SENNO

Cross Platform User Data Unification

Senno.io

Senno is an open, smart contract based, unified customer data platform, which will allow individuals to optimally monetize and control their private information while providing accurate, GDPR compliant, low cost refined data for any industry.

The Senno protocol will disrupt the personal data industry by placing the user in the top of the value chain generated from the use of his private data.

Introduction

In the ocean ecosystem, plankton is the raw material that fuels an entire food chain. These tiny organisms on their own aren't that remarkable, but en masse, they have a huge impact on the world.
Here on dry land, the massive volume of content and meta data we produce fuels a marketing research industry that is worth yearly $250 billion. Every instant message, page click, and step you take now produces a data point that can be used to build a detailed profile of who you are.

Today, the steady march of technological advancement has created a vast data collection empire that measures every aspect of your digital life and, increasingly, your offline life as well. Facebook alone uses nearly one hundred data points to target ads to you – everything from your marital status to whether you've been on vacation lately or not. Telecoms have access to extremely detailed information on your location. Apple has biometric data and Amazon knows your buying habits.

While web trackers and companies like Apple and Google are collecting a lot of personal and behavioral data, it's the whales of the data ecosystem – data brokers – who are creating increasingly detailed profiles on almost everyone.

The goal of data brokers is to siphon up as much personal data as possible and apply it to profiles. This data comes from a wide variety of sources. Your purchases, financial history, internet activity, and even psychographic attributes are mixed with information from public records to create a robust dossier. Digital profiles are then sorted into one of thousands of categories to help optimize advertising efforts.

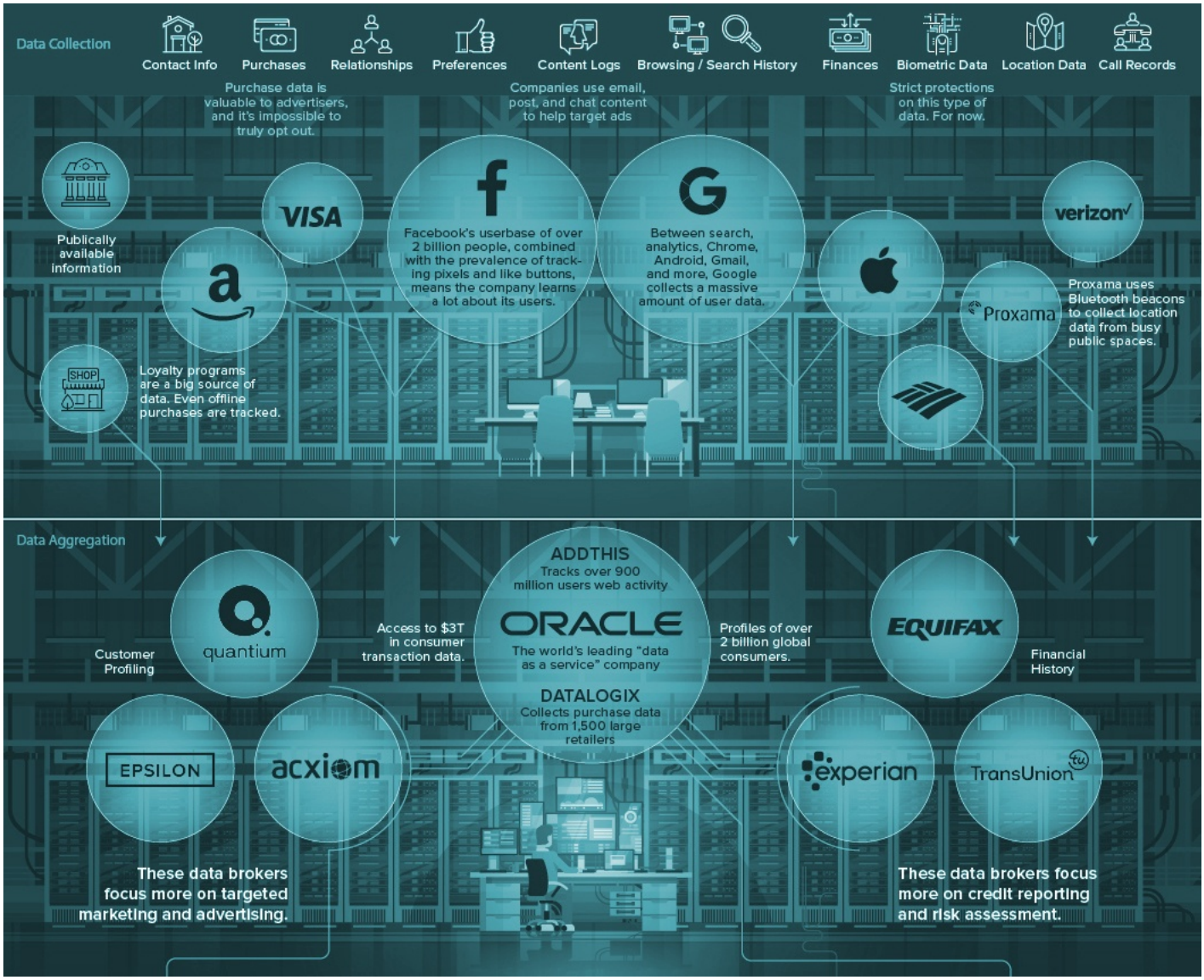
According to Pew Research[1], 91% of Americans "agree" or "strongly agree" that people have lost control over how personal information is collected and used.

Though optimizing click troughs is a big business, companies are increasingly moving beyond advertising to extract value from their growing data pipeline. Amalgamated data is increasingly being viewed as a clever way to assess risk in the decision-making process (e.g. hiring, insurance, loan or housing applications), and the stakes for consumers are going up in the process.

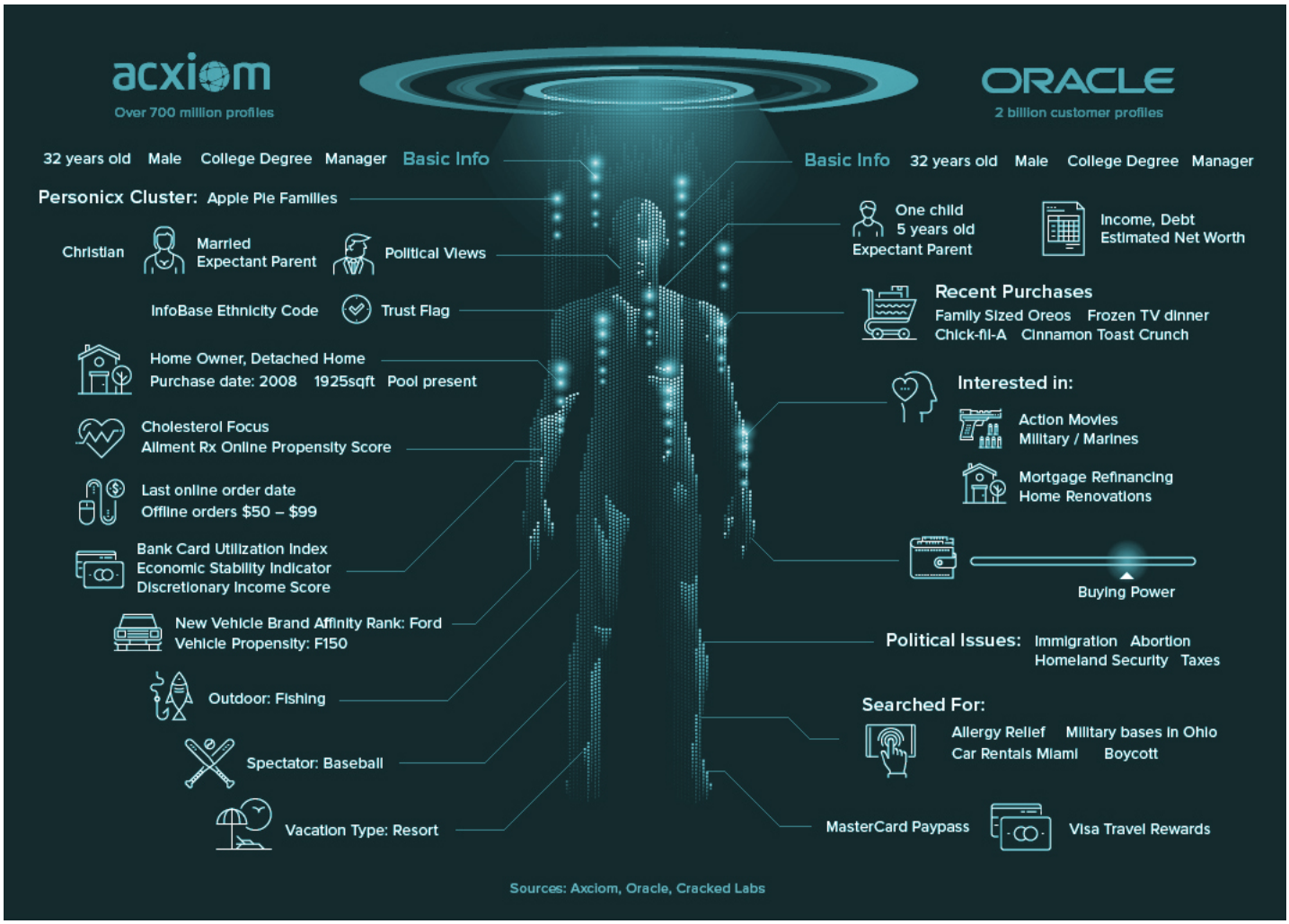
This leads to a reality in which companies are in constant unsuccessful pursuit after refined user data while users are unwilling and un-incentivized to provide it.
In 2017, the US digital advertising industry alone, represented 83$ Billion USD in revenue – non of which was shared with the users that actually own the data.

[1] *January 2018 Core Trends Survey (PDF)*

The Personal Data Ecosystem



What They Know?



The need

There are significant market failures in the personal data industry today:

For Consumers

- Lack of Transparency – Users have no clear view of the usage of their private data. In many cases companies are working behind a veil of secrecy and data is being sold \ transferred to 3rd parties while the user is unaware to its whereabouts and usage. In other cases data is being used to create customer profiles for the purpose of targeting the user with tailored ads and products.

- Lack of Control – Users lack the ability to control which of the different personal data fields are being collected and used by the data companies. Users often find themselves forced to provide much more information than the minimum needed to access a feature or app.

- Lack of Incentives – Providing personal data today is only rewarded with a better used experience (e.g 'one click login') , many users avoid connecting their social profiles and other data sources due to the lack of a adequate financial incentive.

For Advertisers

- No quality assurance – Since data is being collected behind the scenes using latent technics there is no validation of accuracy and no way for the advertisers to verify the data

- Shortage of quantity - The world is becoming more connected and the industry if facing ever growing demand of consumer data as more and more companies understand the necessity of using customer data in order to create the most relevant product and services and precisely optimize their marketing campaigns.

- Violation of privacy – By using un-validated and in many cases unapproved customer data companies can find themselves in violation of consumer data privacy that may result in legal charges.

The solution

A new paradigm for monetizing personal data:

For Consumers

- Data sharing requests, transactions and information are kept on the Blockchain in a clear and transparent way, users have full control on every piece of their personal information and can decide to turn off sharing in a click of a button.

- Customers are financially incentivized to share their personal data, incentives can be different for each new data source connected to the system, and can be implemented in the form of a single payment or an ongoing revenue share.

For Advertisers

- Costumer are sharing their data knowingly and directly which results in higher level of authenticity and holds no privacy violation risks , Senno's ID Chain connects all customer ID's into a single data immutable map.

- Costumer rewards will be paid automatically each time their data is being used by advertisers and data collectors, Such incentives are bound to change costumer's motivation and willingness to share data and will provide advertisers with the data supply needed to answer the industry's demand.

How it Works?

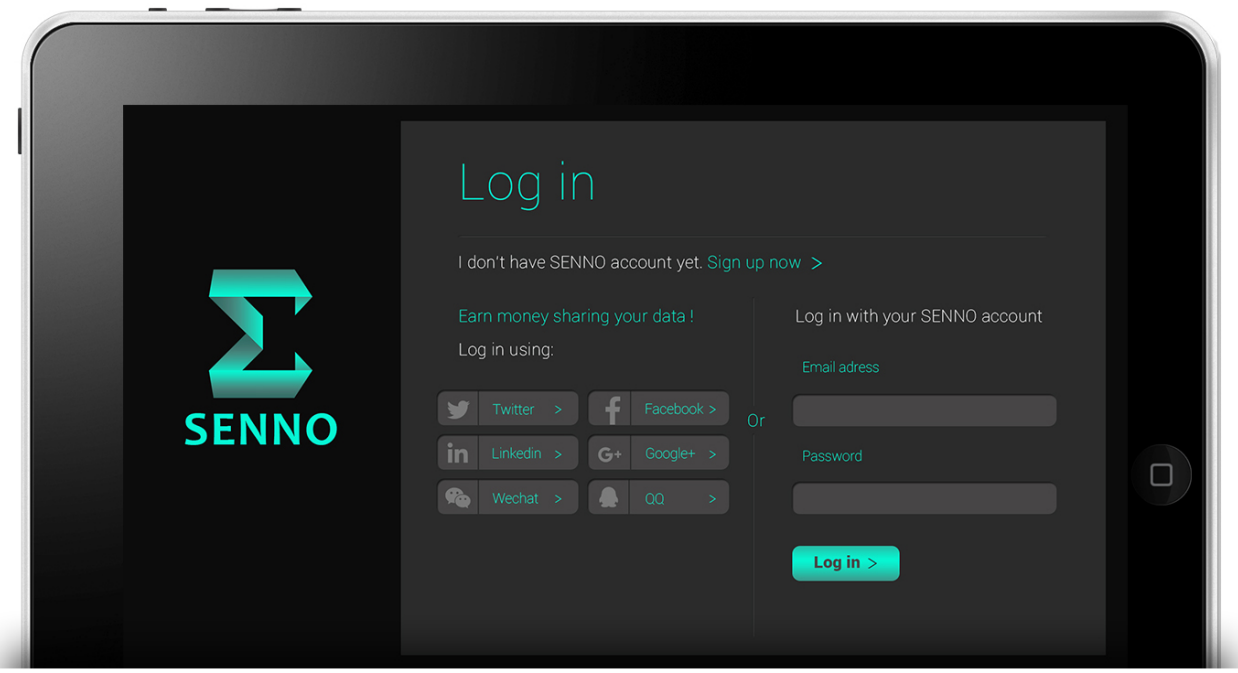
In order to collect information and build rich user profiles combined from different sources of data Senno has developed a unique login module which offers convenience and flexibility to the end user while allowing businesses to create a seamless and secured digital “handshake” with their audience. The login module offers dynamically configured incentives for the end users to preform one click login using their existing social \ blockchain digital ID accounts, which in turn pulls the user’s information from the external account and compensate him according to the configures settings.

Creating a cross platform customer ID

For the purpose of unifying different sources of data, Senno has created a cross platform customer identifier which will aggregate the customer different ID’s from both blockchain and traditional data systems.

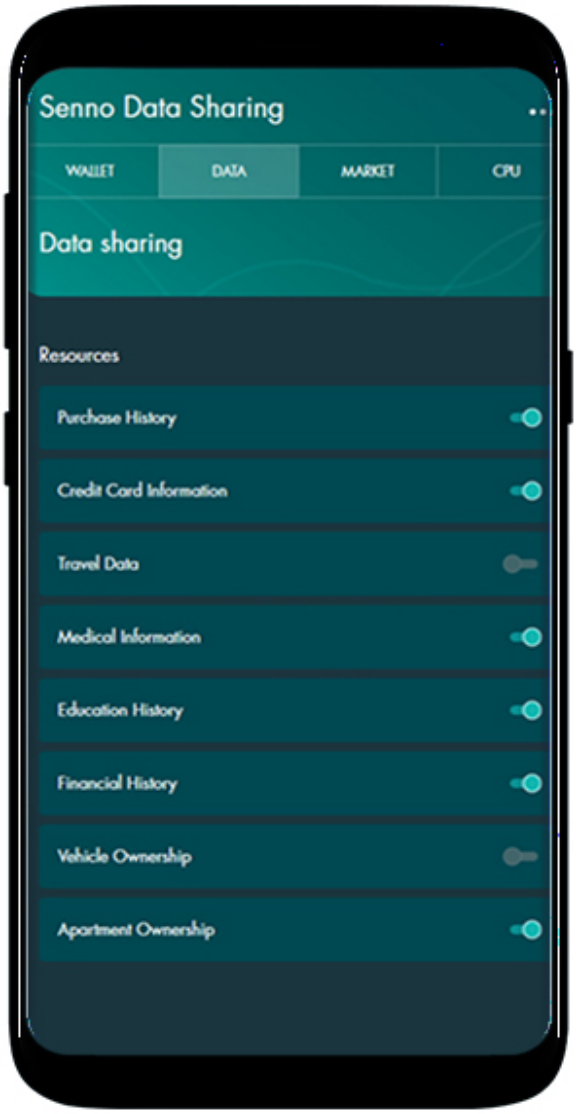
A. Login Module

Senno will provide its clients and business partners with a custom login screen that supports both traditional login as well as login using various social networks and blockchain ID’s, every login made through a 3rd party module will add the 3rd party ID as a link in customer chain of identities and will trigger a data collection task in Senno’s control network.



B. Controlling Private Data[1]

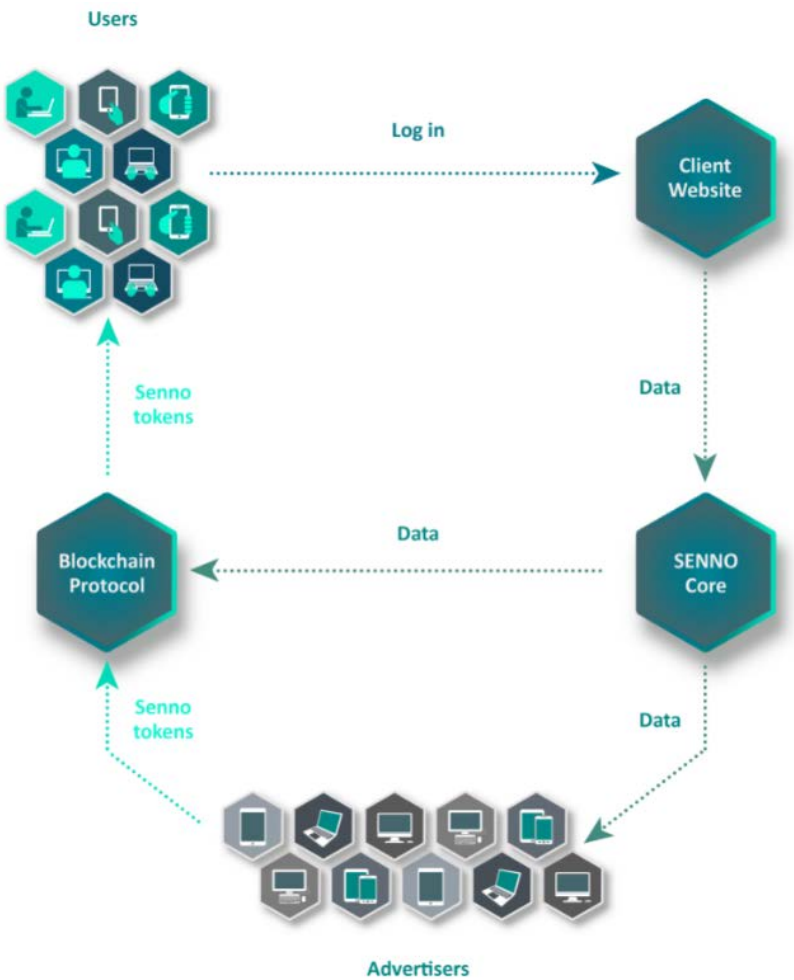
In addition to the login module the costumers will be presented with a data sharing module that will allow them to connect additional data sources that may not have a dedicated login module but contain valuable data for the organizations choosing to use them, such data sources can be credit card history, financial and medical information as well as ownership information. Similar to the login module, the data sharing module includes a dynamic incentive mechanism that is used to compensate the user for the data he adds to the system.



[1] *https://client.senno.info*

C. Advertiser interface

In order to acquire user data, advertisers will be presented with an interface which will allow data retrieval using a wide range of selected filters such as geo location, age, gender, interests, expenses and more. The interface includes an API [1] and a web based module that allows advertisers to acquire user data and manage their account.
For each data retrieval, the interface will check the advertiser's Senno account to insure sufficient balance for the transaction, charge his account and distribute the revenue between the users who owns the retrieved data.



Senno Network usage flow

[1] *For more information refer to the (Senno Protocol Technical WP)*

D. GDPR compliance

The Senno protocol was designed to stand in all GDPR regulation and ensures that following guidelines of the General Data Protection Regulation are fulfilled:

- The consumer owns the personal data and has full control over it.
The right to rectification (art. 16) consumers should be able to update and complete their personal data. The right to be forgotten (art. 17) consumers have the right to request erasure their personal data.

- Personal data never leaves the consumer in an unencrypted format and only the consumer holds the key to decrypt it.
Processing of personal data has to ensure a high level of security (art. 32) including: encryption, confidentiality, integrity, availability and resilience of processing systems and services.

- Personal data can only be transferred to a company with the consumer´s consent. In addition to that the consumer knows exactly who gets the data and for what purpose.
The right of access (art. 15) gives consumers the right to get access to their personal data. Additionally, users have the right to know how and by whom their personal data is being processed (art. 13, 14).

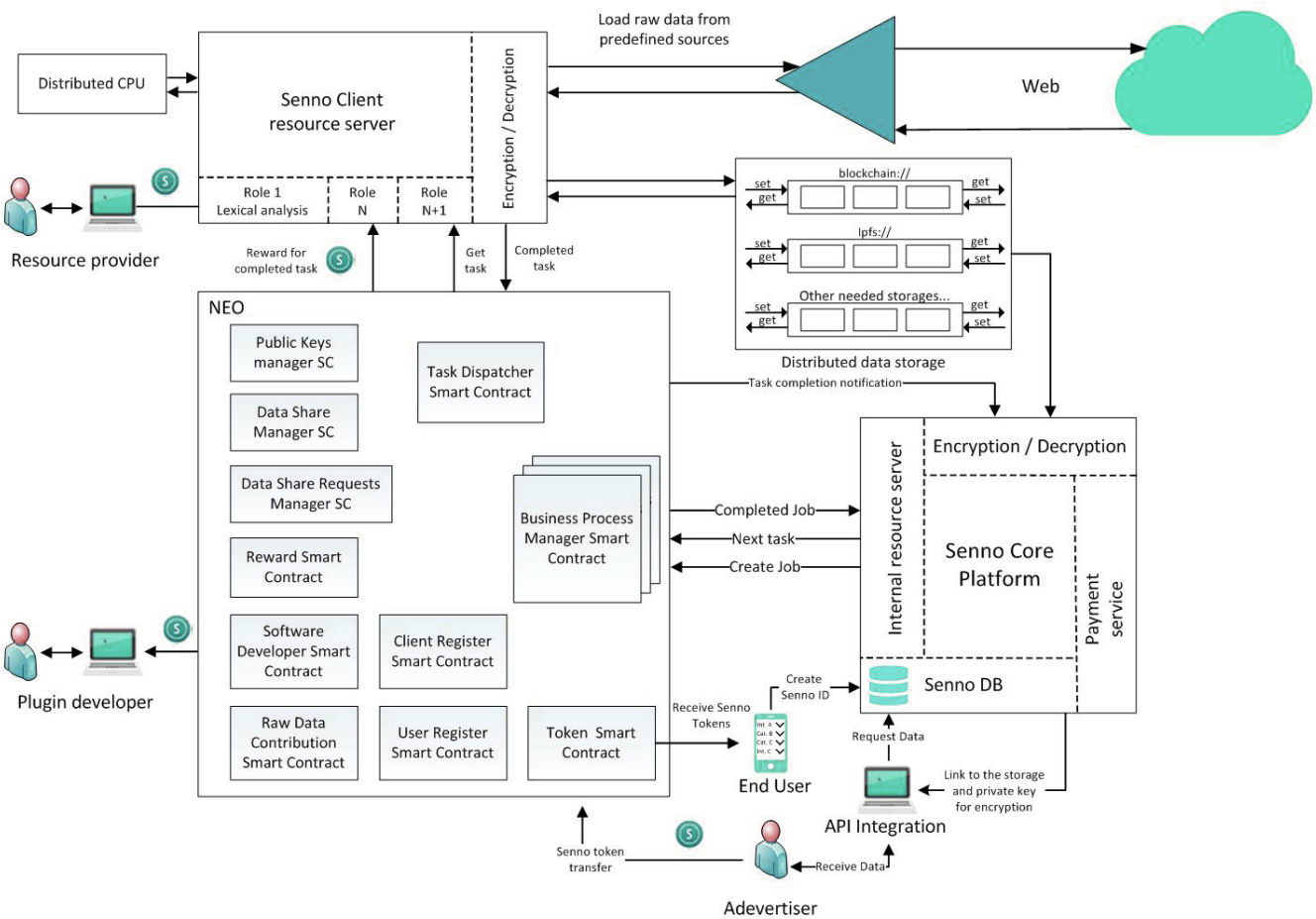
- The trading of personal data is fully transparent and traceable on the blockchain whereby the anonymity of the trading parties is completely protected.
art. 25 requires that privacy settings must be set at a high level by "default".

Architecture Overview

Senno architecture was designed to efficiently allow collection, control, decentralized storage and distribution of personal data and to oversee the integrity of this data using blockchain smart contracts. The heart of Senno is the Senno Protocol which manages the collection of customer digital ID's ("idChain") and store personal information on a distributed data storage. The on-chain smart contracts of the protocol are executed on the NEO blockchain.

Addon services layer - Contains the business logic and in charge of the AI match making and production of insights based on the user's complete data map. The services layer consists of the Senno Client and Senno Core.

Blockchain protocol layer - handles transaction verification, payments, permission management and decentralized storage. For detailed information see [Senno Protocol].



Senno network architecture

Components Description

The Senno Core

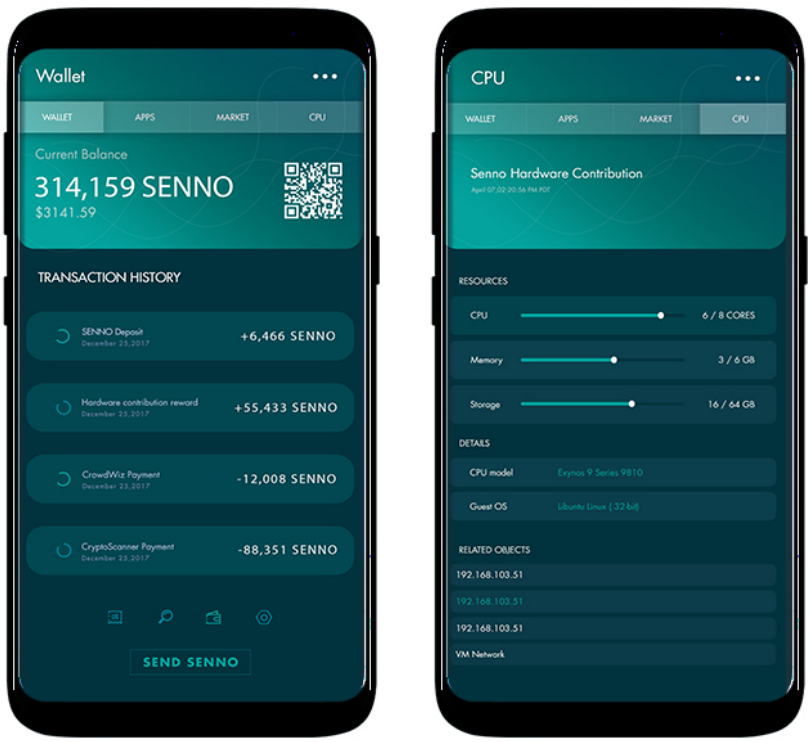
- Holds the business logic of the Senno network
- Handles the communication with external entities (costumer websites)
- Verifies balances and service payments with the blockchain.
- Communicating with the Senno Client to manage distributed hardware resources.
- Handles encryption and saving (to DDS) of data coming after a user successful login

Data listeners

- Acting as a pluggable service architecture, allowing to add, change and update data providers.
- Enables retrieval of data from centralized and decentralized sources based on user provided credentials. [1]

The Senno Client

- Executes tasks received from the Senno Control network.
- Validates contribution against the distributed hardware and control network.
- Constructs the services layer analysis result and sends it to the core
- Wallet for holding and transferring NEP-5 based SENNO tokens
- Manages the data received from the listeners. The data is divided into small chunks and saved into the DDS.



Senno Client

[1] *https://client.senno.info*

NEO Blockchain – Control Network [1]

Senno control network was created to manage various business tasks (data share permissions, public keys management, client & user registration, contribution rewards and business process management). Depending on the settings the network can perform one dedicated role (e.g. permissions update) or several roles simultaneously (e.g. user registration \ confirm reward).

Distributed Data Storage [2]

Senno Distributed Data Storage (DDS) was created in order to establish the important values of privacy and freedom of Information; it is managed by a network of data storage nodes which stores the data generated by platform tasks in distributed and fault tolerant way, thus providing immutability and high availability. It's suitable for big volumes of data exchange between the platform nodes.

[1,2] *For more information refer to the (Senno Protocol Technical WP)*

The 4 Pillar Protocol

Pillar #1 - Contributions rewarding system

30% of the SENNO token supply will be locked in smart contracts and used for contribution rewarding.

- **Distributed Hardware**
  Members will be able to contribute their hardware resources through the Senno DDS system in reward for Senno tokens.

- **Accessing private Data**
  Users who provide access to their private data will be rewarded with Senno tokens. This will open the door for highly valued data which is not accessible to traditional systems.

- **Development contribution**
  Community members will be able to earn SENNO tokens by developing listeners and Plugins for the system.

Pillar #2 – Cross platform Senno ID (Senno ID Chain)

The Senno ID Chain links to all user ID's gathered from Centralized and Blockchain digital ID networks In order to bind them into a chain of ID's.
Each user in the system will have his chain of IDs encapsulated under a unique Senno ID.

- **Centralized ID Networks**
  Facebook, twitter, Google+, Linkedin, QQ

- **Blockchain ID Networks**
  Systems operating using digital ID protocols, such as Neo digital ID, Ontology, Civic.

Connecting all user ID's into to a single ID chain allows Senno to create a unified data map of all user information retrievable by the provided Id's. In addition, whenever Senno encounters a login from a familiar user in one of its costumers websites it will be able to offer the user customized incentives for sharing and monetizing his personal information.

Pillar #3 – Blockchain distributed data storage (DDS)[1]

In order to allow users to control their data and grant access permissions only to chosen 3rd parties , Senno has developed a blockchain based, secure, decentralized proprietary System that is capable of handling user permission and encrypted data for consortiums (as a dedicated blockchain solution) and public network (as a smart contract based Protocol).

- **Security**

  User data will be encrypted using symmetrical AES and the keys will be encrypted using ECDiffielHellman

- **Controlled Notifications**

  The platform enables customizable notifications to participant's external systems, Data consumers will be able to dynamically respond to any change\update in the data they Are using.

- **Dynamic Access Control**

  The DDS supports multilayer access management model which enables dynamic Control of every data field, users may choose to provide access to any piece of data they wish, once user is removed from the access list he will no longer have access to new Updates.

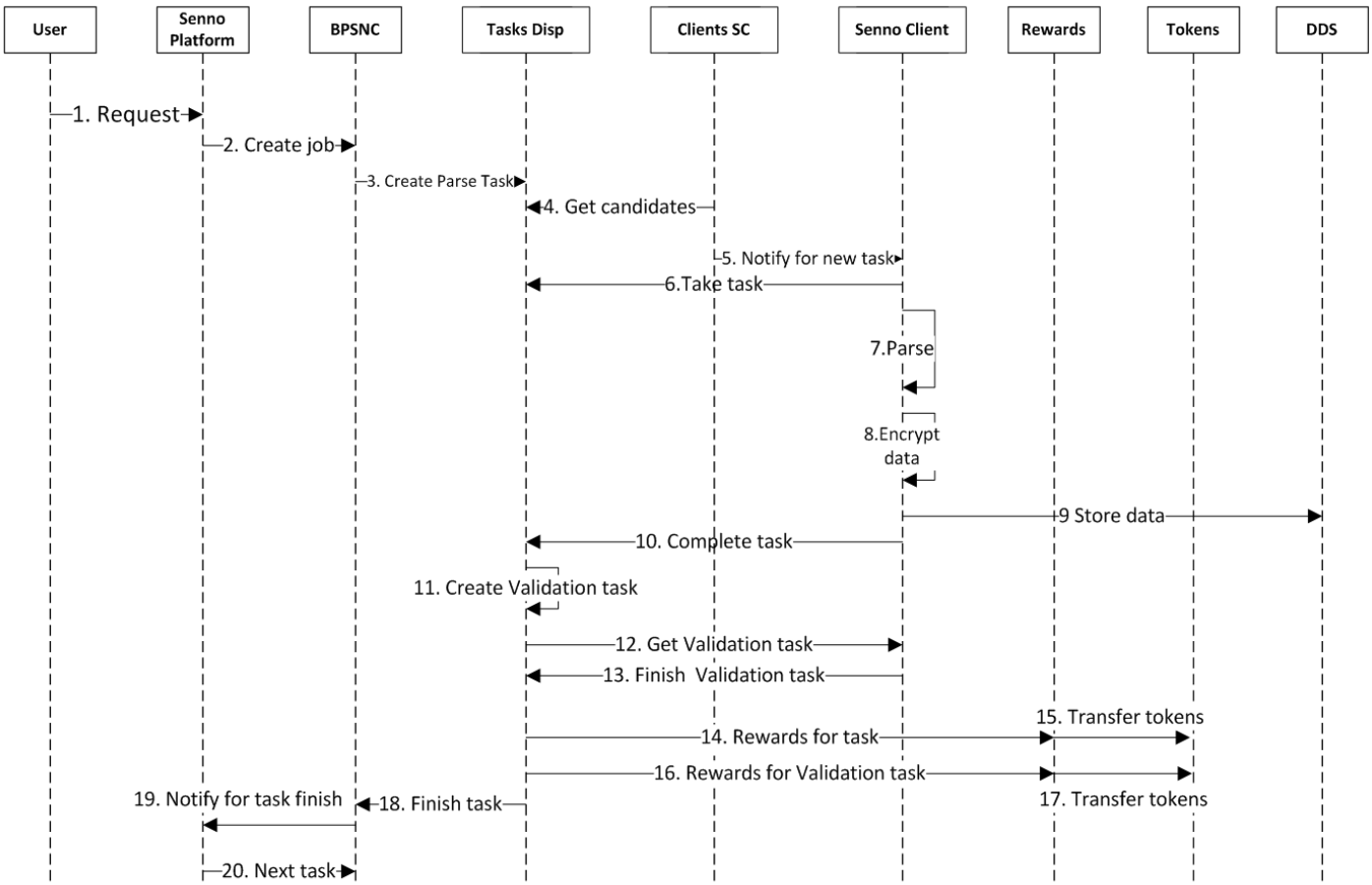
Pillar #4 – Senno Data Binding

The data unification module bridges between Offchain customer data and blockchain Data In order to create a complete user data map represents all the data that can be Retrieved by the user provided Id's.

This complete data map will enable control and monetization for every part of the data. Users will be free to control and decide exactly which parts of their data they wish to share According to the offered incentives. For example, a user can share parts of his medical History to insurance companies and get compensated for the usage of this data.

[1] *For more information refer to the (Senno Protocol Technical WP)*

Main flow sequence diagram



Senno main flow sequence diagram

Flow description

1. User logs in a client website.
2. Upon successful login, The Senno Core checks if the user has an ID chain, encrypts the data and sends a new job to the Control Network's BPM SC(Job examples: Create a new user ID chain if it does not exist or Retrieve user data if the chain already exists)
3. BPM calls task dispatcher with the user login ID to create the task.
4. If a new ID chain should be created Task dispatcher sends the task to the clients SC.
5. Senno Client gets a notification of a new task.
6. Senno Client confirms execution started.
7. Data is decrypted and parsed in the Senno client.
8. Data is encrypted in the Senno client.
9. Data is stored in the DDS.
10. Task dispatcher gets a notification of completed task starts validation.
11. Validation task is created in the Task dispatcher SC.
12. Senno Client received validation task.
13. Task completion is validated.
14. Rewards SC calculated the reward and call the Token SC for payment to the user and DDS contributor.
15. Tokens are transferred to the user and contributor.
16. Rewards SC calculate the reward for validation task.
17. Tokens are transferred to the Validating Senno client.
18. Task dispatcher SC confirms task completion to the BPM SC.
19. Completion notification is sent back to the core.

NEO –An infrastructure for the Senno Protocol

NEO smart economy is a blockchain-based project specifically designed to host smart contracts, ICOs and apps in a decentralized manner. It is open source, Turing complete and has a large community backing with professional and responsive teams. By using technologies such as P2P networking, dBFT consensus, digital certificates, superconducting transactions and cross-chain interoperability, the NEO blockchain enables management of smart assets in an efficient, safe and legally binding manner that surpasses all other blockchains. Senno has chosen the NEO blockchain for its first implementation of the control network, additional platforms may be considered at a later stage.

Why Neo[1]

Bitcoin and Ethereum have dealt with a range of security issues that have resulted in several forks of their respective blockchain platforms. This has led to a variety of workarounds to defend against spam and DDoS attacks, as well as to streamline their blockchains.

The proof-of-work algorithm requires vast amounts of energy, which limits how startups can use Ethereum's smart contracts. NEO uses a delegated Byzantine Fault Tolerance (dBFT) system instead, which is more suitable for smart contracts. Although it compromises on availability, it ensures transaction finality and can support a greater number of transactions.

Transaction finality means that when a transaction has been confirmed, it is permanently recorded and cannot be revoked. We believe that this integrity is far more important than availability when it comes to financial applications. The dBFT mechanism has proved itself to be robust, because it hasn't suffered a single crash in the time it has been operating.

Additionally:

NEO's smart contracts and Apps can be written and compiled in **C#** and **Java**. In the future, developers will also be able to write smart contracts in **Python** and **Go**. This will drastically reduce the entry barrier for all developers around the world.
NEO is quantum computer-proof. Quantum computers are believed to have the ability to break into and hack the cryptographic math on which blockchains are based. NEO indicates that they have already developed an anti-quantum cryptography mechanism called NeoQS.

- As for today, compared to Ethereum's 15 transactions per second, NEO supports up to 10,000 transactions per second, which is very energy-efficient compared with Ethereum.

[1] *Neo whitepaper (GitHub)*

Business Model & Monetization

New Paradigm for monetizing personal data:

Senno is introducing the future of personal data management and monetization, for the first time users will be able to get their share from the $250 Billion USD/year consumer data industry and control which part of their private data can be accessed or sold, while companies can create additional income by selling their customers data through the Senno network and share the revenues with their users. The Senno network supports companies running on public as well as private networks (e.g consortiums) and have two main revenue streams:

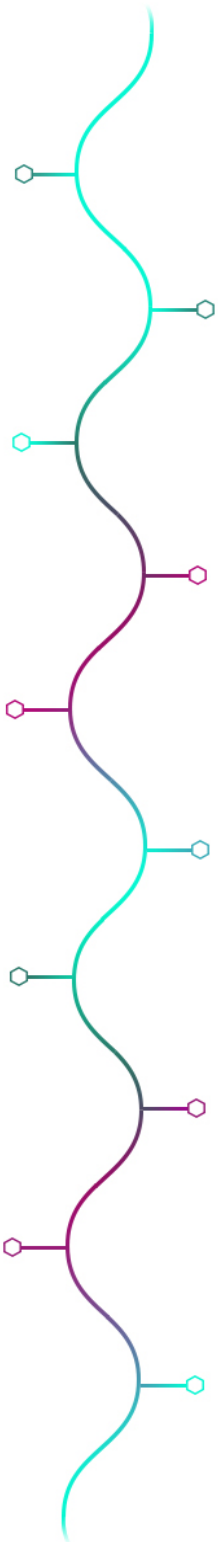
- Software as a service (SAAS) – Allowing companies to enjoy unification and management of costumers profile data while offering preferences and consent settings along with a dynamic incentive mechanism.

- Dynamic Revenue share – Senno's client websites will be able to offer their costumers a dynamic revshare for selling their personal data, revenues will be shared between Senno, the client website and its costumers.

While some companies are trying to find new ways for monetizing personal data, Only Senno offers a complete eco system starting from advanced data collection which leads transparent data control and monetization, the comparison is shown in the table below:

	Industry	Pays user for data	Collects blockchain based data	Incentivized Data Collection	GDPR Compliant	Offers Rev Share (no cost for client)	Technology
Senno	Personal Data	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	Blockchain
Acxiom	Personal Data	No	No	No	No	No	Non-blockchain
DataLogix	Personal Data	No	No	No	No	No	Non-blockchain
Login Radius	Digital ID	No	No	**Yes**	No	no	Non-blockchain
Gigya	Personal Data	No	No	**Yes**	No	no	Non-BlockChain
Vetri	Digital ID	**Yes**	No	No	**Yes**	**Yes**	Blockchain
Opiria	Data Marketplace	**Yes**	No	No	**Yes**	**Yes**	Blockchain

ROADMAP



January 2017
The birth of SENNO

April 2017
First POC approval

November 2017
Announcement

February 2018
Website and
Whitepaper release

March 2018
Crowd sale start

Q2 2018
MVP release
NEO smart contracts

Q3 2018
Crowd sale ends
CryptoScanner (alpha)

Q4 2018
Senno token listing
CryptoScanner (Beta)
Senno Protocol launch

Q1 2019
Senno Protocol (Alpha) release
SDK and API release

Q2 2019
SENNO Network launch

Our Team

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BlockChain savvy and a serial entrepreneur, Founder of LibraTrade™ Inc, A financial technologies company which developed the world's first Smartphone trading platform in 2008. Served at the elite IDF intelligence unit where he mastered his professional skills.

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Our Partners

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ORACLE Dyn
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Risk factors

Possession and use of the token is a vote of confidence in the success of the platform, as well as a means of early support. That being said, there are several risks that all participants in the token sale should be aware of.

The following are the risk factors in relation to Senno' business and the Token Sale event in particular:

- Senno is a complex software platform and its launch may be significantly delayed due to unforeseen development barriers.
- Competition may introduce different sentiment analysis solutions and cause Senno to lose market share and eventually fail to deliver on its business goals.
- International laws and regulations may render the SENNO trade impossible.
- The use of SENNO tokens may come under the scrutiny of governmental institutions.
- The ownership of SENNO tokens may fall under new and unpredictable taxation laws that will erode SENNO benefits.
- Senno may not succeed in creating the necessary momentum and acceptance for the SENNO token.

  which may result in low liquidity and depletion of trades.
- The positions and plans outlined in this white paper may be altered as the project progresses.

References

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