

## 1. The concept of Hypersmart Contracts

**Hypersmart Contracts ('HSC')** are ORS SA's innovative concept of integrating A.I. Algorithms with the decentralized storage and the computing power of blockchain contracts (e.g., Ethereum smart contracts or Hyperledger Chain codes) for **optimizing business processes** (the flow of goods and of information/documents) and automatically **releasing payments** for executing complex transactions – for example in supply chains.

Hypersmart Contracts are **smart daemons with an associated Ethereum account** and can be considered a design concept connecting AI-based software (both on cloud hosting and on dedicated servers) with some key functionalities of Blockchain (smart contracts releasing crypto payments; decentralized document management). In simple terms, by **connecting on-chain** and **off-chain** 'worlds', developers and entrepreneurs – especially from the **Crypto Community** - can create **compelling business models** and software solutions. HSCs help to optimally decide and automatically steer business transactions across value chains and industries (including very innovative B2C business models). Hypersmart Contracts can be used to overcome current limitations of smart contracts, as explained above in previous section.

The **reasons** behind such integration of A.I.-based software and Blockchain are as follows:

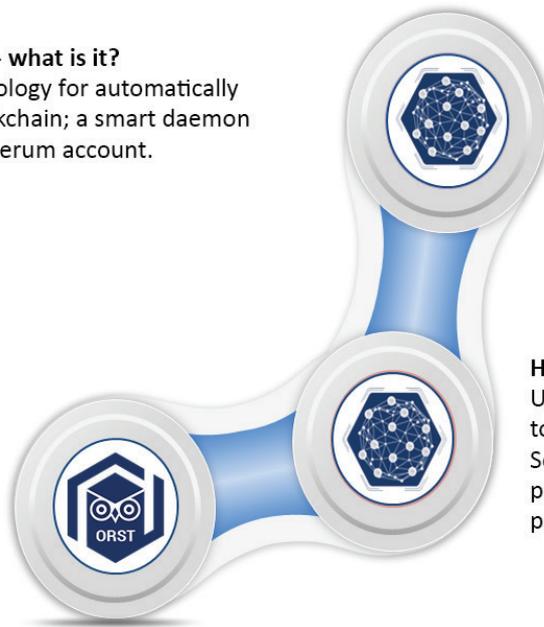
- ⊙ A.I. Algorithms are increasingly being adopted for automatic steering and optimizing of complex business processes in real time under stochastic conditions ('digitalization'; 'Industry 4.0'; etc.) As per the **PWC report**, A.I. could contribute up to \$15.7 trillion USD to the global economy in 2030, more than the current output of China and India combined. Of this, \$6.6 trillion is likely to come from increased productivity and \$9.1 trillion is likely to come from consumption side effects.
- ⊙ Blockchain technologies permit the avoidance of useless (and costly) **intermediaries**, performance of operations in untrusted environments and obtaining certified transactions of data and - more generally – of digital assets.
- ⊙ The use of **cryptocurrencies** can dramatically shorten payments cycles, allowing immediate transfer of money (upon fulfillment of conditions written in smart contracts).
- ⊙ In an **accelerating digital economy**, global value chains - which often involve untrusted parties – require faster and more optimized flows of goods, of information/data and of payments.
- ⊙ Existing **smart contracts are unsuitable** for automatically executing and optimizing complex business transactions, as the language only features some basic arithmetic, logical, and crypto operations (M. Bartoletti, 2017).

#### Hypersmart Contract - what is it?

It is an enabling technology for automatically connecting A.I. & Blockchain; a smart daemon with an associated Ethereum account.

#### About the ORS token

It is an Ethereum based utility token compliant to ERC 20



#### Hypersmart Contract (HSC) - what does it do?

Upon reception of specific amount of ORS tokens, the HSC will activate A.I. Algorithms and Solutions to solve a very complex optimization problem, parameterized with information previously stored on and off-chain

Figure 1. ORS Hypersmart contracts in a nutshell

From the technological point of view, the ORS Hypersmart Contract is a software program hosted on the ORS Platform and with an associated Ethereum account. Upon receipt of a specified amount of ORS tokens, the HSC can activate an A.I. algorithms-based software solution to solve complex optimization problems, which are parameterized with information previously stored by third parties on a blockchain (different HSC can interact with different blockchain types). The **UML sequence diagram** in Figure 3 shows more in details the general working mechanism of the Hypersmart Contracts. On the left, two different actors are represented: Master and Participants. The **Master** is an entity (an organization, a person, a software system), that needs to solve a complex optimization problem (both B2B and B2C); the problem can be solved by a specific ORS' or certified third party's AI-based software solution (the '**Hypersmart Solution(s)**') available on the Platform.

To get the problem solved, the first thing the Master ought to do is to describe it following the given specification syntax and to write such information on the blockchain (the Hypersmart Contracts are **blockchain-agnostic**, i.e., depending on the business case, different HSC can use different blockchains). Subsequently, and depending on the business case, other entities – the **Participants** - (an organization, a person, a software system) can in the problem-solving framework by declaring their contribution (typically, information such as quantity of goods, effort, etc.) on the same blockchain. It is important to notice that both Master and Participants rely on the mining process of the underlying blockchain, that guarantees **integrity of the data**.

**Public key cryptography** can ensure secrecy and authenticity of communications. After a certain amount of time, the Master will activate a specific HSC by transferring a well-defined amount of **ORS tokens** (again, each HSC will make its terms of use publicly available). When the transfer of cryptocurrency occurs, the HSC reads from the blockchain all the data related to that problem-solving request and 'calls' the relevant Hypersmart Solution available on the Platform. After the computation, the resulting information is written back on the blockchain and is available to both the Master and the Participants. Further steps may involve the same HSC with a different parameterization and problem request or may rely on an additional HSC.

"UML The Unified Modeling Language (UML) is a general-purpose, developmental, modeling language in the field of software engineering, that is intended to provide a standard way to visualize the design of a system" (source: [https://en.wikipedia.org/wiki/Unified\\_Modeling\\_Language](https://en.wikipedia.org/wiki/Unified_Modeling_Language))

By acting as a liaison between the **on-chain and the off-chain worlds**, Hypersmart Contracts are set to deliver major improvements against current limitations of smart contracts and will help to achieve the following **major benefits** for users (both established businesses and **innovative blockchain projects** from the Crypto Community):

- ⦿ The flexible architecture of the ORS Platform will allow **dynamic usage of Big Data** (both from businesses ERP systems and from external/public databases).
- ⦿ Managing properly the **stochastic conditions** under which almost all B2B and B2C transactions occur.
- ⦿ Allowing the **fast and powerful computation** required by the modern complexity of value chains and by the use of A.I. algorithms.
- ⦿ **Open source and API-based coding** shall enable third parties' certified offering of innovative Hypersmart Contracts and solutions.
- ⦿ Near-instant value chains ('productivity/efficiency **singularity**').
- ⦿ De facto elimination of '**last mile**' **inefficiencies** in business transactions, due to cumbersome management of information and documents, and slow traditional processing of bookkeeping and payment procedures.

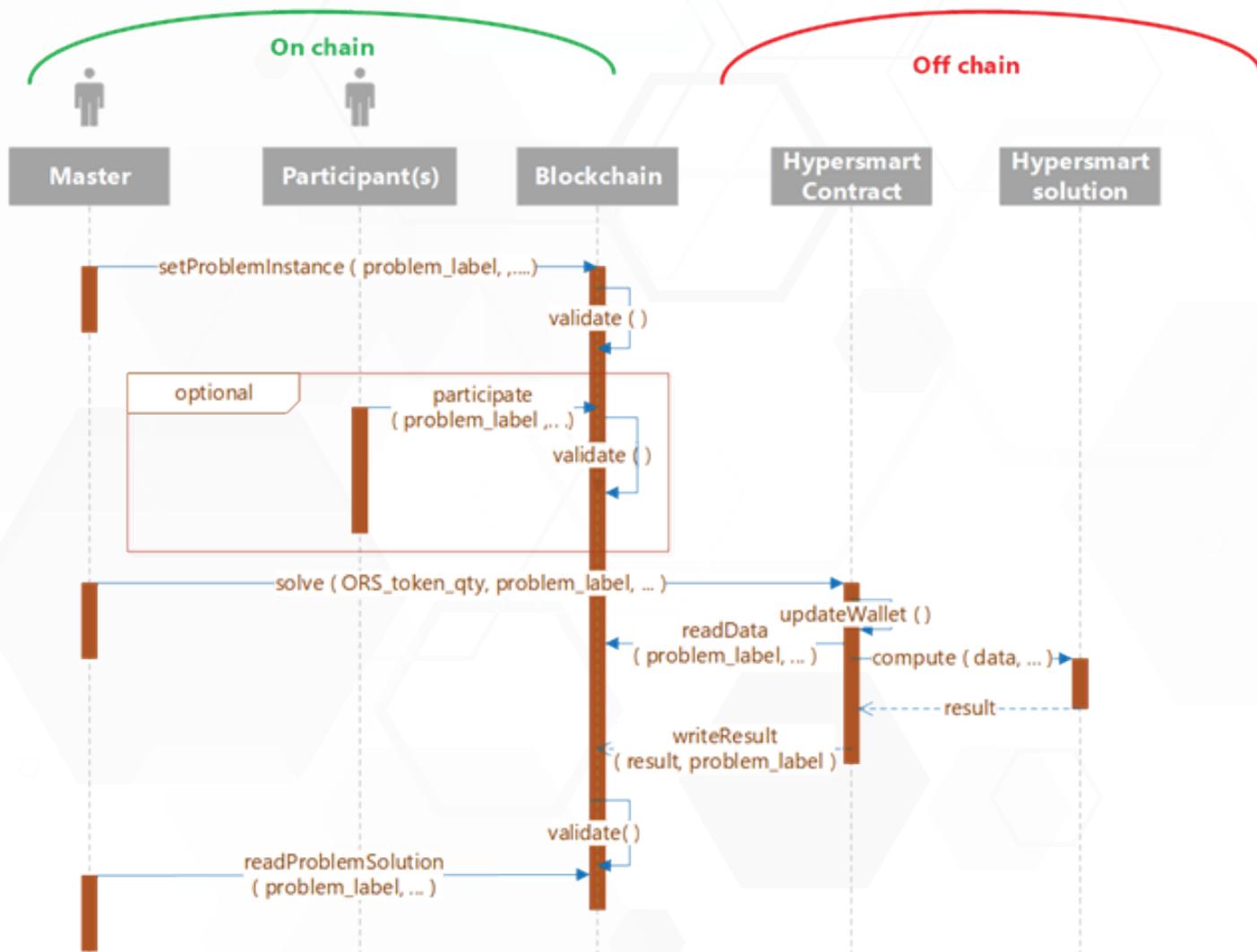


Figure 2. ORS Hypersmart Contract: the general use case