European Commission

SCENE

Smart City on the Edge
Network Enhancement

Deliverable D7.1

Report on Commercial Activities

SCENE Project

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Disclaimer

The SCENE consortium consists of the following partners.

No.	Name	Short Name	Country
1	VISIONWARE - SISTEMAS DE INFORMAÇÃO, SA	VISIONWARE	PT
2	JCP-CONNECT SAS	JCP-C	FR
3	ALMAVIVA - THE ITALIAN INNOVATION COMPANY SPA	ALMAVIVA	IT
4	COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	CEA	FR
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[1]**Types.R:** Document, report (excluding the periodic and final reports); **DEM:** Demonstrator, pilot, prototype, plan designs; **DEC:** Websites, patents filing, press & media actions, videos, etc.; **OTHER:** Software, technical diagram, etc.
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Acronyms and Abbreviations

Acronym/Abbreviation	Description
AMT	Azienda Municipalizata Trasporti (Catania)
API	Application Programming Interface
GDPR	General Data Protection Regulation
DPIA	Data Privacy Impact Assessment
EU	European Union
IoT	Internet of Things
LoRa	Low Range
PM	Person-month
SDN	Software-Defined Network

Contents

1   EXECUTIVE SUMMARY

This deliverable, D7.1 "Report on commercial activities", has the main scope to describe the commercial awareness strategy and to provide a *résumé* of commercial activities performed by the partners and by the Consortium as a whole in the first year of the project.

The Report on commercial activities details a commercial awareness strategy and a summary of commercial activities in the first half of the project and it is a preliminary document that will be developed further in the last year of the project and finally result in D7.2 "Final Commercial strategy" in M24.

The document includes plans and strategies to be applied in order to achieve a high level of visibility of the project outcomes and to transfer knowledge and results.

The Commercial plan will include

- Description of the Project consortium
- Description of the Project outputs
- IPR issues
- Further research required
- Potential expected impact
- Market Identification

2   INTRODUCTION

The purpose of this deliverable is to define activities and instruments to support commercial activities and recall the commercial activities of the first year.

All partners have contributed to and will continue to be engaged in exploitation activity assessing the re-use potential, commerciality and applicability of the concepts and ideas

This deliverable aims to:

- Present a preliminary commercial strategy for the project and provide a holistic overview of the exploitation landscape surrounding it;
- Introduce the actors, markets and sectors that are relevant in the context of exploitation, and analysing their role, needs and potential;
- Serve as a step towards setting out clear and measurable exploitation targets, the results of which will be monitored and reviewed regularly;
- Serve as a guidance document for SCENE project partners and to stimulate exploitation engagement among partners;

- Ensure that exploitable entities will be utilised in an optimal way and that the desired impact is achieved;
- Act as a preliminary document that will be developed further in the last year of the project and finally result in D7.2 Final Commercial strategy in M24.

3 DEFINITION OF COMMERCIAL PRODUCTS AND CHARACTERISTICS

SCENE (Smart City on the Edge Network Enhancement) is proposing an integrated solution based on vehicular networks for a secured environment that securely collects, and processes sensor data based on IoT technologies. This data is transmitted centrally to be analysed and processed by smart-city applications. On the other hand, the system also supports a content delivery platform that deploys a suitable protocol stack for secured content delivery. With this functionality, SCENE is building an integrated security system for both IoT based data collection as well as multimedia secured content delivery. The content delivery platform is intelligent enough to be deployed in both IoT mode and in the stand-alone mode to deliver contents to subscribed smart applications.

Next to the two main pillars of the SCENE platform above mentioned (the IOT pillar and the Content Delivery pillar) SCENE includes the following components

SCENE Intelligent Gateway: an on-board unit that implements caching and processing capabilities and provides (specific) network access tools for sensors (basic features). It also implements a framework/installer that enables the installation of basic logic modules for smart city services (following the principles of edge computing) e.g. to handle lack of Internet connectivity scenarios or to allow local processing and consumption of information. The intelligent gateway will be responsible for the communication with content service providers, using standard interfaces such as Web access and Web services.

SCENE Service Platform: the main module for managing the SCENE Platform. It implements all the business logic of the central system, managing the persistence of all the data received by the Intelligent Gateways. It centralizes all the management functionalities for inventory, configurations and status monitoring for IOT sensors, Intelligent Gateways and communication networks. Identity, Access Management and provisioning regarding users, devices and sensors are core functionalities inside the Service Platform too. It also implements the middleware layer for orchestration, data transformation and event handling. An Analytics module is included, which gathers data by the services to produce reports and statistics about sensors and measures ingested into the data lake

SCENE dashboard: a web UI where operators of SCENE can manage and monitor the service. The dashboard will include management controls and monitoring information for the intelligent gateways and entities within the service platform (sensors/intelligent gateways registration, software/firmware upgrade, applications deployment, connectivity status, traffic metrics, etc.). Additionally, it will also show other metrics inferred (by the Analytics module) e.g. related to citizens' behavior. SCENE dashboard will

consume APIs and interfaces exposed by the service platform. These APIs will be available for third parties to incorporate this information into their systems.

SCENE security framework: based on a distributed set of security components comprising orchestration (implemented at the SCENE Service Platform) and secure access/security detection & reaction nodes (implemented at the SCENE Intelligent Gateways). The service platform allows, by means of an extended SDN API, to monitor and control security entities running on the intelligent gateways. In turn, these latter are both enabled with the capability to perform secure access to locally serviced IoT networks and that of passively monitoring (intrusion detection) these constrained networks. Intelligent gateways also feature advanced self-protection security mechanisms.

The project outcomes will be exploited by the industry partners independently - every partner will develop its commercial reach in its target markets. Parts of the solution could have separate exploitation as they can be used in other product/service offerings. The Consortium will focus on first marketing the solution in its home countries - France, Italy and Portugal.

The SCENE Partners are focused on the commercialisation of the single pillars and of the projects as a whole.

In the following table the specific interests are detailed:

Partner	Commercial Product and Characteristics
ALM	Almaviva intends to propose SCENE as an innovative enabling factor for smart cities solution, thus using it as a competitive advantage in the proposal and offering a win-win for the entire ecosystem I this way ALM can enlarge its offers for smart cities trough the commercialisation of SCENE platform. Almaviva will primarily commercialise the platform, managing the persistence of all the data received by the Intelligent Gateways and evaluating the integration of such data in mobility control room
JCP-C	JCP plans to commercialize two product offers which are direct project results. • The SCENE platform for sensor data processing based on a vehicular network coverage. • The intelligent gateway for content delivery in in urban and non-urban areas with insufficient internet connectivity. The gateway can be used in fixed or mobile scenario.
VIS	VisionWare intends to commercialize the double-parking detector as a service to the municipalities, and to exploit the SCENE network in other IoT sensor network solutions in low-connectivity areas. Application of these solutions include security against environmental threats, monitoring of agricultural and forest areas and detection of events and low time constraints.

| CEA	CEA is not aiming to commercialize the product, but will be available to support the integration of the Distributed Intrusion Detection system developed and customized for the SCENE architecture

4   EXPLOITATION STRATEGY & MANAGEMENT

Exploitation of SCENE results are being fostered and planned since the beginning of the project, following a shared strategy based on two fundamental assumptions:

1. Innovation needs a strategic approach that keeps it in focus throughout the entire cycle that goes from R&D to product and business development.

2. Innovation must generate value for the final user.

Hence, SCENE exploitation will adopt the Solution as its central element, i.e., the combination of technologies, products and services needed to solve a fundamental problem of the user.

The SCENE Consortium is strong in industrial and commercial partners of all types, and specifically citizens' mobility related organizations and public authorities, for whom exploitation is really important We have developed a structured approach to exploitation management which the consortium have assessed and approved.
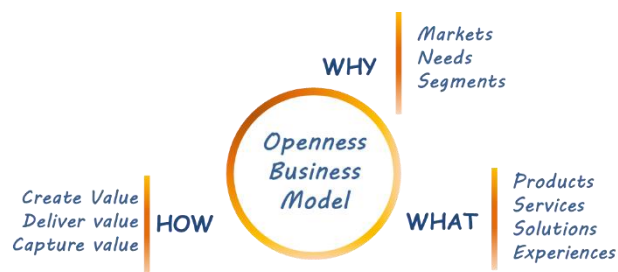
Exploitation Management will deal with the three essential elements required to build a successful business out of SCENE results:

1)   **WHY**. The idea of product or service to be put on the market

This must be considered as a starting point of any business creation activity

The idea definition must answer fundamental questions such as:

- **Who are the customers?**

SCENE is a multisided platform product, which means that different groups of customers can be approached based on the specificity of each country. Since the SCENE platform is mainly supporting the growing of smart cities the main customers are:

> **Municipalities** – Municipalities will be a primary customer for smart city applications in the areas of smart mobility & parking, management of infrastructures and monitoring of air quality
>
> In addition, Municipalities are the considered the main decision makers for smart city investments. Through them other actors in the value chain can be reached such as transport companies and developers of smart city services, since they receive the tender offers from the municipalities.
>
> **Central government** - the primary customer for smart agricultural, forest and irrigation applications.
>
> **Civil defense and law enforcement agencies** customer base for anti-terrorism and anti-crime applications of the SCENE technology.
>
> **Private companies** – some private companies install large populations of sensors in urban or non-urban areas in order to perform certain services (water metering, waste management, cargo management in ports, environment monitoring in mountain ranges, sea shore, etc.) which don't need to answer a tender call with a public authority. The ability to collect and process sensor data in an efficient and cost-effective way is a major plus for them.
>
> **Transport Operators** – Since the responsibilities for smart cities is also related to the investment plan of transport company
>
> **Intelligent gateway** – the customer base for the Intelligent gateway are content providers, municipalities which contract content providers, Wi-Fi installers for events, transport companies. Additionally, event organizers, libraries, hotels etc. are customers as well for the content delivery part

- **What needs are we catering, which problems are we trying to solve?**

Cities have a large amount of data, cities need a large amount of data to manage, to plan, to predict. To collect data, cities need to install sensors, to have high coverage with larger bandwidth, regardless of the connectivity of the area and to overcome the barrier of data fragmentation

The SCENE platform is answering directly to the need of finding a way to cover a large surface with sensors, sometimes collecting very heavy readings (including photos or videos) in a cost-effective way. Instead of investing in parallel fixed infrastructure, a vehicular network can be used to ensure coverage. The intelligent gateways are performing data collection from various formats and processing of the collected data, thus sending to the central Service Platform only the needed data. This lowers the cost of deploying smart city services on both the Capex and Opex side.

Intelligent gateways for content delivery ensure seamless delivery of priority cached content to users in areas where connection is poor, including mobility.

2) **WHAT**. The shape of the idea

It means the combination of technology, service and value-chain features that will **convince users to buy the solution.**

The idea shape must answer fundamental questions such as:

- What *objectives* and *motivations* will drive users to buy the solution?
Main objectives are cost efficiency, coverage in difficult to reach areas, optimisation of public spending offering to small and medium cities the great opportunity to embrace the world of smart cities through a universal smart cities service: plug-and-play, modulable and secure.

With SCENE, Cities can deploy sensors everywhere without having to care about their security and monitor data from a unique access point. The SCENE infrastructure is suitable for a wide range of applications. Customers will be able to develop their own high-bandwidth sensors without concern for the way data is transmitted to the centralized applications

- What *barriers* to adoption will the solution break?
SCENE platform – challenges to the adoption are the ability to articulate the benefits of the solution and to prove a positive business case can be reached. Main barriers are difficulty navigating the administrative machine in different cities, matching the political calendar in responding to calls for offers.

SCENE will overcome the barrier of data collection in cities trough an effective and easy to implement solution, it will break the bandwidth versus distance versus node cost constraints of traditional solutions Concerning the security, SCENE has designed a strong security framework, capable of detecting unknown attacks to the smart city devices while also preventing from traditional attacks.

- How will the solution beat *competition* offers?
The benefit of the project for different customers are detailed in the following table:

VALUE CHAIN			
Transport operators	*Public Authority*	*Technology providers*	*Research, Consultants*
Transport operators are currently less involved in smart-city applications. This solution will allow them to enter this market. They already installed sensors and may not be able to process data and content simultaneously No other commercial offer currently exists for sensor data processing and content delivery at the same time.	SCENE will boost the capabilities of municipalities to provide advanced services to the citizen at a low cost. Cities will have the opportunity to install a network of sensors at low cost and with ease. For municipalities with already existing LoRa or other infrastructure, SCENE can offer complementary coverage in remote areas and coupling with content delivery in public areas. For municipalities with no infrastructure installed, SCENE offers cost-effective solution	Technology providers can develop innovative solutions regardless of the distance, bandwidth and high cost constraints of traditional IoT networks. Technology providers can be attracted to SCENE based on the capacity of the intelligent gateway to collect and process diverse sensor data in very large areas without fixed infrastructure, which is very cost expensive. *In addition, t*he technology provide can embrace the SCENE opportunity implementing professional services	SCENE allows more data to be collected, which will be useful for researchers in the fields of city mobility, air quality, water waste reduction, etc. Research companies can use data to implement research on urban area

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3) **HOW**. The idea implementation

This will be the model selected by an entrepreneur to implement the idea in a financially sustainable way. The implementation model is a way to put the idea into practice through the usual elements of every entrepreneurial activity such as financial resources, suppliers, employees and partners.

- What price will be asked for?

The business case is under development, however preliminary strategy being discussed will be the partnering with a transport provider to cover the cost of deployment, selling the IoT service to the municipalities in a SaaS model. In detail Almaviva is accurately working on a business case, looking at Municipalities fund for such system. The main driver to define the prices will be sensors numbers, locations on premises or as-a-service delivery.

JCP is currently evaluating the business case for SCENE and foresees different pricing schemes based on type of application, number and type of sensors and the vehicular network to be used. The initially foreseen pricing in the proposal in "on premises" and "as-a-service" model is still valid, although it might need towards the end of the project validation by involved municipalities in France. Similarly, the pricing of the Intelligent gateway is dependent on type of application and content delivery bundle

- Which customers make up the target segment? How large is the whole market?

For SCENE the largest segment in the French, Portuguese and Italian market are municipalities of mid-sized cities and private companies with large sensor base in urban or non-urban areas.

For the intelligent gateway for content delivery, we consider content providers, transport companies, WiFi installers are main customers.

- What partnership agreements are needed? How will royalties be managed?

A partnership agreement is needed in order to clearly define background and foreground, to exploit project results against adequate royalties and at the same time allows other partners to exploit the intelligent gateway as well against adequate royalties.

JCP can commercialize the intelligent gateway for content delivery by itself, Almaviva can commercialize the SCENE platform IoT pillar by itself

- What organization will be needed to sell and deliver the solution?

Given partnership agreement with the SCENE partners can be put in place for access to project results for exploitation, JCP can organize itself internally to address the French and international markets. JCP will need to extend its commercial force and undergo internal reorganization with adequate funding to reach its commercial goals, Almaviva will sell directly the product, VisionWare will sell the solutions directly to the Portuguese market and may partner with others to reach other European markets.

- What funding will be required? Where will it come from?

The Consortium will not require additional funds. JCP will look for funding in order to address the commercial potential of SCENE, planning to open a funding round after at least 2 successful pilots. We'll target local business angels with initial estimate of 300K€.

- What value will be created for the investors?

Ramping up the commercialisation of SCENE should bring an adequate return on investment to investors in a range of 5 years after investing in the company. The development of new sensor networks will be a good opportunity for investors in the IoT and smart data areas.

4.1 Individual Exploitation tentative plans

At this preliminary stage the partners cannot enter into details about which SCENE results they will exploit and how. Nevertheless, several partners have manifested their intention to exploit the SCENE outcome towards certain directions,

The following exploitation plans are forecasted in the proposal:

ICT industry is interested in the exploitation of the knowledge gained through SCENE to the benefit of their customers. As commercial partners will validate and exploit the technological results of SCENE within and beyond the duration of the project in their respective areas of industrial and commercial influence, by transferring SCENE tools, technologies and knowledge to their respective portfolio for the mobility sectors. In details:

Partner	
ALM	Almaviva is in aim to commercialise the SCENE products in Italy mainly in medium cities Almaviva has also exploring the interest of public transportation company in the field
JCP-C	JCP has plans to commercialise the SCENE platform among French municipalities in cooperation with local developers of smart city services and transport companies – a list of recent commercialisation activities is given below. We have also identified a rather large market opportunity among private companies who have dispersed sensors over large urban and non-urban areas. We plan to approach this customer group towards the end of the project with a concrete offer. Last but not least we consider the intelligent gateway as a separate offer for content delivery (see below for commercialisation efforts) in fixed and mobile scenarios in remote areas or urban areas with bad connectivity.
VIS	The initial plan is to deploy SCENE based sensor networks in Cascais (206.000 inhabitants) and Matosinhos (175.000 inhabitants). The revenue from these two initial deployments will fund the development of the SaaS solution to be commercialized to the other municipalities.

Public sector is interested in exploitation of the knowledge gained through SCENE to the benefit of their customers and organizations, as well as for the whole citizens. They aim to include the SCENE innovations inside its services to gain confidence and contribute to take better decisions regarding mobility policies, as well as involve citizens on these decisions to promote a more socio-economic and environmental culture of the mobility decisions among its citizens

Partner	
VIS	VisionWare will study with its clients ways to use SCENE-based sensor networks to address the challenges of the modern cities, including smarter mobility, control over greenhouse gas emissions, greener irrigation of public parks, protection against natural threats such as forest fires, floods and extreme weather conditions.

Research and Knowledge is another important area of exploitation for SCENE results. Organizations aiming to perform research exploitation will leverage its position and knowledge in the mobility and in the ICT social data arena by spreading the results and technology developed in SCENE among its customers for enhancing their own R&D capacity.

Consultants are interested in the exploitation of the knowledge gained through SCENE to the benefit of their customers. Consultants aims to include the SCENE innovations inside its services to gain confidence face to its private industry and public sector clients and to expand its market and weight in national and European markets.

Partner	
VIS	As a consultant, VisionWare is interested in exploiting the knowledge gained through SCENE to develop new solutions for the emerging IoT and smart city markets.
CEA	CEA is interested in making the IoT world accessible to all in a secure way. To achieve this, an innovative approach is used to prevent from unknown attacks. Moreover, the specific architecture of the SCENE platform allows to deploy the security in a distributed way all over the network.

5 COMMERCIALISATION ACTIVITIES

Since in the first year the prototype is still on-going, the commercial activities have been mainly focused on dissemination activities pursue to popularize the solution to a wide range of stakeholders, potential customers and end users, but also to collect their feedback, analyse in depth their needs and refine development and commercialization based on that (Objective 2).

Anticipated communication channels have been divided into three main groups:

- Industry Events

  - High level events will be primarily targeted, like Mobile World Congress, IoT world congress, CEBIT, Conference on Vehicle Technology and Intelligent Transport Systems, etc. Industry events in Europe, frequented by targeted customers as municipalities are smart city forums. Some of this include (but not limited) Smart Cities – Exhibition and Conference, IEEE International Smart Cities Conference, etc. Those Conference and forums represent major players in the mobile and IoT industry, so they will gather together many stakeholders. In latter phase of the project we will also demonstrate our product.

- Seminars

  - Seminars are an important part of the communication strategy as they allow us to popularize the SCENE concept among target user groups in a live setting, to collect their feedback, adapt the marketing message accordingly and win potential prospects. We plan to have seminars regarding our solution in at least three countries. We plan to arrange such seminars in countries where we will patronize the events which will help us to gain more attention. We will also cooperate with local partners in each country where seminar will be organized.

- Direct Communication

  - We plan to target with direct communication municipalities, transport companies and smart city service providers. It is very important to communicate the advantages of the product and its capabilities along with demonstrating results from pilot sites.

During the first year some activities have been performed by each partner using the dissemination materials

Partner	
ALM	During the first year Almaviva has discussed the integration of the project in the product catalogue. Almaviva has presented the opportunities of the SCENE project to the Rome mobility agency for mobility, to Verona Municipalities. Almaviva has

	previously discussed also to AMT Catania and the involvement of AMT Catania in the project come by this contact.
JCP-C	During the first year of the project JCP has been in active discussions with the municipality in Rennes city in France. Several commercial opportunities have been identified. The pilot in Rennes city on air quality measurements is a direct result from these discussions. The project is backed up by several local key players and holds the direct possibility for commercial deployment. Additionally, as of the writing of this deliverable, JCP is mapping the coverage of Rennes metropole (extended city area) with LoRa and non-LoRa sensors. A clear need has been communicated by the municipality to find a way to cover sensors in blind spots whose data readings are difficult to collect. We are currently investigating with the municipality which transport networks can be used – trash collection cars, postal service, drones, etc., with what schedule of passing by, covering which sensor data formats, etc. in order to reach a positive business case for the municipality. The JCP commercial team has also reached out to the following municipalities in France by either responding to calls for innovative projects or directly approaching the mobility services of these cities: Dijon, Grenoble, St. Etienne, Quimper, Lannion Since there are the municipal elections upcoming in the beginning of 2020, most of the cities have been reluctant to start on new projects, especially involving a large number of local actors. As of the end of 2019 most cities are focused on wrapping up existing initiatives and showing results before the upcoming elections. Therefore, JCP will resume its communication and commercial efforts after the elections when new programs will be open. On component level JCP has moved forward with the commercialisation of the content delivery system supported by the intelligent gateways. During the last year we have set-up an online portal with useful and touristic information which had a successful technical test during the second largest agricultural show in France – Le SPACE in Rennes city 10-13. September 2019. The content providers were able to dynamically diffuse information to the guests of the show, which was delivered seamlessly even at rush hours. We have partnered with major news and info outlets on regional level such as Ouest France, Bretagne Destination, Rennes TV 1, etc. to build up a content offer that can be accessed in areas with poor connection. Our plans for the future are to commercialise this offer together with the intelligent gateway for public spaces with limited or no connectivity in fixed or mobile scenario.

VIS	During the first year, VisionWare has established direct contacts with Cascais, Matosinhos and other municipalities. We also established the commercial partnership with Metric4 which will produce the double-parking sensors.
CEA	Dissemination: FIC2019/Digihall Days 2019 French events Paper accepted: CNC'20 in Hawaï, "Unsupervised Protocol-based Intrusion Detection for Real-world Networks" Paper on the subject of "collaborative probes" is currently being written