Experience and Interact with Digital Citizens’ Lives

The Smart World by FIWARE built by Lego® bricks helps visitors to experience how FIWARE’s Open Source technology enables actors in the digital transformation space to foster transformation throughout several interconnected domains.

Countries worldwide have welcomed changes in the new digital era at various speeds and to different degrees, embracing more interconnected spaces of life. Interoperability between vertical solutions and domains shows higher importance than ever to unlock new use-cases and benefits. Through the combination of FIWARE’s Context Broker and de facto standardized Smart Data Models, interoperability can be achieved. The displayed Smart World modules showcase how sectors like Cities, Energy, Industry, Agrifood, Tourism or Water can interact to become truly smart.

Interoperable spaces require a series of ingredients. FIWARE brings a framework of open source software platform components that can be assembled. Together with other third-party components innovative platforms are built, thereby supporting the development of smart solutions. The architecture of smart solutions ‘Powered by FIWARE’ is based on the management of digital twin data using the standard NGSI API. The connection to the Internet of Things with a state-of-the-art Context Information Management enables the creation of Digital Twins, and brings Big Data or AI services on the Cloud to reality.

Smart Cities as a Platform

FIWARE envisions the city as a platform that breaks vertical information silos by creating a Context Information Management layer and providing a complete picture of what is happening in the city. Cities have become huge data producers gathering their data in subject related data spaces (e.g. Mobility Data Space), but also providers of means for third parties to publish their data in data marketplaces. They are called to play an increasingly important role in the emerging data economy. Here, right-time and historic information can be merged with data from different providers, to build on new solutions and participate in upcoming monetization opportunities. Data Spaces like the Mobility Data Space will not only enable better governance and management of City Services but also the creation of new innovative services.

Smart Data Models

Smart Data Models is a global and collaborative program driving the adoption as “de facto” standards of data models for digital twin classes across a wide range of domains. Mapping of these data models into concrete JSON/JSON-LD structures provided under this program becomes a crucial asset for developers looking for means to guarantee interoperability between different Internet and Cloud solutions, breaking vertical data silos within organizations and enabling data sharing among organizations within data spaces - all at market speed. This program, led by FIWARE, IUDX, OASC and TM Forum, follows a truly open approach and has been boosting the creation of a global open data and open source community since its foundation. You can join this unique and impactful program anytime by contacting us at smartdatamodels.org
SMART MOBILITY

The Smart Mobility sector demonstrates how various intelligent transport concepts are interlinked. Sustainable and citizen-friendly cities require well-organised public, healthy and economic transportation as well as Smart Solutions for private transport services like Smart Parking. This includes Smart Mobility as a Service (Smart MaaS) solutions making these different kinds of transportation models easily accessible to everyone. FIWARE users across the world provide feasible and smart solutions for such types of implementations. The Smart World explains a Smart Parking use-case from the city of Wolfsburg, and a Digital Twin approach for Mobility Hubs in the city of Kiel, both in Germany.

SMART ENERGY

This sector represents a variety of energy management systems that can be realised with FIWARE technology. In this case, FIWARE technology is used to measure and display the energy production and usage of a city or factory; it enables the design of energy optimized production plans using Artificial Intelligence. Another concept is laid out in Northern Germany: the energy sector is supported to form future green mobility using FIWARE technology. If renewable energy sources, like sun and wind energy, produce more energy than needed in a certain moment, the excess energy is used to transform hydrogen into hydrogen fuel. This fuel in return is subsequently provided to the gas fuel station to support a local bus, commuting between the cities of Niebüll and Husum in Northern Germany.

SMART WATER & SMART TOURISM

These Water showcases point to Emergency Management, Leisure and Mobility activities when it comes to civil protection as well as to use of vehicles and boats in coastal areas. The city of Kiel (Northern Germany) monitors, thanks to FIWARE technology, water levels in its coastal areas to create relevant right-in-time data for their water warning systems, including water storage in the streets in case of floods. It also features sensors detecting the occupancy and punctuality rate of naval vehicles in real-time, as well as opening and closing process automatization of movable bridges. For Tourists, this solution offers the possibility to reserve their yacht space in one of the many sportboat harbours at Kiel Fjord.

SMART INDUSTRY

This section features examples of Digital Twin and Supply Chain Management in the industrial sector through different robots controlled by FIWARE-based platforms. StoneOne, a ‘Web Software Factory’ that offers innovative technologies and complementing consulting services for Cloud IT, presents an example from the field of Predictive Maintenance. Besides, NEC Lab shows how FIWARE’s reference architecture is successfully used in the “Industry 4.0” area.

SMART HOUSE

To make cities really smart, citizens’ private homes can’t be ignored. The Smart House on show here is supported by the IoT sensor hub, which combines and evaluates various data sources and environmental sensors. The data generated through these devices, can be used to heat and cool homes in a more sustainable way or optimise their energy consumption. Additionally, this model shows that air pollution can be reduced in living areas by changing the traffic flow showcasing a traffic light that changes from green to red if air pollution is too high.

SMART CULTURAL SPACES

The building “Dokk 1” is part of the city’s effort to reshape former industrial areas of the Port of Aarhus (Denmark) into residential and commercial areas. It includes future-ready public housing, a library, a culture center with an underground parking facility including Smart Parking solutions and a station and light rail system with trains running through and beneath the building. This cultural city center connects it all: Living, Culture, Mobility, and sustainable urban development.

EGOVERNANCE

This space represents the city hall of Aarhus in Denmark. Aarhus is among the smartest and most innovative cities in Europe today. The future of governance is digital - and this is explained here: Digital governance does not only make city governance less complex, but also creates easier and more resilient lifes for citizens. An inclusive approach allows citizens at the same time to actively participate in the decision making of city governances via digital platforms. That’s smart!
SMART CONSTRUCTION SITE

This module, which is part of the EU-funded project IMPRESS, focuses on the construction site of the university building Zukunftsmile 2, built in 2019 in the city of Paderborn (Germany), a FIWARE user. An impressive construction crane visualizes a smart solution for a more cost-effective usage of Construction Machinery, based on weight and impacting external data such as weather details, for instance. Machinery and equipment leasing rates can thus be properly reduced or increased, depending on the actual construction sites’ needs and users’ behaviour.

SMART AGRIFOOD

With this module, learn from the running project “Internet of Food and Farming” (IoF2020), one of the largest EU projects to date. “City Agriculture” is an important component for the optimization of supply chains, looking at, i.e. the avoidance of long transport distances from production to consumption. Moreover, the EU-funded project CATTLECHAIN 4.0 offers a FIWARE powered global solution to monitor, manage, and support decision making and traceability across the entire beef and dairy cattle supply chain. Check out how FIWARE makes an impact on the food supply chains of the future.

SMART DIGITAL INFRASTRUCTURE CENTER

This module brings you to the headquarters of FIWARE’s Gold member ADDIX, based in the city of Kiel, Germany. Addix provides big parts of the digital infrastructure for Kiel’s innovative approach to turn the city into a real smart city. This includes a glass fiber node connected to the worldwide internet node in Frankfurt, Main, public WiFi, LoRaWAN and a server center. All used to enable the city to create and use the digital twin of their mobility stations.

SMART TOURISM

The mountain module drives the attention to the village of Werfenweng, a small community in Upper Austria. The village follows a “Soft Mobility” (SaMo) approach that enables tourists to enjoy emission free transportation during their holiday. This is an example of fully integrated green and sustainable mobility – a role model for smart mobility of the future. Visitors are required to leave their cars at the entrance to the holiday resort and must choose from there between low-impact and sustainable ways of transport.

Some storytelling of a Mobility Data Space Use-Case from Kiel: The Digital Twin of Mobility stations in Kiel

The following picture story describes the mobility data space use case MaaS from the city of Kiel. Within the story, employees and partners of the FIWARE Gold member Addix meet for a weekend trip to Kiel. Their journey is digitally supported.

CAR SHARING

Hannah needs to get to the city center from the suburbs and decides to use a car sharing service. She can see the availability of electric powered cars in her district and the loading status in the Digital Twin WebApp and can reserve her car in advance.

SAILING BOAT

Max is a passionate sailor and arrives in Kiel’s city center by boat. The yachting moorings next to Kiel’s famous Hörnbrücke are equipped with sensorik to identify free spaces. This way Max can reserve his very own mooring in the city center even in the peak phase of tourism in summer in advance.

Digital Twin explanation

Kiel Sailing City installed several mobility stations throughout the city. Apart from the train stations, these mobility hubs include different kinds of mobility means: Bike Sharing, Car Sharing, bus and other kinds of public transportation, scooters and the possibility to park and load an electric vehicle. Within the framework of the SmartMaaS project, FIWARE has developed a digital twin of mobility hubs. The availability of the different kinds of mobility as well as parking spots is identified by different sensors and provided through the Mobility Data Space. The gathered data is made available to the city, its visitors and citizens through the KielRegion WebApp.
Did we catch your interest? Read on how the FIWARE community leads the digital transformation in different domains:

**TRAIN RIDE**

Yvonne arrives at the train station from another city, but still needs to get to the ADDIX offices. To do this in the most effective way she has informed herself in the Smart Mobility as a Service Application about the different possibilities of transportation beforehand and decided to go by train and switch to an electric scooter at Kiel Main Station.

**SCOOTER RIDE**

Yvonne was capable of reserving her electric scooter during the train ride thanks to the Mobility Data Space and enjoyed her ride to the meeting point.

**BIKE SHARING**

Peter is living in Kiel’s inner city and decides to use the most sustainable and healthy transportation opportunity: bike sharing. Thanks to the Digital Twin of Kiel’s mobility stations he easily finds the nearest free bicycle and takes a ride to the office.

**GROUP MEETING AND TOURIST TOUR**

After the group meets in front of the ADDIX offices and everyone is greeted by Björn, they decide to take a guided city tour to explore the tourist attractions of Kiel. Since the position of all public transport vehicles is available in the Mobility Data Space, planning this trip was convenient for Björn.

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