AMO

Penta Security AutoCrypt® Reverse ICO

Blockchain for the CAR DATA Market

April 2018

Executive Summary

AMO is blockchain project to create and operate the *AMO Market*, a market where car data can be shared and exchanged.

AMO Market = Car Data Market

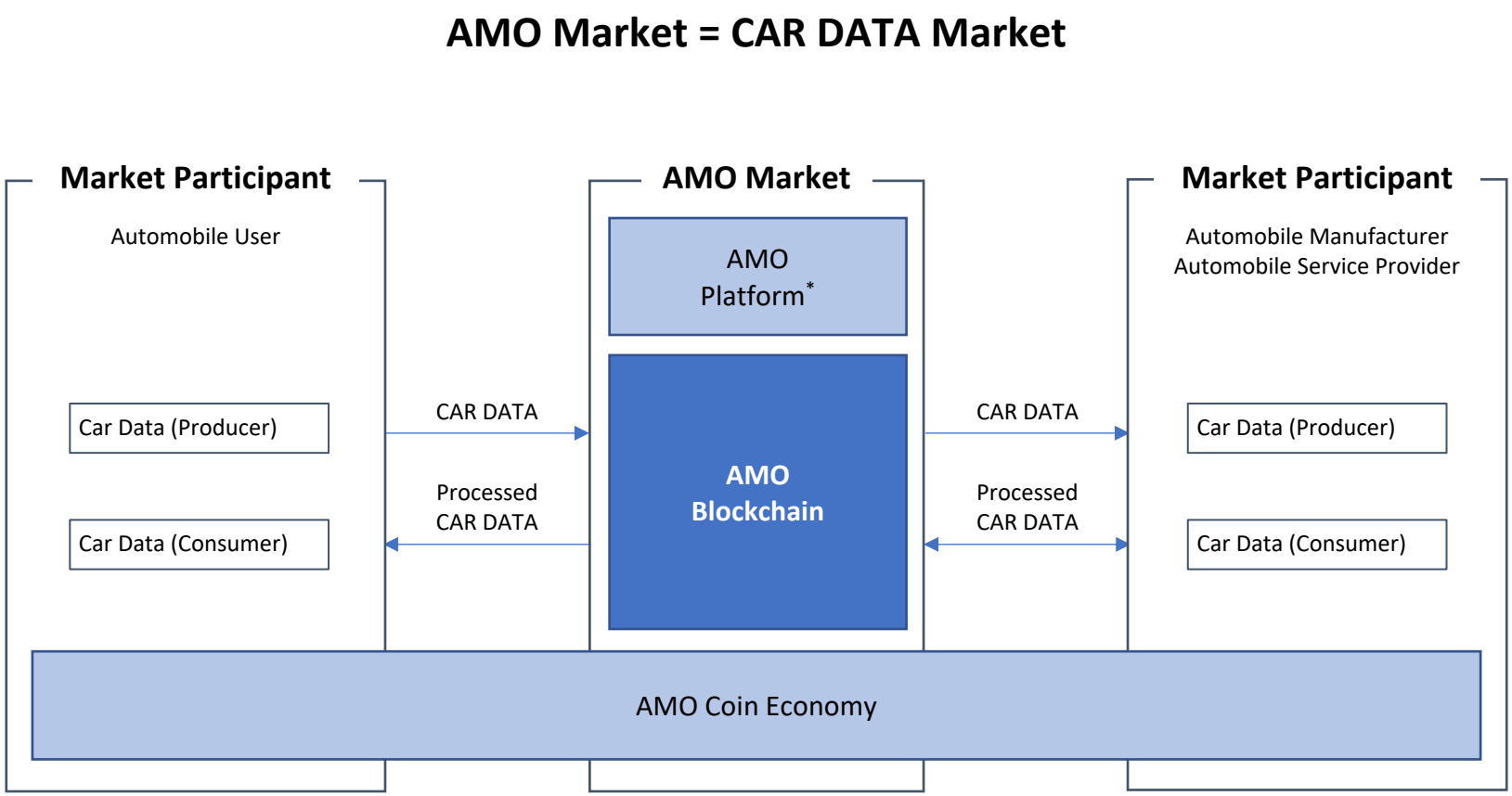
Car Data shared and exchanged on the AMO Market includes all data related to connected cars, electric vehicles (EVs), autonomous cars, and smart cars. With the rapid development of these areas, there is a need for a decentralized, open marketplace for transactions.

Market participants are all users related to automobiles be it automobile users, automobile manufacturers, or automotive service providers. They participate in the AMO Market as data producers and consumers, or "pro-sumers." And as AMO Market is built on the *AMO Blockchain* to be a technology-based economic system, it supports the equal participation and trading of participants involved.

The value of the data is determined by demand and supply, and the *AMO Coin* is used as means of payment. This means that private data is no longer used randomly by a select few, but is used with express consent of the owner with his/her control by those in the AMO Market. If service providers or manufacturers purchase rights to access car user data, the owner must give consent, and even then all information and sensitive data is protected using cryptography.

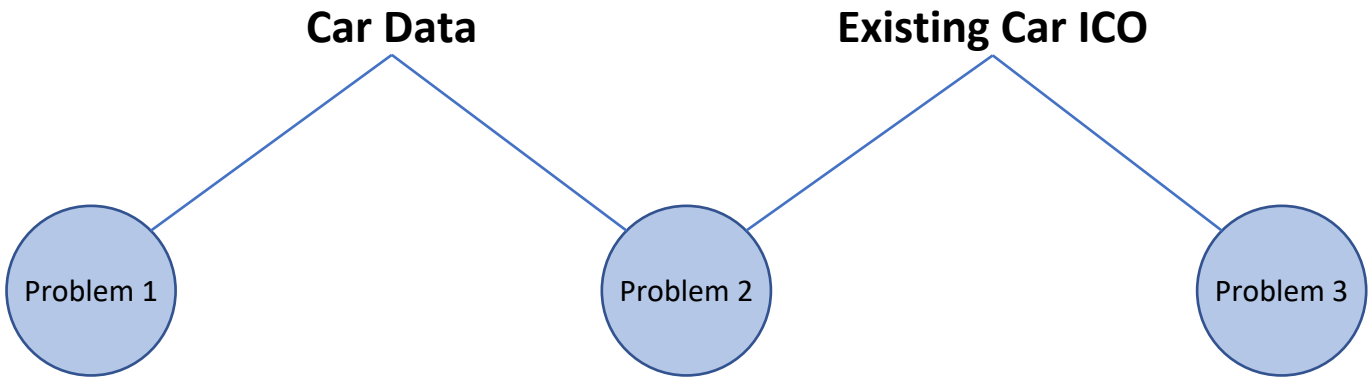
Ultimately, AMO Market aims to create an environment where vehicle data and personal information are no longer used and held by a few select companies, but are used and shared by legitimate and secure processes and transactions. As a result, car data will become a public asset and return more valuable and optimized services to those involved.

Executive Summary



* : The AMO Platform supports the AMO Blockchain for AMO Market operation. It supports communication among participants and manages operational policies and IT systems including software.

Problems

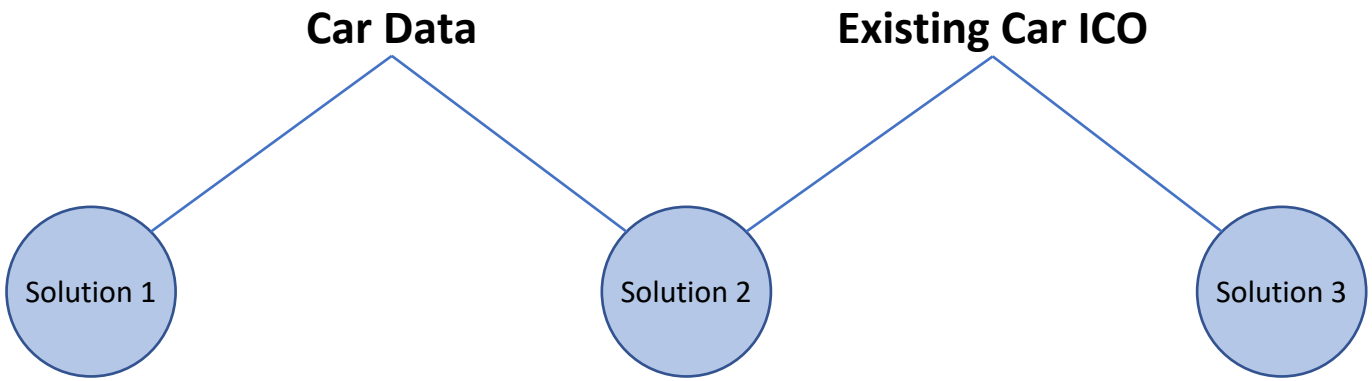


No way to exchange data for value

Only specific types of car data collection

Business plans with no automotive expertise

Solutions



Blockchain-based
Car Data market

Collect all data:
V2X / In-Car / User Data

Tested technology &
proven experience

Penta Security Reverse ICO Concept

AMO Market utilizes Penta Security's AutoCrypt®, AuthentiCA® and Penta CryptoWallet™, solving the issues with car data and existing Car ICOs.

AutoCrypt®

AuthentiCA®

Penta CryptoWallet™

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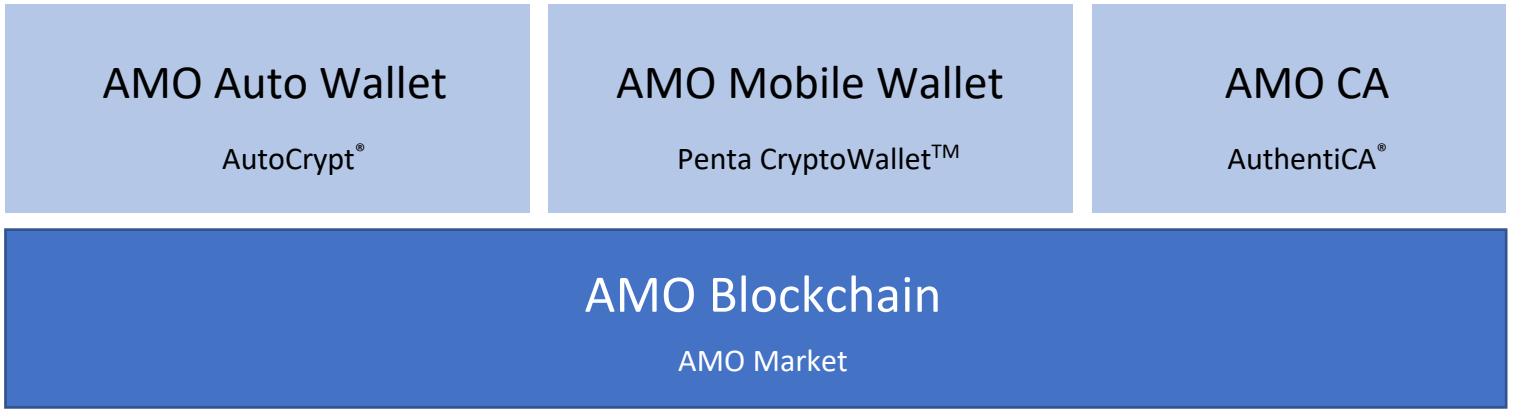
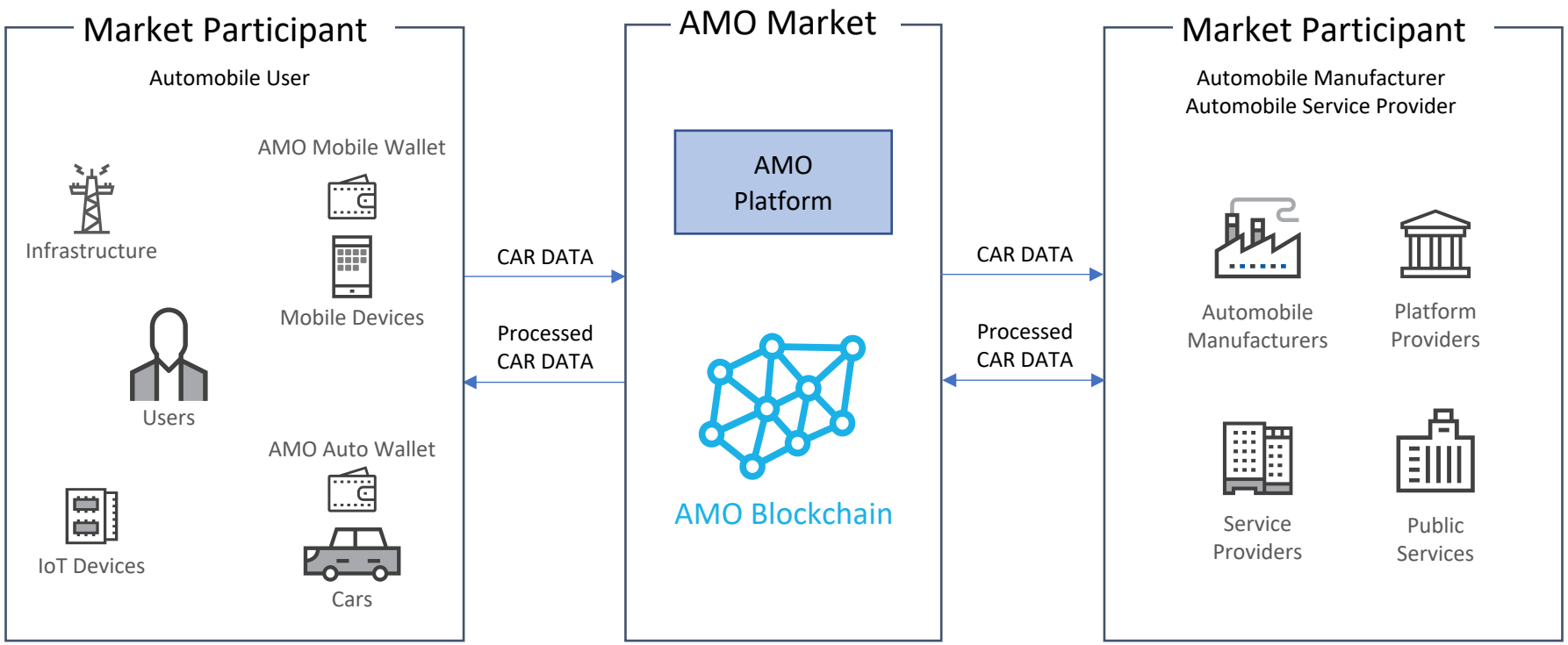
Blockchain

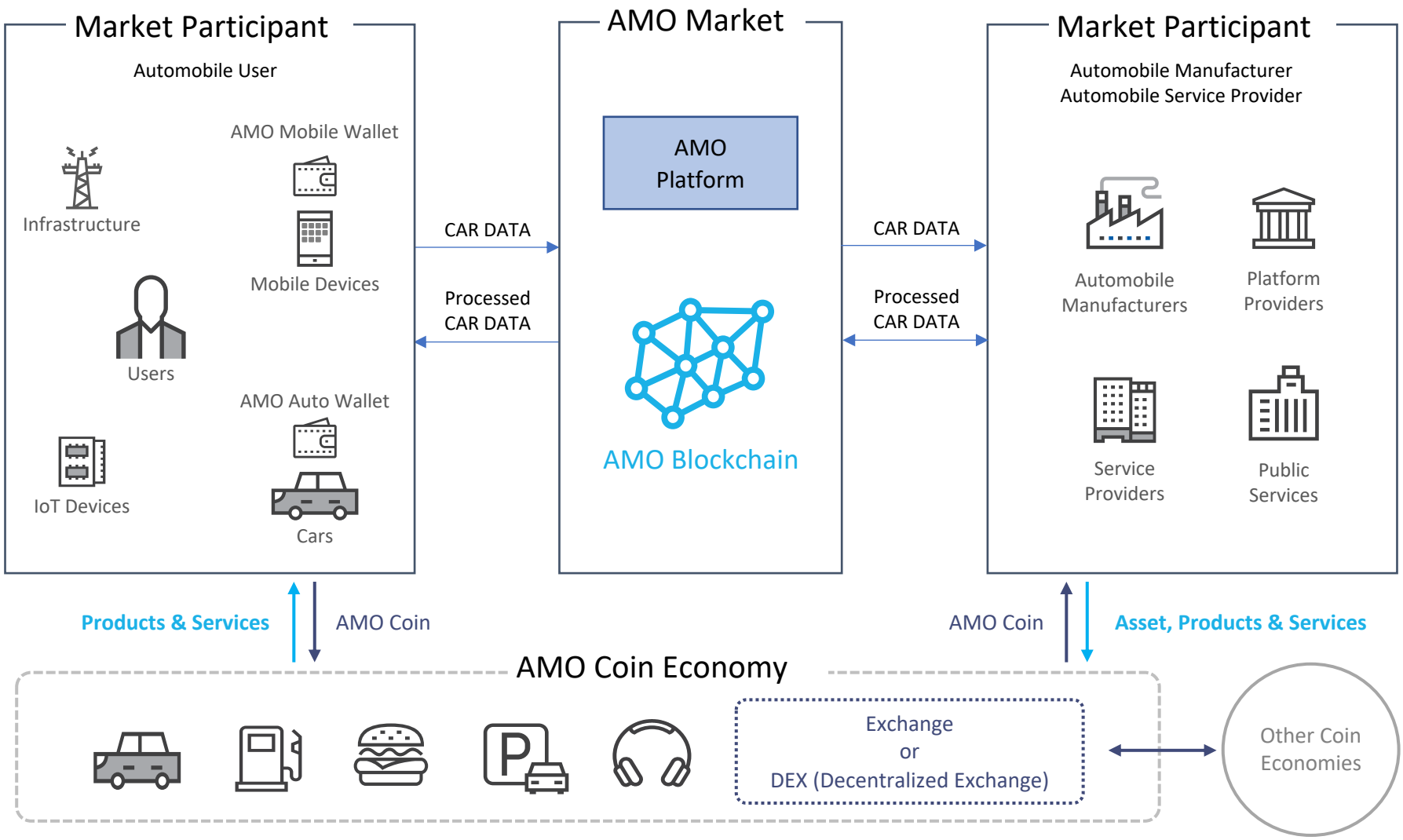


AMO Market

The AMO Market consists of the AMO Blockchain and the AMO Platform which supports it.
Market participants can be both data producers as well as data consumers. Car data generated during the lifetime of the car and processed car data that comes back to the consumer are exchanged. The value is determined by the demand, supply, and support of the AMO Platform, and paid out with the AMO Coin.



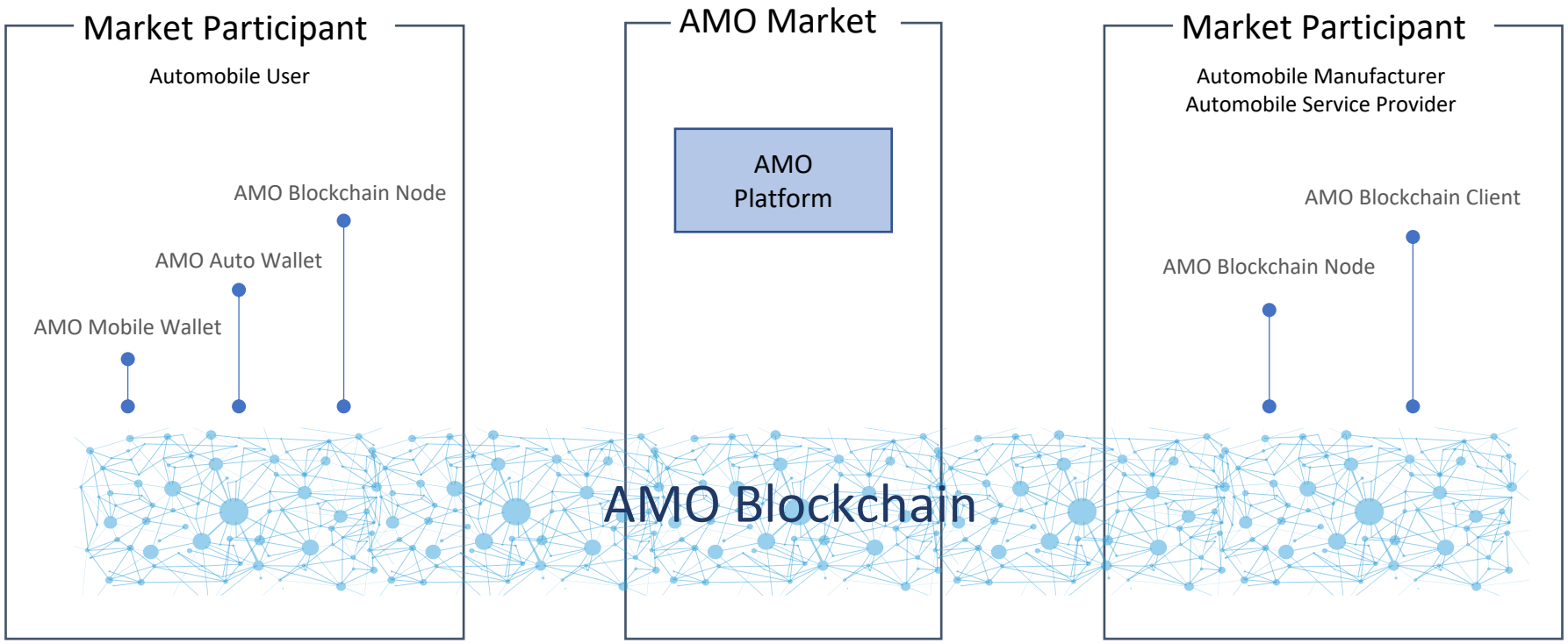
AMO Coin Economy



AMO Blockchain

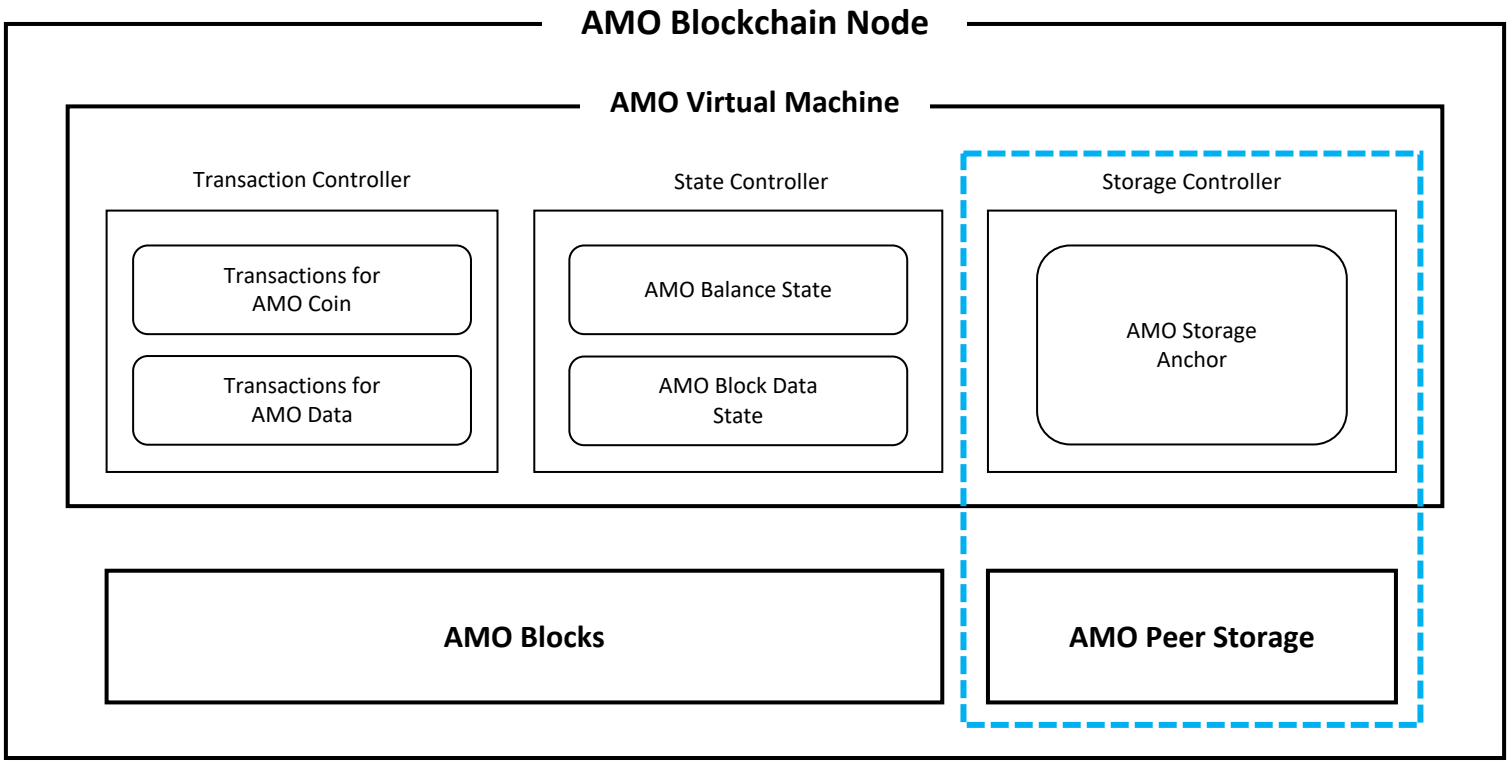
In order to exchange data, AMO Market participants connect to the blockchain through the AMO Blockchain client or the Wallet. When participating in the AMO Blockchain Node, participants are compensated depending on contribution, as blocks are generated in the blockchain and peer storage is provided.

The AMO Blockchain operates on a consensus basis using the DPoS (Delegated Proof-of-Stake) method.



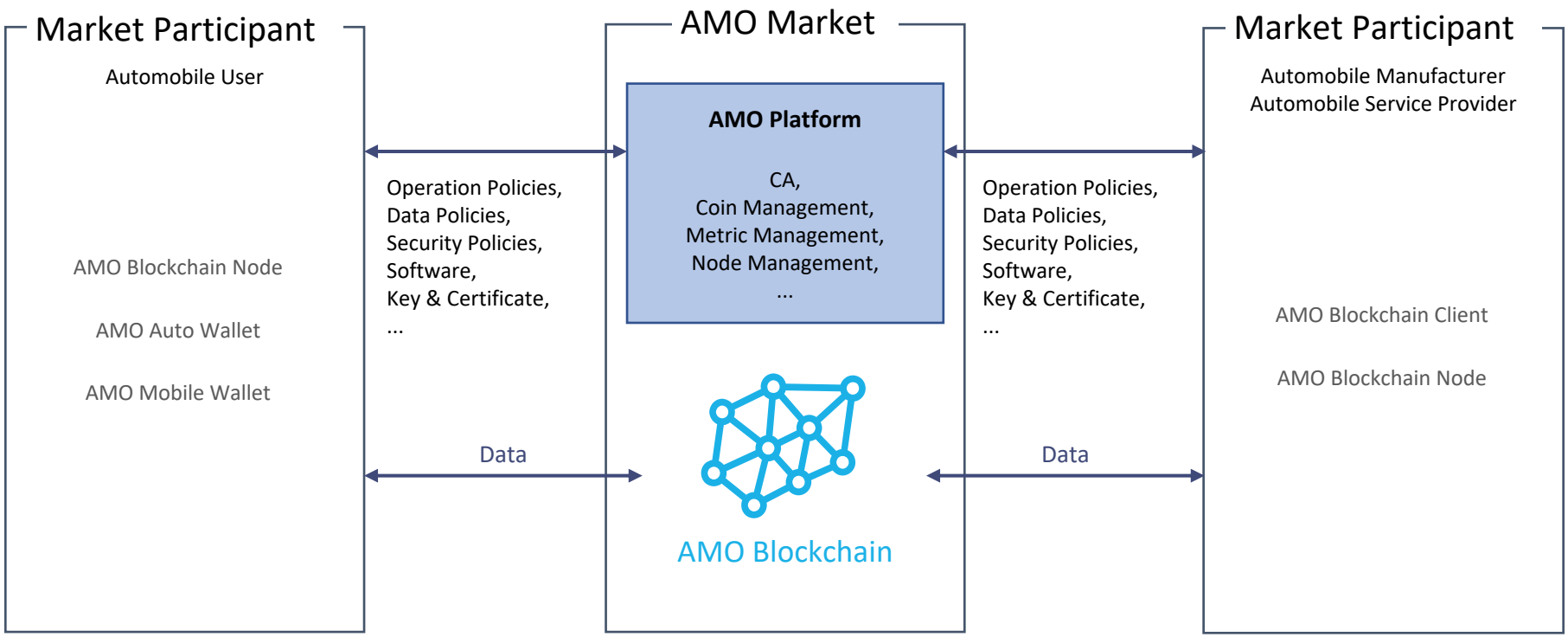
AMO Blockchain Node

One of the key features of the AMO Blockchain is AMO Peer Storage. AMO Peer Storage provides distributed storage based on a P2P network in order to efficiently store, use and share car data. This is implemented by adding the AMO Storage Anchor and AMO Peer Storage to the AMO Blockchain Node.



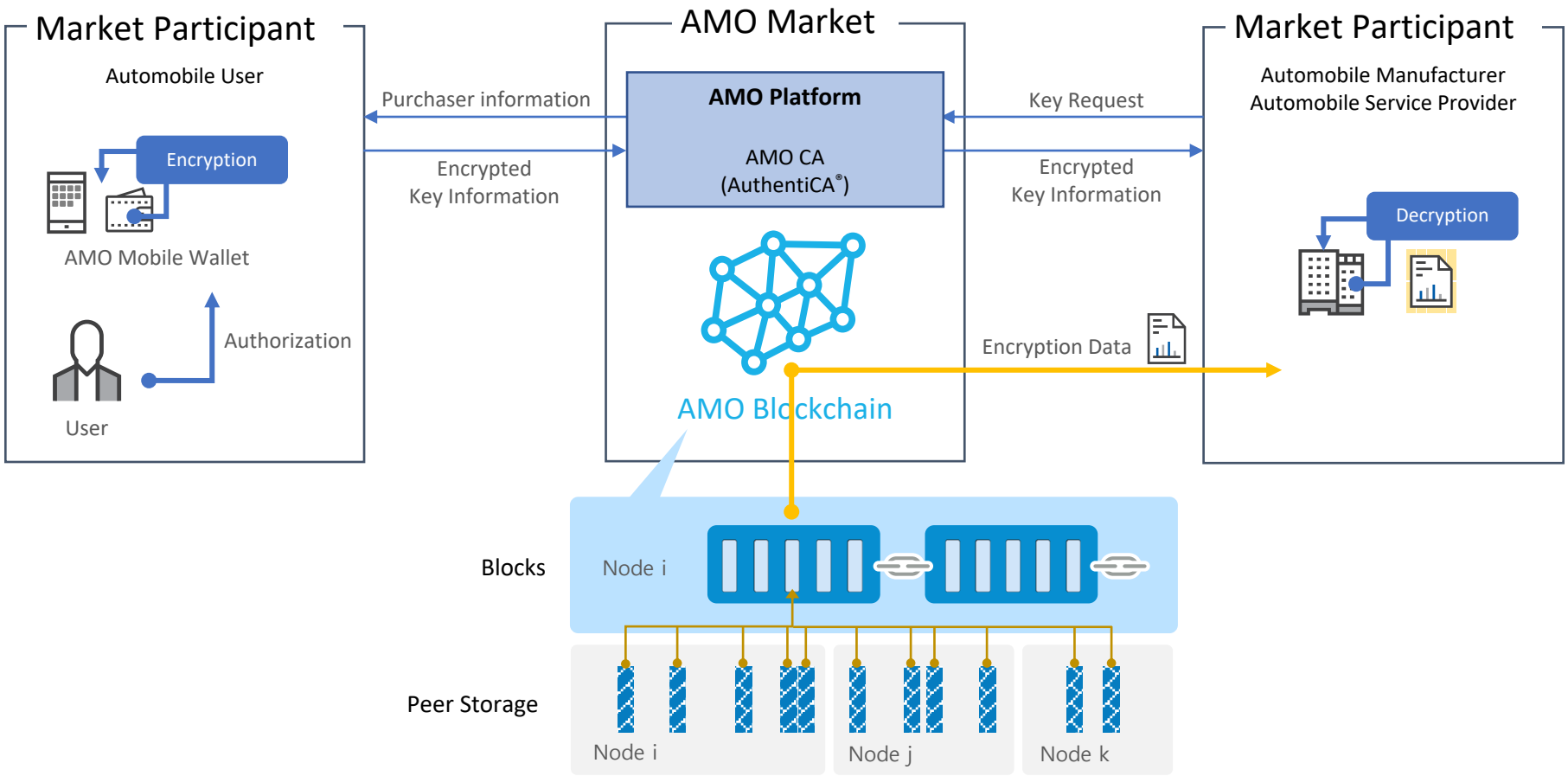
AMO Platform

The AMO Platform is essentially the central IT system made up of the AMO Market operational policies, data policies, security policies, and software. It's also responsible for community operation among the participants and system support for AMO Blockchain operation. Major components include AMO CA, AMO Coin Management System, AMO Metric Management System, AMO Node Management System, etc.



Acquiring the right to use encrypted data through AMO Platform

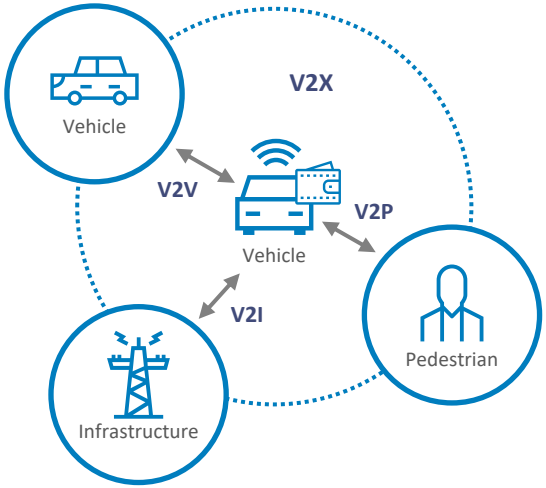
Only the purchaser of the requested data can decrypt the encrypted car data. The AMO Platform supports the connections between the producers and consumers who own the data. Because the authorization process between them is done through end-to-end encryption (E2EE), the AMO Platform does not and cannot decrypt or obtain any information.



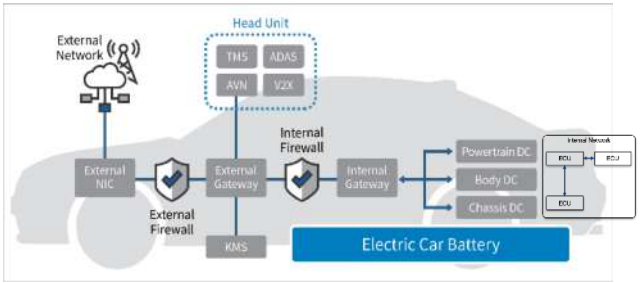
CAR DATA

Car data includes V2X communication data, In-car data from the vehicle, and user data from applications. The data collection goes through all three layers of the automobile: the network, the system, and the application layer.

V2X Data



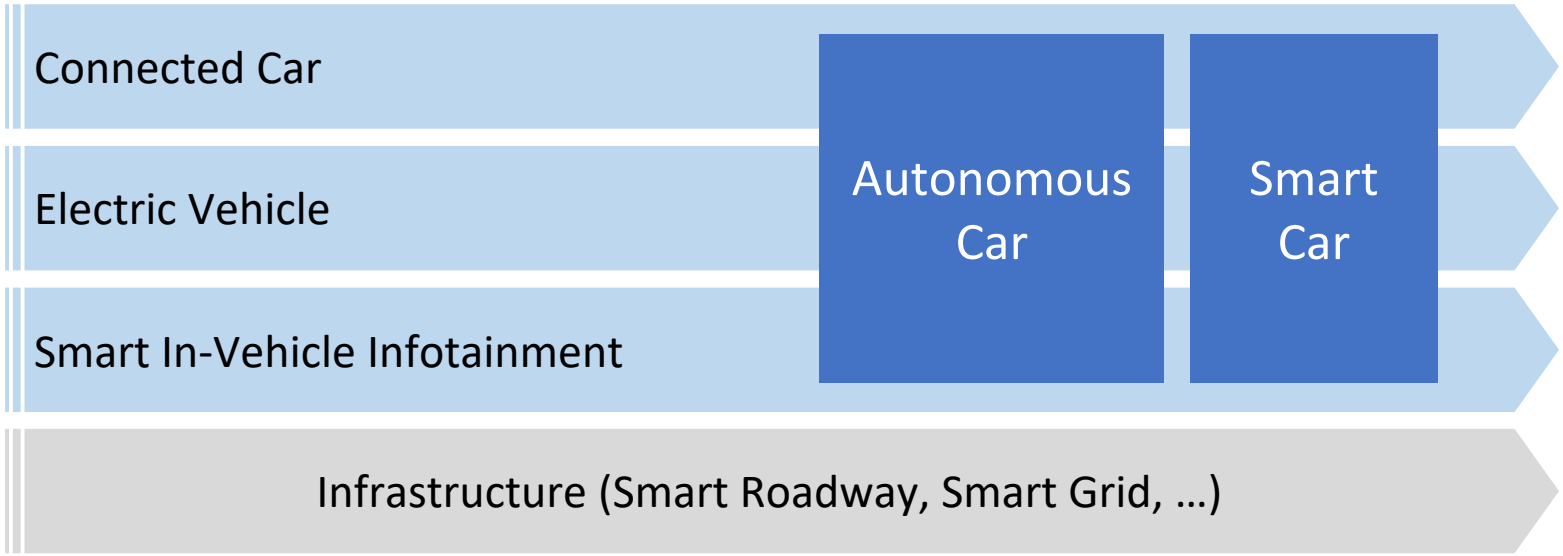
In-Car Data



User Data

The Range of Technology in Car Data

The developments in connected cars, electric vehicles, and in-vehicle infotainment have already made the autonomous car a reality. Car data traded in the AMO Market includes all data generated related to automobiles, including information from the environments of the next-generation of automobiles.

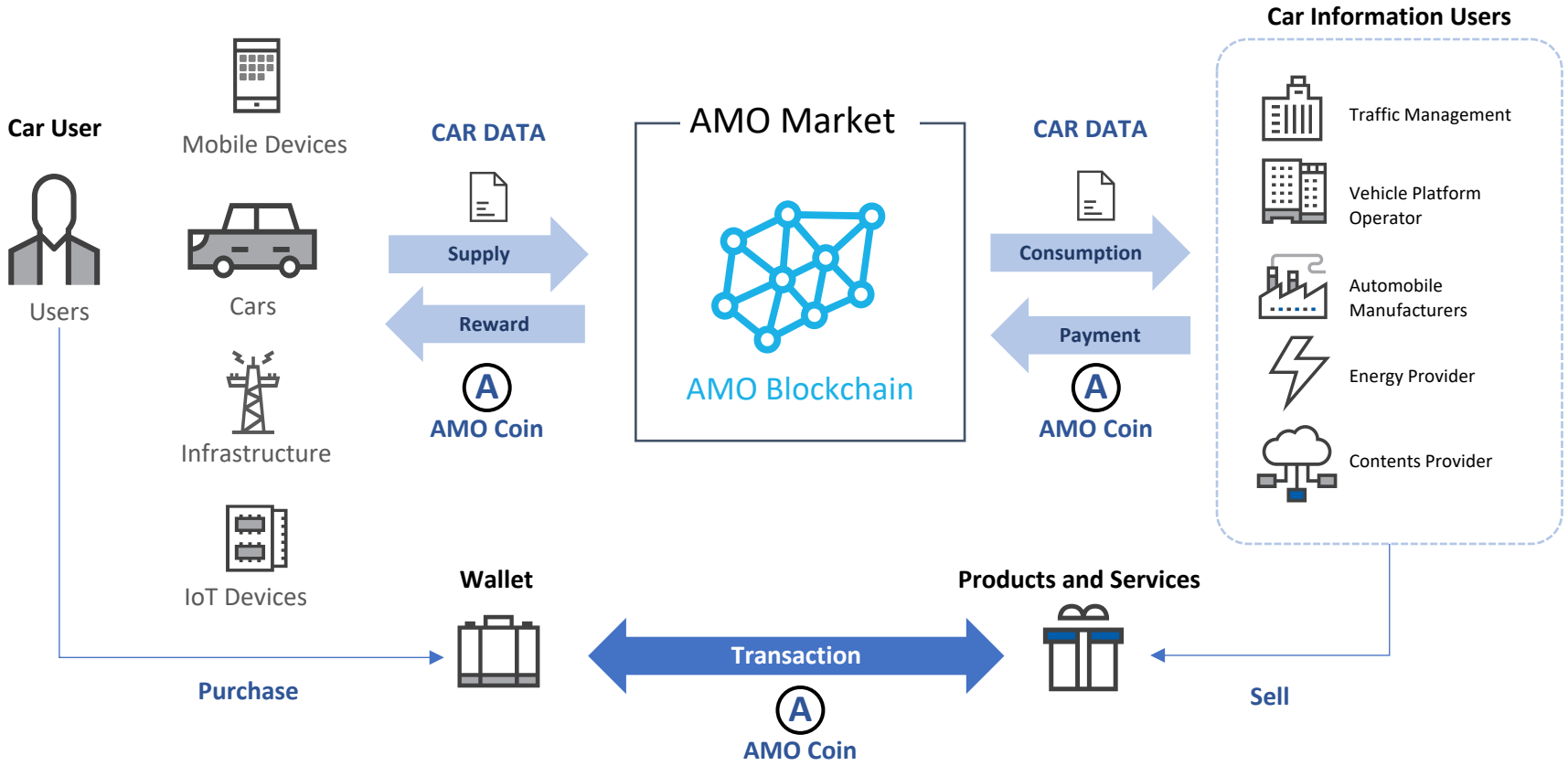


CAR DATA & Processed CAR DATA

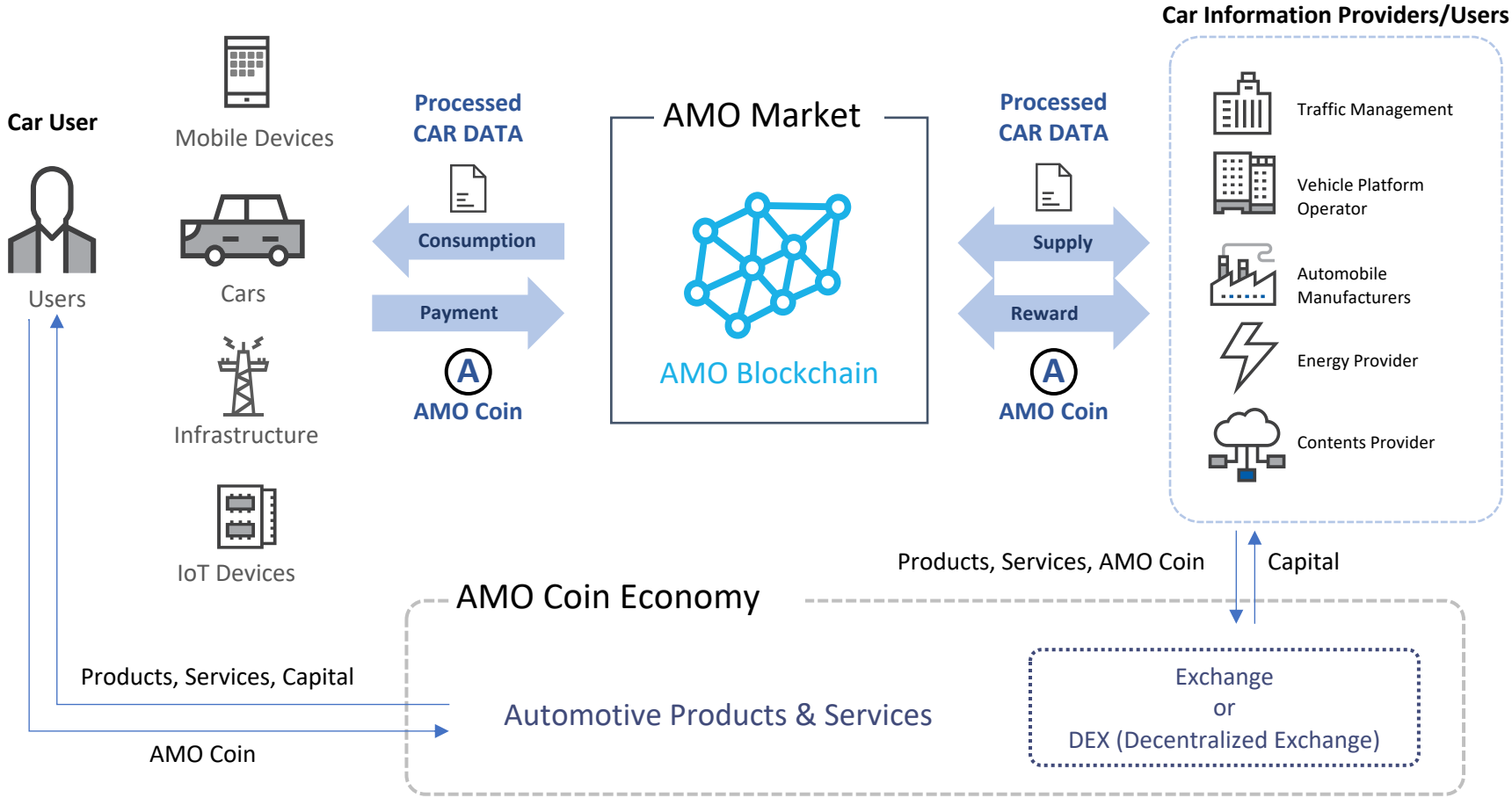
Car data includes all data from the three layers of automobiles. It provides opportunities for car manufacturers and automobile service providers who are the primary consumers, allowing them to use the **car data** to optimize their businesses. With the secondary processing of car data for additional service, the data becomes **processed car data**.

	Layer	Data	Example
Connected Car	**Network**	**V2X Data**	Traffic information Communication information Location information
Electric Vehicle	**System**	**In-Car Data**	Vehicle maintenance information Charging information Battery information Sensor detection information
Smart In-Vehicle Infotainment	**Application**	**User Data**	Data usage Location information regarding applications Billing information

Car Data Lifecycle



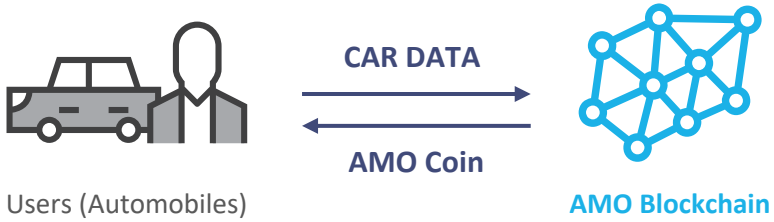
Processed Car Data Lifecycle



AMO Market Based Service Examples

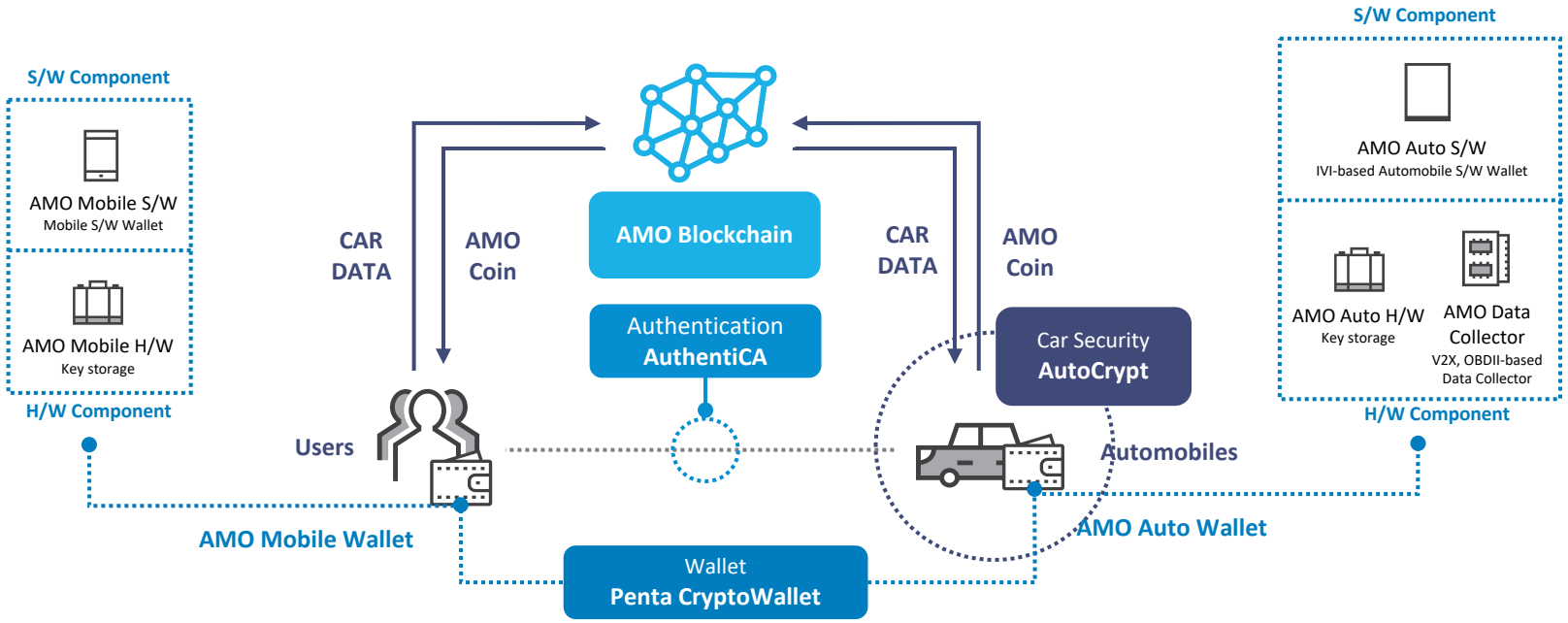
- Lifecycle management of automobile parts
- Predicting and improving car safety
- Product authentication and theft prevention of automobile parts
- Analysis of automotive accidents
- Personalized insurance service planning
- Trustworthy used car pricing and sales
- Direct sales of EV charging
- Electric vehicle charging stations and parking lot guides
- Payments for music and video streaming subscriptions
- Simultaneous content streaming experience in multiple vehicles
- Local Dynamic Map service
- Open participation for bounty for car data users
- Secure monitoring of car-related personal information
- In-Car commerce/payments

Why us?



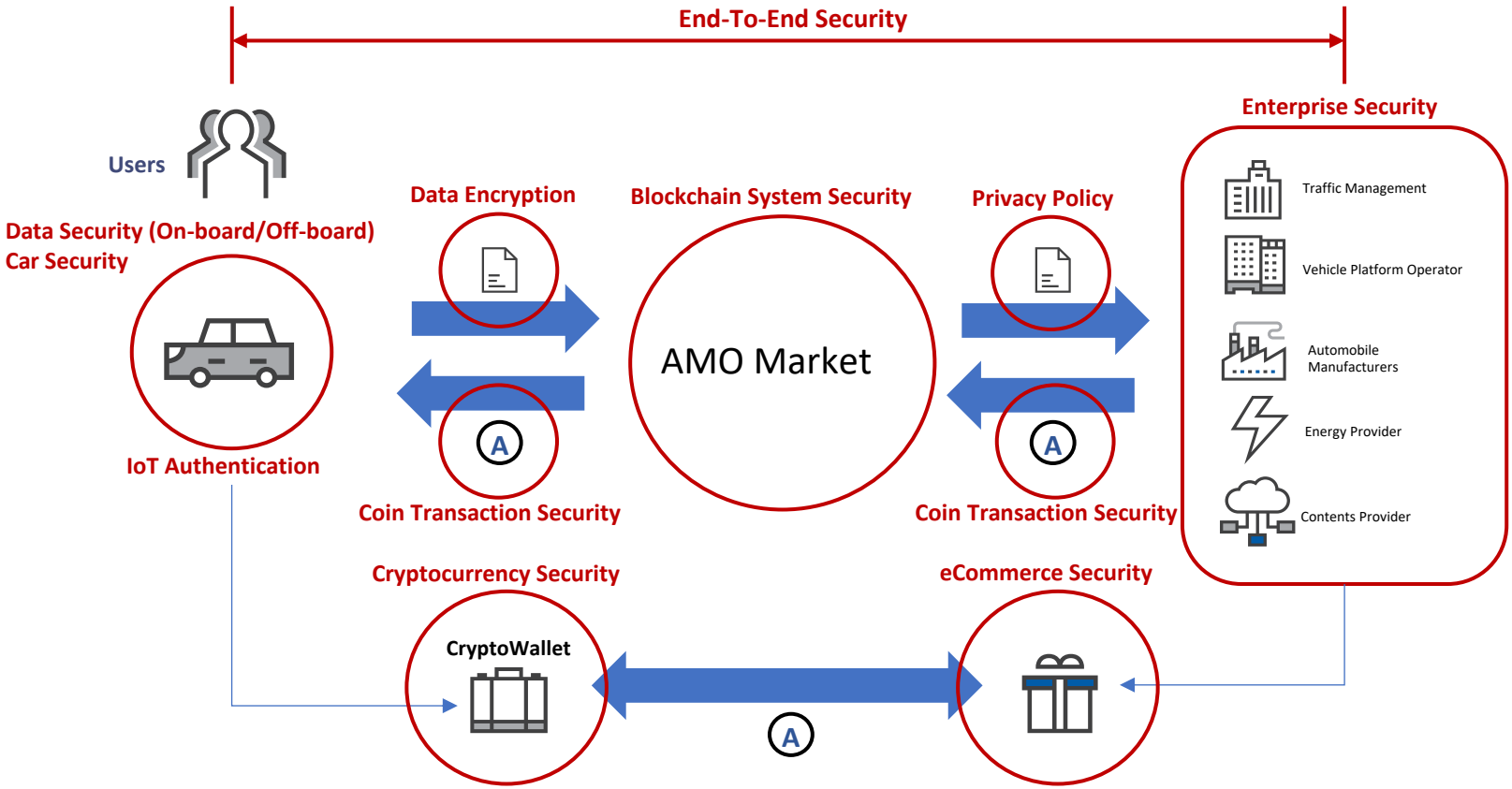
Expertise and Security in Car Data Collection

Collecting car data requires experience and expertise in areas like embedded implementation technology, mobile and server technology, and security technology. De-identification or encryption processing is crucial to protect sensitive data like personal identification or information. System design for data ownership and license acquisition requires authentication, encryption, and access management.



Necessary Security Elements for Car Data Market

It is crucial to design, implement and operate a security system for car data transactions and overall economic system.

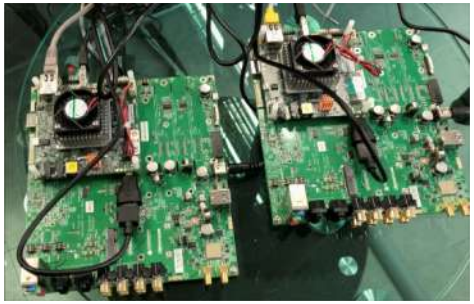


Penta CryptoWallet™

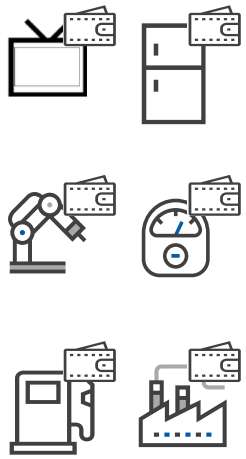
Designated H/W Wallet

Wallet Application for Smart Phone
AMO Mobile Wallet

Wallet for Car
AMO Auto Wallet

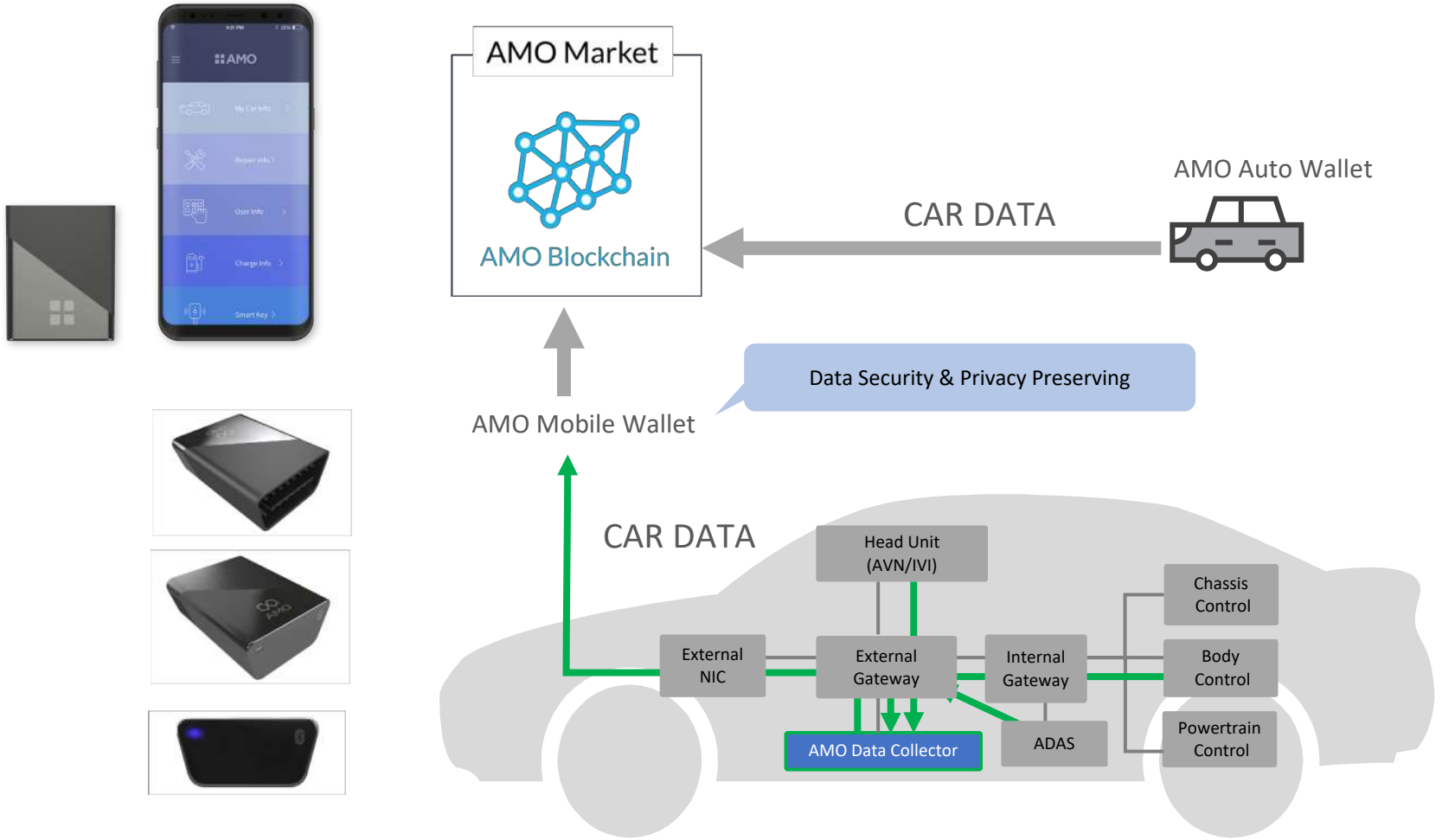


Wallet for IoT Devices



AMO Data Collector™

AMO Data Collector works with the AMO Mobile Wallet to collect car data. The wallet performs encryption and de-identification to protect sensitive information.



AutoCrypt® History

2007. Security between Vehicle and Diagnostic Device

2011. Security between Vehicle and Nomadic(mobile) Device

2012. Security for Patrol Car Fleet Management

2013. V2X Security over DSRC (WAVE)

2014. Mobile Telematics Security (consulting)
VDMS (Vehicle Data Monitoring System) Security

2015. AutoCrypt® Launched
Advanced Firewall for Vehicle

2016. Security for C-ITS Testbed (Daejeon-Sejong)
(Cooperative Intelligent Transportation System)

2017. Security for Electricity Vehicle Charging System

Enhancement to C-ITS Testbed (Daejeon-Sejong)

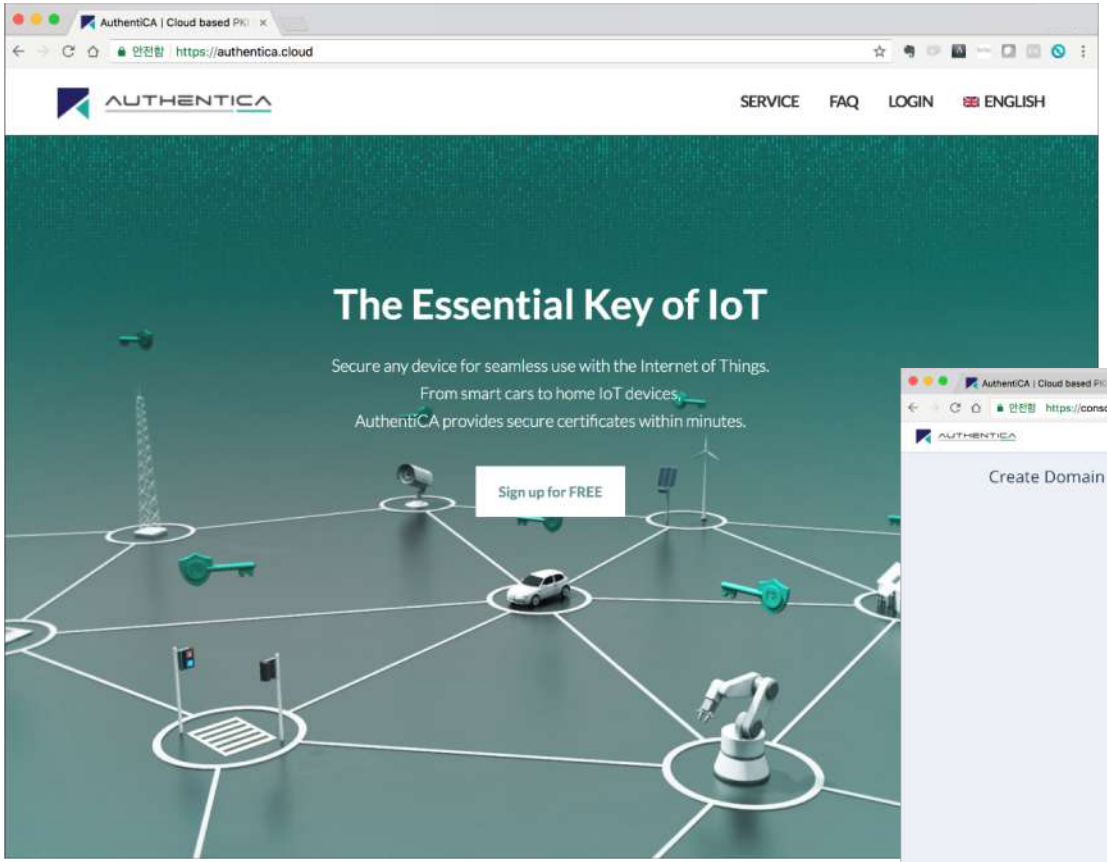
Security for C-ARS Testbed (Yeoju)
(Cooperative Automated Driving Roadway System)

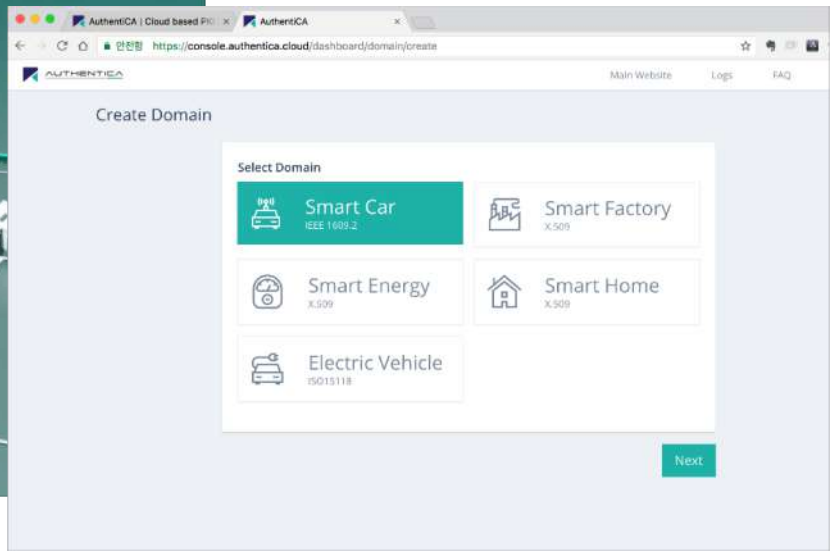
Security for K-City (Hwaseong)
(Korea Autonomous Mobility City)

2018. Scheduled Highway C-ITS Deployments (2018~2020, Plan)

AuthentiCA®

AuthentiCA provides the creation, issuance and management of certificates required for authentication in various IoT environments. It is available at https://authentica.cloud for anyone to use as free software-as-a-service (SaaS). It also provides a key issuance service that works with the MS Azure IoT Suite.





Penta Security Reverse ICO Products

AMO Market utilizes Penta Security's AutoCrypt®, AuthentiCA® and Penta CryptoWallet™, solving the issues with car data and existing Car ICOs.

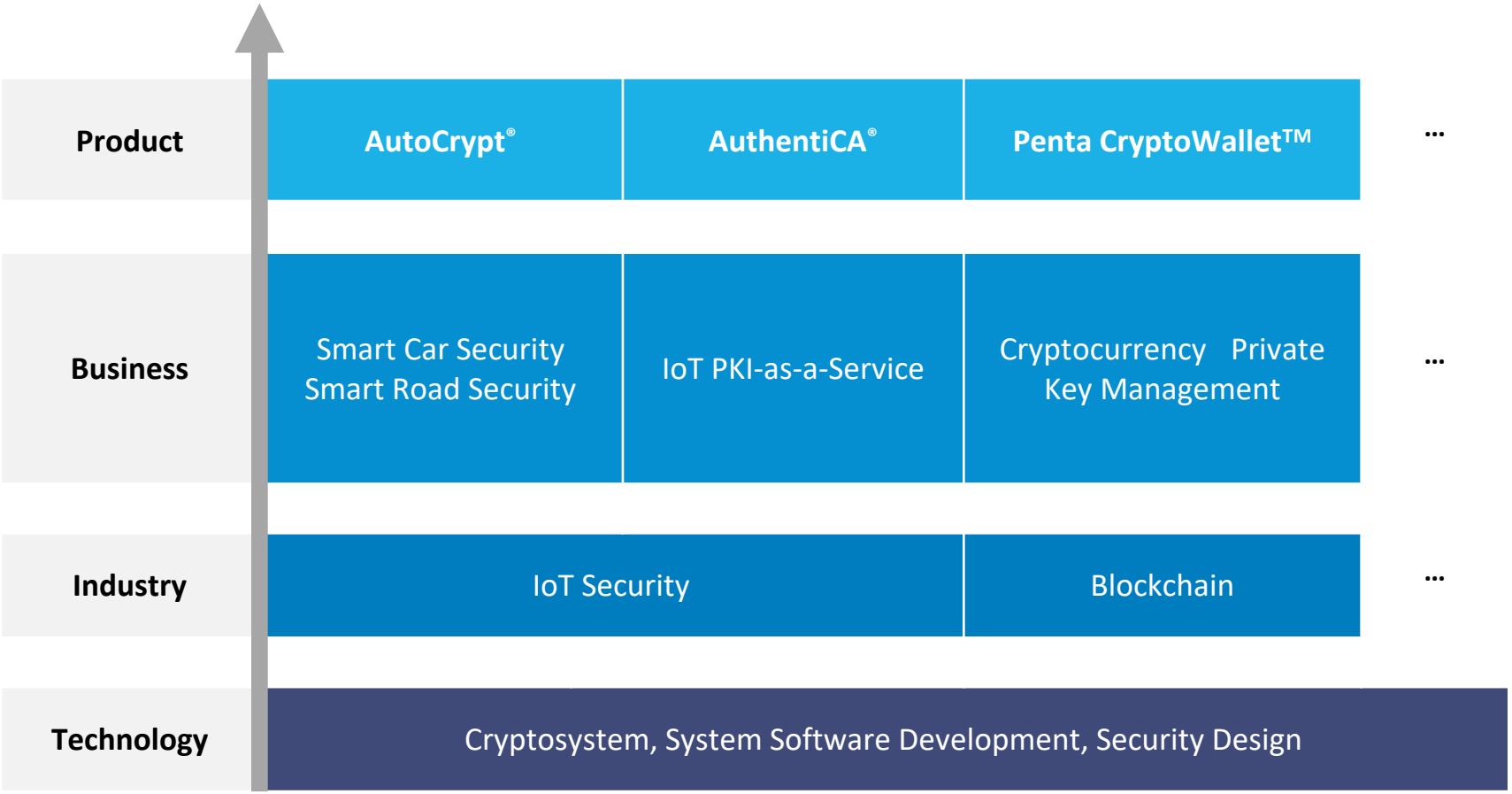
AutoCrypt®
AuthentiCA®
Penta CryptoWallet™

+

Blockchain

AutoCrypt®	• Troubleshooting utilizing data from V2X, In-Car Data, and User Data • With Penta CryptoWallet as the base, AMO Auto Wallet works as an in-car blockchain client as well as a wallet.
AuthentiCA®	• AMO CA works as a PKI for the mutual authentication of IT systems used by different market participants • Encryption provided for market participants to give permissions for data • Encryption key provided to allow for data encryption and de-identification
Penta CryptoWallet™	• AMO Mobile Wallet released with features like data collection, community involvement, transaction, and blockchain client. • Various additional functions for future AMO Coin economy expansion.

Penta Security Systems



Penta Security Systems

Achievements

- Developed world's first query transforming DB encryption solution
- First RFC2510 based PKI product
- Developed Korea's first index-column encryption solution
- Developed KCDSA Korea's first digital signature system
- Japan MyNumber Security Solution Release
- Developed Korea's first Format Preserving Encrytion (FPE) based solution
- DB Encryption Solution D'Amo Release
- SaaS Website Security Service Cloudbric Launch
- Smart Car Security Solution AutoCrypt Release
- POS Security Solution Release
- Developed open-source DB encryption solution
- Smart Factory Security Solution Penta Smart Factory Security Release
- Smart Energy Security Solution Penta Smart Energy Security Release
- Acquired CC EAL3+ Certification For Key Management System
- Appliance-type SSO Isign+ Release

140 Expert Cryptography Engineers

62 Domestic/International Technological Patents

58 Domestic/International Technological Certificates

36 Awards from Technological Advancements

Asian Cyber Security Vendor of the Year

The first and only CCEAL4 certified WAF

No.1 WAF Vendor in the APAC region

ICSA Labs Certified WAF

Recognized on the Gartner WAF Magic Quadrant

SC Magazine Europe Best SME Solution

PCI-DSS Compliance

Hot Company in Web Application Security

Cybersecurity Excellence Awards

Team Members

SangGyoo SIM
- CEO, AMO Labs
- Chief Software Architect & Cryptographer
- Creator of AutoCrypt
- Ph.D in Electrical Engineering, POSTECH

Jaeson YOO
- Security Evangelist & Head of Biz Dev., AMO Labs
- B.A., Occidental College

KiHo JOO
- Head of Automobile & Software Engineering
- Ph.D in Materials Science and Engineering,Seoul National University

G-Hun PAK
- Head of Marketing & Communications
- B.F.A., Korea National University of Arts

Daniel ES KIM
- Chief Strategy Officer, AMO Labs
- Creator of D'Amo
- B.S. in Physics, POSTECH

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- Head of Operations, AMO Labs
- Senior Manager, Certis CISCO
- Senior Manager, LHN Group
- B.A., University of Wales

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- nSketch Founder, LG Electronics
- M.S., Korea University

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DS KIM
- CTO, AMO Labs
- XBrain Founding Memeber & Advisor
- Cloudbric Co-Founder
- M.S. in Electrical Engineering, POSTECH

SungKyoon CHUNG
- Head of R&D, AMO Labs
- Creator of Penta CryptoWallet
- GRock Information Founder, SK Telecom
- M.S. in Electrical Engineering, POSTECH

Niyikiza AIMABLE
- Software Engineering Specialist
- Co-Founder of Go Ltd (Rwanda)
- B.S. in Electrical Engineering, KAIST

Anna AMINOFF
- Marketing Manager
- B.A., Yonsei University

Roadmap

2018.05
- Public Sale & Token Distribution

2018.3Q
- AMO Mobile Wallet v1 Launch (AMO Token Transfer)
- AMO CA v1 Launch (Beta)

2019.1Q
- Testnet Launch (AMO Blockchain Beta Launch)
- AMO Data Collector Launch
- AMO Mobile Wallet v2 Launch (Communication with Data Collector)
- AMO CA v2 Launch
- CAR DATA Open Specifications Release

2019.2Q
- AMO Auto Wallet v1 Launch
- AMO Mobile Wallet v3 Launch (Communication with Auto Wallet/Testnet)
- AMO Foundation Established

2019.3Q
- Mainnet Launch (AMO Blockchain v1 Launch)
- AMO SDK v1 Launch
- AMO CA v3 Launch
- AMO Asia Expo Open

2020.1Q
- AMO Auto Wallet v2 Launch (Communication with Mainnet)
- AMO SDK v2 Launch
- Payment using AMO Wallet

2020.3Q
- AMO Client for Service Provider v1 Launch (AMO Data Manager, GUI for SDK)

2020.4Q
- AMO Blockchain v2 Launch
- AMO World Expo Open

2021.2Q
- AMO Blockchain v3 Launch

t h a n k y o u

www.amo.foundation

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