

SMART MANAGEMENT
NETWORKS
TO BUILD SMART VILLAGES

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1. SUMMARY

The Smart Management Network are open, multi-purpose, multilayer (optical fiber, WiFi, ZigBee), municipal/regional communication networks which are suitable for:

- Data transmission from sensor networks used to remote management of public infrastructures (lighting, water, urban waste, transport, etc.).
- New service offering to citizens (free internet WiFi access, tools for the elderly's social health care using remote video support, e-health, e-learning, tourism and local business promotion, etc.).

The Smart Management Network provides the needed connectivity for Zwit Project's model of development of Smart Villages, which is based in the development of **business entrepreneurship scenarios** linked to the start of some basic **hub projects**. Those hub projects, taking into account the resources and opportunities of a territory, satisfy specific needs of it, and as a whole generate an **innovative development framework** which will allow for new opportunities and initiatives of entrepreneurs and local SMEs to be born, so ensuring the area's future

The main advantages that Smart Management Network and the related Municipal Management Platform give, are:

- To avoid the spread of communication networks, in line with the priority established by the European Innovation Partnership on Smart Cities and Communities Integrated Infrastructures.
- To drastically reduce or avoid the mobile networks (GPRS, 3G, etc.) communications costs, which are normally used by sensor networks and which on many occasions render the services unsustainable.
- To empower local municipalities, giving them freedom from large mobile network operators.
- To generate a new smart city or village business model that guarantees its economic sustainability:
 - The savings generated by not using GPRS/3G/4G for

remote management of the different infrastructures, can be used for the maintenance of the Smart Management Network.

- The local municipality can give access to third parties to the Smart Management Network sharing with them the costs of the maintenance and obtaining additional revenues.

The present document is the frame for the Smart Management Network concept within Zwit Project's Smart Village development proposal. Thus first part of the document is used to explain the proposal itself.

2. INTRODUCTION: A NEEDED APPROACH CHANGE

The **Smart Management Network** is a technological tool supporting the **Zwit Project's model of development of Smart Villages**. A practical idea which is the result of ample experience in local development projects which has lead us to conclude that change in the way local development is seen and done is needed. A change which we now describe.

In a few words we could say that a **Smart Village is one that uses new technologies to create an innovative framework of sustainable development that creates employment, promotes entrepreneurship and attracts talent to the territory**. From our point of view beyond the efficient management of municipal infrastructures and services, the fundamental objective of a Smart Territory project is the generation of a new framework, an innovative ecosystem that empowers the territory and makes it a protagonist of its future by creating opportunities that can ignite the spark of local entrepreneurs and SMEs.

An innovative development framework for sustainable development.

The main objective of any Smart Village proposal has to be focused on the area's sustainable development:

- Environmental: Supporting steps that will preserve existing environmental and natural resources .
- Social: Taking into account the present and future needs of the local people but also listening to their opinions in the design and setting up in the actions to be done.
- Economical: Starting actions which are economically viable in the present and guarantee their success in the future.

Sustainable development is to build the future based on the present situation of the territory, its **identity** and taking into account **needs, resources and opportunities**. The creation of any development plans always has to be based on the acknowledgement of *who we are* and

where we come from, even if the present or the near future is not rosy¹.

Sustainable development entails looking at the future and to do that is necessary to use the tools that allow us to get closer to it. Hence the sense of innovation. In the XXI century, development or is innovative or it's not sustainable. On the same line, development of a territory is all-round or is not development. Neither for industry or agriculture, the plans for economic monoculture are not valid any more.

This is why we talk of “**innovative development frameworks**”.

2.1. Empower the region, support entrepreneurship, attract skills.

Up to now there have been two contrasting models in public investment for regional development that we can use to explain our idea. On one side there's the bottom-up rural development model, with the Leader funds managed by the Local Action Groups. On the other side there's top-down large investment Smart-City pilot models.

It can not be assumed that any private initiative that fits with the objectives, axes and actions included in a local development strategy is actually going to make substantial progress in reaching its goals, trusting and waiting with open arms for the arrival of entrepreneurs and their specific projects. The current subsidy process framework, even though necessary, is not enough, and very few times the projects that do get help, do make an overall impact in the territory, as the depopulation of many areas clearly shows. Depopulation that is in constant growth regardless of the subsidies received.

Neither does work the financial model for smart cities – huge investment in pilot projects that are run by big enterprises which have no connection to the region or to any concept of sustainable local development.

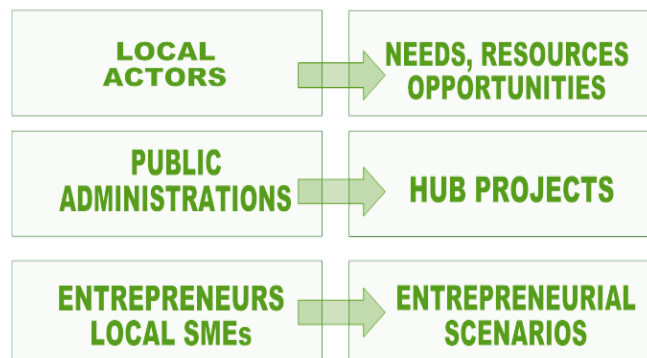
1 An obvious example are the coal-mining regions. Even if the coal industry is in decline, the territory must not give up it's identity, but it has to find a new resource of wealth based on that identity. Maybe using it's history and identity as a tourist resource, or using it's technical skills to move to renewable energy: just like coal was the main source of energy in the XIX century, so will be renewable energy in the near future.

Between the two models there is an intermediary area which combines the engagement of local agents with investment initiatives of different Public Administrations, which manage the different sources of finance currently available. This is the model that we propose, **the creation of entrepreneurial environments linked to the launch of hub projects** which as a whole **will create an innovative development framework**, where new growth opportunities and initiatives, led by entrepreneurs and SMEs will spark and guarantee the territory's future.

We understand “hub projects” as those projects which taking into account the resources and opportunities of a territory, satisfy its basic needs, which can either be social, economic, environmental or other types, and at the same time allow for new possibilities for entrepreneurs and SMEs in what we call “entrepreneurial environments”

In this model, local agents and public administration play complementary roles:

- Local agents that know the territory's needs, resources and opportunities are the ones looking after the:
 - design of a comprehensive sustainable and intelligent development strategy for the territory in accordance with European priorities and guidelines.
 - define hub projects according to the priorities established in the strategy and setting the eyes in future opportunities that those projects may open.
 - start-up coordination, since many times there will be multiple financing sources (local, county, regional, national, European...), where an effective leadership will be needed.
 - boosting entrepreneurship associated to each hub project.
- Public Administrations are the ones responsible for the financing of the hub projects start-up with the municipal, regional or European budgets.
- At the same time it's necessary to give a leading role to local entrepreneurs and SMEs, encouraging them to participate with their innovating solutions.



The following hub projects hereby presented are two examples which can be adapted to most rural areas and with great possibilities of entrepreneurship associated with them: **Intelligent Tourism and Remote Video Support for Social Health Care**, in which, however, **the lack of connectivity suffered by many rural areas limits much of their possibilities.**

That lack of connectivity is what has lead us to propose the creation of municipal or county networks, the Smart Management Networks, which are described further on in more detail when we talk about the **Energy Efficiency hub project.**

The **Productive Sustainable and intelligent Areas hub project** is also featured as an industrial area regeneration model based on the smart city solution.

3. ENERGY EFFICIENCY HUB PROJECT. THE SMART MANAGEMENT NETWORK.

The transition to sustainable energy it's a priority in the fight against climate change, which at a municipal level means a need to:

- Use and produce energy from renewable sources and promote its use by the community.
- Improve energy efficiency in public lighting and buildings.
- Promote sustainable transport initiatives.

The renewal of public lighting is an urgent and necessary need for all municipalities, as much to cut down expenses as for the need to fight against climate change reducing CO2 emissions, being an opportunity to take the path to the Smart Village model.

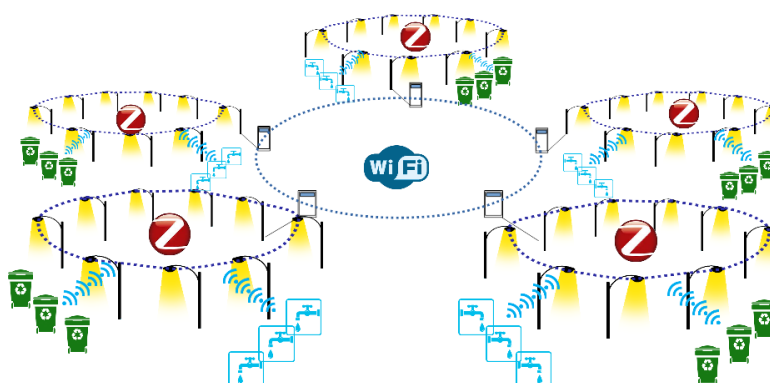
Using open telemanagement technologies such as WiFi or other wireless technologies and open source platforms instead of proprietary ones allow to create an open and multifunctional telecom network, the **Smart Management Network** which will probably be the new municipal infrastructure, as at the time it was the lighting networks, water supply, etc.

Our public lighting renewal proposal is based on:

- Replacing current lights to **LED technology**, which would create 65% savings.
- Deployment of a double layer, open telemanagement system: the **Smart Management Network**.
 - **Telemanagement of the electric panels** via WiFi technology, rather than solutions based on SIM/GPRS, thus creating municipal communications networks which allow for wide bandwidth services like remote video support for the elderly, or offers of smart tourism solutions but with no extra communications costs.
 - **Street lights point to point telemanagement**, using IEEE 802.15.4 wireless technology which allow for the lampposts to become in communication hubs for other sensor networks, like water meters remote reading, filling

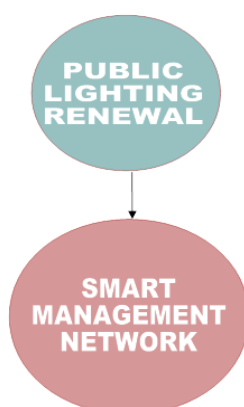
control of urban solid waste containers, etc.

- Deployment of a **Management Platform**, which apart from monitor public lighting, allows for the easy integration of other sensors, webcams, or any other type of device.



Our proposal has four objectives:

1. To dramatically improve energy efficiency in public street lighting, meeting one of the territory's urgent needs.
2. To create a regional Smart Management Network which would give connectivity and communication services for the remote video support and Intelligent Tourism hub projects.

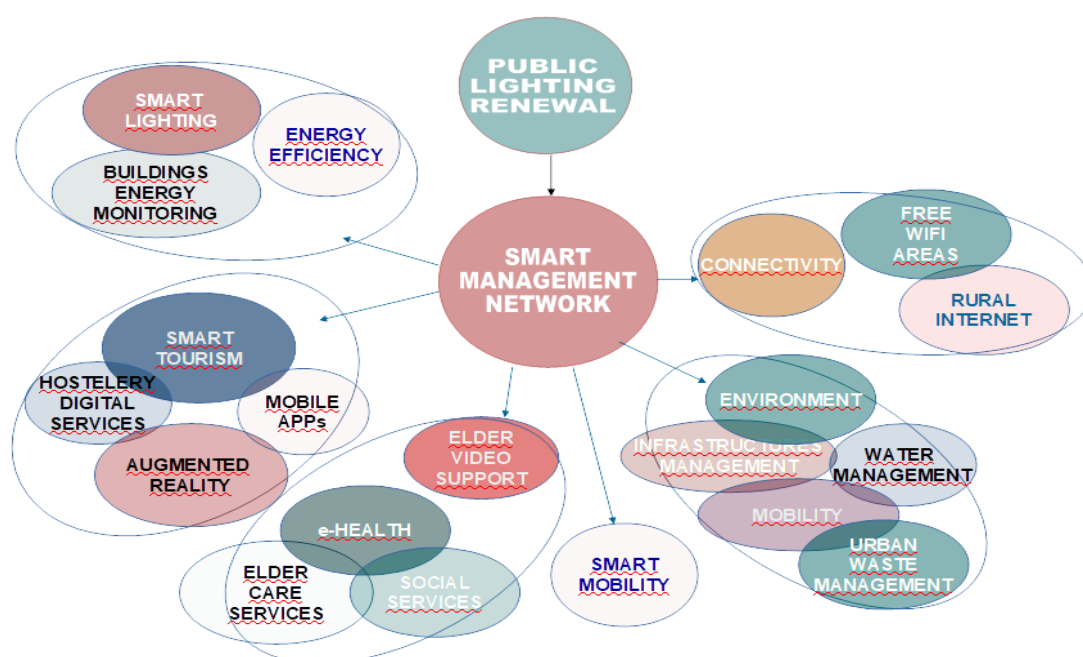


3. To create an entrepreneurship environment connected to the

Smart Management Network and environment sustainability which would favour the proposals from local entrepreneurs and SMEs, like:

- Energy monitoring of buildings.
- Connectivity and Internet access in rural areas.
- Intelligent management of water networks and remote reading of water meters.
- Monitoring of urban solid waste containers.
- Sustainable mobility.

4. To provide the needed connectivity for other hub projects such as Smart Tourism, Video support for elderly, Smart Industrial Areas, etc

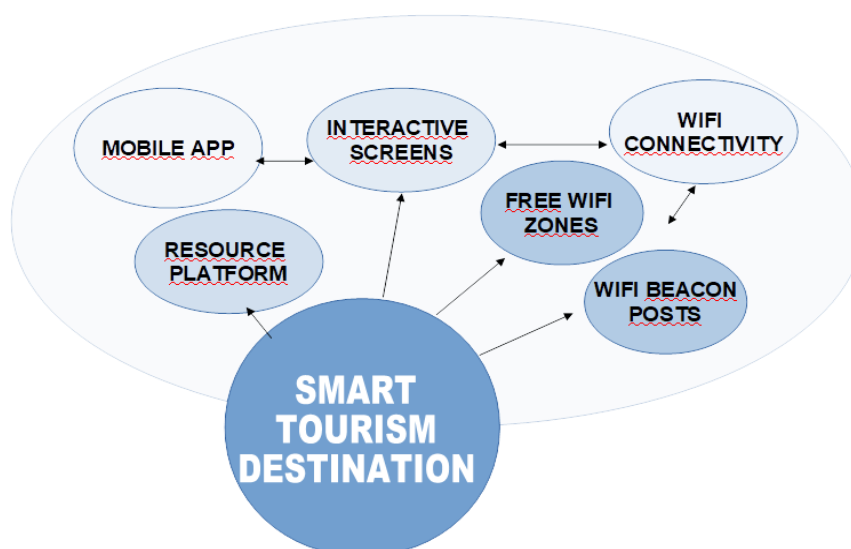


4. SMART TOURISM HUB PROJECT

Many rural areas have an environmental and cultural richness with a huge tourism potential that is not sufficiently developed. **The objective of a Smart Tourism project is to make a two-way connection between the territory and the visitors**, so that visitors have the local resources at their fingertips through the smart phone, a web page or an interactive screen available in any public building in local villages or towns, and the territory is also able to inform the visitor of the local resources and of current or future local events.

To achieve this is only necessary to:

- Collect in a platform all the data related to tourism resources, accommodation and catering sectors, architectural and natural resources, walking routes, etc., plus also specific events, celebrations and feasts, organised tours, cultural events, etc., and to maintain the data updated.
- Provide connectivity (free wifi zones in urban areas, wifi beacons posts in paths and roads).



Accessing the internet through the WiFi network in the free WiFi areas as in the WiFi beacons available in routes and paths, would only be possible with the previous download of the free mobile application, so that every time a user wants to connect to the Internet, would have

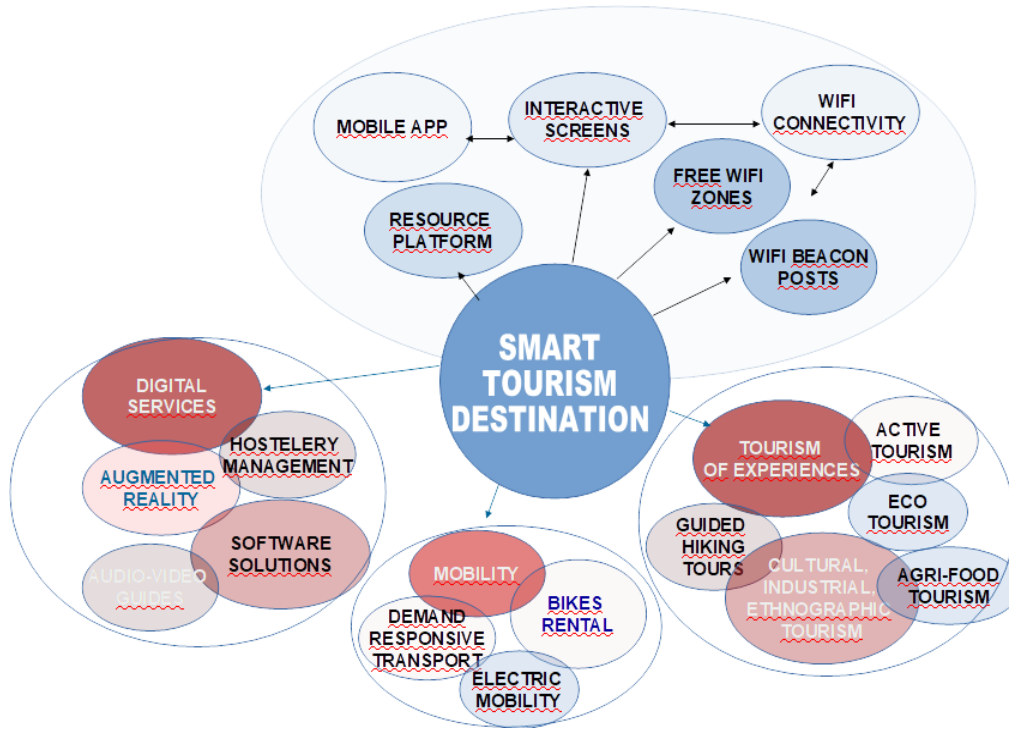
on his device screen not just the tourist resources nearby, but also information about current to the day events or offers, museums opening times, etc. A two-way communication system with the user is created which also allows for user data collection which in time helps to improve the services given.

The mobile application would also have commercial information, health centers, pharmacies, emergency button, incident support section, etc. The contents of the mobile application would be the base for the region's tourism web page and could be used as the content for the interactive screens that would strategically placed in the region (a type of tourist information centers 4.0).

Free wifi areas also allow for the installation of wide angle cameras to show natural or landscape richness, with no maintenance cost, by eliminating the monthly 3G fees that usually come with.

The Intelligent Tourism proposal has a **double objective**:

- **To offer the mentioned services to visitors**, thus satisfying a region's need (economic development), using its own resources (natural and cultural heritage, etc.), and taking advantage of the opportunities offered by new technologies and existing funding sources.
- **To create an entrepreneurial scenario associated with tourism.** Any new activity held by entrepreneurs or local SMEs would be registered in the platform, the mobile application, the web page and the interactive screens. All of them acting as '*shop windows*' and marketing vehicles of the new product offered. Products that could be:
 - setting up of new tourist establishments or new services in the existing ones.
 - generating smart routes or offering transport services, bicycle hire, etc.
 - online sales of local agricultural products, including visits to the local farm.
 - development of virtual or augmented reality applications.
 - new digital services offering to businesses and establishments.

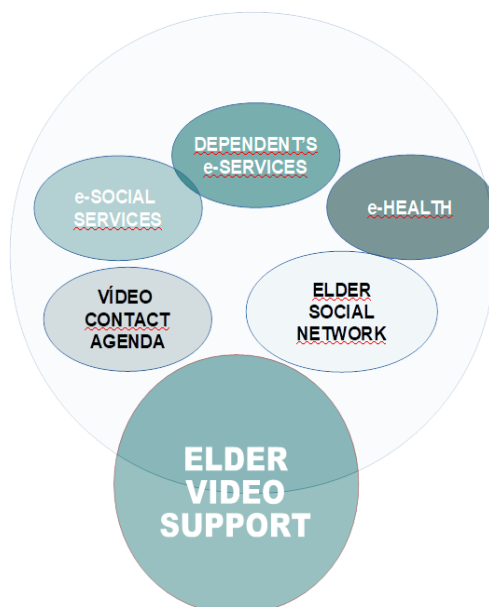


5. REMOTE VIDEO SUPPORT FOR THE ELDERLY HUB PROJECT

A project to connect social workers and local health centers to elderly persons living alone, dependent persons or users of social services, so that they can receive personalised treatment but at the same time helping to maintain their independence.

Users of the Remote Video Support program would be given a tactile screen tablet, connected to the internet and with a software application designed for easy use by people not used to new technologies, which would allow for:

- Video conference with the region's social services and dependent person's services.
- Medical video-consultation for the control and monitoring of chronic illnesses and preventive medicine programs.
- Video diary of frequent contacts (family, neighbours, friends).
- User's and elderly's social network.
- Link to the general municipal services.



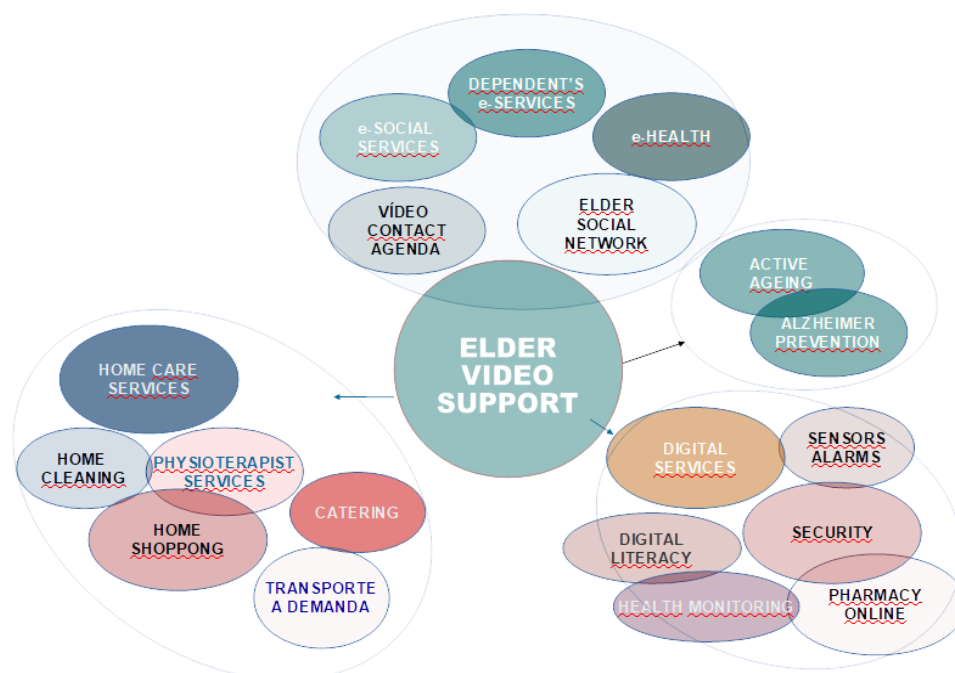
The connection to the internet of the homes of the elderly would be done through the Smart Management Network, overcoming the lack of connectivity in rural areas and avoiding discrimination between households that already have an internet connection and those that do not.

Once again, with the start of this project we hope to gain the following **two objectives**:

- **To offer the described social health services to users**, satisfying one of the region's needs (care of the elderly), using the territory's own resources (local/county social-health services) and taking advantage of the opportunities given by new technologies and existing fund sources.
- **To create a entrepreneurship environment** linked to the needs of the elderly in rural areas, what is known as the Silver Economy.

Once the services have a minimal user critical mass, what is generated is a defined and localised group of potential users of the services offered by local entrepreneurs and SMEs which can be:

- Personal care services, minder services, physiotherapist services, podiatrists services and home cleaning services.
- Home catering services.
- Home shopping services.
- Transport on demand.
- Online programs for active ageing and prevention of diseases related to old age, like Alzheimer, etc.
- Alarm applications for medicines, events, appointments, etc.
- Development/commercialization of health parameters monitoring solutions.
- Development/commercialization of security solutions and sensor alarms (flooding, fire, gas, etc.).
- Others



6. SUSTAINABLE AND PRODUCTIVE AREAS HUB PROJECT.

Adding intelligence and high speed internet connection to the current industrial areas located in rural towns, may be an opportunity for:

- To improve the efficient management of infrastructures such as public lighting, water, waste, etc.,
- The establishment of new industries attracted by a technologically innovative environment, differentiated from other industrial zones.
- The transformation into the space for the development of business initiatives of entrepreneurs and local SMEs, fab-labs, coworking spaces, etc.

Once again, the project would fulfill a double objective:

- Offer a modern industrial space, technologically equipped, that serves as a pole of economic development and employment
- Become the center of entrepreneurship and innovation in the region, attracting companies with high added value and offering new employment opportunities.

