An open platform connecting customers and beauty companies

Website:
www.cosmochain.io

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I. Abstract

In recent years, cosmetics and skincare ("beauty") as an industry has blossomed and become a ubiquitous presence throughout social media, communities, and commerce platforms. The global cosmetics market has been registering steady annual growth of 3%, and in developing countries, (including China) the growth rate has been at 5% annually[1]; however, within the market, hundreds of cosmetics companies have entered a zero-sum game with nearly identical product lines, brand, and sales channels. Simply speaking, it is becoming increasingly difficult to find players that provide differentiated and personalized services or products catering to individuals with tastes and qualities that are outside of the "average" user. The focus on the "average" is ironic because beauty products tend to be one of the most polarizing products in terms of user experience between different individuals, yet due to traditional marketing strategies, the overall industry has been forced away from personalization to generalization and mass marketing, effectively functioning in a declining state of innovation. In an attempt to solve this dilemma, cosmetic companies are perpetually seeking 'innovative' ideas that will bring creative disruption to the traditional value chain, but in the absence of a marketplace or channels that provide reliable consumer data and actionable data insights, such measures face an uphill battle.

At the other end of the market, consumers have to cope with different difficulties. As mentioned above, "cosmetics" is one of the hottest buzzwords and industries regardless of gender, age, and nationality, and among such heated discussions, customers face three major difficulties. First, it is difficult to distinguish real information from fake or manipulated information as companies sponsor and fund most of the current cosmetics content and so-called "studies". Secondly, only a select few 'power influencers' are currently benefiting from pro-rata ownership or enjoying appropriate rewards for their meticulous contribution to various platforms. Thirdly, cyber security has become a dire and pressing issue as the amount of personal information shared throughout social media grows exponentially.

Cosmochain is a complementary Company-to-Consumer platform that connects cosmetics product users and content creators to cosmetics product suppliers, including cosmetics companies, OEM/ODM manufacturers, R&D centers, and distributors. Through this platform, the Cosmochain Team aims to solve the aforementioned unmet needs of both companies and customers. All data collected from platform participants are kept confidential in this customer-centered ecosystem. Those who contribute their scarce time and attention toward producing and curating contents for others are compensated with tokens and receive pro-rata ownership of the contents they create. On the other hand, cosmetics product suppliers are able to actualize a wide variety of "on-demand" services on the platform by utilizing API that Cosmochain provides.

Two different tokens and one internal virtual index make up the Cosmochain ecosystem: 1) The first token is an externally traded token called Cosmo Coin, 2) The second token as well as an index of contribution to the platform is Cosmo Power, which can be used to make payment within the platform and given out as rewards for activities, and 3) The one virtual index is called Cosmo Level. Cosmo Level, a reputation index, is designed to prevent abuse of power within the platform and can only be accumulated by actual activities and contribution. Having been assigned distinct roles within the Cosmochain platform, these three entities construct a healthy ecosystem.

- The success of the Cosmochain platform lies in the active participation of users – where customers create reliable data after trying out various cosmetics products and sharing the experience with one another on the platform. As a result, Cosmochain has designed its own transparent and fair reward system based on Steemit's incentive model.

- The Cosmochain platform connects this user-created data to interested company participants and distributes the payment made by the company to customers as reward for use of the information. Through this reward system, Cosmochain aims to address two structural issues of social media-based platforms: 1) risk of inflation following the necessity of a long-term and great quantity of token issuance to grow the community, and 2) risk of decreasing attractiveness of contribution rewards after the inflation rate has been stabilized.

- In addition, the Cosmochain platform aims to realize an upgraded tokenization model that brings the power back to its users by redistributing the following: (i) the right to display ads in a user's viewing space, (ii) the

[1] Euromonitor International report, predicted market growth between 2017 and 2021: Global 2.8%, China 5.4%

right to access a personally curated Marketplace, and (iii) the right to share personal data to partake in a study or survey. Simply speaking, the Cosmochain platform will go beyond simply allowing users to share one-dimensional personal information.

As such, Cosmochain serves the purpose of revolutionizing the cosmetics industry's ecosystem by redistributing ownership and management authority of personal cosmetics data and contents to those in need, and through operations of transparent rewarding system for the redistribution of data.

II. Cosmetics Industry Trends

II-1. Key changes in the cosmetics industry

Over the last decade, the global cosmetics market grew steadily across product categories and regions to become a $500 billion market[2] (in terms of retail value). In the future, the developed markets are expected to grow at a rate of 2-3%, and developing markets (such as China, Southeast Asia, South America), are expected to grow at 5% or higher. At the same time, some key trends have been spotted within the value chain of cosmetics. They lead to the conclusion that **utilization of "customer data and insight" is going to become a big factor in winning in this business.**

1) **Planning & ideation: No more recycling of existing "success" formulas**
   Today's cosmetics market can be characterized as a war of "differentiation". In the past, whoever had the strongest retail and sales channel always came out victorious; however, today's winners are those that can grab customers' attention. Anyone who has purchased cosmetics for the past few years can immediately tell that one can make thousands of combinations of cosmetics products in a single store, or one can find a single product that can do all the features of toner, lotion, and cream. This is a huge change from the past because customers are now trying to find products that they can customize for their specific skin conditions. As a result, today's cosmetics industry needs to do more than just manufacture high quality products; it has to have a precise understanding of customer needs and putting them into product development.
2) **Production: Personalization and micro-segmentation is the key**
   Customers' preference towards "personalization" has already been proven in other industries. As a result, many leading cosmetics companies are investing a significant amount of time and effort into manufacturing personalized cosmetics products. Kiehl and Lancome are collecting skin data in stores and mix the ingredients for customers on the spot. AmorePacific is using genetic analysis customers[3] who visit stores in person. However, this is not an effective way of personalization as this does not collect enough data within the short period time, and many customers do not feel comfortable having their skin diagnosed in stores. As a result, personalization in cosmetics is much slower, when compared to other industries.
3) **Channel: Marketing/Sales switching to online channel & "marketing effectiveness" decreasing**
   Until the early 2000s, when the offline channel was the main sales channel, marketing efforts were primarily focused on mass penetration and ATL (above the line - TV, Paper etc.) channel. Since late 2000s, where online channel became the predominant sales channel, viral marketing has become a key while brand power has become less important. For the first time, small to mid-sized cosmetics brands were able to participate in marketing to a wider group of consumers. The ensuing online marketing battles caused each brand to spend more and more of their revenue cost on marketing. When social media giants entered advertising from around 2010, the cosmetics companies' most powerful marketing channel became the large social media channels (such as Facebook). However, customers are now over-exposed to unwanted products, and as a result the cosmetics companies' ROAC (return on advertising costs) has been rapidly decreasing. Hence, improving ROAC through effective targeting and content development has become a key driver in winning customers.

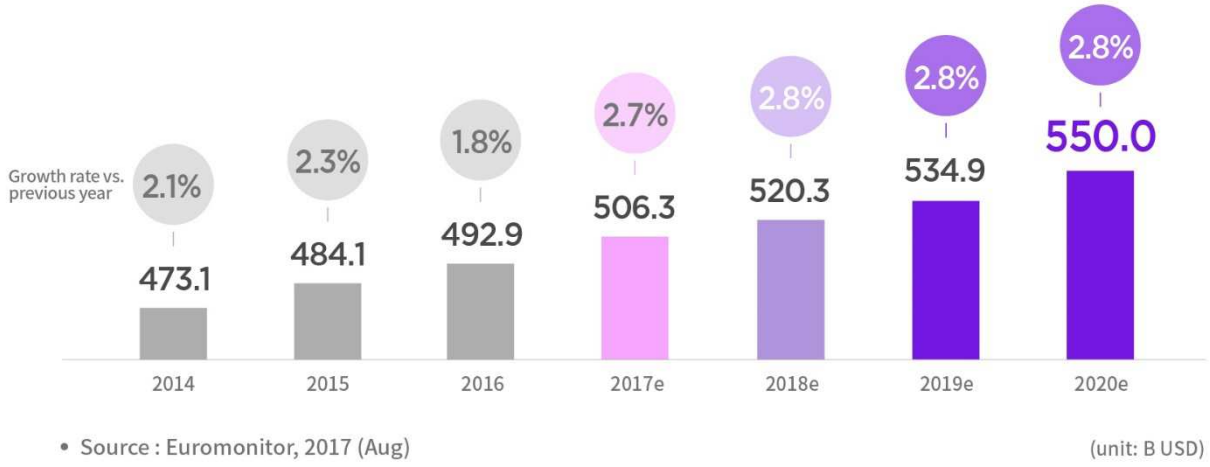
II-2. Market value and size of associated industries

[2] Euromonitor International report, 2017 predicted market size USD $506.3 billion

[3] AmorePacific's Waterbank Cream and Two-tone Lip Bar, Kiehl's Apothecary at select locations

As stated above, the cosmetics industry is a stably growing, highly attractive industry, and the growth is expected to continue in the future as such growth is evenly distributed both geologically and categorically, rather than concentrated in a certain region or product category.

-Global cosmetics market size history & forecast-



-Breakdown & growth of cosmetics market by region-

Desire for collection and sharing of beauty data, which the Cosmochain platform will provide, is prevalent amongst various areas in the cosmetics market, and precise data mining and the ability to interpret or utilize data will become key success factors for cosmetics companies to win in today's highly sophisticated market. Global cosmetics companies are spending billions of dollars to hire business consulting firms or big data analysis companies to collect and process beauty related data, while small and medium-sized companies are working with survey companies to collect necessary data.

There are numerous examples that prove the effectiveness of data mining: 'Beauty by Design' and 'Curology' in the US market, and 'Huiseoul Inc.' in the Chinese market. The aforementioned companies not only connected customers with beauty consultants but collected dermatologic data from customers by receiving skin images, going through personal

consultation sessions, and conducting surveys in order to provide customized cosmetics and skincare solutions. As a result, they achieved rapid business growth and accumulated millions of customers in terms of Monthly Active Users (MAU). As another example, 'Function of beauty,' a big data based customized shampoo manufacturer founded in 2015, has proven the value of innovation in manufacturing by reaching a value of $150 million in two years. In the perspectives of companies, business operations based on such data mining have minimized the manufacture of unnecessary products, reduced marketing expense, offered customized solutions, and provided excellent services based on customer data; companies are now able to eliminate inefficiencies that were once considered almost inevitable.

Also, it is important to take a closer look at how customers collect information and utilize sales channels. Social media services, online shopping malls, and online blogs are the main information sources of female customers in their 20s to 40s, and their annual growth rate is at 3%. On the other hand, the growth rate of the sales channels is somewhat evenly distributed; drugstores are the leading sales channels followed by brand shops, social commerce, and the open market. This means that the data collecting points are going bimodal in that how customers collect information and where customers actually purchase cosmetics are different. Efforts to mine collective data are made by big data experts or keyword extraction algorithm builders, but this kind of collection of scattered data is inevitable given the lack of a unified platform to provide data in a user-friendly manner to the final decision makers (i.e. the customers). Although companies are trying to solve this problem by merging the commerce platform and social media platform, customers are not yet fully satisfied with such platforms that blur the primary and secondary functions.

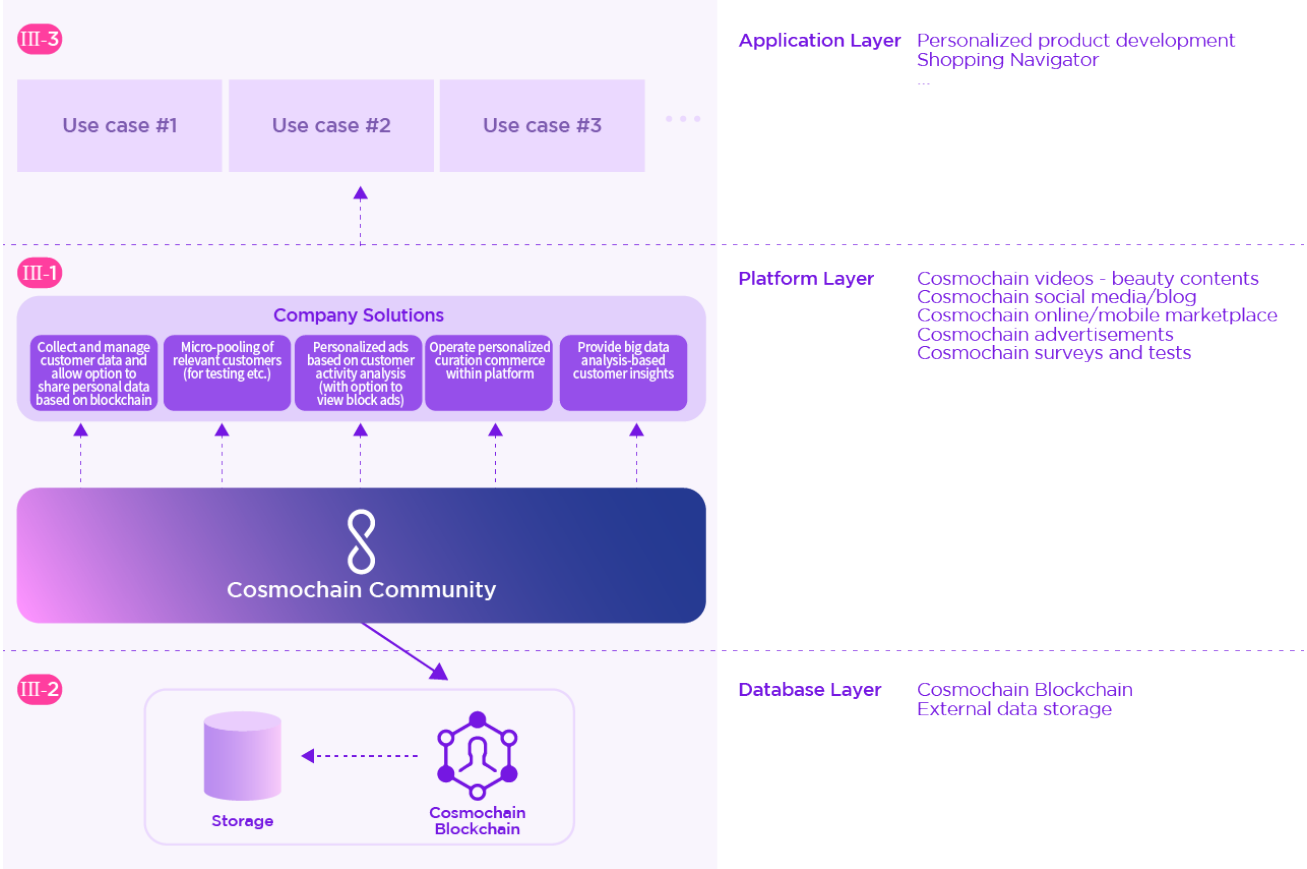
Lastly, relaxation of government regulation will promote the expansion of "customized" cosmetics. It is a well-known fact that providing personalized products are a global trend, from fashion or lifestyle industries to industries that were once considered impossible to personalize such as electronics or furniture. On the other hand, the cosmetics industry has been progressing slowly due to Food and Drugs Administration's strict regulations. The Korean government, starting from the year of 2016, finally relaxed government regulation and extended support for cosmetics; such change initiated the move of the Korean cosmetics industry, the hub of cosmetics manufacturing, towards personalization. As Korea already possesses global leading manufacturers with state-of-the-art technology, and as the government relaxes regulations, Korea-based Cosmochain will create a synergy effect within the Cosmochain platform in that it will connect technology and global trends. In this way, the value of data will also increase.

As such, the primary reason for collecting beauty data within the Cosmochain platform is not limited to a particular area of the cosmetics industry but to bring creative innovations to the entire value chain.

III. Cosmochain's Service Architecture

Cosmochain's architecture is made up of three layers – the database, platform, and application layers. All information created and shared within the platform are managed securely by the blockchain, all individual customers and participants can exercise ownership and management right of their own content, and all platform users can receive compensation when data and content are shared with company participants. Also, participating companies are able to provide a wide variety of "on-demand" services on the platform by utilizing API that Cosmochain provides.

-Cosmochain's service architecture-



III-1. Platform layer

The platform layer is a core layer in the Cosmochain service architecture, where customer-provided data is stored on the blockchain and delivered to companies as business solutions. The platform layer has two components: 'Cosmochain Community' for customers and 'Cosmochain Solutions' for companies. 'Cosmochain Community' is a place where customers can talk about cosmetics and beauty and create various contents. Through this activity, customers can receive rewards in a transparent manner for any beauty insights they provide. The data provided can be effectively linked to participating companies as 'Company Solutions', which can be used by such companies.

III-1-1. 'Cosmochain Community'

This is the most essential part of Cosmochain's service where all insights for the participating companies are generated. Unlike other social media where commercial, unsolicited and mass-oriented content can be overwhelming, Cosmochain

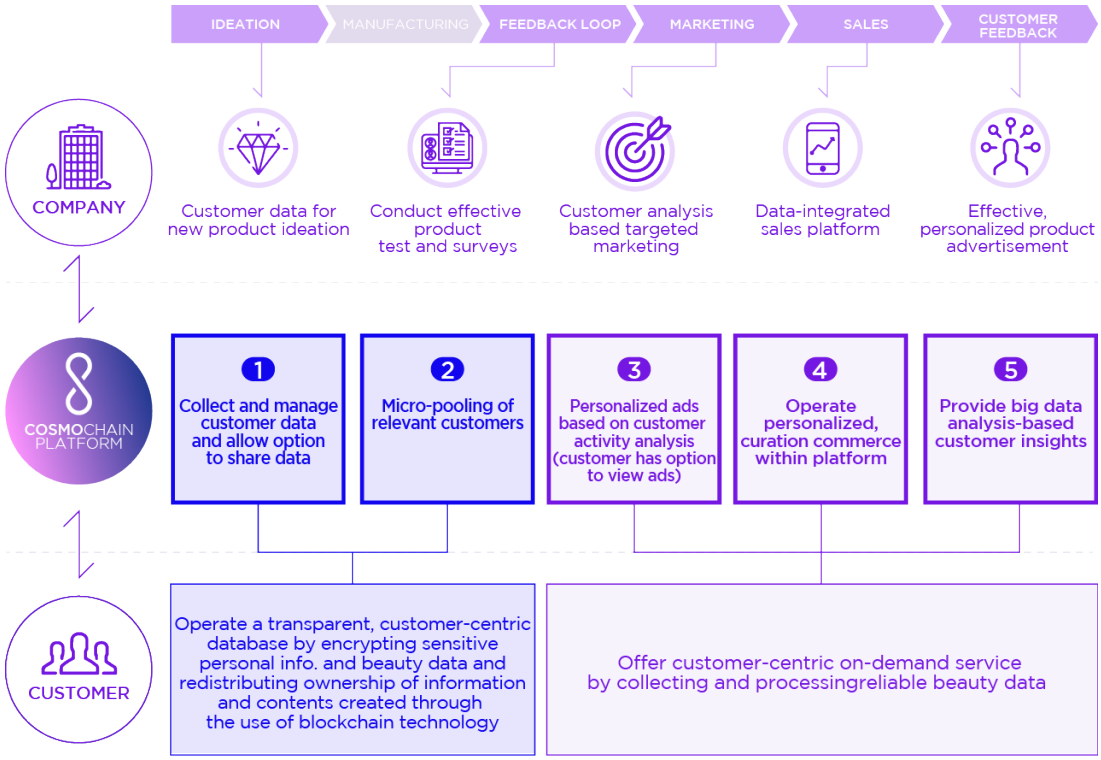
aims to create a community where objective and useful information is shared and communicated. In order to realize this goal, a precisely designed reward system must exist in exchange for valuable contents creation and curation activities. Therefore, Cosmochain has decided to utilize blockchain and apply Steemit's model, which is known to have successfully achieved decentralization and has proven its effectiveness in social media platform to design its own reward system for 'Cosmochain Community'. Customers can participate in 'Cosmochain Community' through content creation (writing posts, uploading videos) and curation activities (voting up or down to other users' posts) – both of which can result in 'rewards' according to the reward scheme.

III-1-2. 'Cosmochain Solutions'

In addition to 'Cosmochain Community', the Cosmochain platform provides various solutions in which companies can participate and use the data of participating customers. Below are the core values of the Cosmochain platform.

1) The Cosmochain platform will provide five different solutions to company participants. Each company participant will pay fees for using data provided by Cosmochain's customer participants.
2) If a company utilizes information provided or created by customers, **the company rewards the customers (the information providers) through the blockchain in a completely transparent manner.** For business models that self-creates extra values using such information, both the **platform and data providers shall share rewards in order to continue the improvement of the platform.**

-Cosmochain's solution map-



Solution 1. Collect and manage customer data and allow option to share data

The essence of the Cosmochain platform is the collection and management of data using blockchain technology, and the key data here is each customer's basic demographic information, and also cosmetics-specific data such as skin type. Such personal data are used only within the Cosmochain platform and are selectively filled out by customers and also

customers can also set a level of how much data will be shared with others. For companies, they can compensate the customers who agree to share their data with rewards.

Access to such customer data is revolutionary – it can change the rules of the game and transform the beauty business model. As discussed in "*II. Cosmetics Industry Trends*", core competency in product excellence is key as customers become more educated and selective in choosing the products. However, it is extremely difficult, if not impossible, to secure the essential input data using current sources such as each company's limited customer pool. If companies are able to obtain customers' dermatological data, such data will become an essential input of product ideation and production. This will pave the way for mass-customization of cosmetics products, which all cosmetics companies regard as the ideal goal. From a data security perspective, implementing blockchain will help eliminate any concern over of personal data leak and other related security concerns.

Solution 2. Micro-pooling of relevant customers

Companies' acquisition of customer data within the platform provides an increased level of convenience, as companies can use the data as a reliable source of customer opinions and ideas for tests and surveys. Currently, when cosmetics companies want to hear from the public, they can only (i) use existing customer pool, (ii) randomly select people with specific characteristics through agencies, or (iii) spend a long period of time to find relevant subjects. Due to the importance of receiving feedback from the right people, companies often spend more time and effort finding the target than carrying out actual testing and analyzing the opinions. In the past, this inefficiency was simply regarded as inevitable.

Currently, the so-called "agencies" act as a bridge between cosmetics companies and customers, connecting the customers with the target characteristics to the companies in need. In fact, these agencies cause even greater inefficiencies – increased time, higher cost, and lack of accuracy in discovering the right sample customers. In the Cosmochain platform, companies do not need to spend time and effort to find the right testing subjects, and there is no agency necessary as customers with the right characteristics voluntarily respond to companies' surveys and test requests in return for a small amount of rewards – a mutually beneficial relationship.

Solution 3. Provide personalized ads based on customer activity analysis

Today's online and mobile ads, both random and personalized, have a great deal of inefficiency. First, the right to display ads belongs to the platform (website, app etc.) owner; therefore, if there are ads within a platform, all visitors are exposed to watching unwanted ads. Second, the effectiveness of ads is questionable as today's online and mobile ads simply show ads related to what the visitors already clicked in the past. As a result, users are willing to pay for services like YouTube Red or other ad-blocking apps in order to avoid watching unwanted or annoying ads.

In the Cosmochain platform, customers have the option to watch or block ads within the platform and at the same time, rewards are given to customers who agree to watch ads. Also, the Cosmochain platform provides data and customer insights from customers' behavior within the Cosmochain platform, which can be used as input for personalized ads – this allows companies to show ads that have the highest chance of being converted into actual purchase. This ¾nefits both customers and companies by providing the customers convenience discretion to watch or block ads, and by eliminating participating companies' unnecessary advertising costs.

Solution 4. Operating personalized commerce within the platform

Cosmochain will operate personalized commerce to allow customers to be exposed to their most desired products and allow companies to display and sell products with the highest click-to-purchase conversion rate. The key advantage of Cosmochain's commerce feature is that the personalization is based on real information from Cosmochain's customers.

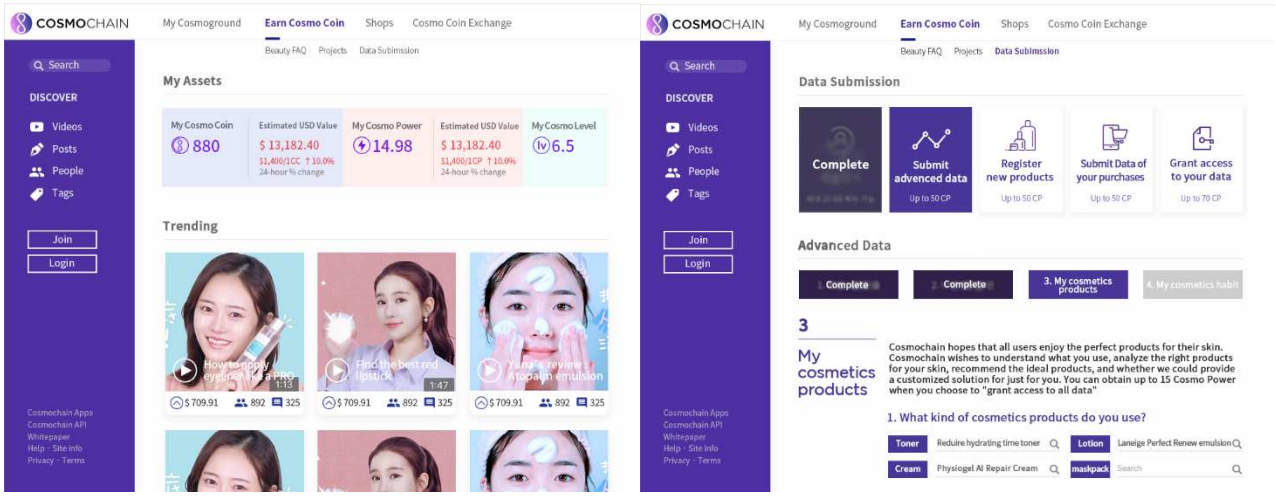
Even Google and Amazon's most advanced personalization engine can only be based on highly accurate assumptions using customer analysis to guess at the customers' information – this is still not the same as using real information which is difficult to acquire in the first place. However, Cosmochain will implement both real data and customer analysis, allowing it to achieve higher accuracy than any other existing algorithm. Another advantage is that the more customers agree to share their personal data and the more customers participate in the Cosmochain platform, the faster the accuracy and effectiveness of personalized commerce will improve.

Solution 5. Providing big data-analyzed customer insight

Lastly, the Cosmochain platform provides multidimensional customer insight by analyzing all information and actions of its customers. Simply speaking, it is possible to convert every community activity, such as blog posts, creating content, shopping etc., into usable data. For example, it is possible to analyze a customer's vote up or vote down activity to analyze what the customer likes, or extract keywords from a popular blog post. This creates synergy with the already provided customer data, and in the end, this will result in customer insights which have never before been available.

III-1-3. How the Cosmochain platform is operated

The Cosmochain platform provides a user-friendly UI in order for users to easily participate in company-sponsored projects.



Five key features of the Cosmochain platform from a user's perspective are as follows:

1. Social media as a community
   - User can freely upload or view content like social media, and other users can vote, write comments or repost in their personal page. Each uploading of content is regarded as a contribution to the Cosmochain platform, and responses from other users will be evaluated automatically by a specific algorithm, which will decide how much Cosmo Power (usable tokens within the platform) or Cosmo Level (reputation index) will be rewarded. Customers who consumed content can receive rewards for their curation efforts.

2. Participating in company-sponsored projects
   - In addition to the basic information provided by platform participants, companies can initiate sponsored projects when in need of extra data, surveys or tests. In the "Project" tab, users can see the current list of sponsored projects, Cosmo Power to be rewarded, qualifications to participate and other relevant information. Individuals should use their Cosmo Power as deposit to participate. Companies can select which individuals to execute the project with, and companies can predict reliability level of participants based on the amount of Cosmo Power or Cosmo Level held by candidates. After successful execution of a project, agreed amount of Cosmo Power shall be rewarded to participating individuals. Amount of Cosmo Power can be adjusted through mutual evaluation of the project, and amount of Cosmo Level rewarded will be automatically calculated.

3. Commerce features for shopping (Marketplace)
   - The Cosmochain platform offers Marketplace, where participating companies can sell their products. When a transaction is made, payment is made by Cosmo Power, and companies can either convert it into Cosmo Coin (Token) and then into cash (fiat money) or use Cosmo Power freely within the Cosmochain platform. Customers can use cash and Cosmo Power combined to buy and companies receive cash and Cosmo Power combined. As a result, Cosmo Power paid by customers are internally vested as Cosmo Coin, and companies receive Cosmo

Coins, or cash (through an exchange solution within the platform) immediately products (more details in *IV. Cosmochain's Token Model*).

4. Data submission

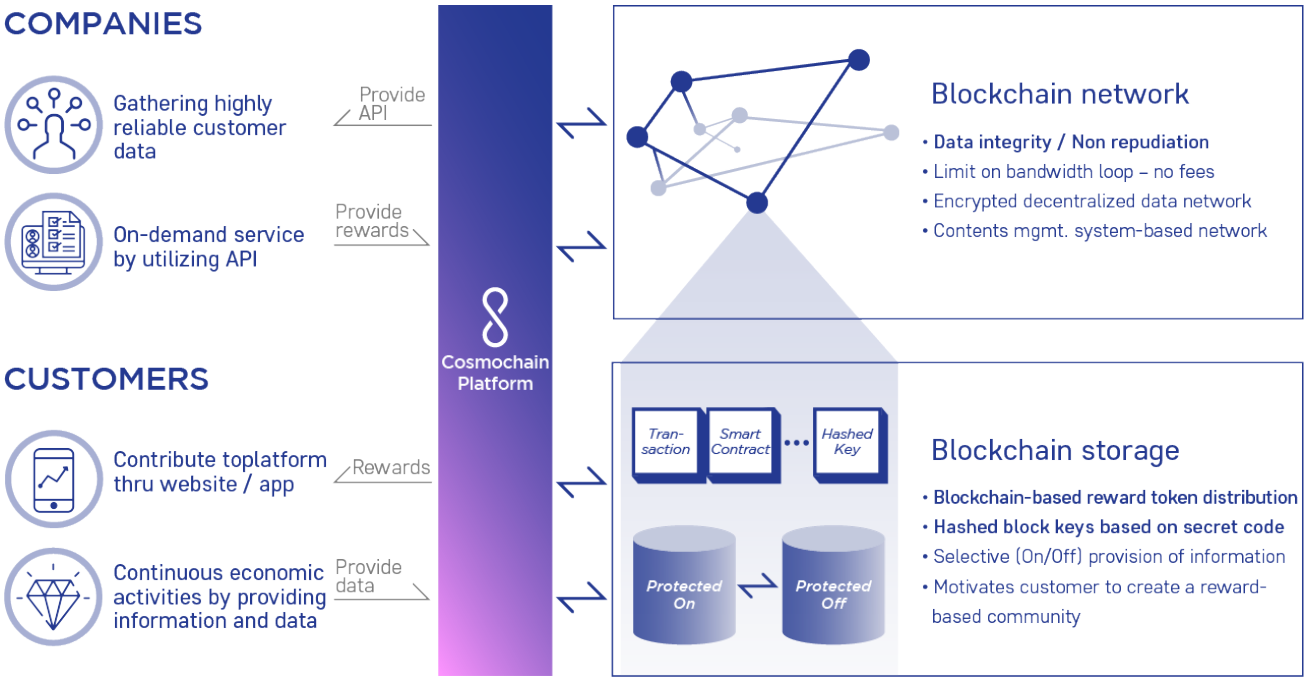
- Participating customers provide personal dermatological and cosmetics-related data, and whenever companies access the uploaded data, customers receive preassigned amount of Cosmo Power. This means companies can access the data of customers who agreed to share their personal data, and in return companies pay customers the agreed amount of Cosmo Power.
- The "data submission" tab of the Cosmochain platform contains 1) Demographic information: personal data such as name, gender, birthday, region etc., 2) Dermatological and cosmetics-related information: actual photos of skin and types of products recently used, 3) New product registration – details of products not yet registered on Cosmochain's database, 4) Purchase data: list of products purchased within and outside of the Cosmochain platform. Customers receive Cosmo Power for submission of data, and they can set the level of what data to make accessible. Companies can perform big data analysis to draw customer insights.

5. Personal account management including Cosmo Coin / Cosmo Power conversion, and provision of platform information

- Since it is essential for the Cosmochain platform to encourage users to create valuable data and create cosmetics-related contents to receive rewards for their contribution, separate 'My Cosmo Power' and "My Cosmo Level" sections have been created. The right-hand side tab features 'personal account management', 'provide platform information' 'FAQ' and other tools that assist in the smooth operation of the platform. In this section, customers can convert/exchange tokens used in the Cosmochain platform, purchase Cosmo Coin, read FAQs, and refer to any other useful information. Developers can access Cosmochain's API information, which will allow them to develop a decentralized application and contribute to the platform as a part of the ecosystem.

III-2. Database layer

In today's so-called Industry 4.0 era of information and communications technologies (ICT), high costs are involved in receiving and processing meaningful data, and there are always questions regarding reliability. Cosmochain designed a full database layer using blockchain as its core technology in order to take full advantage of data integrity, non-repudiation, no network fees, and other inherent benefits.



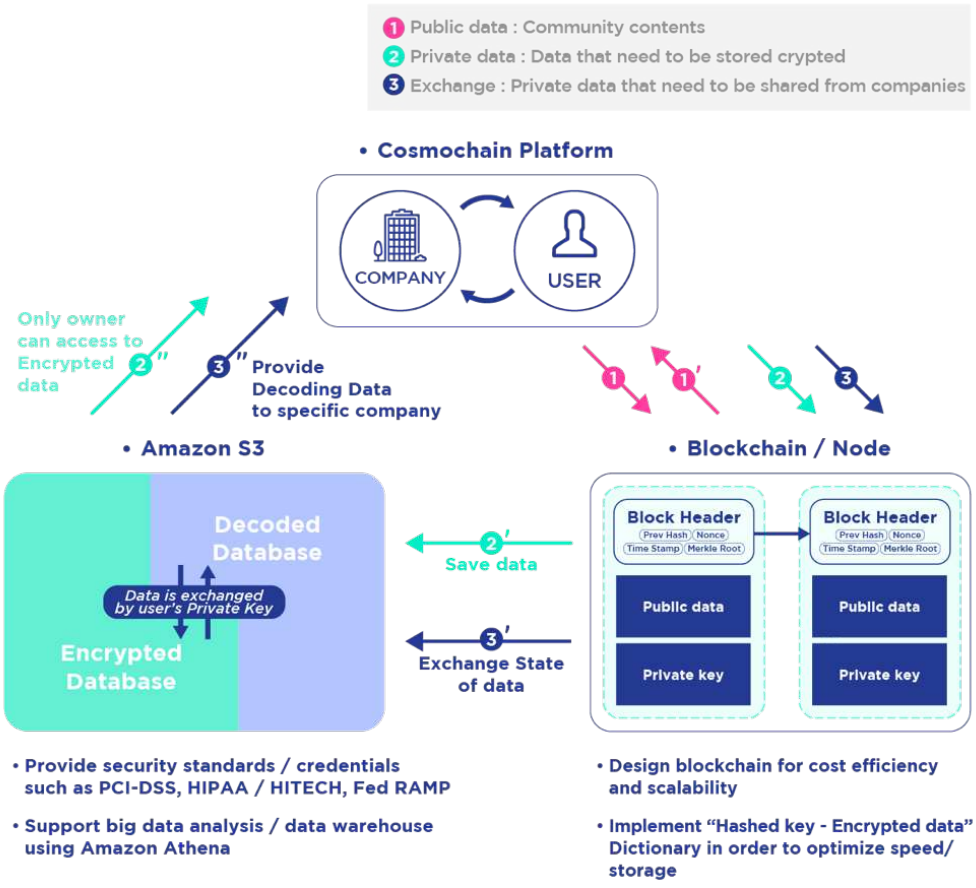
III-2-1. Selection of base blockchain

The Cosmochain Team is spending a considerable amount of time and efforts to research various blockchain protocols for smooth operations of the Cosmochain platform. There are two requirements for selecting the blockchain protocol for the Cosmochain platform: 1) Transaction fee must be minimal - due to the nature of the Cosmochain platform, most activities within the platform require high storage space and frequency of utilization, and if each transaction requires fees, the platform will not be sustainable, and 2) network processing power must be able to handle all transactions simultaneously – the nature of community requires transaction power of at least 1,000 TPS. The Cosmochain Team will continue to evaluate technical requirements and feedbacks from users before development and completion of the Cosmochain platform.

III-2-2. Data classification for the access-restricted

All information within the platform can be divided into public and private, depending on the contributor's intention, and Cosmochain has decided to follow the naming rule of access modifier.

In the middle is the information used for transaction on the platform, and this data can vary from simple demographic info to actual pictures and videos of skin condition, areas of interest etc. Cosmochain classified this as "protected-on" and depending upon the user's choice, it is possible to switch to 'protected-off' and this data is fully encrypted. Key values are saved within blockchain and encrypted values are stored outside of blockchain. Deciding on the scope of information selection (switching on/off of information) is a key item for consideration. Internally, the Cosmochain Team will build global data fabric and execute ETL (Extraction, Transformation, Loading) on the large set of data on the web, analyze the rapidly changing key factors of the cosmetics business, and finally establish the platform as a destination to decide whether to provide information to the next platform user.

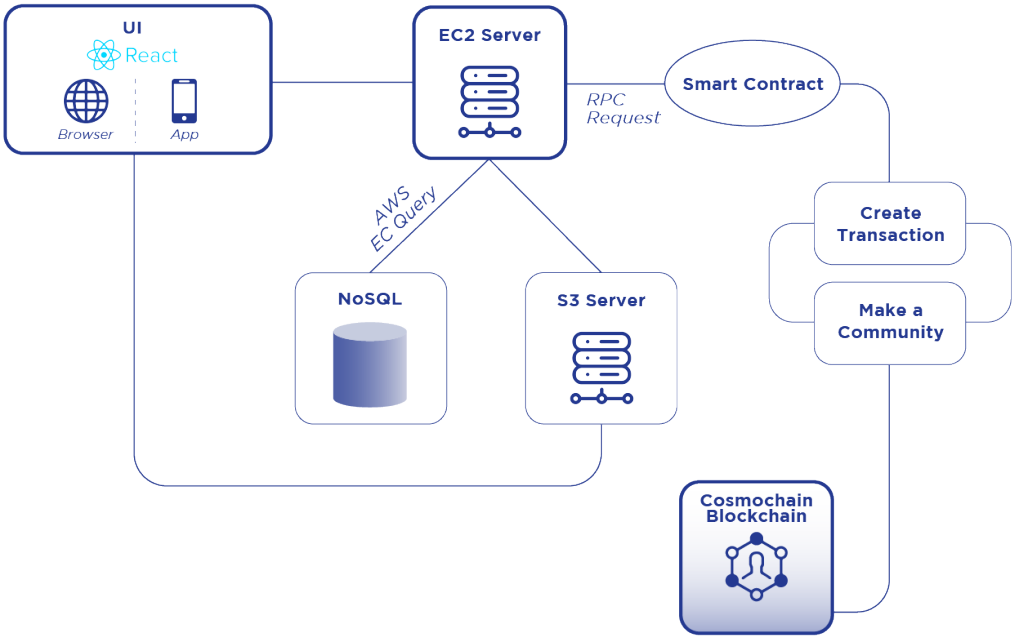


III-2-3. Storage policy

According to Google, visitors will leave the website if the page does not load within 3 seconds; thus, keeping the blockchain body light and securing high service speed. Except for publicly-stored text type data, all data will be encrypted with only hash stored as private key within blockchain, and value data will be securely stored in Amazon S3. Cosmochain also considered IPFS (Interplanetary File System); but concluded other problems may rise as all "protected-on" can be decrypted. Cosmochain will provide various security/certification such as HIPAA/HITECH, Fed Ramp, and will use Amazon Web Services (AWS) as the main external database as AWS offers tools for big data analytics. Public data is stored in data space within blockchain and in decoded area within storage and will be made public to everyone. Private data can only be accessed by the specific user as the data is stored in the encrypted area within storage. Upon users' request, data can be exchanged between encrypted and decoded spaces.

III-2-4. API and other infrastructure overview

Cosmochain Team will provide an API that not only runs results of internally cleansed data, but also provides search engine features that allow the customers to perform queries scoped to various levels of privacy. In addition, this API will also be able to run various on-demand services on the platform and will consider provision of SDK in the future. The end goal of the development will be to surface all of these functionalities as an easy-to-use API for developers to consume. Cosmochain must have Multi-contract/Multi-state interface as the platform will be based on web and mobile. Following specified 'Smart Contract', the flow will follow below infrastructure components. Essentially, NoSQL-based Light DB (such as MongoDB, Redis, Cassandra) will be built in order to accommodate data variation, conducting cache within EC2 Server, and the main data will be encrypted and stored in S3 server. Therefore, below infrastructure design will allow powerful big data analysis (such as AWS Big Data Solutions).



III-3. Application layer

Cosmochain's application layer allows company participants to develop various solutions and applications within the Cosmochain platform, and this will help generate new ideas from all participating parties. Although not implemented yet, following use cases based on Cosmochain are possible:

Use case #1) Personalized product development

- Gather ideas from customers with similar skin types and cosmetics needs, and produce personalized products by customizing the product solution

Use case #2) Big data-based shopping navigator

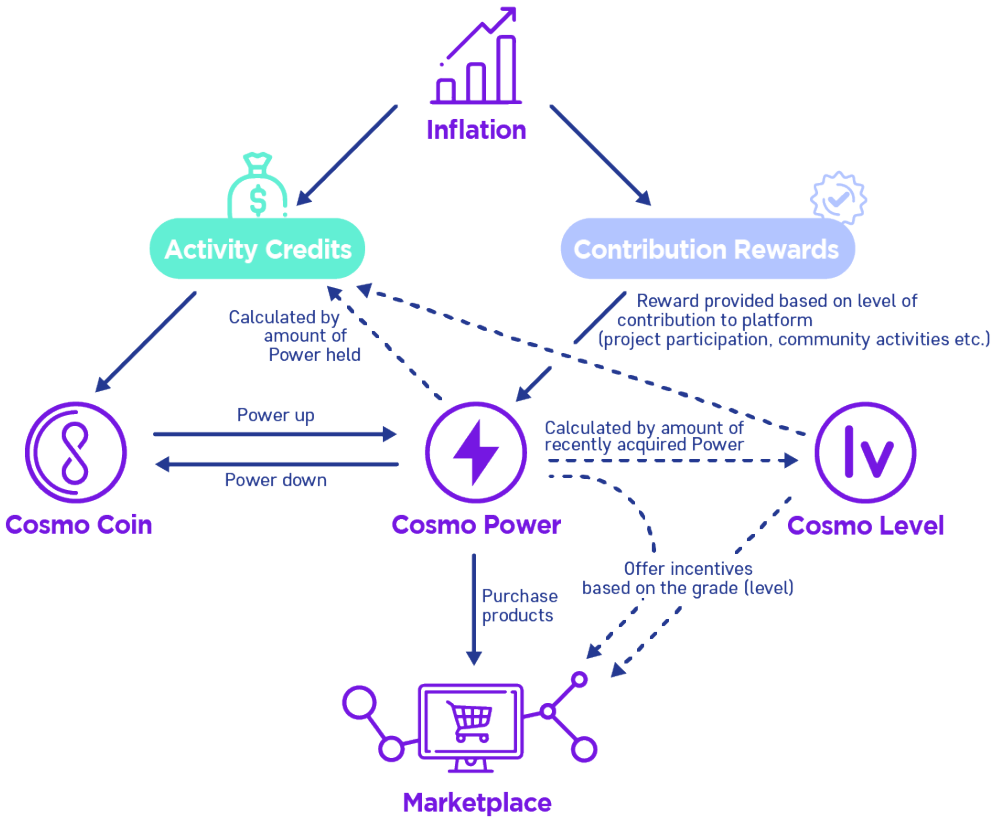
- Perform big data analysis on customer data and guide the customers through the recommended products based on their skin type/nationality/country/age

IV. Cosmochain's Token Model

Three different asset classes make up the Cosmochain ecosystem: two tokens managed by the blockchain (Cosmo Coin / Cosmo Power), and a third in-platform index (Cosmo Level) for expressing the contribution level within the platform.

- Cosmo Coin: Cosmo Coin is the primary medium of economic activity and exchange within the Cosmochain platform. To companies, Cosmo Coin is used as a means of payment for utilizing various solutions within the Cosmochain platform. To individual users, Cosmo Coin is used as a means to purchase Cosmo Power necessary for in-platform activities, and acts as a medium of exchange to convert Cosmo Power acquired from activities into other currencies.
- Cosmo Power: 'Cosmo Power' can be obtained by conversion from Cosmo Coins or through community contributions (e.g. posting reviews, voting up and down posts), and it represents level of contribution to the platform. Therefore, Cosmo Power can be used as an index of influence within the community (which determines how much reward will be given) and when acquired or purchased Cosmo Power can be used to purchase products within the Cosmochain platform's Marketplace. Depending on the level of contribution, Cosmo Power holders are provided with "Activity Credits". Users who wish to tokenize Cosmo Power have the option to convert Cosmo Power to Cosmo Coin through a 30-day vesting period.
- Cosmo Level: Cosmo Level is an indicator and measure of a user's contribution to the Cosmochain community. Cosmo Level is determined by the total amount of Cosmo Power accrued in a moving time window. Cosmo Level cannot be purchased by Cosmo Coin or converted from Cosmo Power – it can only be accumulated through activities within the platform. Depreciation is applied to Cosmo Level through exponentially weighted moving average (EWMA), which encourages active platform activities.

-Cosmochain's token mechanism-



IV-1. Cosmo Power

Cosmo Power is the level of influence a user can yield within the Cosmochain platform. For those who are familiar with the Steemit platform, Cosmo Power is conceptually analogous to Steem Power (SP) in this respect.

[Acquisition of Cosmo Power]

There are two ways to acquire Cosmo Power as platform participants.

1) Through active participation inside the Cosmochain platform: A platform participant can acquire Cosmo Power by sharing his/her personal cosmetics usage history and derma-related information, creating or sharing digital content on the platform, and exercising voting rights on content and interactions on the platform. Below are specific activities from which customers can earn Cosmo Power:

- 1.1) Providing personal information and agreeing to utilization of personal information: In this scenario, a participant simply provides his/her personal and dermatological information by filling out a template guided by the platform. The data provided by participants will be securely stored in an encrypted and decentralized format, keeping the sensitive and personal information safely. However, the number of Cosmo Power awarded will depend on the level of detail and validity of the information provided. Participants can set the level of access to their personal information by subject, and exercise complete ownership and management rights of their data. Companies willing to utilize this information can access the information only at the level of access set by the participants. If companies wish to access information beyond the set level of access, they can request for additional access or ask for more information, to which participants who received the request may choose to accept or decline the request.
- 1.2) Creating contents: Participants can acquire Cosmo Power by creating contents (posts or videos) or through curation activities (i.e. voting) on the contents within the platform. Detailed reward scheme will be defined by Steemit's reward system as a reference. Contents created by users are evaluated through voting from other participants in the platform and are rewarded according to the received votes.
- 1.3) Voting: Participants evaluate contents by voting them up and down. This is an important form of contribution for ensuring the quality of the platform; therefore, participants who vote up or down contents will be rewarded with Cosmo Power accordingly.

2) Converting Cosmo Coin to Cosmo Power: The platform also provides the option to convert 1 Cosmo Coin to 1 Cosmo Power. The conversion is effective immediately.

[Use of Cosmo Power]

1) Cosmo Power equates voting influence in the community: Participants get votes in proportion to their Cosmo Power holdings. Voting power derived from Cosmo Power holdings can be used to curate high-quality contents through voting and this contribution is rewarded with Cosmo Power.

2) Cosmetics purchase in the Marketplace: Participants can purchase cosmetics in the Marketplace using Cosmo Power.

3) Conversion to Cosmo Coin: Cosmo Power can be converted to Cosmo Coin upon request from both participants and companies. After a 30-day vesting period of request, Cosmo Power will be converted to Cosmo Coin. The prime motivation for having this vesting period in place is to encourage long-term holding of Cosmo Power, which is essential to sustainable growth of the Cosmochain platform. The vesting period also serves as an effective deterrence against short-term arbitrage opportunities and a buffer to react to any unforeseen circumstances.

4) Acquisition of Cosmo Coin through long-term holding of Cosmo Power: Cosmo Power represents influence within the community and holding Cosmo Power for a long period is regarded as contribution to platform through community activities. Cosmo Power holders will receive a certain amount of Activity Credits based on their Cosmo Level, which is given according to the level of contribution to the platform.

IV-2. Cosmo Coin

Cosmo Coin is a token that participants can trade with each other and can be transferred outside of the platform. Cosmo Coin provides a medium of monetary reward for users' contribution to the platform.

Cosmo Coin is also used for other functionalities built on the platform. Companies pay for sponsored projects and ads in Cosmo Coin. Also, Cosmo Coin can be used by companies to receive as payment from the Marketplace transactions.

IV-3. Inflation

The inflation rate of Cosmo Coin will initially be set at 10% for the first year of initial token sales and decrease by 30% (of the previous inflation rate in percent) every year. Inflation rates for Y5, will be approximately 2.5%, and from Y11 (2028) onwards, the rate will be fixed at 0.5%. A portion of newly issued coins will be provided to Cosmo Power holders as Activity Credits based on their Cosmo Level.

As such, Cosmochain plans to stabilize inflation faster than other comparable social media platforms on blockchain, including Steemit. This plan is based on the condition that circulation of tokens that exceeds customers' demands occurs through solutions provided within the platform, which means the platform does not need to issue an infinite number of new tokens to reward customers for their contribution through activities. Liquidity of tokens is established through following mechanisms: i) a Marketplace through which customers can directly purchase companies' products with Cosmo Power, and ii) operation of Coin Pool, which stores tokens for in-platform transactions.

IV-4. Coin Pool

The Cosmochain platform's Coin Pool exists to enhance token liquidity between users and companies within the platform.

The Coin Pool is replenished as follows:

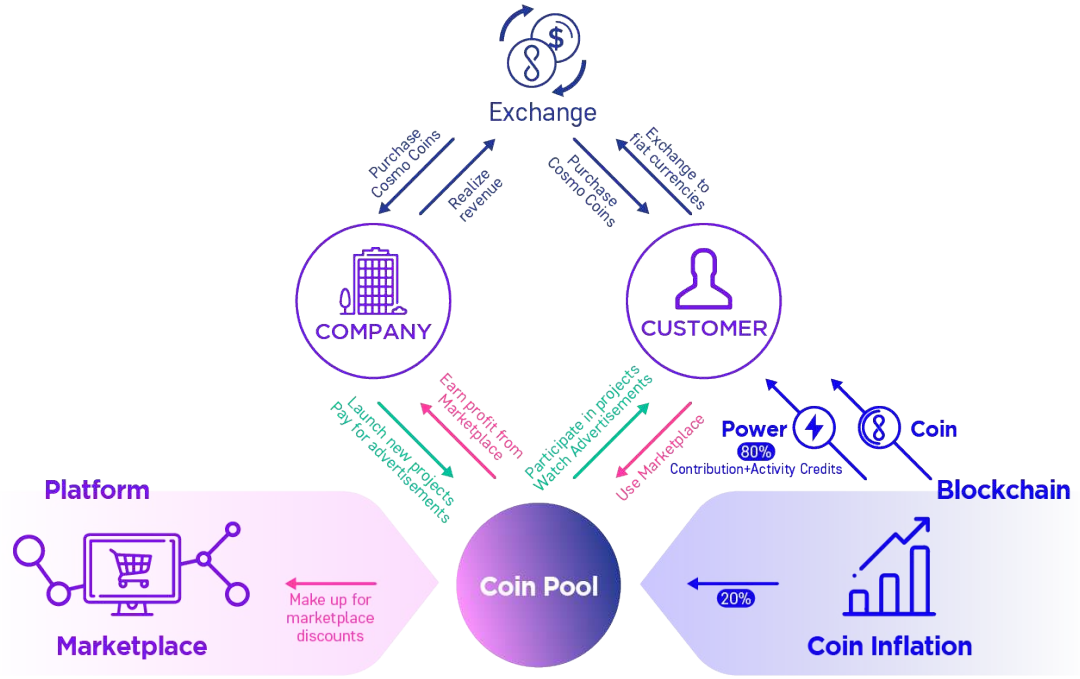
1) **Inflation:** 20% of newly issued Cosmo Coin will be stored in the Coin Pool.
2) **Revenue from businesses:** Upon customers' approval, the Cosmochain platform will provide mechanisms for companies to display advertisements within the platform. Also, companies will be able to carry out company-sponsored projects, such as customer surveys, product tests or focus group interviews. Cosmo Coins used as payments for these services will be stored in the Coin Pool.

The Coin Pool will be consumed as follows:

1) **Payouts to participants:** Platform users who view ads on the platform and participate in company-sponsored projects will be paid by converting Cosmo Coins from the Coin Pool to Cosmo Power.
2) **Providing discounts in the Marketplace:** Platform users will receive benefits in the Marketplace based on the amount of Cosmo Power held (or Cosmo Level), and the discount benefits will be funded from the Coin Pool.
3) **Operating costs:** Operating costs for maintaining a healthy platform and its ecosystem will be funded from the Coin Pool.

-Cosmochain's coin pool mechanism[4]-

[4] Is subject to change upon start of platform operations



IV-5. Reputation model based on Cosmo Level

Cosmo Level is designed to guarantee a more objective platform activity reputation than Cosmo Power, which can be purchased. Cosmo Level assigned to an individual customer or company is proportional to the amount of Cosmo Power acquired as contribution rewards from platform participation.

[Exponentially Weighted Moving Average of Cosmo Level]
Contribution to community is calculated as [Amount of Cosmo Power held * 0.25 + Time-depreciated Cosmo Level * 0.75], and depreciated contribution of Cosmo Level is calculated as below. Period of observation is 6 months. α=0.25. The value of α may change after testing processes to find the value that returns lowest MSE (Mean Squared Error). CL_t refers to the Cosmo Level at a given time t, and S_t refers to the converted value of Cosmo Level by EMWA.

$$S_t = \alpha CL_t + (1-\alpha)S_{t-1}$$

[Cosmo Level loyalty system[5]]
Cosmo Level categorizes both individual customers and companies into three levels based on loyalty, and following benefits will be given. Number of customers/companies in each class level will be divided by the ratio of 10:20:70, and loyalty level will be assigned every week at 00:00, Monday KST.

1) Cosmo Level of individual customers

VIP Class	R Class	A Class
Top 10% of all customers	Top 30% of all customers (the next 20%)	All remaining customers (the last 70%)
20% price discount in the Marketplace	10% price discount in the Marketplace	No discount
10% additional rewards when participating in company sponsored projects	5% additional rewards when participating in company sponsored projects	

2) Cosmo Level of Companies

Level 3	Level 2	Level 1
Top 10% of all companies	Top 30% of all companies (the next 20%)	All remaining companies (the last 70%)

[5] Is subject to change during finalization process of loyalty system

Premium window open (always display items on top of the page)	Can participate in feature sales (brand exhibition)	
Can participate in feature sales (brand exhibition)	Market Fee discount 5%	
Market Fee discount 10%		
Notify all users of sponsored projects		

IV-6. Marketplace

A key feature of Cosmochain is the Marketplace. The Cosmochain Marketplace provides the opportunity for companies to acquire Cosmo Coins without directly purchasing Cosmo Coins. As the platform grows, more companies will be willing to participate as sales through Cosmochain's Marketplace will provide benefits such as lower costs, targeted sales etc.

IV-7. In-depth contemplation of the token model

1) Why does Cosmochain's ecosystem need two types of tokens (Cosmo Coin / Cosmo Power) as well as one extra virtual index (Cosmo Level) to measure reputation level?

Success of the Cosmochain platform stems from long-term commitment of participants to the community. Cosmo Power promotes long-term commitment through the vesting schedule, and this model has been proven through Steemit. Short-term users will hold Cosmo Coin, while long-term users will hold Cosmo Power, taking extra advantage of extra voting power or greater discounts within the Marketplace.

The Cosmochain platform can self-sustain by creating a semi "closed loop value chain" that connects valuable community-created data to companies who can use the data for product improvement and by redistributing its value back to the customers as rewards. If users were rewarded with a currency that could be liquidated immediately, they would not be able to participate from a long-term perspective. By introducing Cosmo Power to the ecosystem, Cosmochain induces participants to be long-term users by providing reasons to hold Cosmo Power and by setting a 30-day vesting period for liquidation. However, Cosmo Power can also be purchased by capital, and platform recommends long-term holding of Cosmo Power by providing (Activity Credits); therefore, amount of Cosmo Power by itself may not be an accurate evaluation tool to measure contribution. Therefore, the Cosmochain platform has implemented Cosmo Level to the operations of the platform, which is a pure reputation index that can be accumulated only by actually contributing to the platform through activities.

2) How is reward rate of Cosmo Power designed?

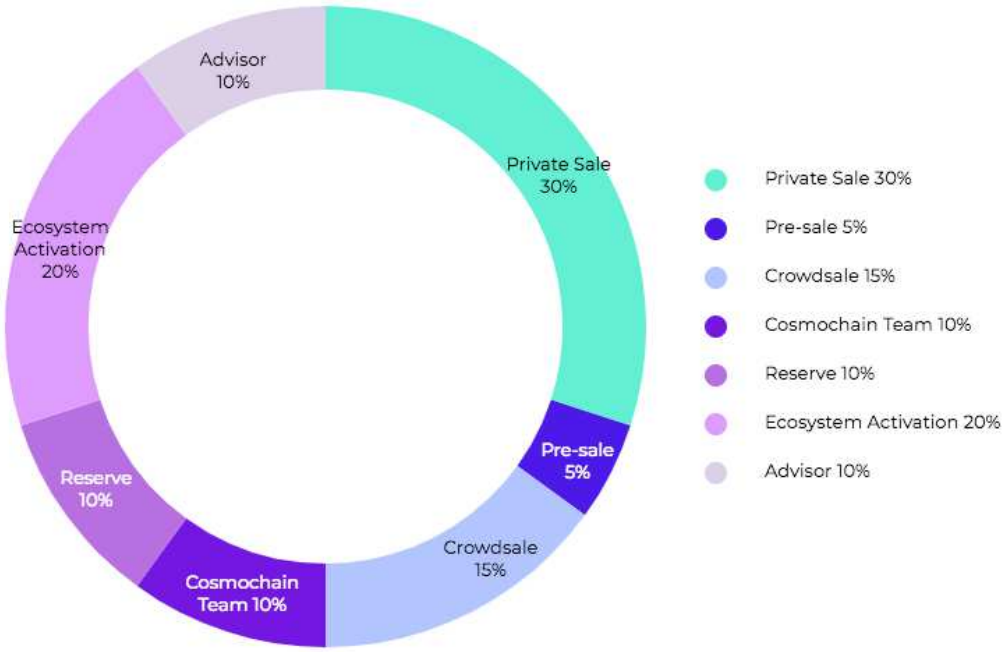
Amount of Cosmo Power to be rewarded, which is provided to the customers for their contributing activities, is designed with the following as key inputs:

1) Community contribution: Rewards for posts are distributed from the coin inflation in proportion to the votes they receive. 80% of the reward is distributed to the author of the post, and the remaining 20% of the reward is distributed among the curators (i.e. participants who voted on the post) in proportion to the votes they have given.[6]
2) Revenue from companies: Activities such as data submission, project participation and ad views are subject to extra rewards provided by the platform. Weights (proportion) of allocation of Cosmo Power follows expected customer demands by categories. As a result, amount of Cosmo Power rewarded for each activity may fluctuate due to short term activity demands; however, the platform will be designed to prevent inversion of relative values of each activity.

V. ICO Plan

V-1. Initial Cosmo Coin distribution plan

[6] Proportion here is an arbitrary number used for example, and the exact number will be set and applied through simulations in the future



Total Token Supply : 1,000,000,000 COSM
Hard Cap : 50,000 ETH
Rate : 1 ETH = 10,000 COSM

- If Soft Cap (5,000ETH) is not met, all coins sold will be refunded.
- If Hard Cap is met, all ICO requests made afterwards will be revoked and ETH paid for the ICO will be refunded to the requestors.

-ICO schedule and bonus scheme-

Token Sale		Period	Min. Cap	Less than 100 ETH	Less than 500 ETH	Less than 2,000 ETH	2,000 ETH or higher
Presale		Apr. 9 - Apr. 20	5 ETH	5%	10%	15%	20%
Crowdsale	Earlybird	Apr. 21 - Apr. 30	1 ETH	2.5%	5%	10%	15%
	Main	May. 1 - May. 20		0%			

*All dates are based on KST (GMT+9)
*Each token sale ends on the last day of each sales period at 23:59:59 KST (GMT+9)

- Above ICO schedule & bonus scheme are subject to change with prior notice depending on company policy.

Issuance of Cosmo Coin is to support the development of the Cosmochain platform, and the economic ecosystem surrounding the platform, and one can participate in the ICO using Ethereum (ETH). The total number of Cosmo Coins issued to ICO participants will equal to 50%[7] of initial token distribution. 20% of total initial token distribution will be distributed towards partners of the platform for acceleration of activities, 10% will be used as Reserve for the purpose of developing and support economic ecosystem of the Cosmochain platform, another 10% will be allocated to Cosmochain Team, and the remaining 10% will be distributed to Advisory and early stage investors.
Tokens that participants purchase through the ICO are the same as tokens consumable in the Cosmochain platform once the platform development is completed. As early participants to the Cosmochain's ecosystem, the participating companies will have the opportunity to utilize Cosmochain's solutions (that are more economical than existing marketing tools) first,

[7] This number may be increased up to 60% due to bonus, but total token supply will not be changed.

and the participating users are expected to be able to exercise greater influence through a more convenient acquisition of Cosmo Power.

V-2. Instructions for ICO

The Cosmo Coin ICO will be done through an Ethereum smart contract. ICO participants will be able to purchase Cosmo Coins by transferring Ethereum directly to the Ethereum Wallet Address that Cosmochain provides. Cosmo Coins will be automatically allocated to the contributors' Ethereum Wallet, if the transfer is properly completed. Cosmochain Team will further provide detailed instructions for participating in the Cosmo Coin ICO through its official website.

V-3. Post-ICO funds implementation plan

Funds collected through the ICO process will be used as follows:

Use	Details
Platform R&D	The Cosmochain platform plans to bring many technological innovations throughout the entire value chain of cosmetics industry. The Cosmochain Team plans to further develop: 1) a "standardized solution" by utilizing customers' image data, 2) a big data analysis algorithm based on machine learning of merging structured and unstructured information, and 3) acceleration of user interface and user experience that meet the requirements of the rapidly changing characteristics of beauty industry customers.
Server operation and maintenance	The most important keys to successfully operating the decentralized systems are the: 1) node operating system, and 2) security of external architecture that is linked to the blockchain. In terms of node operating system, the system needs to either fulfill the necessary conditions of the computing power system (40+ Core, 100+MB Bandwidth) in response to PoW or purchase large amounts of coins to meet the condition of PoS/DPoS. Besides the blockchain's ledger, areas linked to other system are vulnerable to processing/flowing/storing data. In this case, the modification of the architecture is necessary depending on the development of the hardware and security technology in order to provide the best performance and services.
Building partnerships	Building partnerships with industry leading cosmetics companies is necessary for the Cosmochain platform's long-term and stable growth. Thus, the Cosmochain Team is actively seeking for partnerships around the world. Such partnerships include 'image deep-learning software companies,' 'multi-channel networks,' 'global cosmetics distributors,' and 'cosmetics community management companies.'
Marketing & operating expense	Since the beauty community is extremely competitive, the Cosmochain Team will invite active content creators or users from existing platforms such as 'Instagram,' 'YouTube,' and 'Blogs.' This will result in a considerable amount of initial advertising and marketing costs.

V-4. Policies and precautions

ICO participants must be aware of the following before making any investment decisions

1) Risk and uncertainty

The whitepaper is a description of the company's business plan and company's vision and is not a guarantee or assurance of business details. ICO participants must be aware that actual processes of business may change due to surrounding circumstances or any other issues that may arise in the course of business development.

2) ICO Restrictions
   Citizens or corporations of countries where any ICO is prohibited may not participate in the ICO. If such participation is later discovered, the participating individual or entity shall bear all legal responsibility.
3) Language
   Cosmochain's whitepaper is written in Korean, English, and Chinese. Whitepapers written in other languages are for reference only. To all investors, Cosmochain recommends verification of the whitepaper by reading whitepapers written in Korean, English, or Chinese before participating in the ICO.

4) Nature of Cosmo Coin
   Cosmo Coin may not be used for any other purpose than as stated in the whitepaper. Cosmo Coin is not a stock, and no dividends or voting rights will be given to Cosmo Coin holders.
5) Cancellations or refunds
   ICO participants may not request cancellations or refunds on purchased Cosmo Coins.

V-5. Risks that ICO participants should consider

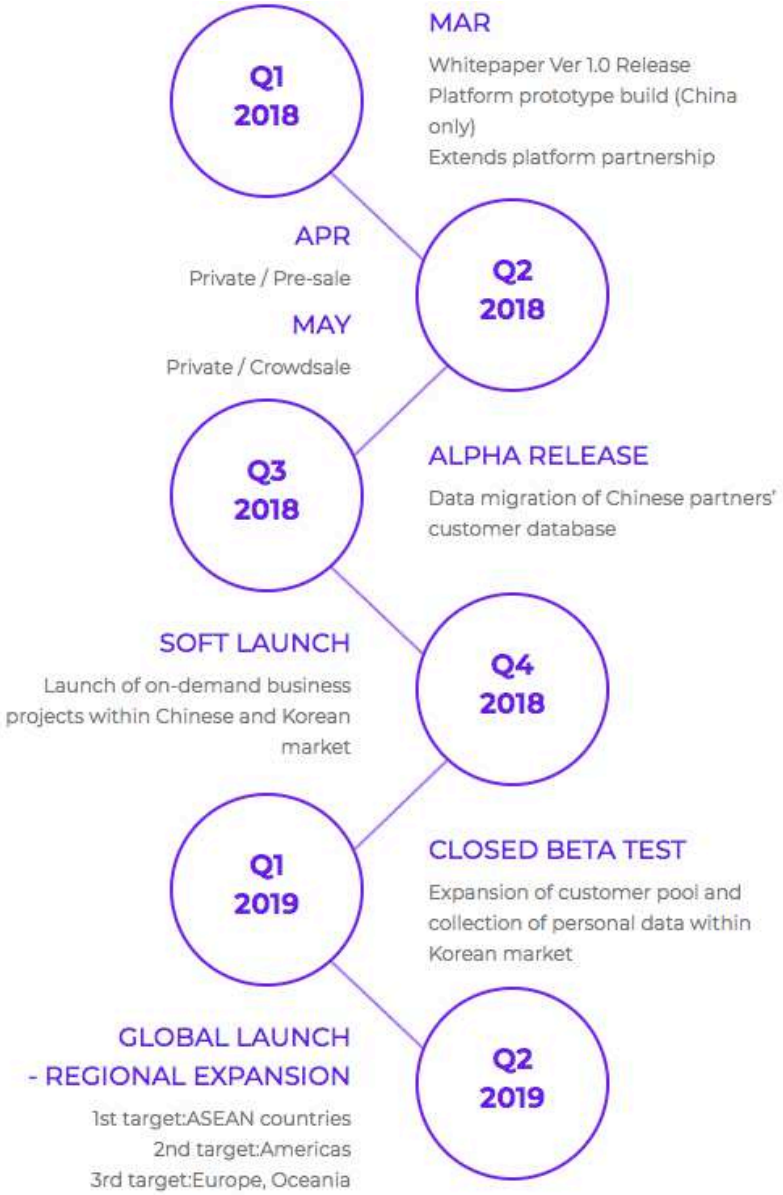
All ICO participants should be fully aware of the risks listed below in related to the construction of the Cosmochain platform before purchasing Cosmo Coins.

1) Risk related to the beauty industry
   The beauty industry is a highly competitive market due to its high trend sensitivity and low barriers of entry. Also, the cosmetics market is highly volatile in that it is strictly controlled by regulations of the Food and Drug Administration. Thus, there are risks of new regulations banning beauty platform businesses, data marketplace, or sharing of personal information. This may result in unexpected outcomes such as low participation levels of both companies and customers or limitations in platform operations.
2) Risk related to blockchain technology and the blockchain industry
   Government regulation is not clearly stated at the time of this whitepaper's release, and new regulations may partially limit or ban the construction of the Cosmochain platform and ecosystem.
3) Risk related to ICO participation
   Participating in the Cosmochain ICO may be banned depending on ICO participants' nationalities and according to their respective countries' regulations.

VI. Roadmap

The Cosmochain Team plans to develop the Cosmochain platform according to the following schedule:

- Mar 2018: Whitepaper Ver 1.0 Release, Cosmochain POC Release
- Apr 2018: Meet-up Sessions (Time and Location: TBA)
- Apr 2018: Private/Pre-sale
- May 2018: Crowdsale
- Q3 2018: Alpha Release
- Q4 2018: Soft Launch
- Q1 2019: Closed Beta Release
- Q2 2019: Global Launch



Vision for platform growth: Cosmochain Team would like to propose the following roadmap in order to quickly organize and stabilize Cosmochain's economic ecosystem. Please note that the roadmap below is in regard to the operation of the Cosmochain platform prior to stabilization, and the Cosmochain Team's endeavor is for the platform to achieve full autonomy and decentralization once stabilization is complete.

1. Growth of the business model

First, the Cosmochain Team will recruit individuals that can actively participate in the Cosmochain platform and secure their data. This activates the "data submission" feature of the platform, and this is the area which Cosmochain shall address through marketing efforts in different target countries. For the early supply of data in the initial phase of business, the Cosmochain Team will partner with cosmetics companies that already have cosmetics databases in the target countries, in order to merge them into the Cosmochain's database. At the same time, Cosmochain will release the social network service, the biggest feature of the platform, within six months of the ICO in order to recruit more platform participants and continue to offer competitive services and drive business growth by further enhancing the accumulated data.
Particularly for the case of Huiseoul Inc., a Chinese K-Beauty mobile commerce company which finalized a partnership agreement with the Cosmochain Team, Cosmochain and Huiseoul Inc., will cooperate to complete migration of Huiseoul Inc.'s entire customer pool and customer data by Q3 of 2018. Huiseoul Inc. is already offering a data-based product recommendation solution; therefore, transfer and integration of the data on the 'blockchain' will likely be seamless. Through this partnership, the Cosmochain platform plans to offer service to customers in China and Korea by Q4 of 2018 with the Soft Launch of the platform.
With enough advanced data and a pool of participants, the Cosmochain Team will cooperate with companies that want to take part in this constructive revolution of the cosmetics industry using the Cosmochain's database and prove that this new concept of the economic ecosystem is indeed effective. This service includes sharing database with participating companies, company-sponsored projects, micro-segmented marketing and establishing personalized sales channel – basically, all business models that Team expect to bring to the world. The innovative services that the Cosmochain platform will provide are designed to address unmet needs of today's cosmetics companies, and it has already been proven elsewhere that these could be solved using blockchain technology. It is at this point that the Cosmochain Team expects the cosmetics companies to be willing to enter private sales on the platform.
When company-sponsored projects enter the soft stage on the Cosmochain's economic ecosystem, companies around the world will be willing to join the platform, which will result in a further development of the Cosmochain's API Layer. Using API provided by the Cosmochain Team, many companies are expected to develop and offer differentiated services releasing DApp (Decentralized Application), and in the course of this service development, the Cosmochain platform can generate even greater business opportunities and value creation.

2. Regional and global expansion

In order to grow the platform and build an economic ecosystem, Cosmochain will gradually expand its business to countries based on their respective strategic importance.
The first global market that Cosmochain will target is China – a top priority country both in terms of cosmetics market size and growth rate. In fact, the Cosmochain Team has already signed MOUs with a number of cosmetics-related companies in China and received content on the supply of their customers' data. Currently, the Cosmochain Team is testing the process of migrating data to the Cosmochain platform. In addition to the Chinese market, Cosmochain will target the Korean market at the same time, one of the most dynamically changing and trend-leading cosmetics markets in the world. Although the Korean market is very mature with the second highest cosmetics-industry-to-GDP rate, the country's cosmetics market is still growing quickly at an annual growth rate of 6%. In addition, with the highest internet connectivity and smartphone penetration rates, Korea is a strategically high priority market for the platform. Cosmochain aims to secure sufficient high-quality data from China and Korea by the end of 2018. By the first half of 2019, Cosmochain plans to execute company-sponsored projects within the Cosmochain platform.
Starting in the second half of 2019, Cosmochain will expand even further to Japan and other ASEAN countries, the Americas, Europe and Oceania. The $23.8 billion Japanese market and the so-called "post-China" ASEAN region with more than 630 million people will be the next target for Cosmochain both for scale and growth. Especially, the ASEAN cosmetics market is projected grow at more than 10% until 2020, and online commerce is growing even faster at 22% annually. The American (US) market is the largest cosmetics market which accounts for approximately 20% of global revenues are made. Using the American market as a starting point, Cosmochain will look towards Brazil (4th largest market) and other markets in the Americas. Into the 2020s, Cosmochain plans to expand to Europe and Oceana.

VII. Team

VII-1. Key team members

Howon Song, CEO
Huiseoul Inc., CEO (current)

MBA, Stanford
M.D., Yonsei U

Joowon Hur, CSO
ex-BCG, Project Leader

B.S., KAIST Mgmt. Eng

Seungho Shin, COO
ex-Hahn & Co. PE
ex-BCG, Consultant

MBA, Kellogg
B.A., SNU Economics

Jingoo Kim, CTO
ex-KB Securities, IT Quant

B.S., KAIST Comp. Sci.

Joonsuk Park
Head of Marketing
ex-Huiseoul Inc., COO

B.S., UC Berkeley Business

Changmin Oh
Head of Investment
ex-BCG, Senior Associate

B.S., Cornell U ORIE

Howard Ro,
Engineering Advisor
Google Mountain View,
Software Engineer (current)

ex-LinkedIn

M.S., Stanford U Comp. Sci.
B.S., Stanford U Mathematics

Mingyu Kim,
Engineering Advisor
Google Mountain View,
Software Engineer (current)

ex-Palantir

M.S., Stanford U Comp. Sci.
B.S., Stanford U Comp. Sci.

Jae Jang,
Engineering Advisor
Facebook Menlo Park,
Software Engineer (current)

ex-Microsoft

M.S., Stanford U MS&E
B.A., Stanford U Economics

VII-2. Current status of team members[8] (as of March 23, 2018)

Department	No. of members
Board	3
Development	5
Sales	3
General Administration	1
Total	12

8 The number of members is subject to change, and the team may be supplemented with additional members after the ICO for platform development and ecosystem advancement.

VIII. Disclaimer

This draft Whitepaper is provided by the Cosmochain Team to those that are interested in the Cosmochain's blockchain-based platform (hereinafter referred to as the "Cosmochain project") as a reference to provide information on the business model of the Cosmochain project and details of Cosmo Coins that have multiple uses within the platform. This draft Whitepaper serves no purpose of recommending investment in the Cosmochain project or to the Cosmochain Team and is completely irrelevant to such purpose.

This draft Whitepaper is written as-is based on the time it was written, and therefore the Cosmochain Team does not guarantee the accuracy or appropriateness of any part of the paper including the conclusion, schedule or accomplishments of the project at or after the moment this Whitepaper is read. This information contained herein is subject to change following the Cosmochain Team's policies or decision-making and such changes will not be applied anywhere but the final version of the Whitepaper.

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