



## Smart Product: IoT-based supply chain traceability

Alexandros Fragkiadakis<sup>1\*</sup>, Antonios Makrogiannakis<sup>1</sup>, Theoharis Moysiadis<sup>2</sup>, Nikolaos Zotos<sup>2</sup>

<sup>1</sup> Institute of Computer Science, Foundation for Research and Technology-Hellas (ICS-FORTH), 100 Nikolaou Plastira str., Vassilika Vouton, Heraklion, Crete, GR-700 13, Greece

<sup>2</sup> Future Intelligence Ltd, Tech & Scientific Park, NCSR Demokritos, Athens, Greece

\* Presenting and corresponding author: [alfrag@ics.forth.gr](mailto:alfrag@ics.forth.gr)

### ABSTRACT

Internet-of-Things (IoT) has revolutionized the technological means that have made feasible the interconnection and interaction between the physical and digital worlds. One important area that IoT technologies can be successfully exploited is supply chain (SC) traceability, where products are recorded as they travel from the manufacturer to the consumer.

SC tracking offers numerous advantages to all parties involved (producers, retailers, consumers): food safety (quality deviation management, recalls in food crisis), perishable product protection, origin verification and brand certification, customer engagement and loyalty programs, monitoring, control, planning and optimization of business processes remotely. On the other hand, an IoT system can read data from a plethora of devices such as smart tags (RFIDs, NFC, Barcodes, Bluetooth Low Energy), along with sensory data like ambient temperature & humidity, vehicle speed, geolocation. Therefore, IoT-based SC tracking appears as an appealing and feasible solution.

The aim of the Smart Product project [1] is the design, the implementation and the evaluation of an IoT-based platform for SC tracking, product authenticity certification and verification of origin, and consumer engagement. The platform utilizes IoT technologies at the device level (tags, sensors), as well as software and communication protocols, with emphasis on interoperability. Specifically, the platform provides SC tracking by recording product-related information such as storage conditions, geographical locations of production, storage and sales. This will make it possible for the producers to monitor the products, partially addressing the availability of products in areas where for various reasons it is not allowed (e.g. exporting smuggled products to other countries), but will also enable consumers to be informed about the origin of the products and their storage conditions during transportation. Prerequisites for successful monitoring and recording are: the existence of a smart label on the product or a package containing a number of identical products, the existence of equipment for reading the smart labels, the existence of equipment for measurement of storage conditions, such as ambient temperature and humidity sensors, and an appropriate database for data storing.

Moreover, the Smart Product project makes possible the certification of products' authenticity and origin, limiting the distribution of counterfeit products and thereby increasing consumer confidence in genuine products. For making this feasible it is important the introduction of relevant product information (e.g. Electronic Product Code) into an appropriate database by certified users (producers, etc.) using the the existing smart label on the product. The smart label indicates with appropriate coding the identity of the product. Also, the user needs the appropriate equipment such as a smart phone with the ability to read this type of labels in order to read the smart labels.

### REFERENCES

[1]: <https://www.smartproduct.gr>