

Interreg
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SMART Villages 
EUROPEAN REGIONAL DEVELOPMENT FUND

DEP concepts and needs analysis report

Work package: WP T2

Activity A.T2.1

Deliverable: D.T2.1.1





University of Maribor

Faculty of Electrical Engineering
and Computer Science



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This is a report of the analysis, which outlines the connection between WP T1 outcomes
(data sources, smartness concept, RSGs needs) and the DEP, i.e. binds the outcomes with
the possible elements of the DEP.

List of content

1. WP T1 outputs	4
1.1 Test Areas	4
1.2 Regional Stakeholder Group Mappings.....	4
1.3 The Dimensions of Smartness.....	9
1.4 The Indicators of Smartness	11
1.4 Indicator cards	13
2. Binding of WP T1 outputs with the DEP.....	15
2.1. The smartness assessment service.....	18
2.2. DEP design & development - Agile approach.....	19

List of Figures

Figure 1: TA Pomurje stakeholders in a quadruple helix logic.....	6
Figure 2: Mapping of stakeholders based on their relevance and influence.	8
Figure 3: Depiction of envisioned pilot activities in the TA.	8
Figure 4: Defined dimensions of smartness.....	10
Figure 5: Indicator process.	11
Figure 6: Procedure to fill the indicators.	13
Figure 7: Indicator card - basic information section.	13
Figure 8: Indicator card - Where are we now section.....	14
Figure 9: Indicator card - "Where do we want to be" and "How do we get there" sections.	14
Figure 10: General architecture of the smartness assessment prototype.	18

List of Tables

Table 1: TA Pomurje stakeholders interests, contributions and conflicts.	7
Table 2: Connection between TAs, project partner representative and smart dimension...	10
Table 3: Structured depiction of WPT1 key output bindings to DEP.	16

1. WP T1 outputs

This section presents the planned outputs of WP T1.

According to the project's specification, the main WP T1 output O.T1.1 are **Regional Stakeholder Groups (RSGs)**. Part of the RSGs are representatives from target user groups (4H) formed in each of the nine **Test Areas (TAs)**. RSGs will be actively involved in the development and implementation of the project activities throughout the whole project.

1.1 Test Areas

Following nine TAs from six different countries were defined and each had to choose one priority dimension on which it wants to work on for the smartness improvement of the TA:

1. **Pomurje**, SLOVENIA
2. **Maribor/Pohorje** SLOVENIA
3. **Kungota, Idrija, Slovenske Konjice, Padna, Žalec, Robidišče**, SLOVENIA
4. **Stura, Orba and Leira Valleys (Valli del SOL)** - ITALY
5. **PACA and AURA territory** – FRANCE
6. **The Municipality of Löffingen** – GERMANY
7. **Lake Costanza** – GERMANY
8. **Pitzal** – AUSTRIA
9. **Lucerne West Region** - SWITZERLAND

1.2 Regional Stakeholder Group Mappings

Each of TA defines an RSG comprised of various stakeholders, which are chosen by the representative project partner.

Each RSG has to prepare a TA presentation and an RSG mapping. An example of an RSG presentation and mapping is presented below. The example is based on the TA Pomurje.

Test area: Pomurje



Area: 1.337 km²

Inhabitants: 117.000 inhabitants (roughly 5% of the Slovenian population)



Main geographic and economic features of the Test Area:

Area:

- flat rural area with small hills
- the most important area suitable for food production in Slovenia – Agricultural holdings of this region cultivate almost 13 % of all agricultural land in Slovenia and raise almost 12 % of all the livestock
- the contradiction between the socio-economic and land structure in the rural area

Main needs of the Test Area in terms of Smart Transition:

- New/smart technologies to be implemented for smart farming (viticulture, fruit growing, livestock breeding etc.)
- New business models for farmers (based on digital transformation and short supply chains)
- New markets (customers) where higher margins are achieved – transformation to agricultural tourism
- New cross-sector life and working models (remote work)

Main issue(s) (niches and domains) to be covered by the Pilot Activity:

- Smart & Sustainable Agriculture
- Pomurje as the hinterland of cities (e.g. Maribor) in terms of short food supply chains (local food), which should eventually lead to self-sufficiency Innovation aspects of the Pilot Activity:
- Creating new and efficient networks between regional food production stakeholders
- Short food supply chain Business model development
- Catalogue of Short food supply chains for digital farm shops
- Integration of digital solutions into the Digital Innovation Hub - DIH AGRIFOOD

Actions to be performed in the Pilot Activity and expected outcomes:

- State of the Art of the Smart Transition in the TA
 - Identified needs and conditions
 - Informal DIH Agrifood
- Core actions of the Pilot Activity
 - Business model development for the Short food supply chains
 - Identification of the
- Main aims and expected outcomes of the Pilot Activity
 - Formalized DIH Agrifood (one-stop-shop) with the portfolio of services
 - Catalogue of short food supply chains
- Funding/funding sources (financial viability) - EU and national funds

Stakeholders in a quadruple helix (4H) logic

The RSG stakeholders had to be chosen and structured into four categories: (1) Policy makers, (2) Academia, (3) Business and (4) Civil society. An example is depicted in Fig. 1.

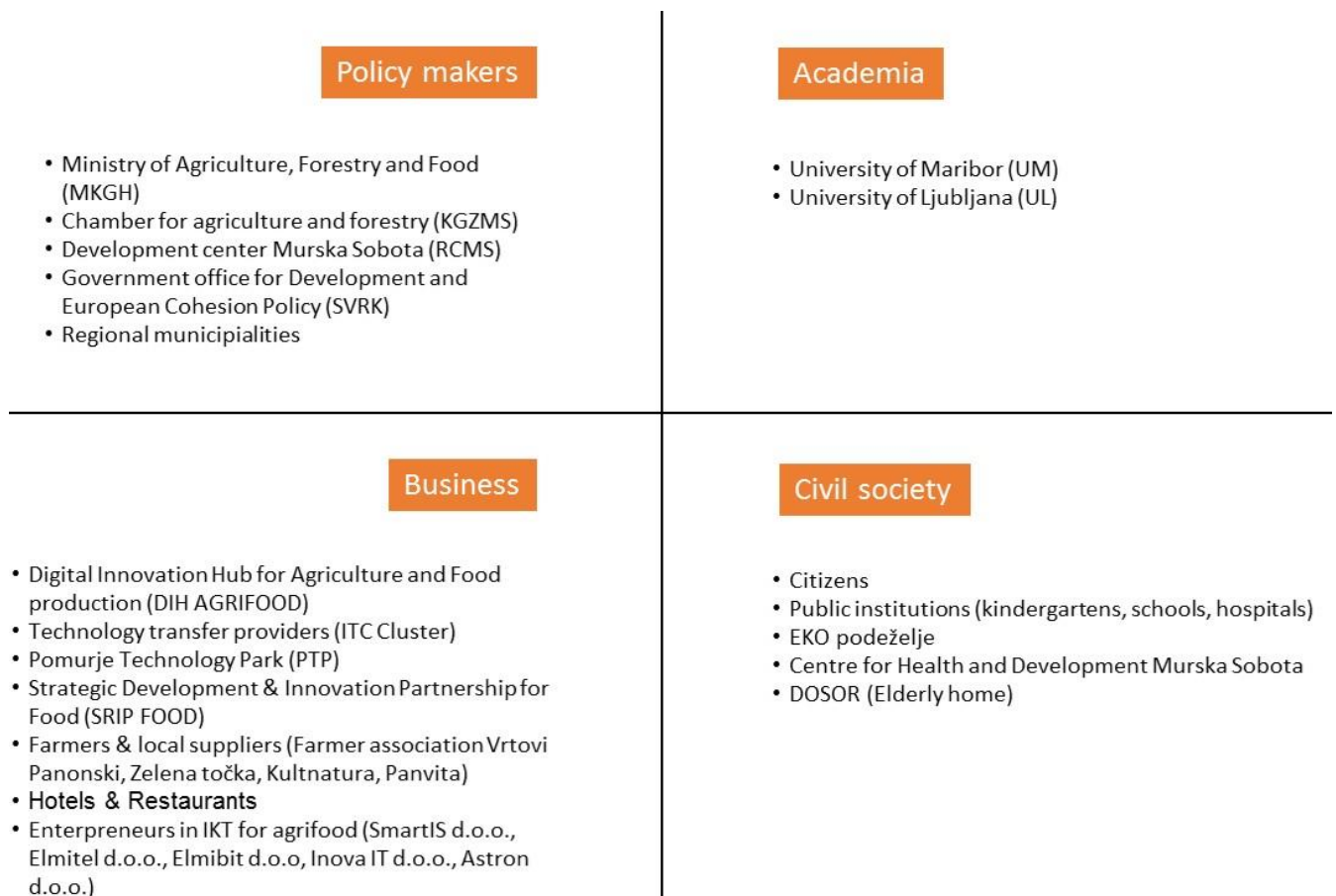


Figure 1: TA Pomurje stakeholders in a quadruple helix logic.

Stakeholders & interests

After preparing a list of possible TA stakeholders for a chosen dimension, these had to be structured into a table where their interests, contributions, and conflicts are presented, as seen in Table 1.

Table 1: TA Pomurje stakeholders interests, contributions and conflicts.

Stakeholders	Interests	Contribution	Conflicts
Policy makers	Co-creation of the future	Framework conditions Preparing strategies for the region Observe & support	Between levels Between thematic fields Existing regulations Change of government
Academia	Generate knowledge New projects / research funds	R&D Information Orientation Know-how	Conflict of interests Personal interests Lack of direct links to end-users/real environment
Business & Technology transfer providers	New business fields and niche technologies Increase of profit New projects/funds	Service provider Information Technology transfer Explaining function	Structural change in companies Winners & losers Personal interests Not easy to implement
Civil society	Better living conditions Better services Co-creation of the common future	Ideas Interests Embrace change Needs Co-creation of framework	Digital illiteracy Disappointments Structural change not positive Personal interests

Influence and relevance of stakeholders

For the purpose of the RSG mapping, the stakeholders had to be put into two separate quadruple helixes, whereby one presents RSGs influence and motivation, as seen in Fig. 2.

Pilot activities: Short food supply chains

Finally, the chosen RSG had to suggest pilot activities for the chosen dimension with the goal of increasing the smartness level of its Test Area. Example of such is the following list, which is backed up by Fig. 3.

- Online system for ordering local foods and goods
- Local farmers and producers included in the supply chain

- Public institutions (Kindergartens, Schools, Hospitals etc.), local restaurants, shops are acting as end consumers
- Direct ordering from the kitchen via online system via an online system

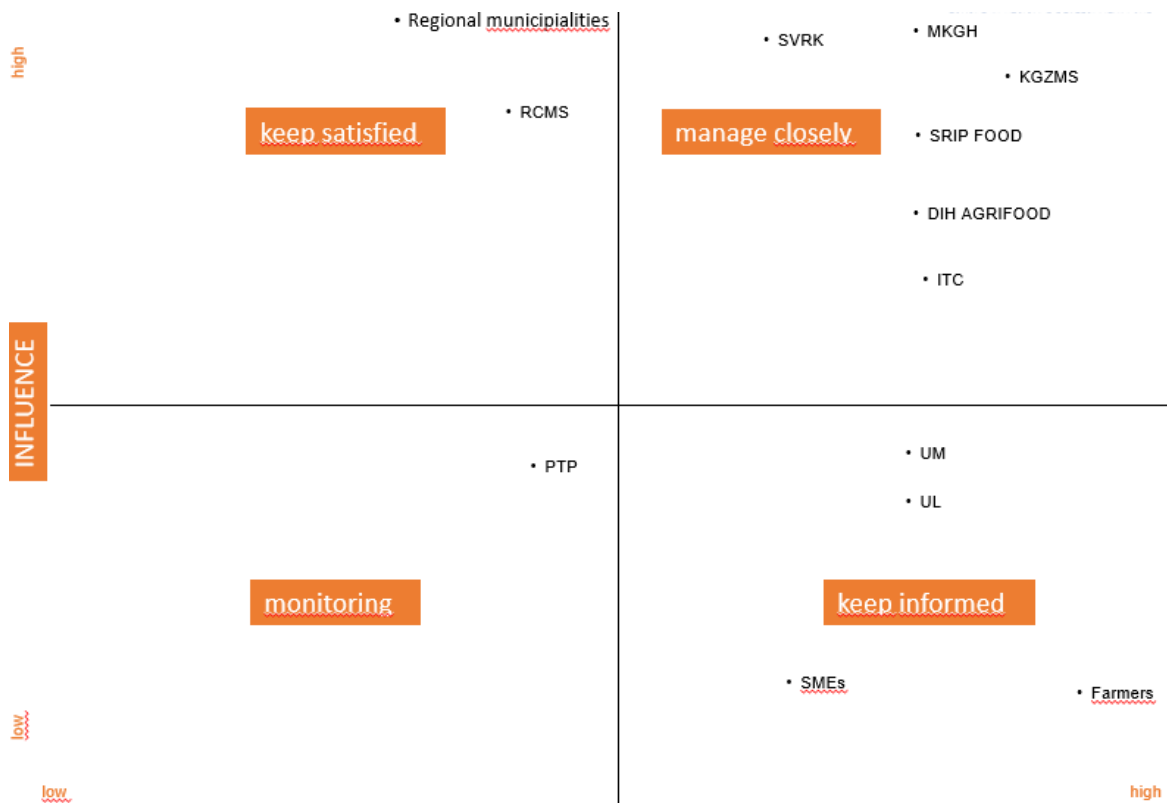


Figure 2: Mapping of stakeholders based on their relevance and influence.

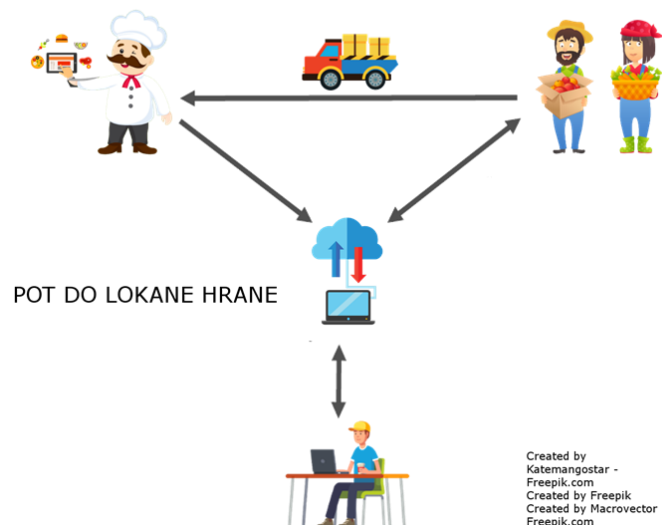


Figure 3: Depiction of envisioned pilot activities in the TA.

1.3 The Dimensions of Smartness

WP T1 partners first defined Dimensions of Smartness on which the RSG will work on with their TAs. The dimensions are explained in detail below while a depiction of these is seen in Fig. 4.

- **Smart Economy:** Variously declined in terms of presence of creative and innovative enterprises and business models in the area, level of employment and unemployment, level of economic attractiveness, penetration of ICT in the local economic system.
 - Examples of indicators include: number and density of certified enterprises, number of young and woman-led enterprises, the rate of business creation, number of patents.
- **Smart People:** Smart People encompasses the participation of local citizens to the job market, the decision-making and involvement in associations, and the education level of people.
 - Examples of indicators include: number of associations, level of equal opportunities, level of schooling, overall employment, political involvement, and engagement.
- **Smart Governance:** Smart Governance encompasses the level of smartness of the governance systems, the penetration of green public procurement, e-governance, propensity to networking.
 - Examples of indicators include: the number of electric cars used, the presence of recycling policies in the PAs, Energy and Planning Policies.
- **Smart Mobility:** Smart People encompasses the quantity and quality of sustainable transport and mobility systems in the area.
 - Examples of indicators include: number of non-conventional-fuel cars being owned/used, level of cyclability, the presence of limited-traffic zones, level and sustainability of public transport.
- **Smart Environment:** Smart Environment encompasses the quality of the environment in terms of air, water, soil, and biodiversity.
 - Examples of indicators include: air quality, level of recycling, the percentage of natural spaces in the overall area.

- **Smart Living:** Smart People encompasses the quantity and quality of services to the population in the area and the degree of satisfaction in them.
 - Examples of indicators include: level of criminality, level of services of general interest provided (banks, post offices, basic goods, etc.), quality and quantity of health care and social care services, quality and quantity of services to the elderly.

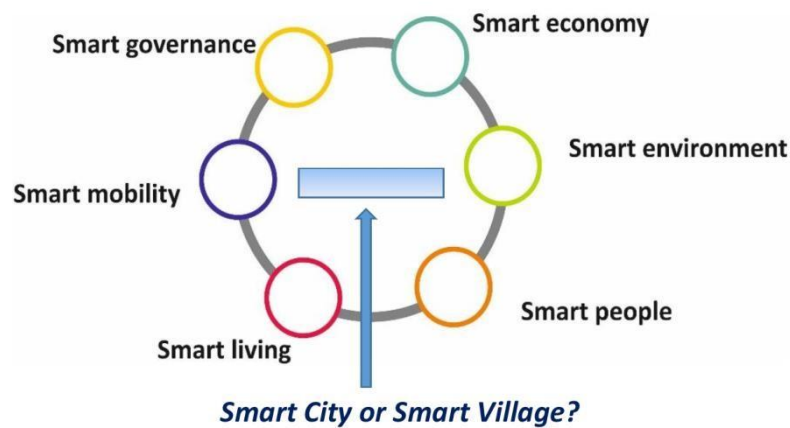


Figure 4: Defined dimensions of smartness.

The following table (Table 2) lists the connections of TAs, their project partner representative and the smart dimension the RSG chose to work on.

Table 2: Connection between TAs, project partner representative and smart dimension.

Partner - Code:	Test Area:	Smart Dimension:					Code
		People	Economy	Environment	Living	Mobility	
SAB	//						
University of Maribor – UMA	Podravje	x	xx				PDR
	Pomurje	x			xx		PMU
University of Ljubljana – ULJ	Idrija		x		xx	x	IDR
	Padna		xx			x	PAD
	Robidišče	x	xx			x	ROB
	Slovenske Konjice		xx				SKO
	Žalec		xx				ZAL
	Kungota	x					KUN
SmartIS City - SMA	//						
Agenzia GAL Genovese – GAL	Valli SOL					xx	SOL
BeNu - EnergyEnvironment							
Lower Austria – BEN	//						
ADRETS – ADR	Alpes Françaises	x			xx		ALF
Regionalverband Südlicher Oberrhein – RSO	Löffingen	x					LOF
Bodensee Standort Marketing GmbH – BOD	Bodensee		xx		x		BOD
Tiroler Zukunftsstiftung – TIR	Pitztal		x		x	xx	PIT
Software Competence Centre Hagenberg – SCC	//						
Region Luzern West - LUW	Luzern West				xx	x	LUW
Poliedra	//						

1.4 The Indicators of Smartness

WP T1 partners have selected 91 Indicators of Smartness, divided into the six dimensions of smartness. The Complete List of Indicators includes the classification for dimensions, categories within dimensions, the name of the indicator, a brief description, one or two driving questions, and possible answers. The answers help in the understanding of the possible ways to respond to the indicator, in terms of the unit of measurement, yes/no, quantitative vs. qualitative description. Of those 91 Indicators, the RSG will work on a core subset of 24 (4 per dimension), by means of a specifically-designed **Indicator Card**. The 'timeline' of the Indicators is linked to the structure of the **Guidelines on the work of the RSGs**.

The Indicators, as seen in Fig. 5, capture the state of the art of the Test Area (Where are we now?), the future target set by the Area (Where do we want to be?), and the way to monitor progress or lack thereof (How do we get there?). The Indicator Card is based on the indicators as presented on next page, while the procedure to fill it is presented in Fig. 6.



Figure 5: Indicator process.

The subset of 24 core indicators of smartness are as follows:

- Smart Mobility:
- Presence of/Access to services of car-sharing
- Presence of/Access to services of car-pooling
- Presence of/Access to an integrated transport platform
- Presence of e-bikes; accesses to e-bike-sharing services
- Smart Governance:

- Presence of/Access to e-government administrative/fiscal services
- Presence of/Access to e-health services
- Presence of participation events organized by public administrations
- Re-orientation of tourist offer • Smart Economy:
- Availability and use of a Brand/Logo for the region
- Presence of digital farming
- Presence of/Access to tourist-dedicated apps
- Young-led enterprises
- Smart Environment:
- Energy produced from renewable sources
- Recycled waste
- Protected areas
- Energy performance certification in buildings
- Smart Living:
- Services of General Interest (SGI): availability and access
- Type of internet connection
- Maternity ward in the closest hospital
- Smart working
- Smart People:
- Citizen participation in meetings of public interest
- Citizen awareness of natural risks/risk management
- Citizen associations, especially if devoted to innovation
- Familiarity with internet

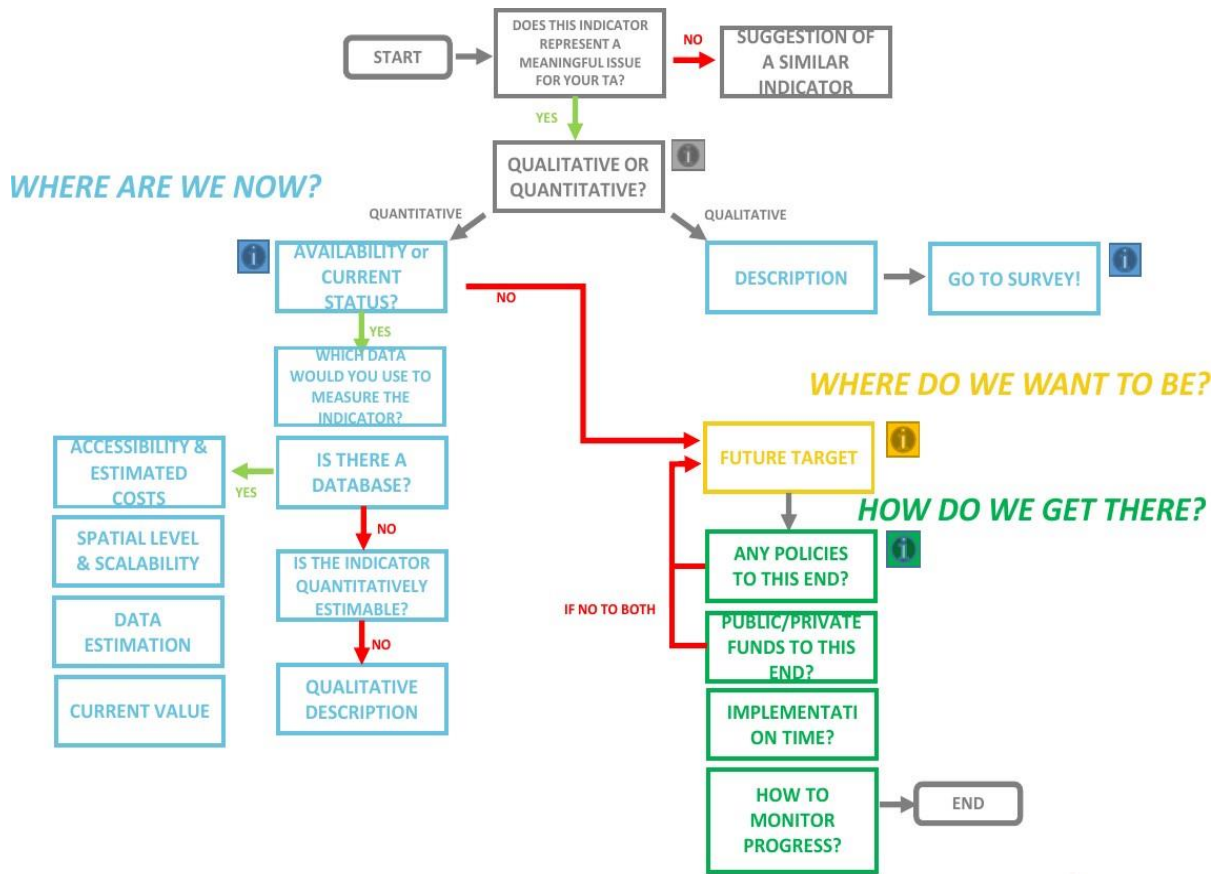


Figure 6: Procedure to fill the indicators.

1.4 Indicator cards

The Indicators are grouped using the **Indicator Card** using four pages as follows. First, page 1 of the Indicator Card provides the basic information as seen in Fig. 7.

INDICATOR CARD: Presence of/ Access to tourist-dedicated apps			
DIMENSION: Smart Economy		CATEGORY: Tourism	
DESCRIPTION: Presence of tourist-dedicated apps, and actual access to them			
DRIVING QUESTION(S) : Do tourist-dedicated apps already exist? How many people use/access them?			
1	Does this indicator represent a meaningful issue you might want to consider?	1. No -> Go to 11 2. Yes -> Go to 2	
2	What kind of indicator is it (qualitative or quantitative)?	1. Qualitative -> Go to 3 2. Quantitative -> Go to 4	

Figure 7: Indicator card - basic information section.

After that the Section “WHERE ARE WE NOW” follows, as seen in Fig. 8.

WHERE ARE WE NOW?		
3	If the indicator is qualitative, describe it and then go to ONLINE SURVEY (WPT2)!	Please provide here a brief outline of the status of the qualitative indicator in your Test Area (TA):
4	<p>If the indicator is a service or item (i.e. a logo, a platform, a car sharing service, ...): is the service/item already available in your TA?</p> <p>If the indicator is not a service or item (i.e. renewable energy production, energy performance certification for buildings, ...): how would you describe its current status in the TA?</p>	<p>1. No -> Go to the section WHERE DO WE WANT TO BE? /HOW DO WE GET THERE? (Next page)</p> <p>✗ Yes. If possible, provide here some relevant information of the status.</p>
5	Which data would you use to measure this indicator? You can indicate one or more possible data sets.	Please list here one (or more) possible data sets to measure this indicator: <i>Monthly downloads and/or accesses to the app</i>
6	<p>Data sources Please provide information on the possible data sources for the data sets listed in question 5. Data can be already available (if so, please indicate possible data sources), or the indicator might be estimable by using information from official data sources, or the indicator might not be quantitatively or numerically estimable.</p>	<p>1. The data are already available. -> What are the data sources? How often are they updated?</p> <p>✗ The Indicator can be estimated quantitatively by using information from official data sources. How would you do so?</p> <p>3. The indicator cannot be estimated quantitatively -> Go to 10</p>

Figure 8: Indicator card - Where are we now section.

Finally, the sections “WHERE DO WE WANT TO BE” and “HOW DO WE GET THERE” are presented and seen in Fig. 9.

WHERE DO WE WANT TO BE?		
12	Indicate your FUTURE TARGET for this indicator, in the context of the smart transition of your TA.	Please provide here your future target: <i>About 50% of tourists will use the app in 3 years</i>
HOW DO WE GET THERE?		
13	Are there any policies which takes this target into account? If so, indicate the policy/ies.	Please list here any relevant funds, current or foreseeable: <i>Regional S3 indicates the need for smarter tourism</i>
14	Are there any private/public funds already allocated or that will be allocated in the nearest future for this target?	Please list here any relevant funds, current or foreseeable: <i>There is a local private company available to allocate funds; PA will open tenders to this end.</i>
15	Implementation time (time estimated to get to the declared target)	Please indicate a possible time span to complete the fulfilment of the declared target: <i>2 years</i>
16	How is it possible to monitor if the implementation proceeds as expected?	Please provide some ideas on how to monitor the activities to reach the declared target: <i>Once operational, a monthly monitoring of accesses is planned</i>

Figure 9: Indicator card - "Where do we want to be" and "How do we get there" sections.

2. Binding of WP T1 outputs with the DEP

In the following, the **key delivered details** are presented, i.e., how the WP T1 outputs are plugged into DEP. These represent the needs of the DEP and outline their delivering concepts.

It should be noted that the project encompasses also an **official project web site**, which will also hold some disseminative project information, whereby some of it will also include static (descriptive) and general information on WP 1 outputs (e.g. Test Areas, Regional Stakeholder Groups).

The building of RSGs (Regional Stakeholder Groups) is detailed and connected with their respective TAs (Test Areas), enumerated for each RSG per TA.

Dedicated TA pages in DEP represent **mappings** for individual RSGs.

The **entering of mappings** in dedicated TA pages per RSG is in a **readable form** for further data processing.

As an **abstract template** allowing a guided and unified approach in entering these mappings, for each TA **Indicator Cards** are presented for different **Domains** (e.g. for tourism, mobility, farming, and energy).

The Indicator Cards are based on **Indicators of Smartness**. These Indicators measure within the Dimensions of Smartness. Both the Indicators and Dimensions are detailed in the next section of this report.

The Indicator Cards are filled for a TA based upon its interest. Each Domain has certain Indicators, based on the Indicators of Smartness. An Indicator Card is initially uploaded possibly as a scan on the DEP per each RSG.

As an enhanced version, the uploaded Indicator Card is later perhaps reformed with DEP online filing support.

Hence, the Indicators and Indicator Card are discussed in more detail in the remainder of this report in the next section, because these are an important detail of the DEP approach architecture.

A summarized and structured depiction of the bindings is shown in Table 3.

Table 3: Structured depiction of WPT1 key output bindings to DEP.

WP T1 Key Output	DEP Binding Description
TA – Test Area	<ul style="list-style-type: none"> • The DEP will have a special Section for the TAs. • Each TA will have a dedicated subsection on the DEP, which will hold: <ul style="list-style-type: none"> ○ Basic static (descriptive) information about TA available also on the official project web site. ○ News and updates on the TAs work and progress in the scope of the project. ○ The chosen dimension of smartness. ○ Possible visualization of project’s outputs connected to the TA. ○ An option to access and download all project’s data collected and created about the TA with the help of RSGs: <ul style="list-style-type: none"> ▪ Reports (doc, pdf, ppt) ▪ Raw data (csv, xls, txt) ○ A subsection for the TA’s RSG (more information below). ○ A list of existing best practices in each TA, collected by the RSG in a structured form and presented on the DEP in a visualization form as well as with a possibility for raw data download.
RSG – Regional Stakeholder Groups	<ul style="list-style-type: none"> • Basic static (descriptive) information about the RSG. • Each RSG will prepare a Mapping as an output of WPT1, whereby the content of this will be made available on the DEP (more information below). • The RSG produce various data outputs. This data will be in the form of the various reports and raw data. All of it will be made available online on the DEP, be it in a demonstrative form or downloadable form for future further data processing. • For the RSGs to be actively driven, the DEP will provide them with a digital collaboration tool in the form of a communication section (e.g. Forum). This will enable RSGs to communicate with each other on dedicated topics, meaning that they all will be provided with access to the DEP.
Mappings	<ul style="list-style-type: none"> • Each RSG will prepare an RSG Mapping in a presentation form (ppt), which will be made available for download on the DEP. • It will encompass stakeholders, pilot activities etc. <ul style="list-style-type: none"> ○ The content may also be visualized on the DEPs page online in addition to the download option.

	<ul style="list-style-type: none"> ○ Possible raw data of the mappings will also be available for download for future further data processing.
<p>Indicators</p>	<ul style="list-style-type: none"> ● WP T1 team will define the indicators of smartness. These will be available on the DEP as a special Section of the platform (probably in the form of a list and descriptive content). The list will also be available for download for future further data processing. ● Possible indicator cards in the form of a document questionnaire will also be prepared and made available on the DEP for download. <ul style="list-style-type: none"> ○ Some indicator cards will be prepared for the TAs by the RSG and available on the DEP in a visualized form or as raw data enabled for download. ○ The cards will probably also be converted in an online form, available for online processing of other possible areas, which are not part of the TAs of the project. <ul style="list-style-type: none"> ▪ It will probably be part of the smartness assessment service for the public, available as a service of the DEP under a specific public Section. ▪ The data of the filled-up indicator cards will be stored on the DEP and made available for download and future further processing. ▪ The collected data will also probably be used for an online service of matchmaking between areas, in accordance with their indicator card results. ● The smartness indicators will be used as a basis for the matchmaking service with possible outputs in the form of suggestions towards best practices, other territories, or companies / products.

Based on the above examples and information regarding the DEP, the conclusions regarding suggested DEP features are as follows: 1) the list of all TAs will be on individual sites of DEPs, where the data about structures will be presented, 2) the Indicators will be possible to be entered online using forms, 3) the list of indicators will be reachable on DEP statically as well as an option to Export in CSV format, 4) the filled Indicator Cards will be published on DEP and stored structured in a database for later easier search, 5) the filling of Indicator Cards will be supported through a guided procedure scheme based on the 4 pages of an Indicator Card template.

2.1. The smartness assessment service

The following subchapter describes the smartness assessment prototype, already mentioned in the Table 3.

The idea of the first version of the smartness assessment prototype aims at allowing Test Areas to make a self-evaluation of their current status in relation to smartness criteria identified in WPT1. At the moment, the architecture for the smart assessment service is envisioned in Figure 1.

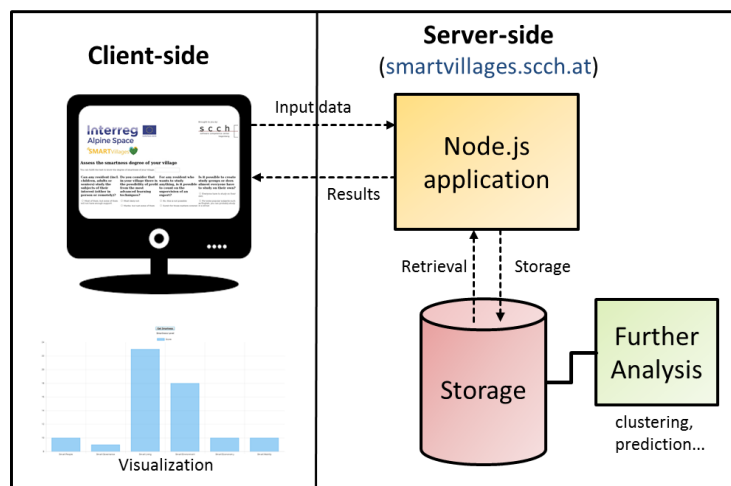


Figure 10: General architecture of the smartness assessment prototype.

The system would work in the following way. First the user connects through the web browser to the location of the service. There, the user will find an online questionnaire that allows filling all the information concerning the smartness indicators. This questionnaire consists of a set of 24 questions with multiple choices answers. These questions are divided into six smartness dimensions. In addition, the user has text fields to provide comments it deems appropriate. Once the online questionnaire is complete, the data (including the village, the answers to the questions, and the comments provided) are ready to be sent to the server for analysis. Then, the results will be calculated and plotted on the screen so that the user can view and analyze them. It is necessary to remark that all the data generated during the process will be stored in the server in order to proceed with further analysis. In addition, every entry is appropriately timestamped in order to develop applications that allow monitoring the evolution of the test areas along the time.



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2.2. DEP design & development - Agile approach

Throughout the first months of the project, the design and the development of the DEP passed several agile phases and activities, due to the complexity of the WPT1 and its bindings to the WPT2 and its main output, the DEP. Several parts and its activities, like the RSGs and the indicator cards, had to be discussed multiple times and the form of it agreed upon between all involved partners in order for the binding of the outputs to be as effective as possible.

As mentioned in the project application, the implementation of the DEP will be performed throughout several agile phases. The novelty is the fact that also the initial design had to be repeated several times, because of the aforementioned complexity. As such, the agile paradigm was applied also on the Design and the preparation of the deliverables, whereby going through several versions in order to adapt to the changes and needs of the project. Such an approach is anticipated also in the future of the project.