indra

NEO

IDEAS AND INNOVATION

TECHNOLOGY THAT CONNECTS THE PHYSICAL WORLD AND THE INFORMATION WORLD

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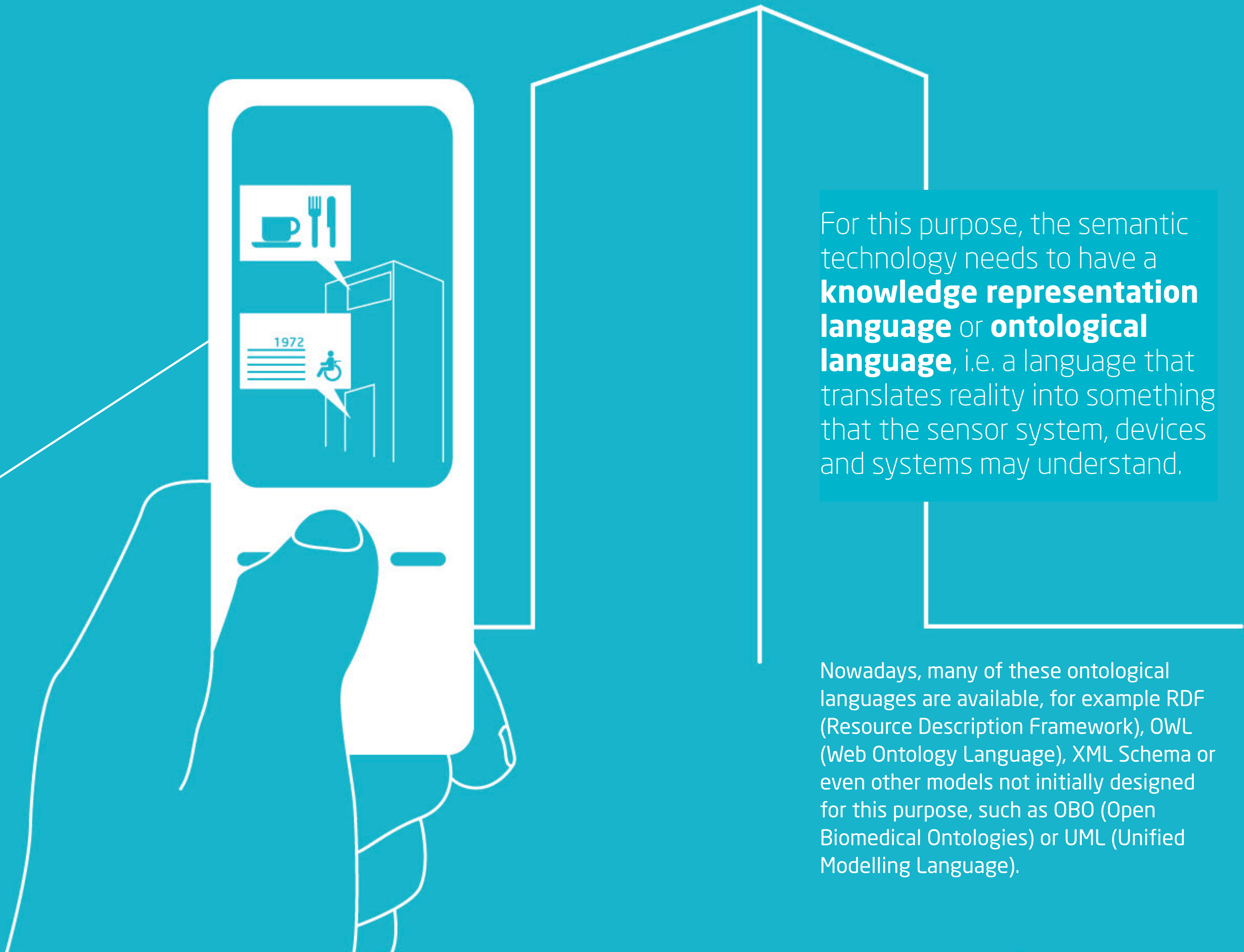
The so-called digital convergence, which empowers digital content delivery through all kinds of devices (televisions, personal computers, mobile phones, etc.), and the high availability of all types of electronic devices, which are constantly within our reach, enable us to build systems that help to connect the "physical" world with the "information" world. The main purpose of this connection is to try to improve the relationship experience with our environment, enriching both the work environment and our private lives.

SEMANTIC TECHNOLOGY

Specifically, this is possible thanks to the so-called **semantic technology**, i.e. a technology that provides a meaning to all objects and spaces in the **information** world that may come from the own **information** world (the web) or the daily **physical** world. An example would be to allocate data to a building, so when the user points at that building with a device (mobile phone, webcam, etc.), it recognises it and sends the previously associated data. In other words, this technology enables, among other things, to **embed** information into physical objects, transforming our ordinary environments into intelligent environments.

Today, there are available applications based on semantic technology with the objective of giving higher intelligence to the **physical** world.

Sets of sensors, devices and embedded systems in general, which interact and have the ability to organise themselves to handle/issue information, make it technologically feasible.



For this purpose, the semantic technology needs to have a **knowledge representation language** or **ontological language**, i.e. a language that translates reality into something that the sensor system, devices and systems may understand.

Nowadays, many of these ontological languages are available, for example RDF (Resource Description Framework), OWL (Web Ontology Language), XML Schema or even other models not initially designed for this purpose, such as OBO (Open Biomedical Ontologies) or UML (Unified Modelling Language).

INDRA AND THE SOFIA PROJECT

Indra participates in the Smart Objects For Intelligent Applications (SOFIA) project, an Artemis project (EU's initiative to promote embedded systems www.artemis-ju.eu), which began in January 2009. The main objective of SOFIA project is to develop a platform based on semantic web technology, interoperability, and intelligent sensor networks, which enables the automation of cities, buildings and cars, as well as providing intelligent and customised services, for instance geolocation, context information or movement detection through mobile devices.

SOFIA includes 8 work packages:

3 work packages to develop technical solutions regarding the system's architecture, applications' development and intelligent environments.

3 work packages regarding application areas including real and specific pilot solutions.

2 work packages to develop and manage a demonstrative pilot.

SEMANTIC TECHNOLOGY APPLICATIONS

All three SOFIA application areas work packages are focused on three different types of spaces, in terms of scale and needs:

1. SMART CITY

Today, urban areas are full of sensors and devices that provide cities with a huge "smart" potential. However, this potential is being wasted because those sensors and devices only work for isolated systems such as traffic and pollution monitoring systems. Integrating public and private devices into a single intelligent environment would enable citizens to participate in urban life and make urban information available to city managers. The most evident applications of semantic technologies, in the smart city scope, are most commonly referred to general interest purposes such as surveillance and monitoring.

An example of the SOFIA platform application, within the tourism industry, is the access to a "virtual teacher" that will explain all the features and history of a building to tourists facing that building and will inform them on other nearby interest points. Through an augmented reality, users would also be able to view a virtual reconstruction of the area or monument in their mobile phones. SOFIA will also enable to guide a mobile device towards a restaurant, look up the menu online, book a table, or read comments from other users. Likewise, it will let the user know if one of the properties in the building you are pointing at is on sale, and will provide details of its price, features and contact details of its owner.

2. SMART INDOOR SPACES

The use of smart spaces in buildings can significantly increase safety, productivity and quality of life. SOFIA considers several applications for this kind of spaces, ranging from systems to monitor physical items and environmental features in premise management (targeting to increase speed in maintenance operations and increasing comfort), to systems that capture, interpret and share context information within home environments in order to boost social connectivity.

Another example includes an application of intelligent lighting, where multiple devices and sensors automatically not only provide lighting strategies according to the user's preferences and context, but also energy savings.

3. PERSONAL SPACES

SOFIA project's work within this application area is developed into two platforms: mobile devices and cars. Possible applications would range from customised media content/services for users to intelligent navigation applications.

SOFIA received the Artemis exhibition Award among 59 projects when presented to the European Commission Members at the ARTEMIS & ITEA Co-SUMMIT 2009.

For further details, please visit **www.sofia-project.eu**