

Appendices

Appendix 1: Ending conditions and their relations to taxonomy development iterations

Ending Conditions		Iterations							
		1	2	3	4	5	6	7	8
OE1	All objects or a representative sample of objects have been examined							x	x
OE2	No object was merged with a similar object or split into multiple objects in the last iteration	x	x	x	x	x	x	x	x
OE3	At least one object is classified under every characteristic of every dimension					x	x	x	x
OE4	No new dimensions or characteristics were added in the last iteration							x	x
OE5	No dimensions or characteristics were merged or split in the last iteration	x	x	x		x	x	x	x
OE6	Every dimension is unique and not repeated (i.e., there is no dimension duplication)						x	x	x
OE7	Every characteristic is unique within its dimension (i.e., there is no characteristic duplication within a dimension)						x	x	x
SE1	Concise: the taxonomy is meaningful without being overwhelming								x
SE2	Robust: the dimensions and characteristics suffice to differentiate objects								x
SE3	Comprehensive: all objects can be classified								x
SE4	Extendible: new dimensions and characteristics can be added								x
SE5	Explanatory: the dimensions and characteristics explain an object								x

Appendix 2: Taxonomy development iterations

	<i>Iteration 1 (T¹)</i> Deductive	<i>Iteration 2 (T²)</i> Inductive	<i>Iteration 3 (T³)</i> Deductive	<i>Iteration 4 (T⁴)</i> Inductive	<i>Iteration 5 (T⁵)</i> Inductive	<i>Iteration 6 (T⁶)</i> Inductive	<i>Iteration 7 (T⁷)</i> Evaluation	<i>Iteration 7 (T⁸)</i> Evaluation
Meta-characteristic	Component	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension
Value creation	Customer segment	Customer segment	Domain	Domain	Domain	Domain	Domain	Domain
			Participants	Participants	Participants	Participants	Participants	Participants
	Value proposition	Value proposition	Privacy	Privacy	Privacy	Privacy	Privacy	Privacy
			Data source	Data Source	Data input			
			Data output	Data output	Data output	Data output	Data output	Data output
			Data service	Data service	Data service	Data service	Data service	Data service
			Data quality	Data quality	Data quality	Data quality	Data quality	Data quality
Value delivery	Customer relationship	Contract	Contract	Contract	Contract	Contract	Contract	Contract
	Channels	Channels	Platform access	Platform access	Platform access	Platform access	Platform access	Platform access
	Key resources	Platform infrastructure	Platform infrastructure	Platform infrastructure	Platform infrastructure	Platform infrastructure	Platform infrastructure	Platform infrastructure
	Key activities	Data processing activities	Data processing activities	Data processing activities	Data processing activities	Data processing activities	Data processing activities	
Value capture	Key partners	Key partners	Key partners	Key partners	Key partners	Key partners	Key partners	Key partners
	Revenue streams	Revenue streams	Revenue streams	Revenue streams	Revenue streams	Revenue streams	Revenue streams	Revenue streams
	Pricing model	Data pricing mechanisms	Data pricing mechanisms	Data pricing mechanisms	Data pricing mechanisms	Data pricing mechanisms	Data pricing mechanisms	Data pricing mechanisms
			Payment currency	Payment currency	Payment currency	Payment currency	Payment currency	Payment currency
	Cost model	Cost model	Cost model	Cost model	Cost model	Cost model		

	Added component/dimension
	Removed component/dimension

Appendix 3: Constructed coding categories

Main coding categories	Focused codes
Data regulation	Design quality standards / smart contract / comply with GDPR / delegated data regulation / preserve data privacy / comply with EU law / setting legal framework is challenging / terms and conditions / privacy is a challenge / privacy regulation / privacy challenge / check privacy regulation / terms and conditions determine data usage / Privacy disables open data publication / use of data is a license / non-cooperation of OEMs / customers restrict data usage / data ownership
Customers	Users / industry domain / attracting a specific customer segment / large target group / customer segment / maintain customer segments / direct OEM relationship
Platform infrastructure	Decentral data control / open governance / centralized or decentralized approach / open protocol / open platform infrastructure / decentral infrastructure / decision making at consumer / challenge to regulate IT integration
Data processing activities	Searching databases / saving time / overview in catalog / perform additional activities / provide corporate and open data / aggregate data / perform activities for all needs / advertise meta data / mixed functionalities / preserve data privacy / national access point / offer broker services / regulate data availability / broker of data / harmonize and synchronize data / setting legal framework is challenging / data processing activities / acting as traditional marketplace / extracting value from data is a challenge / acting as a consent management hub / key activities / key processes / perform several activities / advise OEM in data supply / market leader for development and research / develop own data products / perform activities / enable analysis of car data / generating insights from sensor data is difficult / collect data which is needed / differentiate added value / expand product offering / value chain depends on layer / multiple suppliers cause more activities / production is partially standardized and partially customized / try to standardize terms and conditions / high service quality / added value of aggregated product / performance of data processing activities
Revenue model	Valorizing data is difficult / no active role in data pricing / price discovery / explaining the crypto currency is a challenge / pricing / online product prices / data licensing / Licensing disables open data publication
Data quality	No check of data quality / cooperate to create quality standards / cooperate to automatically improve data
Other	Data marketplace concept / small company size / explain data marketplace concept / role MDM / create fit between customer and marketplace / data marketplace type / fit between governance and client / increase in data generation / more hardware in vehicles / evolve mobility definition / cooperate to develop solution / More data collection because of partnerships

Appendix 4: Preliminary taxonomy

	Component	Dimension	Characteristic						
Value creation	Customer segment	Domain	To be defined						
		Participants	To be defined						
	Value proposition	Privacy	Anonymized			Encrypted			
		Data source	Government	Social media	Commercial	Self-generated	Community		
		Data output	Aggregated			Standardized data			
		Data quality	User reviews			Reviews by marketplace			
	Customer relationship	Contract	Negotiated			Standardized			
Value delivery	Channels	Platform access	Closed			Open			
	Key resources	Platform infrastructure	Centralized			Decentralized			
	Key activities	Data processing activities	All			Limited			
Value capture	Revenue streams	Revenue streams	Usage based		Package pricing		Flat fee tariff		Freemium
	Pricing model	Data pricing mechanism	Set by data marketplace owner	Set by sellers	Set by buyers	Auction	Negotiation	Real-time market	
		Payment currency	Crypto			Fiat			

Appendix 5: Case descriptions

Data marketplace	Description
TomTom (TT) Hierarchical, private Founded: 1991	TomTom is a privately owned company that uses location technology to sell mapped data. They trade data in a hierarchically oriented, bilateral market. TomTom is well known for its sale of navigation boxes to end consumers. However, in this study, the focus is on the B2B segment of TomTom that concerns data trade between TomTom and their commercial buyers and seller.
INRIX (IN) Hierarchical, private Founded: 2005	INRIX is also a privately owned company and applies location analytics to make road transportation more intelligent. INRIX trades data bilaterally with their commercial data sellers and buyers and serves public organizations. In addition to trading data, INRIX performs research on subjects such as road congestion, commuting time, and vehicle carbon emission. Their research branch is out of the scope of this paper because the reports are in textual format and are not considered machine-readable data.
HERE (HE) Hierarchical/market, consortium Founded: 2015	HERE is formerly known as Navteq and was owned by Nokia. In 2015 the company was acquired by a consortium. Audi, BMW, and Daimler are the main shareholders. HERE applies location technology to improve connected driving experiences. The HERE data marketplace has open access for any data seller, data buyer, and third-party service provider to exchange data.
Caruso (CR) Hierarchical/market, consortium Founded: 2017	Caruso is founded by TecAlliance, a provider of vehicle data in the automotive industry. Besides TecAlliance, companies such as Bosch and Continental are shareholders of Caruso. The data marketplace is closed, and only the consortium members and partners are allowed to trade at the data marketplace.
IOTA Market, independent Founded: 2017	IOTA is founded by the non-profit IOTA Foundation. This data marketplace focuses on the IoT market with the goal to enable secure data transactions between data sellers and buyers. The IOTA data marketplace has open access that allows many participants to trade data. It is currently in the proof of concept phase.
Ocean Protocol (OP) Market, independent Founded: 2017	Ocean Protocol is a non-profit organization based in Singapore. Their data marketplace has open access to create an environment in which many data sellers and buyers can exploit data. The data marketplace is currently in its beta stage and is planned for a new release in Q3 of 2020. Ocean Protocol is particularly focused on AI. With high volumes of data and trained algorithms, they aim to advance AI development.

Appendix 6: Case sources

Sources	TomTom	INRIX	HERE	Caruso	IOTA	Ocean Protocol
Website	Main website develop portal	Main website	Main website Develop portal	Main website	Marketplace platform	Main website
Terms and conditions	Buyer Supplier	Site terms	Service terms	Privacy	Privacy	Privacy
Whitepaper	Product Annual report	Product	Product	Slides Live presentation	Technical	Technical Business Marketplace
External	Forbes articles	Forbes articles Harvard Business Review	Forbes articles	Automat report	Forbes articles	Forbes articles
<i>Total</i>	<i>9</i>	<i>8</i>	<i>7</i>	<i>5</i>	<i>5</i>	<i>7</i>

Appendix 7: The codes of data marketplace cases

This appendix presents the content analysis of the documents on the data marketplaces from the online desk research. These are the website of the respective data marketplace, the terms and conditions, the whitepapers, and relevant articles from an external source.

Name	Source type	Source of document	Reference code
TomTom	Website	https://www.tomtom.com/	TT-1a
		https://developer.tomtom.com/	TT-1b
	Terms and conditions	https://www.tomtom.com/en_gb/legal/terms-and-conditions/	TT-2a
		TomTom (2017, December). GENERAL TERMS AND CONDITIONS FOR THE PROCUREMENT OF PRODUCTS AND SERVICES	TT-2b
	Whitepaper	How TomTom's HD Traffic and IQ Routes data provides the very best routing	TT-3a
		TomTom (2019) Annual Reports & Accounts 2019	TT-3b
	Forbes	O'Marah, K. (2017, April 3). Near-Death Experience: TomTom Rises From The Grave.	TT-4a
		Phelan, D. (2020, February 11). Huawei Makes Surprise TomTom Deal To Dodge Trump's Ban	TT-4b
		Koksal, I. (2020, February 10). Amazon Adds Auto-Specific Alexa Skills To Further Impact the Car Industry	TT-4c
Inrix	Website	https://inrix.com/	IN-1
	Terms and conditions	https://inrix.com/site-terms/	IN-2
	Whitepaper	Inrix OpenCar: Connected and Integrated Services for a Safe & Optimized Driving Experience. A Frost & Sullivan White Paper.	IN-3
	Forbes	Newcomb, D. (2016, September 26). Inrix Expands Parking Service to more Mercedes-Benz vehicles, Others on the Horizon	IN-4a
		Yvkoff, L. (2015, September 10). Inrix's Acquisition of ParkMe Could Be a Game-changer for Navigation	IN-4b
		Newcomb, D. (2015, November 3). Volvo Signs With Inrix To Supply Global Real-Time Traffic Information Service	IN-4c
		Bruner, J. (2010, April 1). Compute Your Way Through Traffic.	IN-4d
	Harvard Case Study	Applegate, L.M. & Johnson, R. (2012, September). Inrix.	IN-5
HERE	Website	https://www.here.com/	HE-1a
		https://developer.here.com/products/platform/marketplace	HE-1b
	Terms and conditions	https://legal.here.com/en-gb/terms	HE-2
	Whitepaper	HERE location services on premises white paper	HE-3a
		HERE navigation on-demand	HE-3b
	Forbes	Singh, S. (2015, August 5). HERE Acquisition By The Germans: Open Innovation On The Cards	HE-4a
Caruso		Newcomb, D. (2016, June 27). Inside Audi, BMW and Daimler's \$3 Billion Bet On HERE's Mapping Business.	HE-4b
	Website	https://www.caruso-dataplace.com/	CR-1
	Terms and conditions	https://www.caruso-dataplace.com/privacy-policy/	CR-2
	Whitepaper	Naab, M. & Knodel, J. (n.d.). Architecture of the Caruso Ecosystem.	CR-3
		Software Engineering Institute (2018, June 4). SATURN 2018 Talk: Architecture of the CARUSO Ecosystem, by Matthias Naab. Youtube.	CR-3
		https://www.youtube.com/watch?v=U1qdBsh_MF4&t=1010s	

	Automat	Bounie, D., Marcocchia, G. & Quinn, M. (2018, April 5). Automotive Big Data Marketplace for Innovative Cross-sectoral Vehicle Data Services.	CR-4
IOTA	Website	https://www.iota.org/	IOTA-1
	Terms and conditions	https://www.iota.org/research/privacy-policy	IOTA-2
	Whitepaper	Popov, S. (2018, April 30). Tangle	IOTA-3
	Forbes	Ponciano, J. (2017, November 28). IOTA Foundation Launches Data Marketplace for ‘Internet-Of-Things’ Industry	IOTA-4a
		Munford, M. (2018, January 23). Volkswagen’s Chief Digital Officer Joins Blockchain Non-Profit Iota Foundation	IOTA-4b
		Fenech, G. (2018, November 20). IOTA – Fulfilling the Promise of Blockchain.	IOTA-4c
Ocean Protocol	Website	https://oceanprotocol.com/	OP-1
	Terms and conditions	https://oceanprotocol.com/privacy/	OP-2
	Whitepaper	Ocean Protocol Foundation (2019, April 15). Ocean Protocol: A Decentralized Substrate for AI Data & Services Technical Whitepaper	OP-3a
		Ocean Protocol Foundation (2017, October 19). A decentralized data exchange protocol, powered by blockchain technology and a cryptotoken - Business Strategy	OP-3b
		Ocean Protocol Foundation (2019, February). A decentralized data exchange protocol to unlock data for artificial intelligence – Reference Marketplace Framework	OP-3c
	Forbes	Wolfson, R. (2018, November 20). Diversifying Data With Artificial Intelligence And Blockchain Technology.	OP-4a
		Corea, F. (2018, October 4). The Blockchain-Enabled Intelligent IoT Economy	OP-4b

TomTom Codes

Dimension	Focused coding	Initial coding	Examples of coded lines
Domain	Traffic	In-vehicle navigation / advanced driver-assistance / autonomous driving / traffic information	“HD Traffic real-time traffic information is the backbone of a time-dynamic navigation concept that guarantees reliable routing and precise travel time information” (TT-3a)
Participants	Automotive customers Enterprise customers Consumer customers	Car manufacturers / tier 1 suppliers / technology companies / geographical information systems providers / government bodies / traffic management institutions / Automotive customers / Enterprise customers / consumer customers	“Our Automotive business unit licenses to automotive customers – both automakers, known as original equipment manufacturers (OEMs), and head-unit vendors, known as Tier 1 suppliers.” (TT-3b)
Platform access	Closed	User account	“You may be required to create an Account and subsequently to log into the relevant Platform in order to: i. order a Product or Service; ii. access or use a Service, App and/or User Contributed Data (either obtained directly via TomTom or via a Reseller), and iii. be able to upload and/or download User Data and/or User Contributed Data. iv. manage your account and/or subscriptions.” (TT-2a)
Privacy	Anonymous	Use information for the purpose and duration for which it was obtained / anonymous GPS data	“The profiles have been compiled by aggregating 1.4 billion of anonymous GPS probe data, shared by TomTom’s broad user community” (TT-3a)
Data source	Government, commercial, self-generated	TomTom source / user data / user contributed data / GPS data / GSM data / cellular floating phone data / incident context data / TMC 3 rd party messages / historic speeds	“The core sources of traffic data collection systems are probe data from cell phone operators in the various countries as well as GPS probes from the installed base TomTom connected devices and commercial fleets with TomTom WORK navigation systems” (TT-3a)
Data output	Aggregated data	Maps / navigation software / traffic information / dynamic routing / shift to wearables / product is the core of an ecosystem / retail sell-through data / online maps	“Meanwhile, the data is an essential ingredient of TomTom Personal Navigation Devices and online maps, and is branded as IQ Routes.” (TT-3a)
Data service	Customized location analysis	License products / offer tailor-made solutions / Monitor laws and regulations / need for diversification of content, telematics and licensing / payment service / deliver product / physical delivery / digital delivery / repair broken product / shift towards personalization / customized supply response / build	“We license maps, navigation software and online services as components for applications, offering tailor-made solutions to meet customer’s specific needs” (TT-1a)

		mapping app with partner / supply devices to businesses	
Data quality	Reviews by marketplace	Check quality	“The clusters undergo a couple of quality and alignment steps, finally leading to a set of profiles which serves all countries and markets or a given version of the map” (TT-3a)
Contract	Bilateral	Bilateral contract / accept proposal	“Contracts are concluded only after TomTom has accepted the Supplier’s (final) quotation, proposal, or offer by issuing a Purchase Order” (TT-2b)
Market positioning	Independent	Independent	-
Platform infrastructure	Centralized	Store the data	“On a road segment, only the reference speed (normally the free flow speed) and a link to the most similar profile per day of the week are stored, instead of all the speed data for each time per day.” (TT-3a)
Data processing activities	All	passive channel for distribution of user contributed data / monitor user contributed data / enhance data with road data / enhance data with weather information / filter unnecessary data / separate data / analyze data / filter data / compare real-time data to historic data / predict data / collect own data / link data points / create speed profiles / provide dynamic routing / estimate arrival time / harmonize data / integrate companion platforms / integrate marketing strategies / integrate supporting systems /	“For filtering, an enhanced data analysis is necessary, for example to separate handsets which are used in a train. As a typical speed pattern appears when calls are coming from trains, because all handsets have the same speed and handover events, these data can be taken out.” (TT-3a)
Key partners	Joint venture	Acquired Tele Atlas before crisis / partnership with Nike / partner Huawei for mapping needs / partner with Amazon for better navigation	“First came the global financial crisis, including the collapse of Lehman Brothers. That was bad enough for any business, but especially bad for TomTom, which just before the crash had paid three billion Euros for a mapping company called Tele Atlas and was now loaded with debt.” (TT-4a)
Revenue streams	Usage based, flat fee tariff	Free / monthly subscription / single basis / subscription bases / trial subscription / no more income from Sat Nav box sale / end-user subscriptions / pay as you grow	“A Service may be offered on a single basis or on a subscription basis. When you have a paid subscription, the Service will be provided to you either in a monthly or a fixed basis. Monthly Paid Subscriptions will be entered into for an indefinite period of time, and you will be automatically charged to your preferred payment method at the start of each subscription period for the fees and taxes applicable, unless you cancel the monthly subscription BEFORE the subscription period is renewed. Subscriptions will be entered into for an indefinite period of

			time, unless TomTom and you have agreed on a fixed period of time.” (TT-2a)
Data pricing mechanism	Set by data marketplace	Set by data marketplace	“All prices quoted by Supplier shall be fixed, on a time and material basis or as otherwise detailed or agreed to in the Specifications and/or the Purchase Order, expressed in euros (unless stated otherwise), without prejudice and subject to these General Terms and Conditions, exclusive of VAT but inclusive of any other taxes, incidental costs and/or expenses.” (TT-2b)
Payment currency	Euro	Euro	-

INRIX Codes

Dimension	Focused coding	Initial coding	Examples of coded lines
Domain	Traffic	Automotive industry / transportation industry / real-time traffic information RTTI / traffic data	“Primarily traffic and connected services” (IN-5)
Participants	Internal developers	OEM / TIER 1 / app developers / fleet-based service providers / media / mobile broadband platform providers / public sector / website / automotive / media	“Our partnership with Volvo will enhance the luxury experience Volvo drivers around the globe have become accustomed to by providing them with real-time traffic data” (IN-4c)
Platform access	Closed	Closed	-
Privacy	anonymous	Data control and privacy decided by OEM / API compliance / anonymous data / anonymous real-time GPS data	“The GPS installed in the vehicles acted as a sensor for the RTTI firm’s network, sending information such as car location, speed and direction of travel anonymously back to a central processing center every minute” (IN-5)
Data source	commercial, self-generated	Road sensors / vehicles / GPS-equipped vehicles / mobile phones / network-based cellular car data / netFCD / users actively report data / radar sensors in parking lots / logistics fleet customers / proprietary app users	“By 2012, its network included over 100 million vehicles and devices, including GPS-equipped commercial vehicles, consumer vehicles, mobile phones and data from road sensors, all of which fed INRIX with up-to-the minute data on location, speed and directional heading.” (IN-5)
Data output	Aggregated data	Real-time parking / traffic information / voice-enabled technology / location data / speed data / direction data / state of traffic / average speed / alternative routes / estimated delay times / crowd-sourced data / create lock-in effects / deliver parking info in dashboard / provide data to navigation providers	“INRIX delivers innovative products for the automotive and transportation industries such as real-time parking and traffic information and solutions that facilitate the safe testing and deployment of autonomous vehicles.” (IN-1)
Service	Customized location analysis	Differentiate branding of OEM / take away negotiation between OEM and developers / customized services / aid driver in fast arrival / solve congestion / customized traffic data / different pricing for different customers / selling data as a service / train employees to use tools / pre-paid parking lots / sell aggregated data back to manufacturers / supply predictive traffic flow information	“Support for automakers’ custom applications” (IN-3)
Data quality	Reviews by the marketplace	Reviews by the marketplace	“INRIX combined this data with proprietary algorithms to produce much higher quality” (IN-5)

Contract	Bilateral	OEM contracts are long term / deep customer relationship / due to contract term	“Over the next three years our revenue is projected to grow substantially based on deals we already have signed because the nature of the automotive business is such that you sign a deal, then you have to wait two years until the cars start shipping and then you start getting revenue.” (IN-5)
Market positioning	Independent	Independent	-
Platform infrastructure	Centralized	Cloud environment / central data storage	“A cloud environment creates the ability for app developers and trusted app brands to deliver up-to-the-minute contextual content due to its standardized functionality.” (IN-3)
Data processing activities	All	Analyze data / interface smartphone / find location / get directions / identify nearby parking spots / send parking alert / send safety alert / send traffic alert / update content / connect written software from OEM / aggregate third-party content / reduce down-time / reduce time-to-market / apply proprietary algorithms / crowd-sourcing vehicle data / collect GPS data / algorithms analyze data / statistically estimate RTTI / invest in algorithms / invest in distribution / invest in processing / collect data / predict traffic data / map data / combine GPS data with other traffic affecting data / collect data over prolonged time period / make algorithms / process data / separate data / invest money / develop applications and services / embed transaction-based parking reservations / predict EV range based on traffic / compare current speed to speed limit / detect slow-downs	“Our idea was to collect data from them on how fast their vehicles were going and where they were. This data would be transmitted back to our servers. From there we could process the data with a set of algorithms, to create accurate understanding of traffic conditions. We could then transmit real-time traffic reports to our customers, selling the data as a service.” (IN-5)
Key partners	Strategic: Distribution, software, Sales	Content integrators / license traffic prediction technology from Microsoft / partnership with fleet / partnership with Microsoft for data management technology / partnership with Tele Atlas for sales / Clear Channel data distribution / acquisition of ParkMe / partnership with OEM to provide traffic data	“The technology developed by Microsoft Research was a sophisticated set of algorithms capable of accounting for dozens and dozens of variables” (IN-5)
Revenue streams	Usage based, flat fee tariff	Per subscriber per month / licensing fee per mile covered per year / revenue comes after car shipping	“Pricing differed based on customer type typically relying on either subscriber fees or licensing fees.” (IN-5).
Data pricing mechanism	Set by data marketplace	Set by data marketplace	-
Payment currency	Euro	Euro	-

HERE Codes

Dimension	Focused coding	Initial coding	Examples of coded lines
Domain	Traffic	cross-industry data / location-centric data / location information / maps / RTTI / Weather data	“In the HERE Open Location Platform, data consists of both maps and location information that HERE provides, such as Real-Time Traffic and Weather, as well as data that you and other users provide.” (HE-1b)
Participants	Internal and external analysts	Integrate third-party services and OEM / maintain relationship between OEM and consumer / Data provider / data consumer / third parties / business analysts / business scientists / developers / government	“Another example is a federal government that needs to route its heavy vehicles along appropriate roads, taking into account legal and physical vehicle restrictions and complying with data protection and security rules.” (HE-3a) “HERE Neutral Server functions as a single point of data access from the vehicle manufacturer, which they can use to enhance the driving experience for the customers.” (HE-1b)
Platform access	Open	Request access to data provider / control information a customer can see / view listing on invitation	“The request process makes it simple for providers to manage the level access to their datasets. All requests are logged and recorded by the system.” (HE-1b)
Privacy	Encryption	Private listing / public listing / semi-private listing / continuous access until deactivated / encrypted data	“Data stored at rest in versioned layers, stream layers and index layers is encrypted using AES-256, a strong, proven, block cipher.” (HE-1b)
Data source		Sensor data / neutral server to distribute data / data provided by HERE / data from other users	“In the HERE Open Location Platform, data consists of both maps and location information that HERE provides, such as Real-Time Traffic and Weather, as well as data that you and other users provide.” (HE-1b)
Data output	Aggregated & Standardized data	Catalog metadata / three-dimensional maps	“Today, we’re creating living three-dimensional maps that grow upwards, breathing with layers of information and insights.” (HE-1)
Service	Customized location analysis & standardized data transfer	Ensure functionality with poor network coverage / Connected car navigation / on demand service / provide a HERE SDK / payment and billing partnership / cloud APIs / data services / map software / UX elements / individual OEM branding / modularity lowers costs / Find data / subscribe to data /	“An example of a location-based application involving large amounts of location data and high volumes of service transactions, is location-based analytics, applied to improve the user experience and to gain

		consent management / provide software development kit / provide input and output metrics / enable data promotion, sharing and licensing / facilitate interaction and data exchange / provide monitoring tools / catalog management permission / cooperate in teams / publish data to catalog / have an OLP account / advertise data in listing / convert currency / no support for license execution / filter data / search catalogs	geospatial insights from big chunks of data.” (HE-3a)
Data quality	No info	-	-
Contract	Bilateral & standardized	Subscription functions as contract / standard terms and conditions / self-accept contract / no human interaction / subscribe to listing / provide metadata / provide SDK / visualize data	“There are three types of subscription options available: Customized - This is based on terms that are negotiated offline. Evaluation - These terms and conditions are available for you to self-accept and subscribe to from the listing, as there is no subscription flow. This type of subscription allows you to read data with no subscription fee. Commercial - These terms and conditions help Providers create their listings with different pricings for Marketplace, and allow Consumers to sign up with no human interaction so that the Marketplace can generate usage and/or line-items on the Consumer's bill.” (HE-1b)
Market positioning	No info	-	-
Platform infrastructure	Centralized	Three element architecture / edge technology/ connect different IT layers / access the HERE Cloud / minimum quality guaranteed by edge / modular architecture/ HERE Cloud for larger storage / maintain and update navigation services / Store data in catalogs / store data in partitions / generic partitioning / tile partitioning / limited data storage	“To ensure good performance, the HERE Open Location Platform has limits on data storage and throughput. Some limits can be controlled by layer configuration, which may impact your cost since you are charged based on how you have configured the layers and data usage.” (HE-1b)
Data processing activities		Integrate data in the marketplace / configure consumer navigation system / combine OEM portal and HERE NavOD SDK / List data / aggregate real-time parking data / catalog data / report input and output data metrics / segment data layers / support consistent content / standardize data using schemas / provide schemas	“A catalog is a data storage, that is available for the Data Provider or Data Consumer to access at any time.” (HE-1b)
Key partners	-	-	-
Revenue streams	Usage based	Different subscription / usage based / free / standard pricing	“Cloud-based solutions offer low entry costs and for many businesses, attractive on-

			demand charging based on actual usage.” (HE-3a)
Data pricing mechanism	Negotiation & set by seller & set by data marketplace	Negotiate contract offline / set by sellers / negotiate contract	“With a Commercial subscription process, customers can subscribe to the listing with default pricing by clicking Subscribe or Review pricing for the listing with customized pricing.” (HE-1b)
Payment currency	Euro	Convert currency	“Customers will pay the currency they’ve chosen for their HERE account. HERE will convert currency based on exchange rates at the time of billing.” (HE-1b)

Caruso Codes

Dimension	Focused coding	Initial coding	Examples of coded lines
Domain	Automotive	Smart automotive domains	“smart mobility” (CR-4)
Participants	External third parties	Retrofit suppliers (short-term) / OEM (long-term) / only one OEM / aftermarket / service providers / founding partners are data sellers	
Platform access	closed	-	-
Privacy	Anonymous	Anonymous data / processing under expressed consent / adhere to privacy laws / founders act as legal guarantee	“As a rule, the analyses of your browsing patterns are conducted anonymously; i.e. the browsing patterns cannot be traced back to you.” (CR-2a)
Data source	OEM, Tier 1	Connected vehicle / connect other marketplaces as well / vehicle data	“Development of connected vehicles in Europe” (CR-4) “Founding partners provide the customer base for data suppliers” (CR-4)
Data output	Standardized data	Vehicle information / in-vehicle data / process data / metadata / master data / configuration data / reference data / transactional data / streaming data / monitoring data	“transactional data streaming data monitoring/logging data rather dynamic, high volume” (CR-4)
Data service	Data brokering service	Service marketplace / align business models of data sellers, buyers and marketplace / support client about thinking what data to upload and when to join marketplace / account management service / billing service / file upload service / statistics service / marketplace service (index, offer, subscription) / connecting correct stakeholders / influence partners in ecosystem to make trade happen / provide access to datasets	“We are focusing on providing the data brokering infrastructure and are not offering data or services ourselves.” (CR-1)
Data quality	No info	-	-
Contract	Bilateral	Contract with data marketplace / contracts between provider and consumer	“Whether you want to consume or provide data – or do both, like the majority of our partners – it all starts with our partner agreement.” (CR-1)
Market positioning	Sellers	Develop our platform according to the needs of our partners / owned by participants / website operator processes data / private / 34 shareholders	“We are expanding our shareholder base constantly across other segments of the mobility market bringing us even closer to achieving our goal of creating the mobility data & service marketplace owned by its participants.” (CR-1)
Platform infrastructure	Central	Ecosystem involves many parties and layers / central Caruso platform / marketplace layer (meta-data) / brokering engine layer (API) / Amazon Web Services platform	“Providing a secure platform and respecting the privacy of data owners is vital to the future success of the whole ecosystem. As a result, our

			platform is secure by design, built on AWS with Auth0 authentication, plus every data and service that a company wants to onboard is checked for GDPR-compliance.” (CR-1)
Data processing activities	Limited	No data offering / no services / provide brokerage infrastructure / govern the marketplace / analyze use patterns / collect / harmonize / distribute / match buyers and sellers	“All the data available on the platform is being harmonised to match into a precise data index, providing all partners full transparency of the exact data points available.” (CR-1)
Key partners	-	Stakeholder verticals	“We are growing our investors in a structured manner with a balanced portfolio from all our stakeholder verticals to provide long-term sustainability for all of our partners.” (CR-1)
Revenue streams	Margin	Marketplace gets margin / can be any revenue model / revenue for brokering, contracts handling and data analysis	“Caruso revenue scheme appears to be based on broker transactions for B2B data exchange and in services for contracts handling and data analytics.” (CR-4)
Data pricing mechanism	Set by seller	Control over data and prices at data seller	“You have full control of your data & service and prices.” (CR-3)
Payment currency	Euro	PayPal payment	“If you choose payment via PayPal, we will share the information you enter with PayPal (CR-2)

IOTA Codes

Dimension	Focused coding	Initial coding	Examples of coded lines
Domain	All industries	Interconnected and autonomous devices / machine economy / IoT industry / fine granular datasets / multiple data domains	“The marketplace is hinged on data's use applications in industries such as supply chain, smart cities, energy, manufacturing and healthcare.” (IOTA-4a)
Participants		Participants who issue transactions / participants who approve transactions / corporations / allow B2B, researchers and hobbyists / do not know who or how it will be used / any industry who have transactions / Governments / industries / users and validators are the same	“There are two distinct types of participants in the system, those who issue transactions, and those who approve transactions.” (IOTA-3) “The beauty of enabling fine-granular trade access is that we really do not know who or how it will be used, except that we know it is a completely new paradigm.” (IOTA-4a) “The way this is resolved is that instead of having these two parties turn the users into validators, we make the users and the validators one and the same.” (IOTA-4c)
Platform access	Open	Public marketplace / open data from sensors / open access	“The public marketplace aims to give connected devices the ability to securely transfer, buy and sell fine-granular and diverse datasets while ultimately facilitating access to data that oftentimes sits unused.” (IOTA-4a)
Privacy	Encrypted	Encrypted	-
Data source	Government, commercial, self-generated, community	Content published by the IOTA / corporates / governments	“Within the next few days, participants in these industries and others are expected to open and enable access to streams of data generated by sensors they've deployed.” (IOTA-4a)
Data service	Brokering service	Do research / develop software for the ecosystem / educate people about the foundation / standardize the economy of things / discuss applications with customers / promise of immutability / securing data for free	“Educate and promote technologies and use cases for new generations to understand and to ensure the Foundation's success (IOTA-1a) “Standardize and ensure the maturity and widespread adoption of the economy of things” (IOTA-1a)
Data output	Standardized data	Solves scalability issue / data integrity	“When you put data onto the ledger, it has data integrity, which means it can never be changed again.” (IOTA-4c)
Data quality	User reviews	User verifies previous transactions / reward / validate two previous transactions / more activity = more validation / users must approve	“In order to make a transaction in the Tangle, two previous transactions must be validated with the reward for doing so

		transactions / contribution to the network security / transaction not approved if transaction is in conflict / transaction request needs to approve previous transactions / level of confidence / nodes are not required to have consensus in validity / weight node proportional to invested work	being the validation of your own transaction by some subsequent transaction.” (IOTA-1b)
Contract	Standardized	Trust in DLT for inclusive and permissionless economy / no need for trusted third-parties	“It’s this decentralized permissionless ledger, where the data will be hosted, that will ensure the data being sold on IOTA’s marketplace is tamper-proof.” (IOTA-4a)
Market positioning	-	-	-
Platform infrastructure	Decentral	Open-source / distributed ledger / tangle individual transactions / directed acyclic graph / ledge stores transactions / distinguish between low load and high load / more decentral than blockchain	“The transactions issued by nodes constitute the site set of the tangle graph, which is the ledger for storing transactions.” (IOTA-3)
Data processing activities	All	Synchronize ledgers of data and money / user performs computational work / design transaction rule for linking transactions / algorithm appoints linking transactions / check whether transactions conflict / motivate node to transact / drop lazy node / incentive to participate	“Every node calculates some statistics, one of which is how many new transactions are received from a neighbor. If one particular node is “too lazy”, it will be dropped by its neighbors. Therefore, even if a node does not issue transactions, and hence has no direct incentive to share new transactions that approve its own transaction, it still has incentive to participate.” (IOTA-3)
Key partners	-	-	-
Revenue streams	Usage-based Funding	Free to use / funded by donations / fee free / genesis transaction / initial balance of tokens / tokens distributed over founder addresses / non-profit / no bit for priority / digital payment without fee / pay for the exact quantity you use	“With IOTA, when you no longer have these fees, you can create a completely new economy where you pay for the exact quantity you use, rather than pay upfront or after the factor based on some statistical projections of how much you are going to use it.” (IOTA-4c) “The IOTA Foundation is funded in three ways:1) Holdings of IOTA tokens from community donations and unclaimed tokens from the initial crowd sale. 2) Grants from governments to perform research and development. 3) Donations from individuals or enterprises.” (IOTA-1)
Data pricing mechanism	Set by seller	Defined by sensor owner	-
Payment currency	Cryptocurrency	Tangle / cryptocurrency / IOTA cryptocurrency	“This approach is currently being implemented as a

			cryptocurrency called iota” (IOTA-3)
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Ocean Protocol Codes

Dimension	Focused coding	Initial coding	Examples of coded lines
Domain	Full ecosystem	Autonomous vehicles / medical research	-
Participants		AI researchers / data scientists / data buyer / data curator / data marketplace / data seller / data verifier / data keeper / community / data consumers / data providers / developers / marketplaces / AI developers provide code as a service / lower barrier for smaller players to compete with tech giants	“The greatest beneficiaries are companies that have both vast data and internal AI expertise, like Google and Facebook. In contrast, AI startups have amazing algorithms but are starving for data; and typical enterprises are drowning in data but have less AI expertise. The power of both data and AI—and therefore society—is in the hands of few.” (OP-3a)
Platform access	Open access	Decentralized access control / compute brought to the data / granting access permission / open access / control at data provider / blockchain monitors data access / blockchain provides control points	“while providing open access for developers to build services” (OP-3b) “The marketplaces built on Ocean Protocol will allow data to be accessed by all participants, ensuring that no central player can control or exploit the data.” (OP-4a)
Privacy	Encrypted	Encrypted / keep control and privacy	“During the publishing process, the publisher provides the file URLs as plaintext, which will be encrypted by metadata store (Aquarius) in the backend and stored as encrypted URLs.” (OP-3a)
Data source	Government, social media, commercial, community	Companies with data and AI expertise / enterprises with data without AI expertise / start-ups with algorithms but without data	“The greatest beneficiaries are companies that have both vast data and internal AI expertise, like Google and Facebook. In contrast, AI startups have amazing algorithms but are starving for data; and typical enterprises are drowning in data but have less AI expertise.” (OP-3a)
Data service	Data brokering service	Providing licensing framework with pricing / incentivize data sharing / provide tools for discovery and value-added services / build open software / activate community of developers / provide pricing schemes / token storage / integrate metadata storage / integrate tools / provide dashboards / data compliance frameworks	“Support the designed token dynamics, including token storage and smart contracts business logic. Support for free, non-fungible, fungible and programmable pricing schemes.” (OP-3b)
Data output	Standardized data	Normalize data / metadata content	“Ocean Protocol’s processing functionality provides data curators with the ability to normalize exposed data in order to create new assets, while

			keeping track of source or background IP” (OP-3c) “OEP8 specifies the common attributes that must be included in any Asset Metadata stored in the Ocean Network, such as name, dateCreated, author, license, price, files (to URLs), file checksums, tags, and more. In addition, OEP8 recommends some additional attributes for discoverability and normalizes these attributes for curation purpose, which serve a common structure for sorting and filtering on DDOs.” (OP-3a)
Data quality	Reviews by marketplace	Signal quality, reputation and ward / proof correct data file available / earn ocean tokens by providing data / data keeper / provide network rewards	One only gets network rewards for data they’ve staked if they also make it available when requested; making data available is a key role of keepers” (OP-3a)
Contract	Standardized	Verifiable service agreements / decentralized service agreements / smart contract	“First, a consumer (via Squid) conducts search on a marketplace’s metadata store (via Aquarius interface). He/she finds a service offering (SEA) for data or compute that she likes. She digitally signs the SEA. In the next few steps, a service provider running Brizo will execute the agreement so that consumer can access (via on-chain access control) and consume the asset after sending the payment to Keeper smart contract.” (OP-3a)
Market positioning	Independent	-	-
Platform infrastructure	Decentral	Decentralized orchestration / blockchain technology	“Ocean does decentralized orchestration: at its core are decentralized service agreements and decentralized access control, which execute on decentralized virtual machines.” (OP-3a)
Data processing activities	Limited	Storing and promoting meta data, linking assets and services / connect to data / data curation / monetize data / connect services / inter-service network / metadata management / metadata storage / filter data assets / publish data assets / register users / search data assets / data standardization / provide computation, algorithms, storage, data / ocean keepers discover and validate / P2P consensus of ocean keepers / ocean verifier challenge data / cluster service providers in tribes	“Asset metadata is one part of Ocean DDOs. This is a JSON object with information about the asset.” (OP-3a)

Key partners	Contracting Infrastructure	Dutch Stichting for contracts / partnership with blockchain teams / partners to track compliance laws	“The Stichting lays out contracts for each node operator, including data processing agreements. This clarifies liability.” (OP-3a)
Revenue streams	Any	Free / priced fungible / priced non-fungible / auction	“Ocean Protocol enables many types of data pricing strategies.” (OP-3a)
Data pricing mechanism	Set by data seller	Pricing set by data seller	“set pricing for data via the Protocol to prevent vendor lock-in.” (OP-3b)
Payment currency	Cryptocurrency	Tokens	“The Ocean Tokens (Ocean) are used on the Ocean Protocol network as the means of value exchange, to power the protocol and incentivize the keeper nodes of the network.” (OP-3b)

Aggregated Codes per Dimension

Domain	TT	In-vehicle navigation / advanced driver-assistance / autonomous driving
	IN	Automotive industry / transportation industry / real-time traffic information RTTI
	HE	cross-industry data / location-centric data / location information
	CR	Smart automotive domains
	IOTA	Interconnected and autonomous devices / machine economy / IoT industry / fine granular datasets / multiple data domains
	OP	Autonomous vehicles / medical research
Participants	TT	Car manufacturers / tier 1 suppliers / technology companies / geographical information systems providers / government bodies / traffic management institutions
	IN	OEM / TIER 1 / app developers / fleet-based service providers / media / mobile broadband platform providers / public sector / website / automotive
	HE	Integrate third-party services and OEM / maintain relationship between OEM and consumer / Data provider / data consumer / third parties / business analysts / business scientists / developers / government
	CR	Retrofit suppliers (short-term) / OEM (long-term) / only one OEM / aftermarket / service providers / founding partners are data sellers
	IOTA	Participants who issue transactions / participants who approve transactions / corporations / allow B2B, researchers and hobbyists / do not know who or how it will be used / any industry who have transactions
	OP	AI researchers / data scientists / data buyer / data curator / data marketplace / data seller / data verifier / data keeper / community / data consumers / data providers / developers / marketplaces / AI developers provide code as a service / lower barrier for smaller players to compete with tech giants
Data input	TT	TomTom source / user data / user contributed data / GPS data / GSM data / cellular floating phone data / incident context data / TMC 3 rd party messages / historic speeds
	IN	Road sensors / vehicles / GPS-equipped vehicles / mobile phones / network-based cellular car data / netFCD / users actively report data / radar sensors in parking lots / logistics fleet customers / proprietary app users
	HE	Sensor data / neutral server to distribute data / data provided by HERE / data from other users / maps / RTTI / Weather data
	CR	Connected vehicle / connect other marketplaces as well / vehicle data
	IOTA	Content published by the IOTA / corporates / governments
	OP	Companies with data and AI expertise / enterprises with data without AI expertise / start-ups with algorithms but without data

Data output	TT	Maps / navigation software / traffic information / dynamic routing / need for diversification of content, telematics and licensing / shift to wearables / product is the core of an ecosystem / retail sell-through data
	IN	Real-time parking / traffic information / voice-enabled technology / location data / speed data / direction data / state of traffic / average speed / alternative routes / estimated delay times / crowd-sourced data / create lock-in effects / deliver parking info in dashboard / provide data to navigation providers
	HE	-
	CR	Vehicle information / in-vehicle data / process data / metadata / master data / configuration data / reference data / transactional data / streaming data / monitoring data
	IOTA	Solves scalability issue / data integrity
	OP	Normalize data
Data service	TT	Monitor laws and regulations / payment service / deliver product / physical delivery / digital delivery / repair broken product / shift towards personalization / customized supply response / build mapping app with partner / supply devices to businesses
	IN	Differentiate branding of OEM / take away negotiation between OEM and developers / customized services / aid driver in fast arrival / solve congestion / customized traffic data / different pricing for different customers / selling data as a service / train employees to use tools / pre-paid parking lots / sell aggregated data back to manufacturers / supply predictive traffic flow information
	HE	Ensure functionality with poor network coverage / Connected car navigation / on demand service / provide a HERE SDK / payment and billing partnership / cloud APIs / data services / map software / UX elements / individual OEM branding / modularity lowers costs / Find data / subscribe to data / consent management / provide software development kit / provide input and output metrics / enable data promotion, sharing and licensing / facilitate interaction and data exchange / provide monitoring tools / catalog management permission / cooperate in teams / publish data to catalog / have an OLP account / advertise data in listing / convert currency / no support for license execution / filter data / search catalogs
	CR	Service marketplace / align business models of data sellers, buyers and marketplace / support client about thinking what data to upload and when to join marketplace / account management service / billing service / file upload service / statistics service / marketplace service (index, offer, subscription) / connecting correct stakeholders / influence partners in ecosystem to make trade happen
	IOTA	Do research / develop software for the ecosystem / educate people about the foundation / standardize the economy of things / discuss applications with customers / promise of immutability / securing data for free
	OP	Providing licensing framework with pricing / incentivize data sharing / provide tools for discovery and value-added services / build open software / activate community of developers / provide pricing schemes / token storage / integrate metadata storage / integrate tools / provide dashboards / data compliance frameworks
Data quality	TT	Check data quality
	IN	Reviews by the marketplace
	HE	-
	CR	-
	IOTA	User verifies previous transactions / reward / validate two previous transactions / more activity = more validation / users must approve transactions / contribution to the network security / transaction not approved if transaction is in conflict / transaction request needs to approve previous transactions / level of confidence / nodes are not required to have consensus in validity / weight node proportional to invested work
	OP	Signal quality, reputation and ward / proof correct data file available / earn ocean tokens by providing data / data keeper / provide network rewards
Privacy	TT	Use information for the purpose and duration for which it was obtained / anonymous GPS data

	IN	Data control and privacy decided by OEM / API compliance / anonymous data / anonymous real-time GPS data
	HE	Private listing / public listing / semi-private listing / continuous access until deactivated / encrypted data
	CR	Anonymous data / processing under expressed consent / adhere to privacy laws / founders act as legal guarantee
	IOTA	Encrypted
	OP	Encrypted / keep control and privacy
Contract	TT	Bilateral contract
	IN	OEM contracts are long term / deep customer relationship / due to contract term
	HE	Subscription functions as contract / standard terms and conditions / self-accept contract / no human interaction / subscribe to listing / provide metadata / provide SDK / visualize data
	CR	Contract with data marketplace / contracts between provider and consumer
	IOTA	Trust in DLT for inclusive and permissionless economy / no need for trusted third-parties
	OP	Verifiable service agreements / decentralized service agreements / smart contract
Platform access	TT	User account
	IN	Closed
	HE	Request access to data provider / control information a customer can see / view listing on invitation
	CR	Closed
	IOTA	Public marketplace / open data from sensors / open access
	OP	Decentralized orchestration / blockchain technology
Platform infrastructure	TT	Store the data
	IN	Cloud environment / central data storage
	HE	Three element architecture / edge technology/ connect different IT layers / access the HERE Cloud / minimum quality guaranteed by edge / modular architecture/ HERE Cloud for larger storage / maintain and update navigation services / Store data in catalogs / store data in partitions / generic partitioning / tile partitioning / limited data storage
	CR	Ecosystem involves many parties and layers / central Caruso platform / marketplace layer (meta-data) / brokering engine layer (API) / Amazon Web Services platform
	IOTA	Open-source / distributed ledger / tangle individual transactions / directed acyclic graph / ledge stores transactions / distinguish between low load and high load / more decentral than blockchain
	OP	Decentralized orchestration / blockchain technology
Data processing activities	TT	passive channel for distribution of user contributed data / monitor user contributed data / enhance data with road data / enhance data with weather information / filter unnecessary data / separate data / analyze data / filter data / compare real-time data to historic data / predict data / collect own data / link data points / create speed profiles / provide dynamic routing / estimate arrival time / harmonize data / integrate companion platforms / integrate marketing strategies / integrate supporting systems /
	IN	Analyze data / interface smartphone / find location / get directions / identify nearby parking spots / send parking alert / send safety alert / send traffic alert / update content / connect written software from OEM / aggregate third-party content / reduce down-time / reduce time-to-market / apply proprietary algorithms / crowd-sourcing vehicle data / collect GPS data / algorithms analyze data / statistically estimate RTTI / invest in algorithms / invest in distribution / invest in processing / collect data / predict traffic data / map data / combine GPS data with other traffic affecting data / collect data over prolonged time period / make algorithms / process data / separate data / invest money / develop applications and services / embed transaction-based parking reservations / predict EV range based on traffic / compare current speed to speed limit / detect slow-downs
	HE	Integrate data in the marketplace / configure consumer navigation system / combine OEM portal and HERE NavOD SDK / List data / aggregate real-time

		parking data / catalog data / report input and output data metrics / segment data layers / support consistent content / standardize data using schemas / provide schemas
	CR	No data offering / no services / provide brokerage infrastructure / govern the marketplace / analyze use patterns / collect / harmonize / distribute / match buyers and sellers / provide access to datasets
	IOTA	Synchronize ledgers of data and money / user performs computational work / design transaction rule for linking transactions / algorithm appoints linking transactions / check whether transactions conflict / motivate node to transact / drop lazy node / incentive to participate
	OP	Storing and promoting meta data, linking assets and services / connect to data / data curation / monetize data / connect services / inter-service network / metadata management / metadata storage / filter data assets / publish data assets / register users / search data assets / data standardization / provide computation, algorithms, storage, data / ocean keepers discover and validate / P2P consensus of ocean keepers / ocean verifier challenge data / cluster service providers in tribes
Revenue streams	TT	Free / monthly subscription / single basis / subscription bases / trial subscription / no more income from Sat Nav box sale / end-user subscriptions / pay as you grow
	IN	Per subscriber per month / licensing fee per mile covered per year / revenue comes after car shipping
	HE	Different subscription / usage based / free / standard pricing
	CR	Marketplace gets margin / can be any revenue model / revenue for brokering, contracts handling and data analysis
	IOTA	Free to use / funded by donations / fee free / genesis transaction / initial balance of tokens / tokens distributed over founder addresses / non-profit / no bit for priority / digital payment without fee / pay for the exact quantity you use
	OP	Free / priced fungible / priced non-fungible / auction
Data pricing mechanism	TT	Set by data marketplace
	IN	Fixed
	HE	Negotiate contract offline / set by sellers / negotiate contract
	CR	Control over data and prices at data seller
	IOTA	Defined by sensor owner
	OP	Pricing set by data seller
Payment currency	TT	Euro
	IN	Euro
	HE	Convert currency
	CR	PayPal payment
	IOTA	Tangle / cryptocurrency / IOTA cryptocurrency
	OP	Tokens