

AIRBLOC

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Current Challenges to User Data



In the modern digital advertising market, ‘data’ equals to a strategic choice of weapon.

Personalized advertising - which targets customers who are likely to buy the products based on data - are often used for data monetization from IT giants such as Google, Facebook, and other major search engines. These companies use ‘personal interests data’ to expose ads, and generate sales.

Nonetheless, to the ‘person’ who sources ‘personal interests data’, not a single penny from targeted ad sales is returned. Not only that, individual users do not know the manner in which their data is collected, priced, and sold to the data consumers. Moreover, individuals do not have the freedom to choose types of ads they want to see and the vice versa.

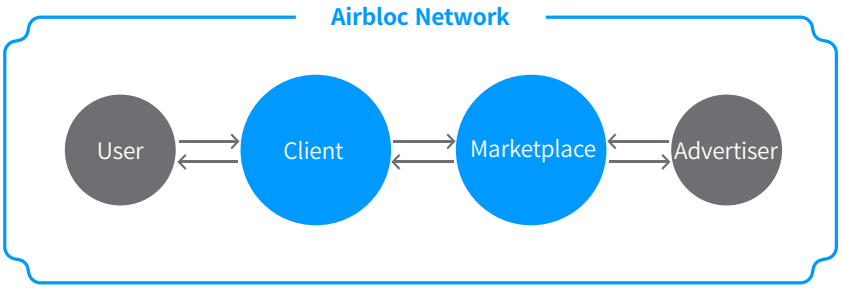
Some advertisers, on the other hand, abruptly changes the Terms of Use without explicit permission from the user, or collect user data through crawling. Moreover, advertisers inevitably share their collected data from their services with other advertising platforms and/or agencies to boost advertisement effectiveness. In this process, user data can be passed on to an unknown third party, travelling far beyond the specified scope of the Terms of Use, at which time the individual's rights may be seriously infringed.

Advertisers are dissatisfied, too. User interests data enabled improved ROI compared to the past, but the target audience remains to be statistically ‘guessed’, based on indirectly collected data. To execute a highly effective targeted ads with custom audiences and/or lookalike audiences, advertisers need direct user interests data beyond simple piece of information such as gender, age, and place of residence. As advertising cost has risen due to soaring demand within centralized advertising platforms such Google and Facebook, how to optimize marketing and maximize ROI have become a much demanded theme even for the advertisers.

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Airbloc,
a New Ecosystem to the Digital Advertising Maket



Airbloc is a blockchain-based, decentralized and transparent ad data trading network and a DAPP.

Here's how it works. When a user submits data directly to Airbloc Main Client Service, the advertiser pays fee to the user group who are likely to purchase their product and buy interests data from Airbloc Main Marketplace. Also, to the individual users who are exposed to ad campaigns, rewards will be given.

How simple is it? Users as an original provider to 'interests data' can regain their data rights, and advertisers can now make improved targeted ads with accuracy based on both direct and indirect data types. This interests data is not legally violated if you have already paid for its value and transferred data ownership. Therefore, advertisers have the legal freedom to use this data. The increased flexibility of data utilization allows advertisers to do all sorts of testing to maximize effectiveness for targeted ads.

To collect data with reliability, Airbloc continuously validates the credibility of each user, the data providers. Personal information, survey responses, and behavioral data are used for credit score computation and bigger reward will be given to users with high credit ratings. Directly collected personal interests data that are below certain credit limit cannot be sold on Main Marketplace.

In Airbloc, ads can become a useful piece of information, not a noise. This is because users can configure types of ads to be viewed and not to be viewed on Airbloc's Main Client Service. Based on users' preference configured, Airbloc ecosystem will allow a transparent trading of both data and ad exposures.

Airbloc will issue 'ABL tokens' as means to buy and sell data and ad exposures. This token can be used as a compensation to reward individual users, the data suppliers, and can also be a means of payment to the data consumers. The initial token is based on the ERC20 standard which initially runs on Ethernet main network, and these purchased tokens can later be exchanged for tokens on Airbloc's own network.

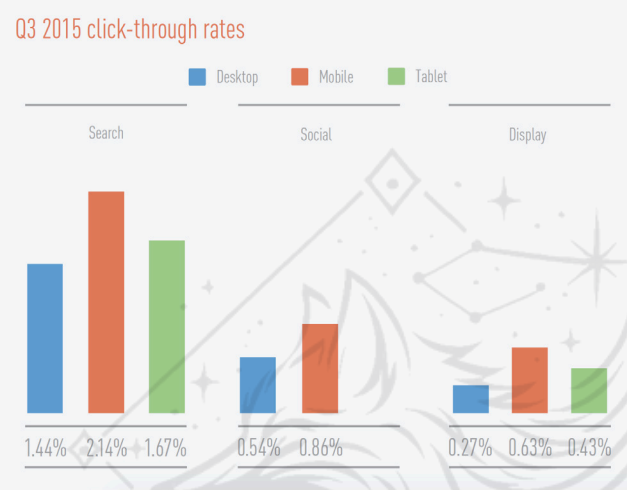
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Digital Advertising Market Status Quo

Ineffective Targeted Ads

Personal data used in advertising today is primarily a behavioral and indirect data to reflect user main interests and intentions. This statistical 'guess' inevitably leads to undermined advertising effectiveness. The fact that search ads have always shown a higher click-through rate (CTR) than display ads supports this.



[The Q3 2015 Performance Marketer's Benchmark Report - Marin Software]

Search ads are usually more effective than display ads because search queries explicitly reflect user interests and intentions. Keywords such as "car insurance", "loan", or "New York attorney" are often traded for more than 100 USD per click (CPC). Advertisers are willing to buy these keywords for a such high price and this means that search ads are quite effective.

Unlike search ads, there is no personal interests data found from display ads. There maybe some 'guessed' interests data, but they cannot be true unless directly asked. For example, you cannot be sure that a user is a cat owner given the fact he or she looks up and posts many cat-related photos on social media.

The popular statistical guessing methods such as Lookalike are also not accurate enough. This is because it is an estimation over similar users to a given target across each siloed ad platforms (e.g. installed app list, personal interest posts, and uploaded posts). Users installing the same kind of app does not always mean a similarity in interests or personal status.

Ad targeting also requires an A/B testing to determine a fit for the advertiser and/or product to be advertised. However, in the current digital advertising market with insufficient user interest data, it is difficult to make A/B testing. This is because the criteria for user interests data differs across all users, and lookalike targets cannot be compared with one another since their estimated resemblance is derived by varying criteria. Also, accessible third-party user interest data is relatively smaller in its volume.

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Infringement of Personal Data Rights

Many people today are unaware of where their data - offered through services they use - ends up travelling to: what kind, how so, and how much.

Let us take an assumption that a user installs a free app that helps mobile battery optimization. From the surface, it may seem this app just serves to optimize your mobile battery use and increase mobile usage time. Just as if it offering you a convenient feature for ‘free’. However, the truth is that this app is exploiting sensitive mobile data from users by selling them to personalized advertising agencies, or is generating revenue by advertising them directly.

How is this possible? The apps installed on a mobile can tell you what other apps are installed on your device and for how long each apps were used. The list of installed apps itself, could also reveal some of your important interests data. When analyzed with machine learning, one can probabilistically guess various facts about you such as the next likely app to be installed, married or unmarried, or even if you raise a cat or puppy. But the vast majority of users are unaware of this.

The truth is, users are unaware of this. Of course, securing data ownership and data usage rights is unheard of. Without oneself knowing, we are illegally handing over data ownership and rights to use to the services that we use without an explicit agreement. Consequently, even when these data are used for sale, or monetized through ad exposures, users are not compensated. Just like the saying "If You're Not Paying For It, You Become The Product" goes, users are already paying for data and ad exposures.

Users are unilaterally exposed to ads, too. Many ad platforms do not provide a configuration function to prioritize ads (information) based on user’s wants and needs, such as personal tastes or a religion. When a user is accidentally exposed to such ads, he or she is forced to manually accept and then block these offensive ads. There is no way for users to protest against these ad exposures, because there is no way to submit a feedback in reality.

Issues with Centralized Data Collection

The current method of centralized data collection has brought many problems to the market. Due to siloed data collection and storage, users are left clueless in knowing when and how their data is extracted, tampered, or sold, as mentioned previously. This centralized method is also vulnerable to security, and there is a high risk of personal data being leaked to unprotected access. All across the world, for example, a great number of social security number spills and personal information leakage from big companies frequently occurs. All centralized platform services carries this serious vulnerability.

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Airbloc,
a Revolutionary Mover to the Digital Advertising Market

At Airbloc, users can offer ‘direct’ interests data as a data provider and be rewarded. Advertisers can buy that interests data as data consumers, trade it with other data consumers, ask users directly to gain certain type of data, or buy already collected data that are valuable to them. Airbloc is basically a blockchain-based data trading network.

Data consumers can start "data campaigns" to ask users about the type of data they want, so that they can buy advertising placements from data providers with wanted responses. The questions usually follow a recommended standard schema designed for information collection. Advertisers first register their questions on the Main Marketplace as data consumers. As a data provider, a user can then provide a corresponding data to the questions via Airbloc Main Client Service and get rewarded with ABL tokens.

The data directly provided from users can be traded to other data consumers on Airbloc Main Marketplace. Nonetheless, users can set a limit to the maximum number for data reach and usage, to prevent their data from being used or unduly used by unwanted subjects.

Not only data, but also ad exposures can be traded among individual users and business entities with enhanced transparency. Users can set up ad formats or specific categories of products, businesses, and industries as they wish, so that they can receive wanted ads and get rewards in return.

Since all transaction history are stored on Airbloc Network with transparency, and these transactions are managed by a decentralized Airbloc Network rather than a centralized entity, individual users and advertisers can trade data under safety and equity.

In Airbloc Network ecosystem, ‘advertising’ functions as a useful piece of information rather than annoying pop-ups while navigating on web. Airbloc Network precisely aims to advance the area of advertising to the domain of ‘information’.

Targeted Ads that are Effective

Advertisers on Airbloc Network can search for and purchase target custom segments based on interest keywords and ontologies on Airbloc Main Marketplace, who can either buy products or participate in promotions. In addition to the auto-collected indirect behavioral data, it is possible for the advertisers to execute ads with accurate interests data that are directly provided by users. For example, if you know who the soon-to-be-married couple is, you can sell a bed or mattress, and perhaps have your targets buy a honeymoon flight or book a room. Furthermore, if you know

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who the pet owner actually is, you can advertise them pet supplies. To a fan of a particular band, you can sell that band's concert tickets or souvenirs. Based on this data, you can run more effective ads by testing multiple targeted groups with marketer's insights on Airbloc Main Marketplace. For instance, if you are selling a New Year's diary, various target testings could be made. The target segments can include self-development lovers, those who adore fancy stationery (e.g. cute diaries), college passers or newbies to a company, or people with their birthdays approaching. If the result turns out that self-development lovers display good purchasing efficiency, the demand for the interests data can be reflected in terms of price to Marketplace, which can lead to a huge A/B testing forum to verify ad effectiveness. Therefore, advertisers can effectively run target ads end-to-end, from data purchase to targeted ad execution on Airbloc Network.

Ads as User-Controlled & Useful Information

Users can regain control over their own data. Users will be able to determine what data is collected and how data shall be sold via Airbloc Main Client Service configuration. Particularly for the sales of data, users can set up different permission levels per each data attribute; whether you want to export data to third-party ad platforms without having to compromise raw data or simply transferring data ownership entirely. By providing a direct reward to users for sales of data, users can become an independent data producer and provider as an economic entity. In addition, users can also control the permissions to ad exposures by pre-setting ads they would like to view or not to view.

Expanded Ad Targets with Auto-Collected Indirect Data

The interests data directly provided by users via Airbloc Main Client Service can be effective in quality, but data quantity may be insufficient compared to the indirect data that are collected automatically. On the other hand, the amount of indirect data (e.g. user visits, purchases, app installs, etc.) which companies collected automatically via SDK or IoT devices through users' agreement to the Terms of Use, are vast and wide. These indirect data can be used to expand targets through a Lookalike audience algorithm. For instance, suppose you have a data of 100,000 individuals who raise dogs. The number 100,000 is somewhat insufficient to deliver targeted ads on a large scale. In this case, both indirect data collected and direct data can be used to give a statistical estimate of similar targets, allowing the ads to be exposed to users who are "likely to raise puppies."

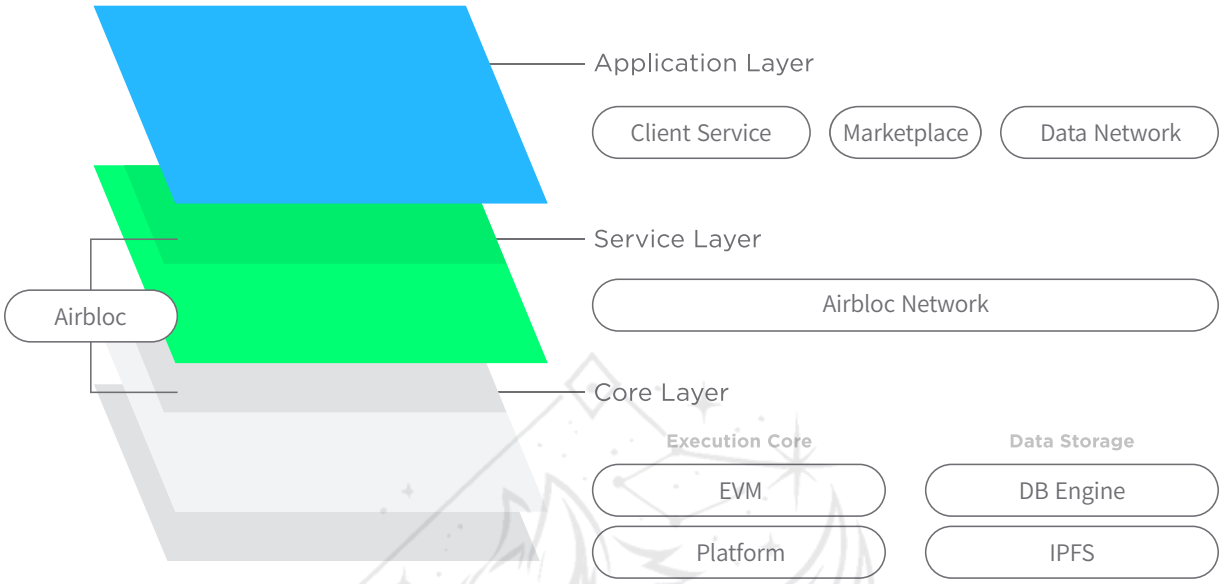
As such, Airbloc Network can combine the interests data collected from users directly with the indirect data collected automatically, which can result in a greater synergy. And this can also mean that individual users will be rewarded more during the process.

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Airbloc Network's Technology and its Ecosystem

Architecture of Airbloc Network



Airbloc Network is composed of three layers: Application, Service, and Core.

Application Layer refers to apps that use Airbloc Network. It includes Airbloc Main Client Service and Airbloc Main Marketplace. Service Layer refers to the DAPP running on an EVM named 'Airbloc Network'. Lastly, Core Layer refers to the blockchain platform on which the Airbloc Network will grow and stores data.

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Application Layer

Inside the Application Layer, many apps that use Airbloc Network are located. These apps communicate with the Service Layer as configured on the blockchain. The Application Layer is composed of Airbloc Main Client Service - which receives data from individual users, and Airbloc Main Marketplace - a platform for buying and selling data. However, it is highly encouraged that third-party applications be developed via open interfaces. In the future, we will provide a separate SDK service which enables an easier use of Airbloc Network in existing apps.

Service Layer

The Service Layer refers to the DAPP running on a blockchain named "Airbloc Network". For more details, please see the Airbloc Network section and Technical White Paper which will be published soon.

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Core Layer

Airbloc Network is mounted on its Core Layer. This Core Layer is composed of a platform to run Airbloc Network and a data storage for transactions.

We use an Ethereum platform. Accordingly, Airbloc Network will be placed on the EVM with a smart contract format, and ABL tokens will be following the ERC20 standard. Depending on Airbloc Network's technical requirements in future, the platform can be transferred to other compatible EVM platforms.

We store on an IPFS-based system, which is maintained by storage nodes as described below. The data is protected by Intel Software Guard Extensions (SGX) technology and processed within Secure Enclave, blocking any possibilities of unauthorized access and information leakage through storage nodes.

The blockchain technology continues to evolve itself very quickly. Therefore, this architecture might not ultimately be our final solution. In this regard, there is possibility that the Airbloc Foundation build an independent Airbloc blockchain network to replace the Ethereum network. The Foundation might also choose to substitute the storage layer with Ethereum Swarm to integrate both storage and service layers into the Ethereum network.

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Participants to Airbloc Network

The participant nodes to Airbloc Network can be grouped into Data Provider node, Data Consumer node, Credit Evaluator node, and Storage node.

Data Provider Node

The Data Provider node is made up of individual participants who provides data to the Airbloc Network. They will be rewarded with ABL tokens for their data provided, and will be responsible for data reliability.

Data Consumer Node

The Data Consumer node is made up of advertisers who purchase data from the Airbloc Network. They will use ABL tokens to pay data providers as means of compensation and to trade data.

Credit Evaluator Node

The Credit Evaluator node assesses reliability of data providers and data consumers to lower credit level and guarantee their credit. In return for evaluation, the credit evaluator node will receive ABL tokens from the ABL Token Pool. The Credit Evaluator node is responsible for accurate evaluation of transaction entities' reliability.

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Storage Node

The Storage node executes core Airbloc Network software to provide and maintain storage on Airbloc Network. Participants will receive ABL tokens from the ABL Token Pool as compensation. The Storage node has an obligation of availability to ensure access to data access requests.

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Application Layer's Main Apps

There are three main services initially launched with Airbloc Network:

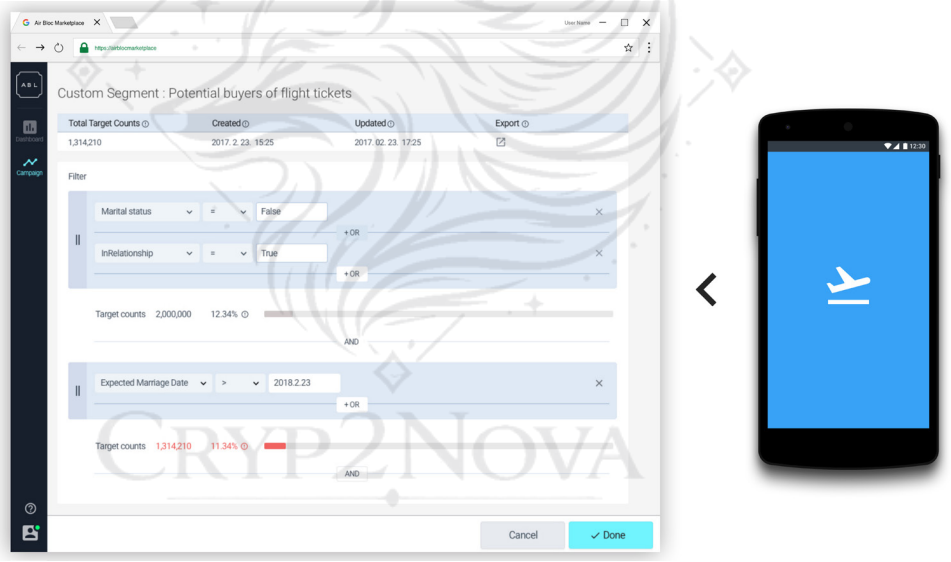
Airbloc Main Marketplace（Marketplace)

Airbloc Main Client Service（Client Service)

Airbloc Main Data Network（Data Network)

These services are presented by the ab180 corporation and are the very first type of service to be created and commercialized using Airbloc Network, aimed at its initial establishment and formation of Airbloc ecosystem. Later, other entities can also join to expand the ecosystem by creating the same kind of service using Airbloc Network.

Airbloc Main Marketplace



Setting Campaign Targets

Airbloc Main Marketplace is a free P2P and P2P transaction avenue for interests data, for both directly collected data and auto-collected indirect data. At the same time, it helps the advertisers to carry out ad campaigns as a platform.

Airbloc Network Main Marketplace is an open and free data exchange where anyone can join, like Steemit, a blockchain-based content community which recently created a stir. Anyone can participate to Airbloc Network through its Main Client Service surveys, which advertisers can use instantaneously after signing up.

At the Main Marketplace, mainly user-level interest data and ad exposure are traded. The data is

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a granular type that users have agreed to provide to the Airbloc Main Client Service. Ad exposure is also a kind of advertising campaign that is exposed to usersvia Airbloc Main Client Service or a decentralized advertising placement of a third party ad networks.

Advertisers can search for ad targets , purchase data if sufficient in quantity, and if they are unable to find a wanted type of data, they can collect data directly through creating a new data collection campaign. Once a personal data is collected via an advertiser's campaign, this data can be re-sold to data consumers for a limited number which was pre-set by the original data owner.

Airbloc Network offers a set of useful utilities for advertiser's easy targeting and data purchasing. The utilities are as follows:

1 Segmentation

Airbloc Network has its own ontology system which categorizes user interests (like schema.org by search engines). Advertisers can see in real time the number of user segments that meet their filtering options. For instance, you might want to filter out who will be getting married within the next month, out of total user pool. At this point, you can buy as many data as you want, or if you do not have one, you can launch a new data collection campaign to gather as many new tailored segments as you like.

2 Search

It allows data consumers to search for data with any unstructured keyword. The system can show relevant search results the given keyword and can recommend a similar set of data even if there is no data directly related to the desired keyword.

3 Sampling

Clients do not have to purchase the entire data. If the number of users in the segment exceeds the number of users that client requested, the client can purchase a sufficient number of unbiased user data with statistical sampling.

4 Prediction

For users with predictable data set, certain probability of user purchasing can be computed and used as a filter option. For example, you might be able to extract 1,000 most likely users with a 10% or higher chance to purchase a travel product, a product item ID of "A " (Thailand travel package within 30 days).

5 Lookalike Audience

If there are insufficient number of user data as seed audience, machine learning can identify the group of users displaying similar attributes of the target interest data. These lookalike audience engines can be built from data set with statistical homogeneous characteristics such as the list of installed apps.

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6 **Target Sharing**

The clients can export the created custom audience from the Main Marketplace as an ad target of major ad platforms such as Facebook, Google AdWords, and Twitter, without risking raw data being compromised (all user-level data will be hashed on the client side before sent to the external server).

Once data transactions are successfully settled at the Airbloc Main Marketplace, we will be able to offer new and advanced digital marketing campaigns that are experimental and mutually beneficial, in addition to the traditional types of campaigns. The new types of marketing campaigns that are currently reviewed by Airbloc Main Marketplace are:

1 **Bargaining**

You can suggest a data transaction of exchanging user conversion and reward. For instance, when a user deletes an app of an e-commerce company A and then installs an app of the competitor, company B, then it can propose an offer with a 10% discount coupon to that user, if the user deletes company B app and re-installs app of company A.

2 **Education**

Education is type of a campaign designed for a reasonable user. It can help customers voluntarily learn the merits of their products through an in-depth comparative analysis with those of competitors. For example, if you are a bank, you can compare three financial products and attract users to buy your best financial product.

3 **Market Research**

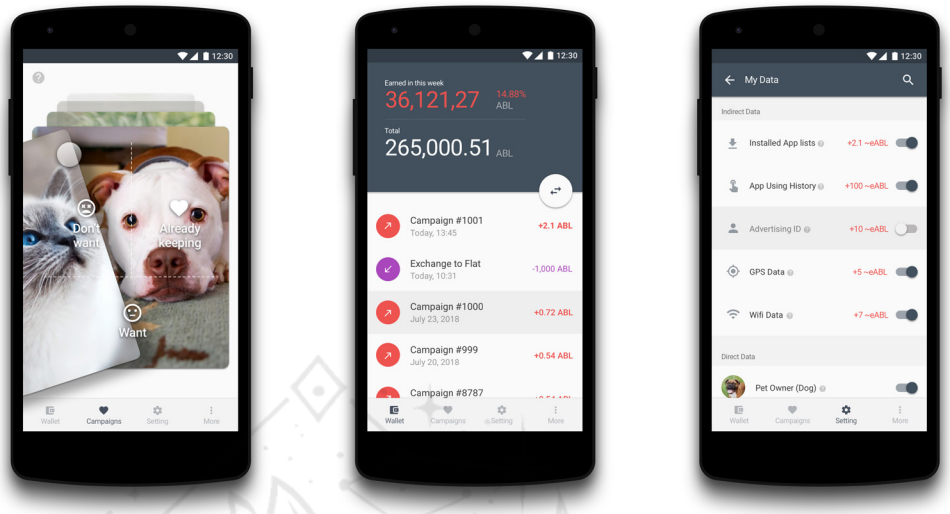
When curious, you can directly reach out to users to fill out a survey. The survey questions can follow the format of various questionnaires.

Advertisements on the Airbloc Main Marketplace are requested to always respect the rights of users, and must be in the form of a useful information, not a spam. For example, a user expecting a wedding anniversary will receive a list of general gift ideas such as a flower bouquet and other related items, and it will be perceived as non-spam.

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Airbloc Main Client Service



Data Collection | Collected Data Management | Token Management

Airbloc Network Main Client Service provided in a form of app and web application. It supplies personal interests data like a powerhouse, and manage revenue generated from that data.

Any user can easily sign up for this service, and user data will be structurally collected when responding to exposed questions (data campaign) in a friendly chatbot UI. Moreover, with a wallet feature, you can manage reward revenue for your data ad usage, and see where your data is sold and traded with transparency. The features provided by the Airbloc Main Client are as follows:

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1 **Data Collection**

A friendly chatbot interface will answer your questions as a data campaign and collect a detailed and structured data. Data that can be automatically collected under user's consent on device, and data collected while syncing to other data storages like social logins can be set to be automatically sold in Airbloc Main Marketplace.

2 **Ad Exposure**

You can receive ads within the scope you set, and receive a compensation when you are exposed to those ads.

3 **Configuration**

Users can determine the level of your data to be sold for sale, to what extent to grant the right to sell the data, and to decide which ads to receive and which ads to not receive. All sorts of configuration for data and interests usage are available.

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4 Diagnosis

In Airbloc Main Client Service, you are able to find out the types of data to be collected automatically other than the structured data gathered through direct questionnaires. This feature will later extend and evolve to become a self-diagnosing function to oversee data collection of other installed apps on the end user's device.

5 ABL Wallet

You can manage your tokens compensated from data sales to control and store them, as well as to transfer to another user within the token ecosystem. You can also import and use your personal wallet. In the near future, it will be possible to easily exchange tokens to other coins (e.g. BTC, ETH, etc.) by integrating with other platforms or to encash them.

Airbloc Network seriously values the rights of users. In this regard, we give users the control power to diagnose, decide, and determine the specifics of data to be collected respectively. For instance, collected data via Airbloc Main Client Service will be allowed to be sold under the following permissions:

1 Sales of One-time Data Ownership

The ownership of current data can be completely transferred to the data consumer in raw data. In this case, data consumer will have access to raw data, making it vulnerable for compromise or being delivered to a third party without approval. The reason for a one-time data ownership sales is because raw data can be modified after sales.

2 Sales of One-time Data License

This permission is a right to use data as target data without exporting the original data and export it to various ad platforms without transferring the data ownership. In this case, the raw data can not be compromised, but the target extracted by the ad platform itself may be compromised or passed to an unauthorized entity without approval.

As such, the data owner can set their own level of permission, even if they sell their own data, thereby have a full control over the sale of data. Moreover, each control level is followed by different compensation as user themselves can determine the data disposition by weighing the compensation differences.

To ensure reliable data, Airbloc Network through its thorough own credit rating system can detect and block fraudulent activities like answering questions in a dry manner or attempting to trick the system for compensation. More details can be found from the Credit Rating System section.

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Airbloc Main Data Network

Airbloc Main Data Network is the first P2B2B data network which enables services to provide and monetize first party data for their services, rather than using advertising placements.

Publishers can provide and monetize their customer's data from own service, and users can receive compensations from other services as well. Hence Airbloc Main Data Network can accelerate the cycle of data collection and sales by acquiring data via both Airbloc Client Service and third-party services.

Towards protecting users' data control and data transparency, we will allow publishers to sell data only under the following principles on behalf of users:

1 **Sales of Personal Data**

Services may only sell data from users who have agreed to the data collection in advance via Airbloc Main Data Network. This principle is based on Airbloc's belief that untraceable and/or non-transparent data by a user cannot be sold in Airbloc Main Marketplace.

2 **Revenue Distribution**

Publishers must distribute revenue from data sales to users. Users can see the distribution ratio at the Airbloc Main Client Service and may at any time prohibit the data surrogate sales.

Control over Personal Data

3 All data collected through Airbloc Main Data Network can be viewed at the Airbloc Main Client Service. In addition, on Airbloc Main Data Network, you can prohibit the sale of collected data or the surrogate sales of data of that service, or limit the data sales rights through a third party at its source.

Through Airbloc Main Data Network, greater amount of data can be traded on the Airbloc Main Marketplace by overcoming the limits of first-party data centric client applications that are usually not scalable. Furthermore, the companies that have only monetized with advertising will be now be able to monetize with legitimate data surrogate sales. Airbloc will continuously commit itself to expand and vigorate the ecosystem through Airbloc Main Data Network, even after Airbloc Main Client Service has successfully settled in.

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One problem that arise from data transaction is that reliability cannot be mutually guaranteed between trading parties. To a data consumer, the data being traded and target of transaction cannot be trusted. At the same time, a data provider cannot trust the buyer as he or she sells data. As such, problems with data reliability and reliability with trading partners exist. To solve this, Airbloc Network addresses the problem with the following methods.

Unique Identifier-based Data Escrow

In data transactions, there is a problem that buyers cannot trust the seller's data. This is because the seller may provide inaccessible or invalid data. In particular, since Airbloc Network mainly deals with the trade of data from unspecified and private data providers rather than a certain company or consortium, reliability can be questioned. Therefore, we have implemented a safe data escrow process which can ensure reliability to our data consumers.

Airbloc Network progresses trusted escrow transactions through an unique identifier-based data escrows. An unique identifier-based escrow is a data structure where all unique identifiers to data are deleted before data is delivered, so that the data consumer can check the contents before transaction. It is based on the premise that data with no user-level unique identifier (UUID), which cannot track a particular unidentified user, is simply valueless.

1. The data provider uploads the rest of the data to the storage except for the unique identifier information.
2. The data provider sends the access key for the data to the data consumer.
3. The data consumer reviews contents directly and decide whether to buy the data.
4. If a purchase is decided, the data provider sends the remaining unique identifier information and the data consumer enters an escrow transaction to pay for data value. If you decide not to purchase, the data will be discarded from storage.

Because the data consumer can preview data contents to determine a purchase and even when data contents are disclosed, the data provider does not provide unique identifier information until the transaction is concluded. Therefore, even if the data consumer knows the data contents, they can not guess or track data provider.

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Credit Rating System

If the data escrow guarantees the reliability of the data, our Credit Rating System ensures the reliability between the transaction parties.

Airbloc Network implements a Credit Rating System to quantitatively determine the credibility among data transaction parties. Each Network participant (node) will be given a credit rating so that other participants to the Network can use it as a quantitative indicator to assess participants' credibility.

Basically, the credit is a sum of your credit score and attribution. When a credit rating score is requested by each transaction entity, the credit evaluator node determines the creditworthiness of the subject and appropriately rates the score. The attribution is awarded by Airbloc Network as a measurement to entity's contribution to the network, depending on their role and depth in activities.

First and foremost, Airbloc Network does not sell nor use interests data that falls short of the credit rating (Cliff Credibility). In addition, Airbloc lowers profitability of users with a low credit score by decreasing the amount of data they can sell, and encourages them to actively make efforts to improve their credit score.

On the other hand, users with a minimum credit score will receive more compensation as their credit score increases. Under these conditions, users will be motivated to increase their credit level voluntarily.

Attribution Rate

Attribution Rate is a measurement to see how well each participant contributes to the Network in their corresponding roles. Unlike the credit rating score, it is an objective indicator given by Airbloc Network which rules out any subjective judgments by an individual subject. It is a more general measurement to be applied to all Airbloc Network participants.

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The criteria for attribution determination for each participant is as follows. With a higher satisfaction of each criteria, a higher Attribution Rate will be given.

Common Criteria

—Degree of Holding Reward (ABL) received from Network

—Degree of Holding AGT (ABL Genesis Token)

—Degree of Holding Network Penalty (more penalty means a lower Attribution Rate)

Data Provider

—Degree of data provision

Data Consumer

—Degree of Campaign Execution

—Degree of Data Transaction

Storage Node

—Degree of Data Availability

—Degree of Data Capacity

—Node Retention Time

Credit Evaluator Node

Detailed data and complex evaluation and validation procedures are required to assess each transaction entity's reliability. However, this cannot be completed by Airbloc Network alone because it is subject to questions of interpretation and credibility standards on data. Therefore, Airbloc Network keeps a participant node named Credit Evaluator, which allows a credit assessment.

The Credit Evaluator assesses the creditworthiness of the transaction entity (data provider, data consumer). For this, the Credit Evaluator may use on-chain data such as transaction history, interests, and information provided by the subject, or may request for additional submission of data to analyze the credit score ranging from 0 to 10.

The higher the level of participation from a transaction entity who gave high credit scores without penalty, the more ABL tokens the Credit Evaluator is rewarded. But for a sensible judgement, when a provider with high credit score receives a penalty, that particular Credit Evaluator Node will face a penalty where compensation will be temporarily lost for a fixed period. Since a low-accuracy rating can result in an extended penalty for the Evaluator, the Credit Evaluator Node must conduct assessment carefully.

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If anyone can be eligible for a Credit Evaluator, there is a possibility for abused use. So the following qualifications are necessary.

—Holding 200,000 ABLs and above
—Engagement Activity (above certain score limit)

Airbloc Credit Evaluator

Airbloc Network operates its own Credit Evaluator node named Airbloc Credit Evaluator. Not all transaction entities are requested for a credit evaluation from Airbloc. Nonetheless, Airbloc Credit Evaluator will offer an incomparably outstanding value to ensure reliability.

A top priority agenda to Airbloc Network would be identifying malicious users and ensuring data reliability. The more truthful you become, the greater reward you get in Airbloc.

Airbloc Credit Evaluator derives credit score based on three following factors:

1 **Request on Personal Information**
Users are asked for their personal information to evaluate credit. Some indirect information examples would be a OAuth 2.0 based third-party (e.g. social media, Github, etc.) logins, while a direct example would be the KYC. To a provider with greater information, higher credit score will be given.

2 **Response Accuracy Testing**
Users who have not attained a certain credit score will be asked to re-answer some of the questions they had previously responded during service use. Users who submit correct responses repeatedly will be given credit points, and for those failing to respond correctly will be given a lower credit score.

3 **Behavioral Data Accuracy Testing**
We will analyze user's service use and response patterns to filter users with irregular patterns. To users with irregular patterns, additional verification will be asked and their credit level will decrease along with repeated activities. A good example would be when a user displays a consistent pattern similar to a 'attendance check' like filling out huge amount of data in a very short time and immediately leaving service after submitting response to Airbloc Main Client Service. These users will be statistically assessed and filtered for the overall quality of the data set.

Even with a Credit Rating System in its place, there will still be irrational users who do not make the effort to improve their credit ratings, and malicious users attempting to trick the system with misinformation and get rewards. To maintain our core value on data reliability, Airbloc Credit

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Rating System can still use automatically collected indirect data from these malicious users which cannot be fabricated. Some examples would be the list of installed apps, and behavioral usage of specific apps.

Airbloc Credit Evaluators can close accounts of malicious users seeking unwarranted profits via automated software bots such as headless browsers and virtual devices. The danger of an automated software is that it will not stop with just one user, but it can propagate itself to others and destroy large-scale ecosystem. Thus these users will be dealt with no tolerance.

From the viewpoint of service usability at Airbloc Network, statistical techniques such as Conjoint Analysis, consumer behavioral techniques such as Gamification, and behavioral economics techniques such as Nudge will be continuously studied to encourage truthful user activities.

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A total sum of 220 million Airbloc tokens will be issued and will not be newly issued after the genesis creation and distribution. The 55% of the total token volume will be distributed to 120 million units, through private sale, pre-sales and ICO. More information about token sales and distribution will be posted on Airbloc Network website.

The remaining 45%, 100 million tokens from sales distribution, are paid as a bonus for investors participating in private sales, pre-sale, and are used as incentives and community incentives for ecosystem resources and advisors.

The raised funding from token sales will be used to successfully operate project as follows:

1 **Ecosystem Development and Maintenance Operation: Total of 45%**

- —Open Source Protocol (DAPP) Development 20%
- —Service Operation and Maintenance 10%
- —Development of Standardized Client SDK 10%
- —Development of Standardized Advertising Data Schema 5%

2 **Development related to Airbloc Main Marketplace and Main Client Service : Total of 55%**

- —Investment for Early Stage Growth (Compensation to the end-users) 10%
- —Airbloc Main Marketplace and Main Client Service Development 20%
- —Service Operation 10%
- —Data Science R&D 5%
- —Legal Research 5%
- —Enhancing Security 5%

Airbloc Legal Research includes not only the legal review of Airbloc systems, but also the costs of researching personal information protection for a public purpose. Airbloc's legal review will be conducted in respective countries with a focus on restoring individual user control over data.

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Early Stage Growth Scenario of Airbloc Main Marketplace

Airbloc Main Marketplace will driven by data providers. The ab180 corporation will participate in the market as a data consumer, not as a centralized entity but as a separate non-profit entity which constructs the DAPP and Airbloc Network.

During this time, the ab180 corporation will use some of the initial funding (up to 10%) from token sales to encourage individual users to provide data.

Then, through various steps as shown below, Airbloc Network will show a virtuous circle in Marketplace.

1 To obtain interests data in the early stage, the ab180 corporation pays rewards to the data provider (hereinafter "user") and the data consumer (the "advertiser") and collects a large amount of interests data in advance. At this time, the ab180 corporation predicts the advertisers' demand, and collects the data with high expected demand. The collected data will be either stored in the centralized database or truncated permanently. Event and data collected from cron jobs that can be indirectly gathered from a user is automatically collected without compensation. But when sold to an actual advertiser later, rewards will be given to that user.

2 When sufficient amount of data is collected, advertisers start to pay for compensation and purchase data, basically forming a market where the demand and supply is met.

3 Once data sales begin, some highly demanded data may continue to be sold, and while some data may not be sold well due to low demand. In accordance with Airbloc Network's frequency capping and depreciation algorithm, the supply of personal data will be limited. Then 'price' will be set, and for 'goods' that are traded in the Marketplace, some data will be priced at a high price due to excess demand while some are priced low due to oversupply. As the participating player to transactions, users and advertisers will naturally learn to tell which data of value and continue to be reflect data's value in terms of price.

4 The greater the amount of data a user provides, the higher the value, and the better it sells. Therefore, the user is motivated to provides more data aggressively to increase his or her revenue.

5 With more data provided, enhanced virtuous circle for advertisers will be reached.

As such, the ab180 corporation will continue its contribution towards early stage settlement of the ecosystem as one of the data consumers without a centralized system. Once the ecosystem establishes, the demand and supply will coordinate with each other to create a virtuous cycle structure.

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The Roadmap

Airbloc Network will achieve its roadmap of transparent transactions and personal rights restoration in a perfectly competitive data and ad exposure market, within an incomparably short period of time than any other service. To this end, our footsteps and roads ahead are as follows:

November, 2015

Establishment of a Search Engine Company
- Where our Research Journey on Big Data Started

ab180 was founded in 2015. In the beginning, ab180 started its business as an in-app contents search engine, using the App Indexing technology which enabled automatic collection of in-app contents which made them searchable on major search engines.

July, 2016

Changed Orientation towards an Ad-Tech Company
- The Beginning of Massive Data Collection

At the request of customers, ab180 switched its service orientation from search engine to analytics to analyze mobile campaign performance (aka. attribution analysis). Since then, we have begun to collect massive data with mobile and web SDKs and offer useful web and mobile app data for our advertisers.

June, 2017

A People-based Analytics and R&D for Technology

Towards a people-based analytics, which is the future of advertising performance analysis and targeting, we began an integrated collection of user-focused data via web, mobile app, and offline data through cross-device and cross-platform identity matching technologies.

October, 2017

New Business Development on DMP and Blockchain

ab180 forecasted that the traditionally centralized DMP would have its limit to activate data trading due to differing individual privacy laws and companies' poor participation in each country. We also reached to the conclusion that in existing DMP, personal data infringement is inevitable. Hence we was convinced that a direct data marketplace (P2P and/or P2B) would be the only viable solution and this development will be facilitated with the advent of blockchain technology and as an alternative to innovate the market. Therefore, we started developing 'Airbloc Network', a blockchain-based data marketplace.

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March, 2018

Publication of White Paper and Pre-Sale of DMP Token

Airbloc White Paper will be published to share concepts and roadmaps with the public. During this period, pre-sale will be conducted for users for the first time, for those who have signed-up through a pre-recruitment.

June, 2018

Release of Airbloc Network Test Net

A test network of Airbloc Network will be released, which operates on Ethereum. This test network will be testing Network's reliability to the ecosystem which will be released with the full version. It also tests the basic providing and consuming logic and escrow systems as well as reliability of credit evaluation systems, data breach prevention, and data integrity.

July, 2018

Release of Airbloc Main Marketplace and Airbloc Main Client Service (Alpha version)

By using DAPP in Airbloc Network, the simplest exchange form of data transaction as well as the simplest form of data provision and monetization will be enabled via release of Airbloc Main Marketplace and Airbloc Main Client Service alpha version.

September, 2018

Launch of Airbridge Main Network Beta Version

With the release of the simplest data network, individual users can sell data through third-party surrogate services as well as Airbloc Main Client Service.

October, 2018

Launch of Ad Exposure Deals on Airbloc Network

Not only individual user's interests data, but also ad exposure will also be adjusted to the personal preference and configuring types of ads to view and not to view. Also, through the Airbloc Main Client Service advertisement placement or a decentralized third-party advertisement, additional revenues can be earned.

December, 2018

Release of Airbloc Network V1.0

Official version of DAPP V1.0 will be released, reflecting the trials and errors from system's initial version. Furthermore, the test network will start a live operation.

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ab180, Team Built with Solid Technology

ab180 is a team with rich expertise in digital advertising. With ab180's accumulated standardized data and technology, we are confident that Airbloc project will be accomplished with success.

Inside ab180, there is a 'technology-centric culture'. Our team of developers are composed of 14 software engineers from Software Maestro, Google, Naver, and WeMakePrice, who have rich experience in both data engineering as well as blockchain-based projects. At ab180, even our visual designers can code simple front-ends and make publishing themselves, while all other operation managers can write SQL queries and Spark logics, allowing an efficient operation of product development.

With this technology-centric culture, we have been servicing mobile app advertising analytics tool named Airbridge (airbridge.io), tracking over a cumulative total of 40 million devices and above over the last 1.5 years, and currently tracking approximately 13 million devices real time per month. We have worked closely with many advertisers, agencies, and media representatives and have experienced a strong demand for personalized interests data from the advertisers.

We know it by heart, what data is needed for an effective ad execution. And based on our data pipeline cycle constructed for data collection, mining, and analysis, we do not have to learn the basics of digital advertising industry from scratch to create a new standard. This is precisely where ab180's confidence lies at, that we will be faster than anyone.

Our journey starts with a sincere question on the digital advertising market.

How can companies legally use of user interests data without violating privacy laws?

Why is that individual users' data are not appropriately compensated?

How can I make more my ads more effective, with higher ROIs?

To answer these questions, we have chosen the blockchain technology as a solution. Team ab180 will sincerely commit ourselves to the project with a care for the blockchain technology and its ecosystem.

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Industry-leading Expert Mentor Group

Mr. Louis Jinhwa Kim (Co-founder/Board of Director, The Blockchain Association)

The advertising market continues to democratize itself. This is applied to data market as well. Airbloc Network is located at the intersection to the two.

Innovative services change the the rules of the world at once. Only a few can be successful. However, most of the successful services can put a trigger on established rules. This trigger can only come from a giant's shoulder, not toes.

The Airbloc Network carries the potential to grow into a service that can democratize the advertising and data markets through ICO, a democratization of the capital market. Indeed, the blockchain technology has many limitations and challenges to overcome. I am pleased to join the team with Airbloc Network for its ongoing monumental experiment.

Background

(Current) Co-founder/Board of Director, The Blockchain Association
Co-founder/Director, Korbit Inc.
Director, Tide Institute
Financial Informatization Award, Bank of Korea (2016)
Delegate of Republic of Korea, UN Conference on Environment and Development (2012)
Author of first bitcoin book in Korea, <Next Money, Bitcoin> (2013)

Mr. Sean Lee (Digital Transformation Strategist and Investor)

The Airbloc Network transforms individual users from passive objects to active subjects in the advertising market. This user-led data market will not only overcome market's structural limitations, but also will maximize the value of the data.

Having witnessed ab180's past journey closely, I am confident that this blueprint will surely turn into a reality. They have proven themselves by solving various problems in the advertising market through focusing on the essence, technological power and strikingly strong execution power. We are looking forward to seeing how the Airbloc Network, accompanied by Team ab180's competence and passion, will transform the existing advertising market.

Background

(Current) Director, Corporate VC, GS Shop
Board of (External) Director for Dano, Spoqa, Buzzni, and HelloMarket
(Former) Boston Consulting Group, SK Telecom
Graduated from INSEAD, Yonsei University

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Mr. Seo Wooseok, Data-driven Technical Entrepreneur & Growth Hacker

Airbloc Network, with its transparent, reliable, and indefinite scalability based on blockchain, will innovate the market just like the changes brought by Internet to the world. The Airbloc Network will return value and indefinitely leverage personal information within a controlled domain. It will become a broader platform for all Ad tech, CRM, data marketplace, and many other. I am very pleased to be able to help Airbloc Network become an indefinite growth platform towards a constant communication with the world.

Background (Current) Adjunct Professor, Kyunghee University
(Former) CTO, DeliveryHero (Yogiyo / Baedaltong)
M.A. from KAIST (Korea Advanced Institute of Science and Technology)

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The Airbloc Network Bill of Rights lays out our philosophy on how to improve data rights of individual user and ad exposure on our ecosystem. This philosophy will serve as a compass to orient directions of Airbloc ecosystem.

Bill of Rights on Personal Data

Airbloc Network allows users to regain their rights over personal data and data monetization. Our definition of Rights on Personal Data is as below:

1 **Rights to know about collected data: What types of data were collected?**

2 **Rights to use collected data with freedom: How to sell the data?**

3 **Rights to monetize collected data: If agreed to sell data, to whom and for how much?**

All users must be granted the right to get accurate diagnosis and confirmation access to the types of data collected from themselves, for both structured or unstructured data. Nowadays, increased scope of data are collected, including personal digital behavioral information and location, stretching far beyond basic and static personal (e.g. email, phone number, address) information. Therefore, users must be able to get a thorough diagnosis and access details on indirect data used for machine learning, deep learning, and technologies that could be otherwise used for prediction, recommendation, and categorization.

The collected data in this way should allow users to freely decide whether to keep his data on his own or to give it to another entity.

Finally, users must have the right to get shared revenue from the data use and get most of compensation from their data sales revenue.

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Bill of Private Ad Exposure Rights

Airbloc Network allows users to regain their ownership over user interest data and rights to enjoy "freedom of opinion". To this end, Airbloc defines Rights on Personal Ad Exposure as below:

1 **Rights to limit content and/or format of unwanted ads: What are the types of undesired ads to be viewed?**

2 **Rights to give feedback over contents and formats of wanted ads: What are the types of desired ads and what do I think of it?**

3 **Rights to monetize my attention exchanged for ads with freedom: If I were to sell my interests data, to whom and for how much would I sell?**

We believe that user's opinion and freedom must be respected at all times. In particular, both "Negative Freedom" and "Positive Freedom" should be respected, two of which are the attributes to the notion of freedom. In today's world, the most infringed type of Negative Freedom would be the exposure to unwanted ads. Targeted ads towards an inferior complex on particular part of body, specific fact of my daily life, disinteresting ads with different thoughts, repeated ads that are displayed regardless of my purchasing willingness are the kind of unpleasant ads which must be restricted.

In terms of Positive Freedom, users should be allowed to view ads that they wish to see. Even for discount offers, there will be customers hoping for a fast-food offer, while others want a discount coupon for a flight reservation. Not only that, users must be able to comment directly to advertisers. In the current setting, banner ads rarely collect feedback from users for future postings. Such behavior is close to a "Fire-and-Forget". Being able to deliver user comments to advertisers as a potential customer is crucial to protect user freedom of expression from the threats.

Lastly, in a similar way to data selling, users should receive a proportionate reward to the interests they provide. This way, users can be compensated for the type of 'liked' ads as they configured to the system.

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Airbloc Ecosystem

Airbloc Ecosystem is a collective term for advertising data trading ecosystem built around Airbloc Network. Data providers and data consumers trade data or ad exposures through various exchanges, and within this ecosystem, data providers can monetize their personal data using multiple client services.

→ Airbloc Blockchain Network + DAPP on Airbloc Blockchain Network + Many client applications using the DAPP interface (including Airbloc Main Marketplace and Main Client Service)

Airbloc Network

Airbloc Network is the main DAPP that provides the advertising data transaction protocol and interface that is based on the Ethereum, where its own blockchain network and EVM of the nodes belongs to. It is managed by the Airbloc Foundation, a non-profit body and an open source community. In terms of its architecture, it contains a dual layer of Service Layer and Core Layer and generally provides the core logic to this project. It is a similar concept to the backend that provides a DB + API in a traditionally centralized system.

→ Airbloc Blockchain Network + DAPP on Airbloc Blockchain Network

Airbloc Main Marketplace, Airbloc Main Client Service, and Airbloc Main Data Network

These are ab180's very first commercialized service managed by ab180 corporation using Airbloc Network. Users and business entities trade and monetize their data through Main Marketplace, and users directly monetize their data and manage revenues from their Main Client Service. In Main Data Network, a large number of data networks allow businesses to sell data collected from general customers.

Airbloc Main Marketplace : for data consumer (mainly businesses entities)

Airbloc Main Client Service : for data provider (mainly individual users)

Airbloc Main Data Network : for data provider (surrogate sellers, mainly businesses entities)

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