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**scch** { }

software competence  
center hagenberg

Digitalization (and  
education) in the  
Smart Villages  
environment

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# Agenda

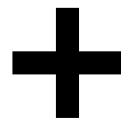
- Introduction
- Problems
- Possible solutions
- Involving students
- Conclusions



# Introduction

Smart Villages refer to the improvement of infrastructure management and planning to fight...

...against depopulation and low population density as well as the cuts and centralization of services supported by digitalization efforts



# Smart Villages

DIGITAL EXCHANGE PLATFORM

Our platform is a digital support system for the EU Smart Village Project.  
Look at the good practices we acquired from multiple villages in Alpine region or assess the smartness of your village.

Smartness survey

Good practices

## Introduction

- In the project Smart Villages (Interreg Alpine Space) we have built an online platform to help villages to increase their level of smartness...

<https://smart-villages.eu>

# Problems

- The rural world is experiencing a series of problems that if managed in time can be prevented from getting worse
  - **Depopulation** because of rural exodus, where many people leave the place where they have lived during many years in search of new opportunities in the urban world.
  - **Aging of the population**, related to the previous point, as young people consider that other more populated places can be more attractive and offer more professional opportunities.
  - **Disappearance of public services**, because it becomes very expensive to offer a service that will not have many users.



# Possible solutions

- The smartness assessment process involves activities that offer a set of pre-established good practices and tools to bring similar practices into the real world.

```
1 {
2 "goodpractices": [
3 {
4   "id": 2202,
5   "title": "test",
6   "short description": "test",
7   "country": "Slovenia",
8   "region": "test",
9   "town": {
10     "address": "Koroska cesta 46, 2000 Maribor, Slovenia",
11           "latitude": 46.5590355,
12           "longitude": 15.6380735
13   }
14 }
```



# Possible solutions

```

* goodpractices:
  0:
    id: 920
    title: "On demand transportation - Collectif Rouge Tranquille"
    short_description: "That group of citizens handles an on demand transportation system in the Royans territory (fra"
    country: "France"
    region: "Royans Vercors (Central French Alps)"
    town:
      address: "Saint-Jean-en-Royans, France"
      latitude: 45.016847
      longitude: 5.291574999999966
    category:
      0: "smart_mobility"
      applicable_in_rural: true
      region_level: "nats_1"
      affecting_scale: "local_region"
    affecting_population:
      0: "elderly"
      timescale: "2010 - ongoing"
      language: "en"
    evidence_of_success: "Stop points and carsharing areas installed. Royans Express working and growing. \r\nIn 2018, 3 loop to be launched in order to extend the territory coverage, to the villages situated in rem"
    detailed_information_on_the_practice: "Rouge Tranquille is a group of citizens that allowed a real thinking and actions on mobility o regular transport on classical trips or on demand transport at home. It also created 4 carpooli investments."
    short_description_of_territory_where_best_practices_are_implemented: "The Royans-Vercors Intercommunality is a rural area of 497 km2 located one hour south-west of famous for its landscapes and its local farming products such as nuts/fruits. Territory is agri actually address: small diversity of mobility solutions based on major car-dependant use, lack "
    resources_needed: "Investment for electric cars : 1 minibus, 1car with european funding\r\n1 person from the soci "
    key_conditions_for_success: "Local population involvement.\r\nDuration of the project and pilote structure to handle fundin "
    key_steps_for_activity_implementation: ""
  
```



```

0:
  id: 1
  name: "Focus group"
  short_description: "Focus group is a method to collect qualitative in-depth information. It is a group interview where t phenomena already identified, its difficulties or viewpoints. Participants of the focus group are sel are often used to learn more about opinions on a designated topic but further also to serve as a star"
  long_description:
    description: "Focus group is one of the qualitative methods for collecting, analysing and interpreting the data. R is characterised by discussions that uncover concerns and opinions held about some particular issues. but indicate why. This method is used in many cases: for collection of data, analysis of data, detect participation in the process of decision making or identification of local difficulties are increased"
  before_the_meeting: "For carrying out a focus group meeting, first we need organising team: - Content planner is also a f timetable, technical equipment etc. \r\n- The role of facilitator can be taken over by any member of written with voice or video recorders (describes atmosphere etc.). \r\n- Analyser takes over the last time we are going to need and whether we need some financing/funding to organize he events. \r\nThink recording equipment. Invite the participants (e-mail or mail) and shortly describe the main objective"
  meeting_execution: "The facilitator makes the introduction and acquaints participants with the aim of the meeting, intro recorder and facilitator make short summary of the event and expose important points. \r\nIf there ar "
  after_the_meeting: "After the meeting analyse the date collected through the audio/video records and in the notes. Make "
  participation_phase:
    0: "1.1. Define the problem"
    1: "1.2. Define the objective"
    2: "4.1. Evaluation"
    3: "4.2. Continuation"
  method_steps:
    0: "1. Organizing team is set up."
    1: "2. The topic is decided and questionnaire is formed."
    2: "3. Date and location are chosen."
  
```



# Involving students. Example I

- Some of the entries in our database are not legit. Therefore, we need to identify them in an automatic way

```
MySQL 8.0 Command Line Client
| This is comment 3 |
| This is comment 3 |
| This is comment 3 |
| ccccccccc |
| ccccccccc |
| What can I say |
| What can I say |
+-----+
7 rows in set (0.00 sec)

mysql> select answer3, answer3a from Results;
+-----+-----+-----+
| answer3 | answer3a |
+-----+-----+-----+
| 1 | This is comment 3 |
| 1 | This is comment 3 |
| 1 | This is comment 3 |
| 0 | ccccccccc |
| 0 | ccccccccc |
| 4 | What can I say |
| 4 | What can I say |
+-----+-----+-----+
7 rows in set (0.00 sec)

mysql> select * from Results;
```

```
<?xml version="1.0" encoding="UTF-8"?>
<SmartEconomy>
  <village category="A" average="4" points="16" name="Ruše"/>
  <village category="A" average="4" points="16" name="wuhan11"/>
  <village category="A" average="4" points="16" name="Peking3434334"/>
  <village category="A" average="4" points="16" name="mb"/>
  <village category="A" average="3.25" points="13" name="Peking3434334"/>
  <village category="A" average="3" points="12" name="Linz-test"/>
  <village category="A" average="3" points="12" name="Hagenberg-test"/>
  <village category="B" average="2.75" points="11" name="Maribor-test"/>
  <village category="B" average="2.5" points="10" name="gfd"/>
  <village category="B" average="2.5" points="10" name="test3"/>
  <village category="B" average="2.5" points="10" name="gfd"/>
  <village category="B" average="2.5" points="10" name="gfd"/>
  <village category="B" average="2.5" points="10" name="gfd"/>
  <village category="B" average="2.5" points="10" name="gfd"/>
  <village category="B" average="2.5" points="10" name="gfd"/>
  <village category="B" average="2.5" points="10" name="test3"/>
  <village category="B" average="2.5" points="10" name="test2"/>
  <village category="B" average="2.5" points="10" name="test1"/>
  <village category="B" average="2.25" points="9" name="Montehermoso"/>
  <village category="B" average="2.25" points="9" name="Sašin vilid"/>
  <village category="B" average="2.25" points="9" name="Sašin vilid"/>
  <village category="B" average="2" points="8" name="Maribor"/>
  <village category="B" average="2" points="8" name="test-tor"/>
  <village category="B" average="2" points="8" name="gfd"/>
  <village category="B" average="2" points="8" name="gfd"/>
```





# Involving students. Example II

- Similarity that measures the degree of maturity in relation to each of the dimensions of study that we address in our framework.
- The calculation of similarity is very useful because it allows the local authorities of the rural world to determine which places present some characteristics to those of the place in question.

$$\text{similarity}(\mathbf{A}, \mathbf{B}) = \frac{\mathbf{A} \cdot \mathbf{B}}{\|\mathbf{A}\| \|\mathbf{B}\|} = \frac{\sum_{i=1}^n A_i B_i}{\sqrt{\sum_{i=1}^n A_i^2} \sqrt{\sum_{i=1}^n B_i^2}}$$



# Conclusions

- We have presented our framework for data analysis in the context of the smart villages
- Our goal is to develop novel methodologies and tools that will help local authorities in the rural world to pilot an appropriate transition to an effective and sustainable digitalization model.
- At present, this transition lacks proper guidelines and tools, and it is so unstructured that most local authorities do not have a starting point nor software support to guide them in making adequate progress in terms of smartness maturity.



Thank you very much for your attention

