

Online knowledge database

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1 EXECUTIVE SUMMARY

The online Knowledge Database (KD), <http://science2society.eu/main-knowledge-database>, part of the Science2Society web portal, is a public accessible and easy to use database that contains all the knowhow gathered by the WP1 activities; existing knowledge, methods and tools of state-of-the-art and emerging approaches of cooperation between universities, industry and research organisations in the field of open innovation and science 2.0.

The knowledge database and its content will foster the success of the S2S project and the fulfilment of its objectives, since it will be used by the different stakeholders (universities, industry and research organisations, society) as a methodological toolbox and practical guidelines for cooperation, identification and analysis of innovation models.

An initial version of the database was implemented and published at the end of February 2017 by ATOS. Further features will be incorporated during the second year, such as standard input forms for other cooperation projects/initiatives to be added in the KD as well as possibility of moderation of such forms before publishing.

From a technical point of view, the public website has been developed using Drupal 7 which is an open source Content Management System (CMS) addressed to easily manage websites, edit contents, upload images, documents, etc. via a browser-based interface. It follows the graphical identity of the project defined in deliverable D4.3.

This is an accompanying report of the deliverable *D1.1 online KD*, whose nature is “*Websites, Patents filling, etc.*” and planned within work package WP1 entitled “Collection and analysis of models, programs and tools”. The main objective of this work-package is to collect the existing knowledge, methods, tools and approaches of cooperation between university, industry and research organizations in the field of open innovation and science 2.0 and publish it in an easy to use online database. Moreover, WP1’s outcome will serve for the modelling, analysis and enhancement of the seven innovation schemes of the Science2Society CSA project.

This document is divided into 4 chapters:

Section 2 details the objectives of the S2S online KD;

Section 3 provides the technical design of the KD;

Information about the KD interface is provided in section 4;

Finally, the Conclusion section presents the main outcomes of the document and future planning.

2 OBJECTIVES

In line with the objectives of WP1, a public online database was developed by ATOS, based on the visual identity of the Science2Society project and the design by SD.

The online database provides a unique, interlinked collection of Open Innovation and Science 2.0 schemes, approaches, tools and experiences. This enables stakeholders from universities, industries, RTOs and society to not only get access to an information source which can be browsed through but also to answer specific questions and address real problems in the field of Open Innovation.

The online database bundles practically relevant, scientifically reviewed knowledge, and thus shall function as a drop-in centre in the field of Open Innovation and Science 2.0.

3 KNOWLEDGE DATABASE TECHNICAL DESIGN

The KD is composed of four main datasets:

- Clusters (schemes, pilots)
- Approaches
- Tools
- Experiences

The relation between the three datasets is:

- One cluster may have many approaches.
- One approach may belong to many clusters.
- One approach may have many tools.
- One tool may belong to many approaches.
- One cluster may have many experiences.
- One experience may belong to many clusters.

The image below shows a graphic presentation of the database structure:

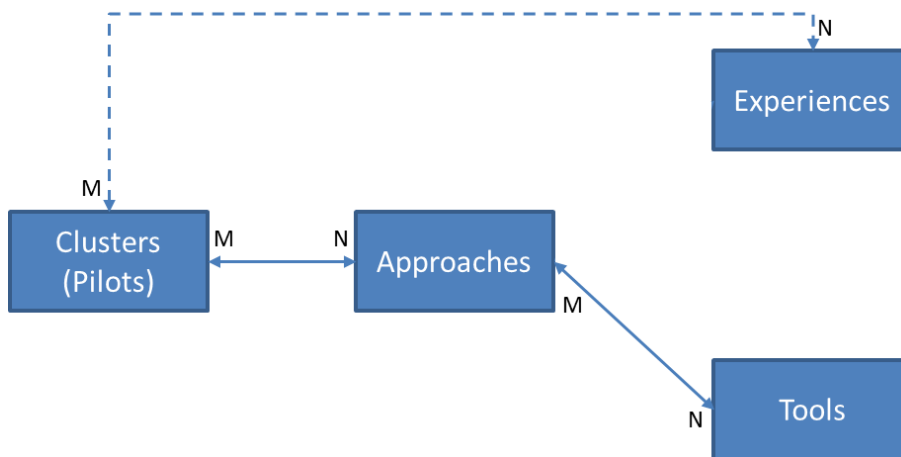


Figure 1: KD Database structure

3.1 Database

The description of the database is presented as a classical relational database.

CLUSTERS TABLE

CONTENT	DATA TYPE
Name	Text
Subtitle	Text
Description	Text
(Keywords if required)	Text
Relation with approaches	Related approaches
Relation with experiences	Related experiences

Table 1: Clusters table**APPROACHES**

Contents available in the approaches template:

CONTENT	DATA TYPE
Title	Text
Subtitle	Text
Keywords (up to 3)	Text
Stakeholders (many can be selected) <ul style="list-style-type: none"> • University • Large Company • SME • RTO • Consumer • Investor 	Text
Objective of approach	Text
Description	Text
USP	Text
Resources	Text
Success factors	Text
Barriers	Text
Contact information	Text
Relation with clusters	Related clusters
Relation with tools	Related tools

Table 2: Approaches table

Contents available in the tools template:

TOOLS

CONTENT	DATA TYPE
Name	Text
Description	Text
Tool type (many can be selected) <ul style="list-style-type: none"> • Audio / video / web conferencing tools • Challenge announcement platform • Collaboration tools • Content Management • Innovation platforms 	Text

- Mock-up tools
- Newsletter
- Online surveys
- Project and task management tools
- Tools for financing and crowd funding
- Tools for live creativity
- Tools in the area of intellectual properties and in the art research
- Video tutorial software

Business Case (short)	Text
Business Case (extended)	Text
Web page	URL
Tool developer	Text
Tool provider	Text
Date of first version	DD/MM/YYYY
Date of last (actual) version	DD/MM/YYYY
Type of license	Text
Cost schema	Text
Bibliography	Text
Methodology	Text
Process description	Text
Domain	Text
<ul style="list-style-type: none"> • Universities • RTOs • Enterprises 	
Sector	Text
Block diagram or graphic description	Image file
Requirements to implement in an organization	Text
Technology & integration	Text
Relation with approaches	Related approaches
Partner providing information (hidden field)	Text

Table 3: Tools table

EXPERIENCIES

CONTENT	DATA TYPE
Title of the project	Text

Subtitle	Text
Brief general description of the case study and related context	Text
Map of actors <ul style="list-style-type: none"> • University • RTO • Start-Up • SME • LE (Large Enterprise) • Other 	Text
Objectives and success factors	Text
Process of the collaboration in time, what are the main stages	Text
Analysis of the experience & Identification of bottlenecks	Text
Benchmarking and reference to other similar initiatives	Text
Conclusions and recommendations: Do's and don'ts	Text
Relation with clusters	Related clusters
Actors	Text

Table 4: Experiences table

4 KNOWLEDGE DATABASE INTERFACE

4.1 Navigation

The navigation of the KD is graphically depicted in the figure below.

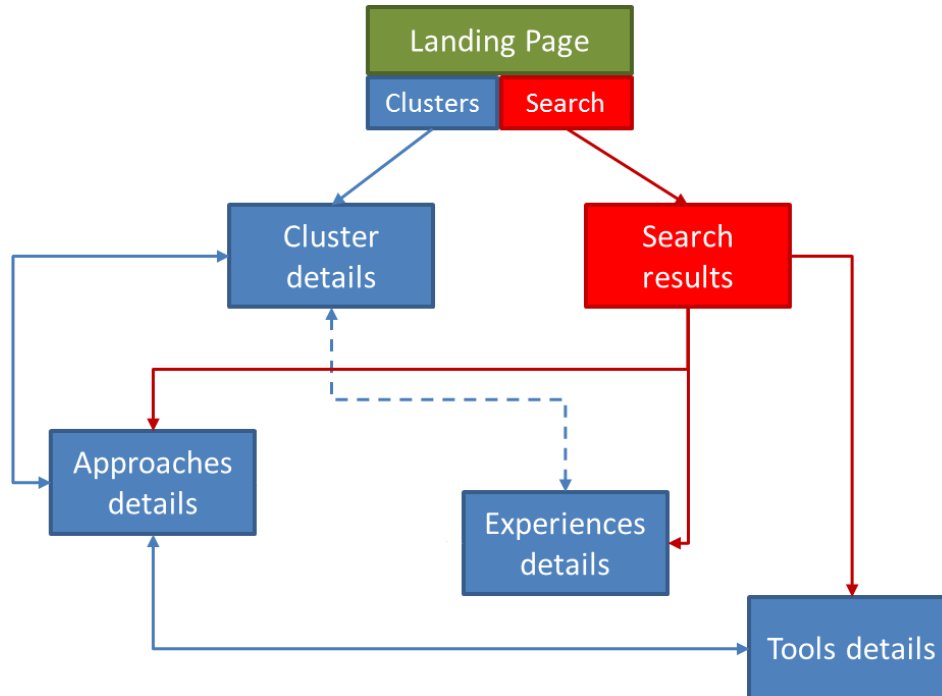


Figure 2: KD navigation flow

From the KD landing page there are two possibilities:

- Search for entries that fulfil the search criteria (search text and filters)
- Navigate from the cluster (pilots) entries that are presented

Search for entries:

Through the search, a series of entries corresponding to approaches, experiences and tools that fulfil the search criteria are presented. By clicking on each of the entries, it is possible to access directly the corresponding page with the description of the entry. From the details of each type of entry, it is possible to navigate to the linked entities (e.g., from cluster to approaches associated to that cluster, or to experiences, etc.) by following the navigation arrows shown in the picture above.

Navigate from clusters:

Instead of using the search, the exploration can be done from the links to the clusters listed in this landing page. So by clicking on a specific cluster, the details of that cluster are shown and the approaches linked to it, and from there it could be possible to navigate to the corresponding tools linked to that approach.

In both cases described above it is also possible to perform the navigation from cluster to experience and vice-versa.

The pages with the details of the different types of information (clusters, approaches, experiences and tools) have static links that will be possible to access even externally from the KD.

4.2 Landing page

The landing page of the Knowledge Database contains the seven clusters as well as the search text and filters. The content displayed by default is a layout with the clusters (pilots).

When a search is performed it only searches through approaches, experiences and tools, as the clusters are just an entry point for the other contents.

When a cluster is selected, the details of that cluster are displayed.

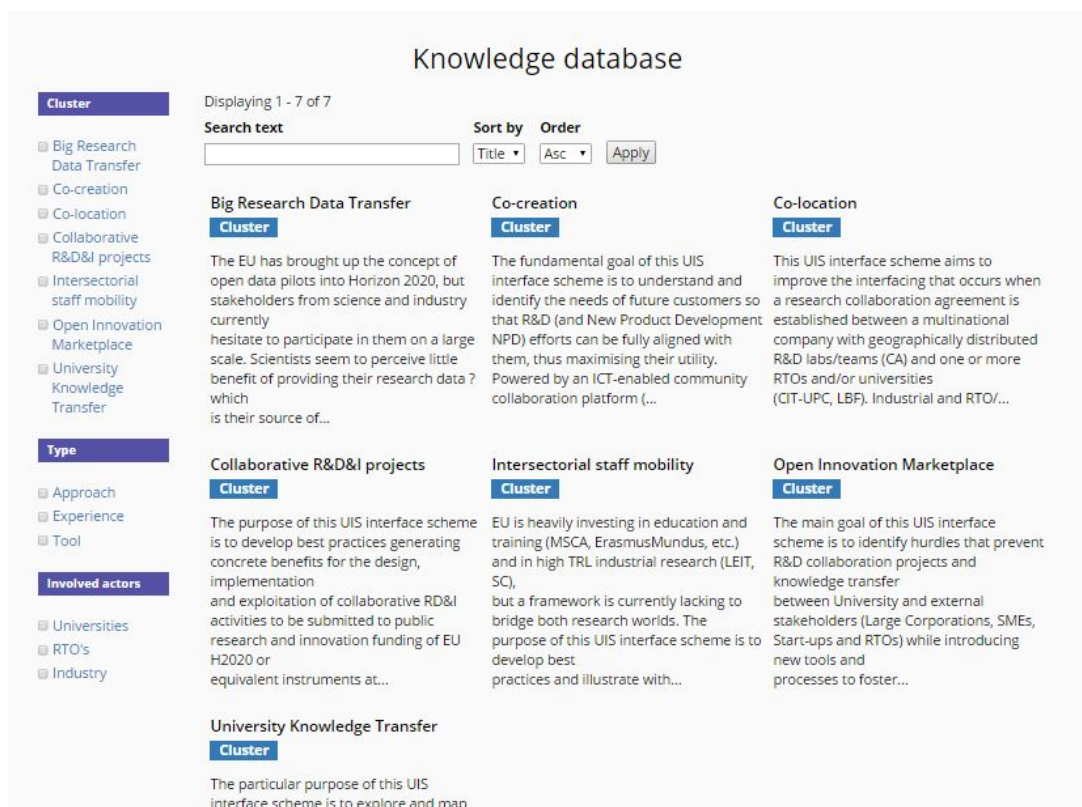


Figure 3: KD landing page

The search text is looked up in the following fields from the database items:

- CLUSTERS
 - Name
 - Subtitle
 - Description
 - Keywords
- APPROACHES
 - Title
 - Subtitle
 - Keywords
 - Objective of approach
 - Description
- TOOLS
 - Name
 - Description
 - Keywords
- EXPERIENCIES

- Title of the project
- Brief general description of the case study and related context

The filters on the left function according to the following criteria:

- Selecting specific items linked to clusters (pilots) chosen
- Selecting the type of entities (approaches; tools; experiences)
- Selecting the involved actors (Universities; RTOs; Industry) from:
 - Approaches: Stakeholders field
 - Tools: Domain field
 - Experiences: Map of actors

4.3 Results page (from search)

For each entry found that matches the search criteria display:

First line: Name of entity:

- APPROACHES: Title field
- TOOLS: Name field
- EXPERIENCIES: Title of the project field

Second line: The type of entity (approach; tool; experience)

Third line: The text from the description of the entity, with a maximum of 50 words.

- APPROACHES: Subtitle field
- TOOLS: Description field
- EXPERIENCIES: Brief general description field

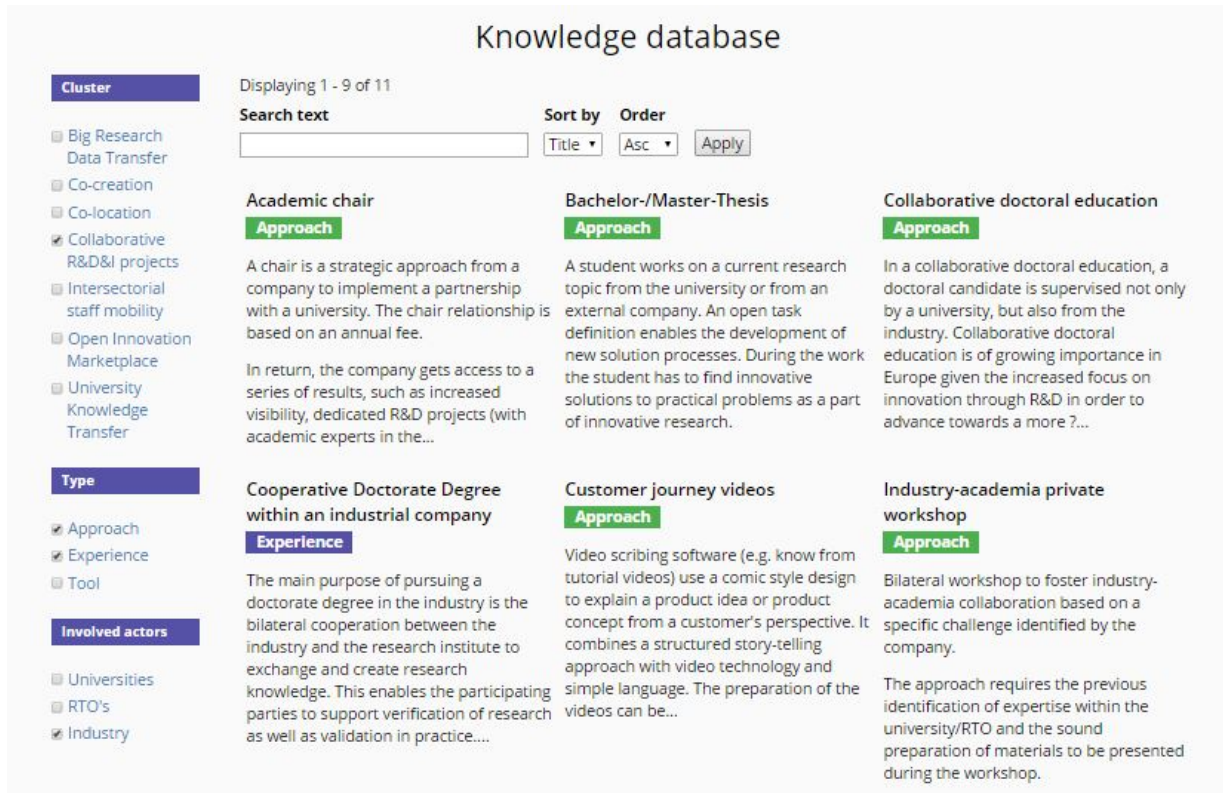


Figure 4: KD Search results

4.4 Cluster details

For each cluster, the following contents are displayed:

- First line: Name of cluster
- Second line: Type of data, in this case “cluster”
- Third line: The description of the cluster

After the contents, there is one section with the approaches linked to that cluster. Each entry redirects to the corresponding page that displays the contents for such approach.

The same applies for the experiences linked to the cluster.

Co-creation

Cluster

Subtitle:
Product development with future users in a virtual idea-laboratory

Description:
The fundamental goal of this UIS interface scheme is to understand and identify the needs of future customers so that R&D (and New Product Development NPD) efforts can be fully aligned with them, thus maximising their utility. Powered by an ICT-enabled community collaboration platform (provided by COG), the UIS interface scheme lets the civil (primarily young) society (students from TUD and KIT-IPEK in this case, and if possible also involving local school students) experience, contribute to, and learn about real product design processes, by engaging them in challenges, engineering competitions or ideation workshops led by industry. The aim is that companies (CRF) are able to both identify future latent needs of the users and discover new talent, while at the same time allowing universities (TUD and KIT-IPEK) to be aware of relevant applications with which they can align their research efforts, consequently increasing their exploitation potential. The whole ideation and co-creation process will be infused with Design Thinking principles to identify and optimize touch-points (by SD). This particular pilot will be centred in the theme of future mobility and transportation systems.

Content Navigation

Subtitle
Description

Related information

Approaches

- Crowd intelligence
- Customer journey videos
- Innovation Coaches
- Innovation platform
- Live online training
- Mockups in virtual teams
- Project surveys
- Software partnerships
- Students as product developers
- Virtual co-creation in product development
- Virtual creativity sessions
- Virtual feedback session

Experiences

- ProVIL - Product development in a Virtual Idea Laboratory (2016)
- New equipment to Collect Recycling Bins
- Nimble Bee: the co-

Figure 5: KD Cluster details

4.5 Approach details

For each approach, the contents are displayed like in the figure below.

On the right side of the screen, there are three sections with the clusters, experiences and tools linked to that approach. Each entry redirects to the corresponding page that displays the contents for such clusters, experiences or tools.

Innovation platform

Approach

Subtitle:
Using an innovation platform as social innovation hub in product development

Stakeholders:
University
Large Company

Objective of approach:

- Improve product development activities through better integration of internal and external stakeholders
- Include elements of open innovation into early stages of product development processes
- Enable the usage of crowd intelligence

Description:
The usage of innovation platform as the social innovation hub for product development projects enables companies to increase success of product development projects. Innovations platforms allow to include internal and external innovation impulses and to continuously improve their quality and maturity over time. A big role plays the so-called crowd (internal and external persons) which continuously evaluates existing ideas and give some feedback and remarks to improve project results.

USP:
Combining the strengths of a structured product development process with the strengths of open innovation approaches using an innovation platform.

Resources:

- Professional innovation platform
- Innovation Coaches

Success factors:

- Usability of the innovation platform
- Clearly distinguished phases of idea generation and valuation of ideas
- Integration of methods of product development on the innovation platform
- Using appropriate platform elements to allow for intrinsic and extrinsic motivation of the participants

Barriers:

Content Navigation

- Subtitle
- Stakeholders
- Objective of approach
- Description
- USP
- Resources
- Success factors
- Barriers
- Contact information

Related information

Clusters

- Co-creation
- Open Innovation
- Marketplace

Tools

- Atizo
- Chaordix
- HYPE GO!
- Hyve
- Idea Connection
- Ideas4All
- IdeaScale
- IDEENPORTAL
- Innocentive
- Innoget.com
- Innoversia
- Jive X
- Jovoto
- Nimble Bee
- NineSights
- Open Innovation
- Cloud Platform
- openideo

Figure 6: KD Approach details


4.6 Tool details

For each tool, the contents are displayed as shown in the figure below.

On the right side of the screen, there is a section with the approaches linked to that tool. Each entry redirects to the corresponding page with the contents for such approaches.

On the left side of the screen, a mockup of the tool is presented as well as some basic information of the tool is displayed. Clicking on the picture one can view it in a bigger size.

Atizo



Web page:
<https://www.atizo.com>

Tool developer:
HYPE Innovation

Tool provider:
Atizo GmbH, betrieben von HYPE Innovation GmbH

Date of first version:
2009

Date of last version:
not available

Type of license:
Software as a service

Cost schema:
Starting project, CHF 22.000

Tool

Description:
Crowd sourcing: idea Generation with the international atizo.com Community

Tool type:
Innovation platforms

Date of first version:
2009

Date of last version:
not available

Business Case (extended):
Companies post challenges and rewards. Innovators submit ideas. Companies assess the ideas and divide the reward. Atizo also has closed user groups which work collaboratively on challenges.

Methodology:
A Company posts a question on the Atizo Platform and is starting thereby a brainstorming project. Innovators registered at the platform (Artizo Community, 25.000 Innovators) post ideas, make comments and rate the ideas. The best ideas will be selected and awarded.

Process description:
Idea generation, collection and evaluation

Domain:
Enterprises

Sector:
Any

Requirements to implement in an organization:
Can be adopted to the customer needs

Technology & integration:
Web based platform

Content Navigation

- Description
- Tool type
- Date of first version
- Date of last version
- Business Case (extended)
- Methodology
- Process description
- Domain
- Sector
- Requirements to implement in an organization
- Technology & integration

Related information

Approaches

- Crowd intelligence
- Identify talent through solving industrial challenges
- Innovation Coaches
- Innovation platform
- Start-up & Innovation Day
- Trusted Global Open Innovation, Science and Technology Network
- Virtual co-creation in product development

Figure 7: KD Tool details

4.7 Experience details

For each experience entry the contents are displayed like in the below figure.

On the right side of the screen, there is a section with the clusters linked to that experience. Each entry redirects to the corresponding page that displays the contents for such cluster.

Dual-Desk PhD researchers

Experience

Subtitle:
An open innovation approach implemented between KU Leuven and Siemens Industry Software

Brief general description of the case study and related context:
To boost realization of Siemens Industry Software’s and KU Leuven’s complementary ambitions to advance, respectively, the industrial state-of-the-use and scientific state-of-the-art in mechanic and mechatronic system design and analysis, both organizations co-developed a concept they label ‘Dual Desk PhD’.

A steering team, composed out of the corporate RTD Director of Siemens and the head of the KU Leuven Noise and Vibration research group, discuss on a regular basis cross-fertilization opportunities between the industrial product and service roadmap and the academic research roadmap. After identifying such opportunities, it is investigated if it makes sense to recruit/host a co-supervised researcher to develop the opportunity towards PhD-level scientific innovation with an industrial valorization target. Once the research objectives are defined and funding is agreed, an appropriate candidate is selected from within either organization or recruited as new researcher. The process is strongly enabled by dedicated industry-university funding schemes such as VLAIO Baekeland (Flanders) and H2020 Marie Skłodowska Curie Industrial Doctorates, but can also take the form of a bilateral PhD programme.

The researcher has two desks, one at KU Leuven and one at Siemens and divides his/her time between both, hence benefitting from being submerged in an academically inspiring environment, while at the same time gaining experience on what it means to bring innovation into an industrial context. The researcher can fall back on the fundamental knowledge base of KU Leuven while he/she can at the same time be challenged by full-scale industrial application studies with end-users through the network of Siemens Industry Software.

Over the past years, several such Dual Desk PhD’s have successfully defended their degree and are now continuing their career at KU Leuven, Siemens and other organizations worldwide. KU Leuven and Siemens Industry Software highly appreciate the scheme and are continuously updating and further improving it learning from do’s and don’ts experienced, expanding lessons learned to and streamlining processes in legal, financial and doctoral school administrations.

Map of actors:
[LE \(Large Enterprise\)](#)

Objectives and success factors:
Success factors driving the growing interest of both KU Leuven and Siemens Industry Software in the Dual Desk PhD scheme are a clear win-win leverage between scientific research advancement and industrial product and process innovation. The combination of academic research being pushed and inspired by industrial problem statements and industrial products and processes being fed with unique and truly revolutionary technologies yields extremely interesting and attractive PhD projects. Key requirement here is the open mindset and attitude of the members of the steering group, respecting each other’s organization DNA and KPI’s. The fact that logistically and culturally the barriers between both organizations are rather low, also contributes to the success of the scheme.

Content Navigation

- Subtitle
- Brief general description of the case study and related context
- Map of actors
- Objectives and success factors
- Process of the collaboration in time, what are the main stages
- Analysis of the experience & identification of bottlenecks
- Actors

Related information

Cluster

- Intersectorial staff mobility

Figure 8: KD Experience details

5 CONCLUSIONS AND OUTLOOK

The Science2Society online KD was built based on the compiled and organised knowledge derived by the activities performed in WP1. The KD follows a simple, clear and easy look and feel following the graphic identity of the project. It is publicly available on the Science2Society website, which ensures that it can be used by all relevant stakeholders at any time.

The content of the online KD reflects highly relevant Open Innovation and Science 2.0 approaches, tools and experiences. Some of them were derived from best practices in SMEs, universities and RTOs. Others were identified within Open Innovation and Science 2.0 literature. All elements are described in a standardized manner to make them understandable and usable for Open Innovation and Science 2.0 practitioners.

In order to allow practitioners from different fields to identify relevant information efficiently, approaches, tools and experiences are interlinked. This also enables stakeholders being interested in Open Innovation or Science 2.0 to browse through the KD without specific focus.

The KD is designed in a way that can provide high value to internal and external stakeholders. As such it is closely connected to all seven Open Innovation pilot projects which are run and evaluated within Science2Society and functions as one of their main sources for Open Innovation and Science 2.0 knowledge.

During the second project year, further functions will be provided within the KD, focussing the following aspects:

- Possibility to add Open Innovation and Science 2.0 approaches, tools and experiences to the KD for internal and external stakeholders with an online form.
- Moderation and peer review functionality of new content including voting and comment functions.

6 REFERENCES

- [1] Deliverable D4.3 Project Visual Identity (S2S_D4.3_Project_Visual_Identity_Final.docx)
- [2] Description of Work of the Science2Society project (Grant Agreement-693651-Science2Society.pdf)

A. ABBREVIATIONS AND DEFINITIONS

Term	Definition
ATOS	Atos Spain
KD	Knowledge Database
SD	Spirit Design
S2S	Science2Society
T	Task
WP	Work package