - Riders with high level can call for a faster ride - Riders with high level can call for a faster ride with a premium **Penalty Waiver** - Drivers with high level gets ABP points penalty waiver	Gets Everyday Life Benefits based on driving habits and favorite places to go(e.g.: offer affiliated business vouchers based on favorite places to go)
2 (Bronze)	basic + 5%	basic - 2 days	once a week		
3 (Silver)	basic + 10%	basic - 5 days	twice a week		
4 (Gold)	basic + 15%	basic - 10 days	three times a week		
5 (Diamond)	basic + 20%	basic - 15 days	five times a week		

The following figure is an example of the point status page that a driver can check in the TADA app. Users can check their level, level points, mileage points, behavior points and more.



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IV. MVL Team's Growth Plan

1. How Data is Recorded(Blockchain-based)

The most important part of developing the MVL Ecosystem is sorting the data to be recorded on the blockchain.

Data generated from mobility services and driving should be managed on the blockchain. However, since there is a limited storage capacity on the MVL Ecosystem, it is very important to decide which data should be stored on the blockchain. Therefore, large-scale raw data will be managed separately while the related car data and account-specific data will be recorded on the blockchain. In the future, we are considering a way to record small-sized data and data that can inform users of main driving characteristics on the blockchain.

Recording data related to goods(coins) and participation(points, levels) in the MVL Ecosystem is also important. MVL levels, MVL Mileage Points(MMP), MVL Behavior Points(MBP), MVL Coin transaction record should be managed transparently and safe from hacking and manipulation threats. Therefore, all transaction data must be able to be recorded and managed on the blockchain.

We are looking for a way to record data related to mobility services, driving, points and coins generated in the MVL Ecosystem to create value as big data and return the value of data in the form of incentives to the users.

The basic concept of the data storage method is as follows. With the operation of the Singapore TADA service, our team is going to conduct a detailed review with external experts and companies to determine the final specification of the data that will be recorded on the blockchain.

Classification	Data	Data Size	Data Storage	Note
Driving Record	Vehicle GPS data(Coordinates, time)	Big	Cloud	
Continuous Driving	Vehicle GPS data(Coordinates, time)	Big	Cloud	
Passenger Reviews	Reviews	Small	Cloud	
Short-distance rides	Availability	Small	Cloud	

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Main Driving Habits	High Risk Driving Behavior	Small	Blockchain	Speed, Rapid Acceleration, Harsh Breaking
	Distance Travel	Small	Blockchain	
	Total Time of Travel	Small	Blockchain	Starting Time, Ending Time, Total Time of Travel
	Final Destination Coordinates	Medium	Blockchain or Cloud	
	Fare Price	Small	Blockchain	
	Vehicle Type	Small	Blockchain	
Point	MVL Mileage Point(MMP)	Small	Blockchain	
	MVL Behavior Point(MBP)	Small	Blockchain	
	MVL Level Point	Small	Blockchain	
Transaction History	MVL Coin Exchange, Items Purchased	Small	Blockchain	
Data History	Personal Data, Car Data, etc.	Small	Blockchain	

2. Future Plans

2.1 MVL App Launch and Expansion Plan

As mentioned earlier, our team plans to apply the MVL incentive protocol to the TADA ride hailing service, prepare the MVL app for data collection, and provide the MVL Point. The logic will constantly be revised based on the collected data. When all the logic design is completed, the MVL app will be officially be launched in Vietnam and other countries.

In the future, the logic for drivers driving their own cars will be similar to the protocol for TADA drivers. In the case of incentive payment standards for prosocial behavior, a detailed plan will be made in the future and a different concept from the standard applied to the TADA service is likely to be introduced.

As we are currently discussing collaborations with a number of navigation companies, car repair shops, and used car dealerships, we will continue to customize the incentive system according to the needs of each industry.

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2.2 Business Model

The business value of a platform is generally proportional to the size of the platform. In other words, the more loyal a user is, the more benefits the user is able to receive.

Although the core profit model of the existing major enterprise platform was based on a brokerage commission system, MVL's main business model is expected to be B2B where the revenue is generated from places such as commissions from coin payment, platform-based advertisement and incentive protocol subscription fee.

For example, when the MVL incentive protocol is implemented to the TADA app, the TADA app mentioned above is required to pay for the MVL protocol. In addition, revenues from advertisements, safe driving data, car certification fees and protocol operation fees will also be generated by linking with various partner companies. In the case of the MVL apps, market sales, advertisements, and protocol operation fees will be created. We will do our best to prevent the value of the ecosystem from deteriorating and the value of the ecosystem to grow.

In addition to the business model described here, we have a variety of other business models. Although we cannot disclose the details now, we will utilize core resources such as a user's driving data and platform data to get profits in the software development & sales(driver certification software, driving record software, etc.), commissions (closely related to transportation such as duty-free shops, airline companies, and credit card companies), hotline (transportation campaign notification), and driver behavior verification service on top of the transportation sector. As the new revenue business model is generated, the revenue that can be shared through the MVL Pool will increase significantly.

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3. Roadmap

2018

- **2Q**
  · Initial Coin Offering is officially ended
- **3Q**
  · Launch a Ride-Hailing Service 'TADA'(Singapore)
- **4Q**
  · Launch TADA Taxi Singapore
  · Launch TADA Cambodia

2019

- **1Q**
  · Launch TADA Vietnam
  · MVL Incentives protocol implemented to TADA Singapore
- **2Q**
  · Partnership with BinanceChain
  · Mainnet Code release
- **3Q**
  · MVL Incentive protocol implemented to TADA Vietnam and TADA Cambodia
- **4Q**
  · Raise US$ 5.6 Million in Series A Funding
  · Launch TADA Wallet with Shinhan Bank(Cambodia)
  · Launch Beta version of MVL Taxi for Driver App

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Conclusion

Our team aims to improve mobility services and vehicle-related businesses by linking them to into a single ecosystem, sharing information transparently, and providing compensation for sharing information.

The first step in achieving our goal is to implement a token economy that rewards tokens for behaviors that have a positive impact on the MVL Ecosystem and a token payment system for services and products within the MVL Ecosystem. First, we will design the MVL incentive protocol and integrate it into MVL's first mobility service, TADA.

The incentive protocol logic will continuously be revised through steady monitoring of the test period. Once the MVL app has launched, a point incentive system will be provided and users will be able to pay for the TADA services using the MVL tokens.

In the second half of 2018, we plan to launch a ride hailing service in major cities in Vietnam. We will continue to expand our ecosystem by launching various mobility services in various countries around Southeast Asian countries or by linking the MVL protocols with local leading companies.

While we will actively start the operation of mobility services, once we achieve stabilization, we will also carry out services related to vehicle management. Ultimately, we hope that the MVL protocol will be applied in various forms to all future transportation methods so that the project will be useful in everyday life.

Our team will link the entire automobile industry and the transportation industry to the MVL Ecosystem and strive to share profits by offering various convenience to users. In the meantime, we will continue to solve various social problems just as we have been collaborating with the government, public corporations, and global corporations in a short period of time.

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Legal Issues

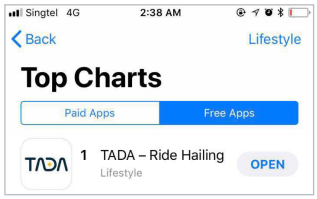
MVL Token Economy & Related Business Model provides the description of the ecosystem. This paper does not advise investment. MVL is not responsible for any damages, loss, debt and other monetary harm inflicted on someone who took this paper into consideration and MVL is not obliged to compensation, indemnification or other responsibility. When someone refers to or bases this paper to make a decision and faces monetary loss or debt, MVL Foundation Pte. Ltd. will not compensate or indemnify in any way. This paper content is based on when it was written, meaning changes can be made in the future. MVL Foundation Pte. Ltd. does not make a statement on or guarantees any matter to the readers and does not have legal responsibility. For example, this MVL paper was written based on its legitimate rights and it does not guarantee that the paper invades a third party, has valid market value, is suitable to its reader's certain agenda and has no error in content. The range of responsibility is not limited to the examples provided.

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Appendix

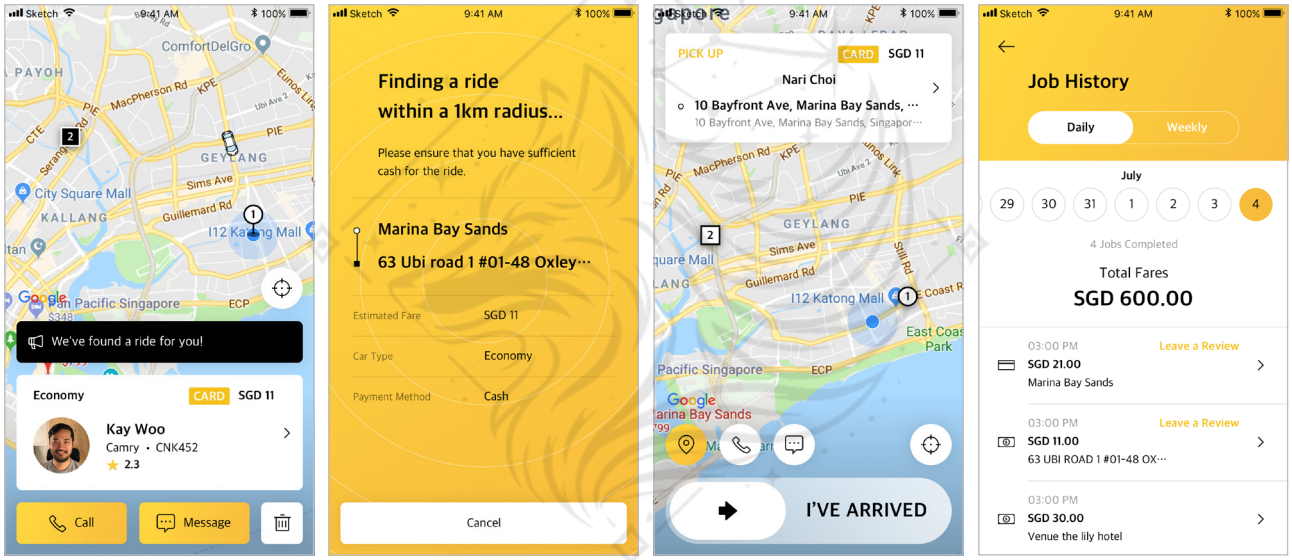
TADA



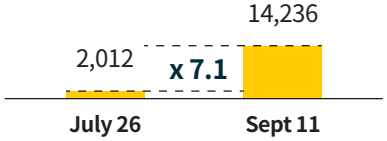
TADA is a first mobility service launched in Singapore by MVL Foundation. This is a ride hailing service which uses online-enabled platform to connect between passengers and local drivers using their personal noncommercial cars. TADA was launched in July 26th and it has ranked number one in Singaporean app downloads chart.

< TADA Riders >

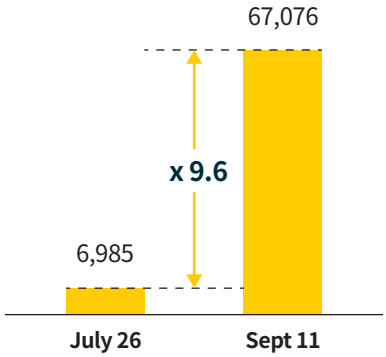
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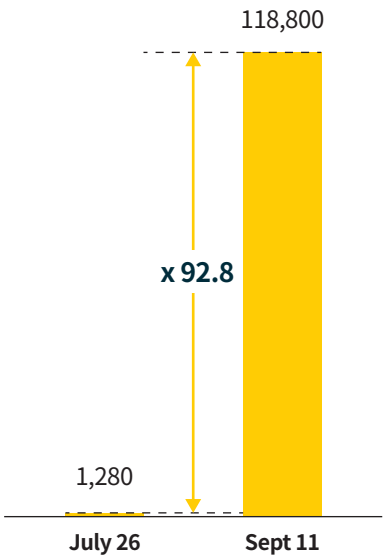
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