

**Interreg**  
Alpine Space



**CARE4TECH Smart Living  
Alliances: roadmaps for future  
excellence in technology and  
innovation**

**D.T2.1.2**



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| PP                  | Restricted to other programme participants        |    |
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## 1 INTRODUCTION

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The purpose of this document is to provide Project Partners (PPs) with a guideline on how to define their Smart Living Alliance Roadmap. In particular, the purpose of this document is to help partners in describing how to move from described potential (T1) to concrete regional & transnational applications.

Partners will be asked to provide 9 new applications (tot. 99 new applications) starting from the 3 identified Best Practice Case Studies, that can be found, or further added, in the Visula Matrix.

In order to achieve the above-mentioned goal, a template for defining the Action Plan is provided. Partners are asked to fill this template for the 9 identified applications.

## 2 CONNECTION TO OTHER WORK PACKAGES

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CARE4TECH Project main result consists in an increased knowledge transfer capacity between quadruple helix actors & a subsequent enhanced potential for business & technology innovation in the whole AS area in the selected field of smart living technology.

According to this, Work Package 1 (WPT1) aimed to create a common knowledge base for all members of the project partnership and their stakeholders related to the topic of Smart Living. In particular, a AS KNOWLEDGE ATLAS was defined: a map of leading cases and approaches classified in a transnational database combined to a visual matrix (Hypertree).

Within Work Package 2 (WPT2), the focus is on technology & innovation transfer. Starting from the Case Studies classifications, PPs are indeed required to identify Best Practices to be further exploited through specific roadmaps for future excellence in technology and innovation, leading to 99 new applications.

## 3 THEORETICAL BACKGROUND

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The main goal of Activity 2.1 is to **provide roadmaps for future excellence in technology and innovation**. This section provides a theoretical background in order to help PPs understand what is and how to define a Roadmap for a technology transfer activity.

**Roadmaps** allow technology developments to be integrated with business planning, and they allow assessment of the impacts of new technologies and market developments on the prospects for a firm [1]. Roadmaps are developed in a number of ways, and various scholars have produced outlines of the key stages of developing technology roadmaps. From this variety of approaches, a set of core practices can be identified:

- Roadmaps identify the major players in the innovation system, and provide an outline of the industry or emerging innovation network.
- They describe the current status of a technology.
- They set out a view of the future of a technology, including the possibilities for its development and deployment.
- They identify needs and priorities—including R&D needs, and sometimes market and regulatory needs, such as codes and standards.

- Those produced at the sectoral level (rather than by individual firms) aim to offer a consensus view of the way forward. As a result, they are almost always collaborative, or at least consultative, in the sense that they include the views of different teams, groups and stakeholders.
- Many roadmaps involve regular updates and monitoring of progress against milestones and targets.

As the current ‘state of the debate’, a roadmap embodies a view of the status of a technology in terms of its development, and an inventory of possibilities, barriers and opportunities. As an attempt to create a realistic and pragmatic projection of what is both feasible and desirable. A successful roadmap must be seen as at least credible or plausible, even if they are not always seen as setting out a likely or inevitable future. As a guide to innovators, roadmap maps the key areas in which progress is required, including the barriers and the opportunities, to get a clearer sense of where resources need to be focused to move the innovation system forwards. Roadmaps articulate a particular view of what the future can and should be like and they demand resources and support accordingly.

Roadmaps are processes that facilitates the development of networks and the alignment of actors within an innovation system.

Many roadmaps are periodically updated and provide an institutional structure through which actors in the innovation system can monitor progress, consider changing priorities and identify opportunities.

**Knowledge Transfer** is a term used to encompass a very broad range of activities to support mutually beneficial collaborations between universities, businesses and the public sector. It is about the transfer of tangible and intellectual property, expertise, learning and skills between academia and the non-academic community. [2]

This can refer to transfers from SME to SME, Large Industry to SME, SME to Large Industry, Research Institute to Enterprises; Research Institute to Research Institute, within and between regions and countries. This can refer to the transfer of products, services and/or solutions as well as projects and programmes.

We consider as a theoretical background a model of a “Knowledge and Innovation Transfer Process”. In particular this model, that has been developed based on existing and proven approaches and models, highlights three high-level tasks that must be filled to achieve a successful transfer process:

- Knowledge Supplier (KS): an idea/product/service/solution/project/programme, that becomes the unit of transfer that is provided by one entity. (In CARE4TECH Projects, KS have been already identified in the Knowledge Atlas).
- Knowledge Receiver (KR): an entity that is the beneficiary of the knowledge created by the supplier.
- Knowledge transfer Facilitator (KF): a process by which the knowledge supplier, and the knowledge receiver are connected, and the knowledge is moved from one to the other. For CARE4TECH, this facilitation is done by PPs.

Defining Roadmaps for Technology & Innovation Transfer in CARE4TECH refers to the possibility of moving from described potential (WPT1) to concrete regional & transnational applications related to Smart Living and its declinations, identified by the 11 Smart Alliances.

Figure 1 provides a picture of this process between the ‘knowledge supplier’, and the associated knowledge creation process, and the ‘knowledge receiver’, and the associated innovation process required to utilize this knowledge for market development.

The key connection between these two aspects is the knowledge transfer process; enabled by a ‘knowledge facilitator’. This connection focuses on the creation of a partnership system, which eases the transfer of knowledge using contact (network) development and project development.

## 4 ROADMAP DEVELOPMENT METHODOLOGY

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Within the framework of WPT1, the PPs identified and elaborate 110 case studies to build the so-called AS Knowledge Atlas, that have been introduced into the Visual Matrix according to the related Smart X Topics.

In order to **define a successful Roadmap for the Technology & Innovation Transfer Process process**, it is suggested to follow 3 main steps:

- **1st step – Best Practices Identification:** identification of at least 3 Best Practice case studies per each Alliance.  
Each Task Force should identify at least 3 case studies (idea/product/service/solution/project/programme) that becomes the unit of transfer. These case studies should be included in the Visual Matrix (they can be already included or new cases that have to be further included in the Hypertree).
- **2nd step – New Application Identification.** Identification of 9 potential new Applications (starting from the identified Best Practice Case studies). Each Alliance should identify overall 9 new potential applications.
- **3rd step – Knowledge Process definition:** define an Action Plan to achieve the pre-defined 9 new potential Applications (a guiding template is provided in the following section).

### **How to reach the 1<sup>st</sup> Step**

Starting from the already identified Smart Living Case Studies that have been included in the Visual Matrix, each Alliance is required to select at least 3 Best Practice examples related to the specific Smart X Topic. These Case Studies have to be considered worthwhile for a Technology & Innovation Knowledge Transfer activity. The Best Practice can be an **idea, product, technology, service, project, programme**.

In order to achieve this step, the following questions must be kept in mind:

- Why the Case Studies is a Best Practice in your field of application? Why the Case Study is relevant?
- What knowledge could be transferred in the Alpine Space Smart Living context?
- What are your expectations, what is your motivation?
- What available resources (money, time and people) are required to supply the knowledge?
- Which types of training is required to successfully supply the knowledge?

It is highly recommended to **leverage on the CARE4TECH Available Tools, in particular Slack and Trello** when accomplishing the above-mentioned activities. In particular, it is highly recommended to use the tools for:

- Organise the next Alliance online meetings (e.g. for identifying the Best Practice Case Studies), that can be organized using Slack channel, leveraging on the polling function.
- Start discussions on what the possible Transfer Applications could be for each Alliance. The discussion can be initiated using Slack, for instance through the channel chat functionality.

Emerging ideas can be then uploaded in Trello, as well as the New Potential Applications that will be developed within the project timeframe.

**Requirement for each Alliance:**

- At least 3 Best Practice Case Studies eligible for a Technology & Innovation Transfer process must be identified at the end of this step and uploaded in Trello.
- Alliance must schedule at least 1 specific online or face-to-face meeting at this scope and must provide proof of evidence (Use of Slack tools, minutes of the online meetings).

**How to reach the 2<sup>nd</sup> Step**

According to the identified Best Practice Case Studies, it is necessary to identify overall 9 new possible Applications, to be achieved through a Knowledge transfer activity.

This can refer to the transfer of tangible and intellectual property, expertise, learning and skills between academia and the non-academic community. And/or to transfers the Best Practice from SME to SME, Large Industry to SME, SME to Large Industry, Research Institute to Enterprises; Research Institute to Research Institute, within and between regions, countries or industrial sectors (see Table 1 for practical examples).

The Idea is to identify potential new Applications which could be transferred via pilot actions within the project timeframe and in later stages as follow up project.

Hint: since 9 new application is a quite challenge number to reach, an idea could be to identify 3 short-term application, easy to achieve within the project end, and 6 ideas of potential new application to be achieved beyond the Care4Tech timeframe.

**Example:**

- *If you achieve the minimum number of Best Practice (3), for each of the 3 Case Studies you can identify 1 New Application achievable in the short-term, 2 new Application achievable in the mid-long term.*  
**➔ Overall 9 New Applications.**

**Application examples according to the different “type” of Case Studies:**

| Case Study         | Potential New Applications  |
|--------------------|---|
| Product/Technology | <ul style="list-style-type: none"> <li>• Transfer of the product/technology in a new organization/industrial sector/market/region</li> </ul> <p><b><u>Example #1</u></b><br/> <i>Portable Testing Unit</i> is an experiment developed by Whirlpool EMEA under the project BEinCPPS, focused on the CPS-ization of Statistical Quality Check in the White Good industry. The product is now used only inside whirlpool production plants for the statistical quality check of refrigerators and microwave ovens.</p> |

|         |   |
|---------|---|
|         | <p><i>A new possible application could be the adoption of the Portable Testing Unit in a different industrial sector.</i></p> <p><b><u>Example #2</u></b><br/> <i>A company from industrial manufacturing sector having a technology that can be newly applied in the agricultural sector within a specific region.</i></p> <p><b><u>Example #3</u></b><br/> <i>Several woodcarvers established a consortium in order to transfer their craftsmen’s knowledge to the digital manufacturing field. The enterprise <b>3DWood</b> now has great expertise in adapting 3D-data especially for wood carving and is a perfect example of the transfer and combination of craftsmen’s knowledge and experience with digitalisation</i></p> <p><i>This experience can help other craftsmen to shift from the traditional production to digital innovation, e.g. carpenters using 3D-scanners instead of measuring building places by hand.</i></p> <p><b><u>Example #4</u></b><br/> <i>A <b>consortium of 5 enterprises</b> starts a pilot project in Telemedicine in South Tyrol. In order to do so they are in exchange with other companies from other alpine regions and will adapt and implement already tested methods.</i></p> <p><b><u>Example #5</u></b><br/> <i>A local <b>e-bicycle manufacturer</b> is developing a hydrogen driven bicycle. This makes it necessary to transfer the expertise of hydrogen engines to this new field and combine it with the already existing knowledge in bicycle manufacturing and to adapt it accordingly.</i></p> |
| Service | <ul style="list-style-type: none"> <li>• Transfer of the service in a new industry</li> <li>• Transfer of the service in a new region</li> </ul> <p><b><u>Example #6</u></b><br/> <i><b>AFIL Cento4.0 initiative</b>, focus on the collection of innovative advanced manufacturing solutions, has been designed according to the similar 100 Orte Baden-Wurttemberg initiative.</i></p> <p><i>New possible applications could be:</i></p> <ul style="list-style-type: none"> <li>• #1 Replication of this initiative in different Regions (Italian or EU Regions).</li> <li>• #2 Focus on a different industrial field/topic (e.g. with a focus on smart X solutions)</li> </ul> <p><b><u>Example #7</u></b><br/> <i><b>DREAMY Digital Readiness Assessment Tool</b>, a widespread tool developed by Politecnico of Milan for assessing company maturity level in digital technologies adoption.</i></p>  |

|                |  |
|----------------|--|
|                | <p><i>A new possible application could be the adoption of this tool in different Regions.</i></p>  |
| <p>Project</p> | <ul style="list-style-type: none"> <li>• Transfer of Project Best Practice/outputs in new industrial contexts</li> <li>• Transfer of tangible and intellectual property, expertise, learning and skills between academic and/or non-academic partners</li> </ul> <p><b><u>Example #8</u></b><br/> <i>Within the Interreg Central Europe project <b>3DCentral</b> a dynamic database was developed. This so called Hyper Tree was transferred to the Interreg Alpine Space project <b>Care4Tech</b>.</i></p> <p><i>A possible use of this platform after the project closure could be the application in Technology Parks or similar knowledge institutions.</i></p> <p><b><u>Example #9</u></b><br/> <i><b>Knowledgize</b> project (from Lombardy Region Call “Bando Accordi”) has been developing a Knowledge Management Platform that is going to be tested and adopted in 3 Lombardy manufacturing companies.</i></p> <p><i>A new possible application could be the testing and adoption of the Knowledgize platform in different industrial sectors.</i></p> <p><b><u>Example #10</u></b><br/> <i><b>BEinCPPS H2020</b> project has developed a common learning between partners concerning the identification of funding opportunities for SMEs willing to adopt CPS through the developed technology architecture.</i></p> <p><i>A new possible application could be:</i></p> <ul style="list-style-type: none"> <li>• <i>Application among partners for new project opportunities based on existing learning (e.g. BEinCPPS project partners within the Smart Workplace Alliance are monitoring and evaluating the possibility to apply to a new call on Workplace topic that gives the opportunity of financing SMEs).</i></li> </ul> <p><i>In addition, a network of Regional Manufacturing DIHs in the 5 involved BEinCPPS Regions (Lombardy, Baden-Wurttemberg, Auvergne Rhone Alpes, Euskadi and Norte) has been created.</i></p> <p><i>A new possible application could be:</i></p> <ul style="list-style-type: none"> <li>• <i>The transfer of the DIHs best practices in other Regions (AFIL, as RM DIH is mentoring new emerging DIHs in less developed countries).</i></li> </ul> |

Table 1: Application examples according to the type of Case study

As already stated, the use of CARE4TECH Tools, Slack and Trello, is highly recommended during this phase. Slack, indeed, can be used to start discussion on the potential new applications, that might then be uploaded in Trello, within the Board of the referring Alliance.

**Requirement for each Alliance:**

- Identify 9 new potential applications (some in the short- term and some in the mid/long-term).
- At least 3 New Applications should be achievable in the short-term (within Project timeframe)

**How to reach the 3<sup>rd</sup> Step**

In order to define and successfully implement a Roadmap for Technology & Innovation Transfer, an Action Plan should be defined for each of the 9 new potential application.

The following template is provided in order to support PPs in accomplishing this goal.

| Roadmap for Technology & Innovation Transfer  |   |
|---|---|
| <b>Name of Organisation</b>   | AFIL  |
| <b>Smart Living Topic</b>   | Smart Workplace   |
| <b>Best Practice</b>  | BEinCPPS  |
| <b>New Application</b>  | BEinCPPS RM DIH method applied in a new Region  |
| <b>Knowledge supplier</b>   | RM DIH - AFIL   |
| <b>Knowledge receiver</b>   | TBV   |
| <b>Knowledge facilitator</b>  | AFIL  |
| <b>Reference Consideration</b>  | <b>Response</b>   |
| <b>Why the identified Case Studies is a Best Practice in your field of application? Why is it relevant for C4T?</b> | BEinCPPS project ia an Innovation Actions that developed a network of Regional Manufacturing DIH in the 5 Vanguard Regions involved in the Project. The RM DIH have been recognized by I4MS as operating DIH, that support companies, in particular SMEs, in successfully embarking the digitalization journey.                               |
| <b>What knowledge can be transferred in the Alpine Space Smart Living context?</b>                                  | AFIL has been recognised as a Regional Manufacturing Digital Innovation Hub by I4MS. The knowledge that can be transferred in this context is the processes that lead the cluster to become a RMDIH, an association working on development and expansion of innovation ecosystems, making digital technologies accessible to any EU business. |
| <b>What is the new Application about? Briefly described the idea behind the new application.</b>                    | Innovation Hubs act as the ‘spider in the web’ of innovation ecosystem, supporting the (regional) community, sharing infrastructure and expertise, and linking research, industry and (regional) government. The main goal is to set up a RM DIH in TBD Region, focusing on the field of<br>....  |
| <b>Which types of training is required to successfully supply the knowledge?</b>                                    | The processes put in place for the development of this RMDIH can be transferred as best practice. Training sessions have already been experimented with the support of I4MS webinars  |
| <b>Which Stakehodlers are involved in the new Application?</b>  | Responsible: AFIL<br><br>Receiver: TBV  |

|  |  |                  |                |
|--|--|------------------|----------------|
| <b>Describe the Responsible, the Receiver, the other Stakeholders (end-users, service providers,..) that will be involved and who will benefit from the new Application.</b> | Beneficiaries: SMEs and Innovation Stakeholders in the addressed Region focusing on XX topic.  |                  |                |
| <b>Which are the main challenges/barriers that may arise to be overcome?</b>   | The sustainability of the Hub (how to finance the Hub) is a common DIH challenge.  |                  |                |
| <b>Which are the main opportunities/benefits from the new application?</b>   | Setting up a similar RM DIH in X Region will strengthen the cooperation on the XX topic.   |                  |                |
| <b>Which LiLab will be involved and how it will contribute?</b>  | LItalyLab will support the provision of the needed resource for the training needed to set up the new RM DIH and will support the engagement of innovation stakeholders. |                  |                |
| <b>What is the timeframe you expected for the fully implementation of the application?</b>   | Mid-term.<br>1 year foreseen for the fully implementation  |                  |                |
| <b>MILESTONES</b>  | <b>ACTIONS</b>   | <b>DEADLINES</b> | <b>RESULTS</b> |
| #1   |  |                  |                |
| #2   |  |                  |                |

Table 2: Roadmap for Technology & Innovation Transfer

**Requirement for each Alliance:**

- Fill the “Roadmap for Technology & Innovation Transfer” (Table 2) for each of the 9 New Potential Applications.
- Keep track of results! (that will be included in D.T2.1.5)

## 5 CONCLUSIONS

This document is meant to provide Project Partners (PPs) with a guideline on how to define their Smart Living Alliance Roadmap. In particular, the goal of this activities is to identify 9 new potential applications starting from the already identified Case Studies.

Each Alliance must fulfill the following Requirements **by June 2019:**

- At least 3 Best Practice Case Studies eligible for a Technology & Innovation Transfer process must be identified at the end of this step.
- Alliance must schedule at least 1 specific online or face-to-face meeting at this scope and must provide proof of evidence (minutes).
- Identify 9 new potential applications (some in the short- term and some in the mid/long-term).
- At least 3 New Applications should be achievable in the short-term (within Project timeframe).

- Fill the “Roadmap for Technology & Innovation Transfer” (Table 2) for each of the 9 New Potential Applications.
- Upload the “Roadmap for Technology & Innovation Transfer” on BSCW.
- Keep track of results! (that will be included in D.T2.1.5)

In order to accomplish the above-mentioned objectives, it is highly recommended to **leverage on the CARE4TECH Available Tools, in particular Slack and Trello**. More in details, it is highly recommended to use the tools for:

- Organise the next Alliance online meetings, that can be organized using Slack channel, leveraging on the polling function.
- Start discussions on what the possible Transfer Applications could be for each Alliance. The discussion can be initiated using Slack, for instance through the channel chat functionality. Emerging ideas can be then uploaded in Trello, as well as the New Potential Applications that will be developed within the project timeframe.

**REFERENCES**

<sup>1</sup>R. Phaal, C.J.P. Farrukh, D.R. Probert, Technology roadmapping — a planning framework for evolution and revolution, Technol. Forecast. Soc. Chang. 71 (2004) 5–26.

<sup>2</sup>Knowledge Transfer, University of Cambridge, May 2009