Digital innovation HUBs and CollAborative Platform for cyber-physical systems

HUBCAP

Survey on Initial HUBCAP Industry Experience

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0.2	04-09-2020	ENGIT	Integrated KPIs list
0.3	01-10-2020	UNP	Added Survey template
0.4	07-10-2020	BEIA	Added BEIA's answers to survey
0.5	15-10-2020	VAL	Added VAL's answers to survey
0.6	19-10-2020	TTS	Added TTS's answers to survey
0.7	19-10-2020	VSI	Added VSI's answers to survey
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1.1	30-10-2020	VV	Internal review
1.2	13-11-2020	FBK	Internal review
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1.4	24-11-2020	UNO	Final version (without sandbox specific KPI's)
1.5	22-12-2020	VV	Added sandbox specific KPI's

Abstract

This document presents the survey given to the Seed SME to provide feedback on the HUBCAP platform. The survey was created to understand the initial experience of the SMEs regarding the HUBCAP platform and receive feedback on it. It contains information about the questions that constitutes the survey, and an analysis of the responses received. It also takes into account the feedback given on some of the responses in order to make a first assessment of the platform. A set of KPIs were also created to evaluate the platform, and the current (m12) assessment of those KPIs. This document provides feedback to further improve the HUBCAP platform.

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Terms and Abbreviations

Abbreviation	Term
VM	Virtual Machine
HUBCAP	HUBs and CollAborative Platform
SME	Small and Medium-sized Enterprise
KPI	Key Performance Indicator
DIH	Digital Innovation Hub
CPS	Cyber-Physical Systems
FMU	Functional Mock-up Unit

1 Introduction

1.1 Objectives

This deliverable is the first outcome of Task 3.7 with the objective, as described in the DoA: "Continuous Evaluation and Feedback. Beside the trial-experiments the consortium seed SMEs are continuously evaluating existing and new versions of the collaboration platform provided features and services before they are officially released to the general public. Several workshops are executed according to platform features and feedback is provided in form of dedicated evaluation reports."

The survey was created to understand the initial experience of the SMEs regarding the HUBCAP platform and receive feedback on it. This document provides an overview of the survey presented to first participants trying out the platform, and an analysis to the responses given. It also takes into account the feedback given on some of the responses in order to make a first assessment of the platform. On top of that, a list of KPIs was created, along with the current status of the KPIs at m12 and are made available in section 4 of this document.

A new deliverable on M30 will update the information presented in this deliverable.

1.2 Relation with the other tasks

In order to achieve the previously stated objective, close interaction with the other tasks of WP3, the seed SME experiments, was needed. The Seed SMEs are the ones answering the survey. An overview of experiments is given here:

- *Task T3.1 (TTS): PULL-Trial: Manufacturing Digital Twin*
- *Task T3.2 (CLP): PULL-Trial: 3D Animation FMU*
- *Task T3.3 (BEIA): PULL-Trial: Smart Building Energy Efficiency*
- *Task T3.4 (VSI): PULL-Trial: Model-Based Testing*
- *Task T3.5 (VAL): PULL & EXPERIMENT-Trial: Tool Qualification*
- *Task T3.6 (TTS/VV): EXPERIMENT-Trial: Function-Oriented Manufacturing*

Along with this document, deliverable D3.1 - Initial SME HUBCAP Experiments Report, will also be submitted as a companion report, describing the work done on the tasks associated with WP3, explaining in detail the work carried out in the implementation and deployment of the Seed SMEs experiments. There is also a connection to WP5 as it is the one dedicated to the HUBCAP Platform and interactions with it were made in order to deploy the survey directly in the platform, and to validate the list of KPIs and their availability to be automatically evaluated within the HUBCAP Platform.

2   HUBCAP Industry Experience Survey

2.1 Purpose and Target

As mentioned before, the survey was set up in order to understand the initial experience of the SMEs regarding the usage HUBCAP platform. It was intended to understand if the interface is adequate, it's ease of use, and any difficulties the users may have had when setting up his sandbox and also to receive, in form of written responses, any constructive criticism and suggestions the respondents might have.

2.2 Survey description

The HUBCAP survey was divided in five different sections:
- the first section being the Identification, containing questions about the identification of the respondent, including Name, Email and Organization.
- The second section relates to the Platform Overview, and the respondent were asked about the overall appearance of the HUBCAP platform, if they feel the layout is well arranged, is easy to navigate and the content and information provided is clear and understandable.
- In the third section the respondent is asked questions related to the Company profile and tools description functionalities. Specifically, if the company profile was easy to create, the requested information from HUBCAP was appropriated, and if not to describe which weren't. It is also asked how many tools associated to the company were created and if it was easy to provide the tools descriptions within the platform. To finalize the section the respondent was inquired if he finds the information provided upon creating both company and tool description are sufficient for the intended audience.
- In section four the questions are related to the third-party access to the technologies. It is inquired if the respondent provided any Sandbox or VM environment for the tool created, if there is any limitations as consequence of it being in the HUBCAP platform and how easy it was to set it up. It is also asked how easy it was to create a Sandbox/VM, how it performs within the HUBCAP platform and how easy is it to access and use the tool.
- The last section focuses on the expectations regarding the HUBCAP platform and the impact expected from it in regard to the respondent SME.

2.3 Survey implementation and dissemination

The survey was created in Microsoft Forms Pro and it has been integrated in the platform (by ENGIT). Upon completing all the necessary information and creating a sandbox with the installed tool, the survey was displayed so the users could respond to it with their immediate experience.

Figure 1 - HUBCAP Survey first section

3　Survey Results

3.1 Results Statistics

This section of the Deliverable shows the distribution of the responses to the different questions of the survey. In total there were 5 respondents completely filling the survey, with all questions being answered. This represents 100% of the seed SME's from the previous mentioned tasks, see section 1.2 (note VV is considered as DIH not as SME).
The complete answers to the survey can be found in Annex A – Survey Reports.

3.1.1　Platform Overview

What did you think of the overall HUBCAP image?

| ■ 5 Stars | ■ 4 Stars | ■ 3 Stars | ■ 2 Star | ■ 1 Star |
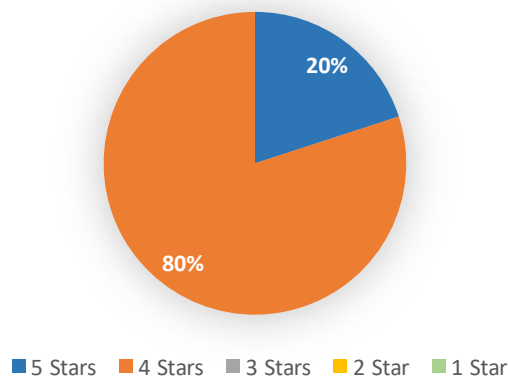
Figure 2 - Distribution of responses to the "What did you think of the overall HUBCAP image?" question.

In this question the responses could be one on a range from 1 to 5 starts. The most common was 4 starts meaning it has an overall positive feedback with a little rage for improvement.

Is the platform layout well-arranged?

20%

80%

■ 5 Stars ■ 4 Stars ■ 3 Stars ■ 2 Star ■ 1 Star
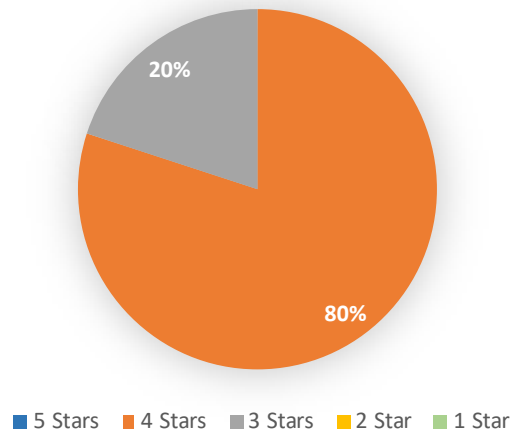
Figure 3 - Distribution of responses to the "Is the platform layout well-arranged?" question.

Like in the previous question, the responses could range from 1 to 5 stars. The most common was 4 accompanied by a 3 star response, which means even having overall positive feedback we can consider it has a lower rating, meaning it has more room for improvement.

Is it easy to navigate in the platform?

20%

40%

40%

■ 10 ■ 9 ■ 8 ■ 7 ■ 6 ■ 5 ■ 4 ■ 3 ■ 2 ■ 1 ■ 0
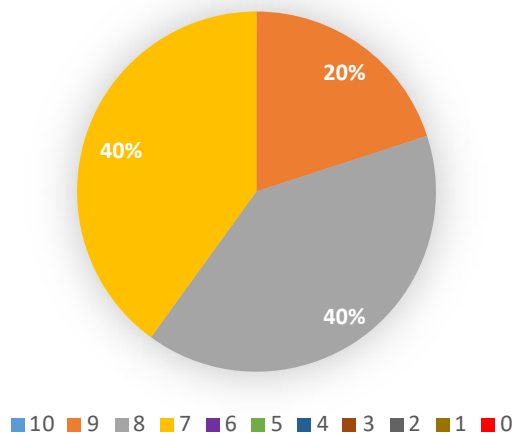
Figure 4 - Distribution of responses to the "Is it easy to navigate in the platform?" question.

This question's responses could range from 0 to 10, 0 being "Not easy at all" and 10 "Extremely easy". The most common response is equally 7 and 8. It has a fairly good sentiment overall, with room for some improvements.

Are the terms/words and content understandable?

■10 ■9 ■8 ■7 ■6 ■5 ■4 ■3 ■2 ■1 ■0
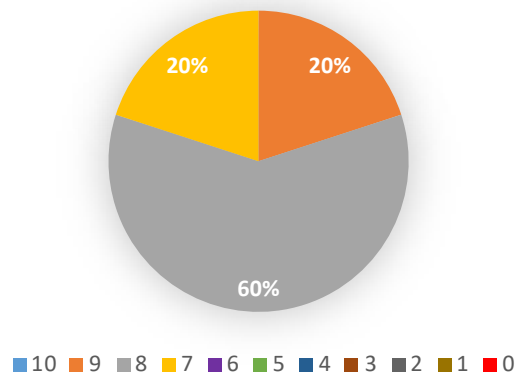
Figure 5 - Distribution of responses to the "Are the terms/words and content understandable?" question.

Again, the question answers could range from 0 to 10, 0 being the lowest rating and 10 the highest. As we can see the most common answers is 8.

Some feedback to this previous two question can be read on the next section and as a more deeply review on the full responses present in the Annex A – Survey Reports.

3.1.2   Company profile and tools description

How easy was it, to create the company profile in the HUBCAP platform?

■10 ■9 ■8 ■7 ■6 ■5 ■4 ■3 ■2 ■1 ■0
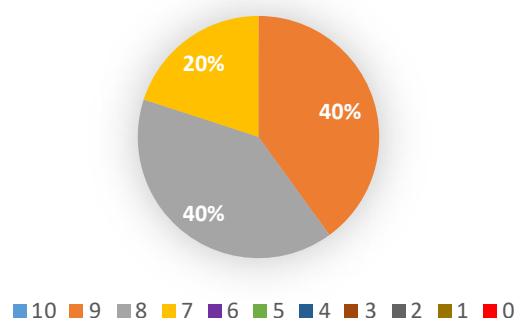
Figure 6 - Distribution of responses to the "How easy was it, to create the company profile in the HUBCAP platform?" question.

The response to the question could range from 0 to 10. Overall, the sentiment is very positive, meaning the respondents did not have any major problem in this section of the interaction with the platform.

To create the company profile, did you find the requested information appropriate?
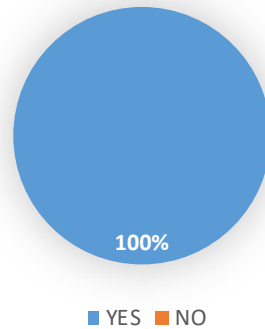
Figure 7 - Distribution of responses to the "To create the company profile, did you find the requested information appropriate?" question.

All the responses to the question were the same. No respondent found the requested information inappropriate when created the company profile.

Did you upload pictures? How do you rate this functionality?
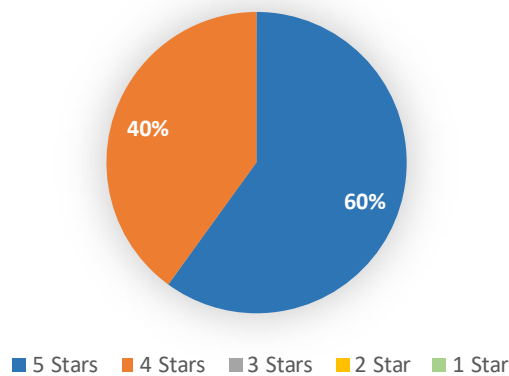
Figure 8 - Distribution of responses to the "Did you upload Picture? How do you rate this functionality?" question.

This question was not mandatory, meaning that if there was a response it means that they uploaded a picture. The options ranged from 1 star to 5 stars. Out of 4 responses, the most common evaluation is 5 starts, which translate to a very positive rating.

How many tools did you create, associated with your company ?

■ 1 ■ 2 ■ 3
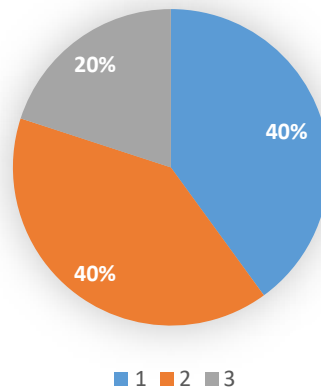
Figure 9 - Distribution of responses to the "How many tools did you create associated with your company?" question.

From the pie chart we can see, that out of 5 responses, one respondent created 3 tools while there were 2 respondents creating one and the remaining creating another 2 tools. Comment from WP3 leader: some seed SME's provided different versions of their tool (old/test versions have been deleted later from the repository)

How easy was it, to provide the tools descriptons within the platform?

■10 ■9 ■8 ■7 ■6 ■5 ■4 ■3 ■2 ■1 ■0
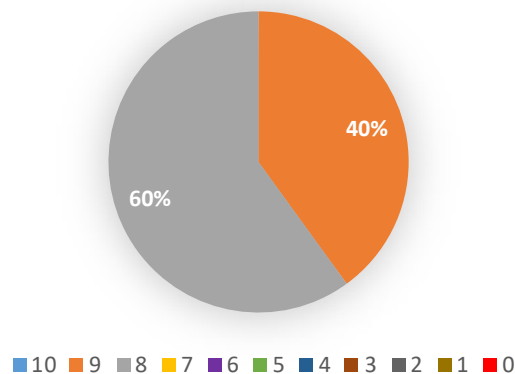
Figure 10 - Distribution of responses to the "How easy was it, to provide tools description within the platform?" question.

From 0 to 10, 10 being extremely easy, we can see from the answers that it was pretty easy to provide the tools description.

Did you find the requested information appropriate, for the tool description ?
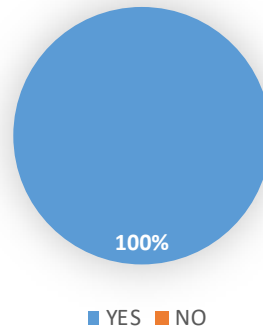
Figure 11 - Distribution of responses to the "Did you find requested information appropriate, for the tool description?" question.

Again, all the respondents found the requested information for this section appropriate.

3.1.3   3rd party access to technologies

Did you provide any sandbox or VM environment for your tool?
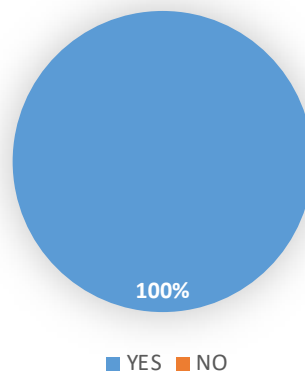
Figure 12 - Distribution of responses to the "Did you provide any sandbox or VM environment for your tool?" question.

From the survey, we know that all the respondents provided a sandbox or VM environment for their tool.

Does the sandbox/VM environment limit any feature of your tool?

■ YES ■ NO
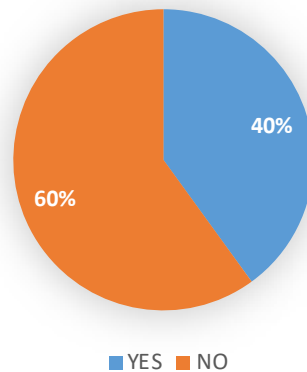
Figure 13 - Distribution of responses to the "Does the sandbox/VM environment limit any feature of your tool?" question.

From the answers it is possible see that only a minor of the tools created had limited features (or performance) as a consequence of it being executed in a sandbox/VM environment. More details to restrictions/limitation due to the virtual environment can be found in D3.1

How easy was it to setup your tool in the sandbox/VM?

■10 ■9 ■8 ■7 ■6 ■5 ■4 ■3 ■2 ■1 ■0
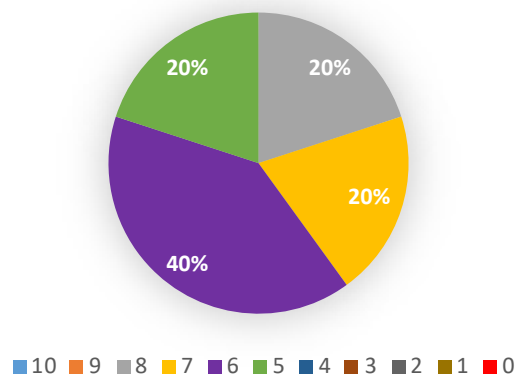
Figure 14 - Distribution of responses to the "How easy was it to setup your tool in the sandbox/VM?" question.

From 0 to 10, 0 being the lowest and 10 the highest, the respondents that created a Sandbox/VM within the platform have different sentiment on how easy is to setup them. Overall, it's an average to positive sentiment.

How easy was it to create a sandbox/VM within the HUBCAP Platform?
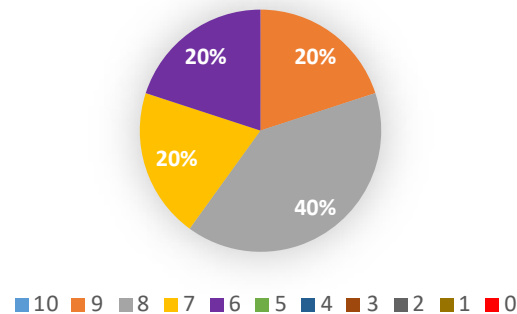
Figure 15 - Distribution of responses to the "How easy was it create a sandbox/VM within the Hubcap Platform?" question.

Again, on this question, the respondents tend to have different opinions. It is a fairly positive evaluation as seen in the distribution of responses.

The last two questions demonstrate that of the entire interaction with the HUBCAP platform, the hardest part for the respondents is the creation and setup of their tool in the Sandbox/VM. This section could be the focus of good amount of improvement in order to ease its use.

How easy is it, to access and use the tool provided in the sandbox/VM?
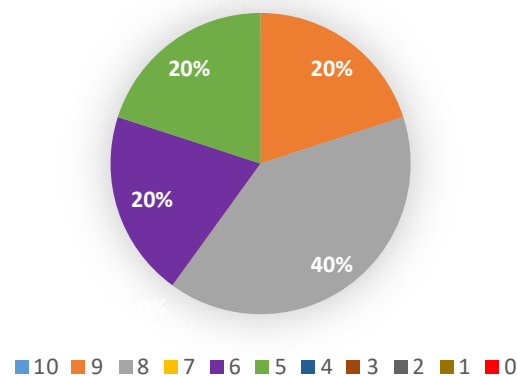
Figure 16 - Distribution of responses to the "How easy is it, to access and use the tool provided in the sandbox/VM?" question.

On this last question the responses also have a fairly positive sentiment with the respondents, choosing fairly different ratings.

3.2 Results analysis

By looking at the previous pie charts, an overall positive feedback from the respondents can be concluded.

Specifically, we can see that the user interface its appealing to the users and they had no major problem when interacting with it. We can see that the respondents had the most negative experience in the process of setting up their Sandbox/VM, but nonetheless its sill a fairly positive sentiment.

The users were also able to leave some written feedback, in which some of the suggestions were:

- *"search function should be improved"*,
- *"make the tool entry clickable. At the moment, neither the image, title nor white space is clickable"*
- *"not cut the description with "..." after three lines automatically but allow each tool at least one full sentence of description"*.

The full responses can be read on Annex A – Survey Reports, where the complete answers can be found.

By doing the survey on Microsoft Forms Pro we also have access to a satisfaction metrics functionality calculated based on the written responses. This functionality is automatically provided by Microsoft Forms, and we extracted its results and added to this report.

As an initial overview, the results indicate the satisfaction is fully positive. The next graphics represent the distribution of these metrics on the different questions.

What is your overall opinion of our platform?

100%

■ Positive   ■ Neutral   ■ Negative
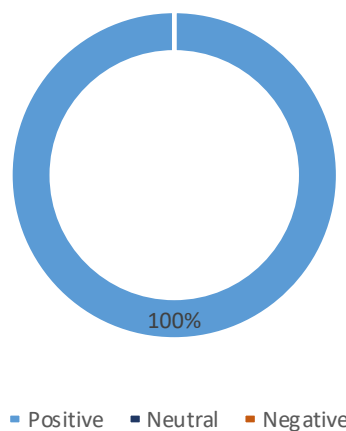
Figure 17 - Satisfaction metric of the question "What is your overall opinion of our platform?"

When you finalised the creation of both company and tool description, did you find the information sufficient for the intended audience?

100%

■ Positive ■ Neutral ■ Negative
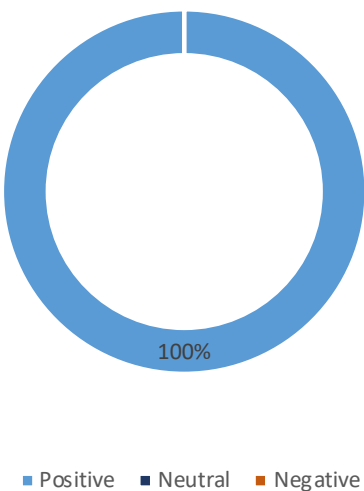
Figure 18 - Satisfaction metric of the question "When you finalized the creation of both company and tool description, did you find the information sufficient for the intended audience?"

As we can see the satisfaction metric calculated by Microsoft Forms Pro, to each question is fully positive. This denotes that the overall sentiment of the respondents towards the platform is very positive.

4   Key Performance Indicators (KPIs)

Several KPIs were defined to evaluate the quantity of content available in the platform. During the project, these same KPIs will be evaluated regularly.

4.1 Defined KPIs

Table 1 presents a set of categories (first column) that represent the individual sections of the HUBCAP platform which are intended to be evaluated. For each category, individual KPIs were defined (third column). However, it turned out that not all planned KPIs can be evaluated (due to missing information in the catalogues or technical issues). The last column indicates which of the KPIs are able to be automatically evaluated within the platform ("yes" in the column).

Table 1 – KPI's for Continuous evaluation of HUBCAP platform

	KPI No	KPI definition	Automatic extraction?
platform related KPI's (general features)	1.1	# of provided services (ECO System, catalouges, tools, sandbox,…)	Yes
	1.2	# users registered in the platform	Yes
SME related KPI (catalouge)	2.1	# of domains of application (Manufacturing, Automotive)	No
	2.2	# of SMES registeres in HUBCAP Platform	Yes
	2.3	# of SMES with technologies available in sandbox environment	No
tool releated KPI's (catalouge)	3.1	# of domains of application (Manufacturing, Automotive)	Yes
	3.2	# of physical Domains (Thermal, Electrical,….)	No
	3.3	# of employed model-based techniques	Yes
	3.4	# of tools available on platform (both download and sandbox)	Yes
	3.5	# of tools sandbox capable	No
	3.6	# of editing tools	Yes
	3.7	# of simulation tools	Yes
	3.8	# of analysis	Yes
	3.9	% of free tools	Yes
model related KPI's (catalouge)	4.1	# of domains of application (Manufacturing, Automotive)	No
	4.2	# of physical Domains (Thermal, Electrical,….)	Yes
	4.3	# of available models	Yes
	4.4	# of Model-Based Techniques	Yes
	4.5	# models in FMI format	No
Sandbox related KPI's (technical features)	5.1	# of Instantiated Sandboxes	Yes
	5.2	# of Models in the Sandbox Repository	Yes
	5.3	# of Instantiated Models	Yes
	5.4	# of Tools in the Sandbox Repository	Yes
	5.5	# of Instantiated Tools	Yes
	5.6	# of Owner Accesses to Tools	Yes
	5.7	# of Invited Guests	Yes

Finally, it has been decided to remove the KPI's which cannot be extracted automatically.

KPI description:
KPI 1.1 is based on the number of entries in the five categories of the platform: Innovation ecosystem, Business and Technology, Test before Invest (Models and Tools catalogue), Skills and Training and Collaborative Space
KPI 1.2: number of registered platform users (based on participants from SMEs, DIHs, …)

~~KPI 2.1: number of application domains which are covered by the SMEs (e.g.: Manufacturing, Automotive, …)~~
KPI 2.2: number of SMEs which are part of the HUBCAP platform
~~KPI 2.3: number of SMEs which are providing technology/assets (models, tools, …)~~
KPI 3.1: number of application domains which are covered by the tools in the catalogue (e.g.: Manufacturing, Automotive, …)
~~KPI 3.2: number of physical domains covered by the tools in the catalogue (e.g.: Thermal, Electrical …)~~
KPI 3.3: number of applied CPS technologies for simulation (e.g.: Discreet events simulation, Model-Based Testing, ...)
KPI 3.4: number of tools listed in the catalogue. Not all tools are necessarily available in sandbox (some may be downloadable)
~~KPI 3.5: number of tools which are available in the sandbox~~
KPI 3.6-3.8: number of tools for editing models, simulating models (e.g.: INTO-CPS), analysis models/tool chains, …
KPI 3.9: number of tools which are license free/open source
~~KPI 4.1: number of application domains which are covered by the models in the catalogue~~
KPI 4.2: number of physical domains which are covered by the models in the catalogue
KPI 4.3: number of models listed in the catalogue. Not all models are necessarily available in sandbox (some may be downloadable)
KPI 4.4: number of applied CPS-technologies for modelling (e.g.: component-based design, Differential Algebraic Equations, ...)
~~KPI 4.5: number of models compiled as FMU~~
KPI 5.1: number of instantiated toolboxes. Note, a toolbox can contain several VMs
KPI 5.2: current number of VMs in the model repository
KPI 5.3: number of instantiated VMs from the model repository
KPI 5.4: current number of VMs in the tool repository
KPI 5.5: number of instantiated VMs from the tool repository
KPI 5.6 and KPI 5.7: there are different roles of a sandbox user, KPI 5.6 gives the total number of accessing a VM by the owner/creator, KPI 5.7 is the total number of guests invited to a VM (for collaboration purposes)

4.2 KPI Status at month 12

The KPIs presented in the previous section are going to be evaluated on a regular basis throughout the entire project in order to track its evolution. Table 2 shows the evaluation of the KPI's from the start of the project until month 12.

Table 2 - KPI's for Continuous evaluation of HUBCAP platform with M12 results

	KPI No	KPI definition	MS2 (m12)
platform related KPI's (general features)	1.1	# of provided services (ECO System, catalouges, tools, sandbox,...)	46
	1.2	# users registered in the platform	38
SME related KPI (catalouge)	2.1	~~# of domains of application (Manufacturing, Automotive)~~	-
	2.2	# of SMES registeres in HUBCAP Platform	11
	2.3	~~# of SMES with technologies available in sandbox environment~~	-
tool releated KPI's (catalouge)	3.1	# of domains of application (Manufacturing, Automotive)	10
	3.2	~~# of physical Domains (Thermal, Electrical,....)~~	-
	3.3	# of employed model-based techniques	23
	3.4	# of tools available on platform (both download and sandbox)	15
	3.5	~~# of tools sandbox capable~~	-
	3.6	# of editing tools	5
	3.7	# of simulation tools	6
	3.8	# of analysis	10
	3.9	% of free tools	7
model related KPI's (catalouge)	4.1	~~# of domains of application (Manufacturing, Automotive)~~	-
	4.2	# of physical Domains (Thermal, Electrical,....)	-
	4.3	# of available models	20
	4.4	# of Model-Based Techniques	12
	4.5	~~# models in FMI format~~	
Sandbox related KPI's (technical features)	5.1	# of Instantiated Sandboxes	108
	5.2	# of Models in the Sandbox Repository	8
	5.3	# of Instantiated Models	6
	5.4	# of Tools in the Sandbox Repository	25
	5.5	# of Instantiated Tools	127
	5.6	# of Owner Accesses to Tools	338
	5.7	# of Invited Guests	6

The KPI's values are expected as the results come mostly from the WP3 SMEs and WP6 participants. Items related to ENGIT user have been excluded for the sandbox specific KPIs (5.1-5.7), since they were used for sandbox testing/development only.

As the project proceeds these values will rise in consequence of the open call participation. In the upcoming deliverable D3.3, the presented KPI's values are going to be updated based on future evaluation.

The KPIs 5.1, 5.3, 5.5 and 5,6 are based on the summation during a time frame (July 2020-December 2020) while the others are the current values at month 12.

The values of KPI 3.4 and KPI 5.4 differ since the listed tools in the catalogue do not necessarily match with the VMs in the tool repository. Moreover, a tool provider can save several VMs with different versions of his tools or install the same tool in VMs with different operating systems (e.g.: TTS installed the DDD-Simulator in a VM with Linux as OS and in another VM with Windows as OS, both VMs have been added to the tools repository). The same is valid for values of KPI 4.3 and KPI 5.2 (in that case not all models from the catalogue are provided in the model repository until month 12).

5   Added Value of Using the HUBCAP Platform

The overall user experience and feedback in terms of the user interface is very positive. The users found the layout pleasing. Quoting some responses:

- *"I believe that good principles have been abode by in the design of the platform, enabling users to easily navigate the portal and find the information that they are looking for. I also appreciate the simplicity of design, i.e. not cramming too much information on pages, using large icons, simple backgrounds, a tailored search facility, etc., which all contribute to improving the user experience."*
- *"The platform is well organized and offers a lot of functions. "*

Some minor improvements were made as a suggestion:
"One minor tip; Please make the tool entry clickable under Tools. At the moment, neither the image, title nor white space is clickable. Only the text inside the tool entry is clickable (…)",
"Search function should be improved".
Also, some improvements to information showed: "The term Sandbox might not mean much to some users. The important point here is perhaps to emphasise the ease-of-use of the sand-box environment, having a personalised and ready-to-play setup."
In terms of creating company profiles and tools descriptions the respondents feel that the platform matches the expectations towards end users and no issues were raised, only one suggestion was made which is: "add rating to the tools".
The respondents were able to create the sandbox/VM of their tools, but analysing the responses it is notable that this is not an easy process and should be the main focus of improvements in the future.

In the end HUBCAP raises awareness of the model-based design services that companies can provide improving their visibility. The expectation is that, quoting a response, the "tools image considerably lowers the entry bar for new users of the (…) tools, removing all hurdles in terms of installation and profiting from the (…) functionality to target a larger class of application scenarios". It is expected the users of the HUBCAP platform try different available tools, being "a big leap forward and would reduce the costs for users to qualify their toolchain for heterogenous environments".
The seed SMEs expect an improved possibility for future collaboration, innovation and novel application scenarios of model-based testing. In the end, all expectations converge on an increase of the SMEs business volume.

Annex A – Survey Reports

This section contains the answers of the five respondents to the survey (anonymized by response to survey #1 - #5)

Response to survey #1:

Platform overview

What did you think of the overall HUBCAP image?

★ ★ ★ ★ ☆

Is the platform layout well-arranged?

★ ★ ★ ★ ☆

Is it easy to navigate in the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Are the terms/words and content understandable?

0	1	2	3	4	5	6	7	8	9	10

Not at all   Extremely understandable

What is your overall opinion of our platform?
Can you share with us your feedback so that we can improve our platform?

Design looks good. One minor tip; Please make the tool entry clickable under Tools. At the moment, neither the image, title nor white space is clickable. Only the text inside the tool entry is clickable which is a bit annoying.

Company profile and tools description

How easy was it, to create the company profile in the HUBCAP platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

To create the company profile, did you find the requested information appropriate?

◉ Yes

◯ No

Did you upload pictures? How do you rate this functionality?

★ ★ ★ ★ ★

How many tools did you create, associated with your company?

We have added two tools to the platform, the Unity FMU package and the software 20-sim.

How easy was it, to provide the tools descriptions within the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all　　　　　　　　　　　　　　　　　　　Extremely easy

Did you find the requested information appropriate, for the tool description?

◉ Yes

◯ No

When you finalised the creation of both company and tool description, did you find the information sufficient for the intended audience?

Yes

3rd party access to the technologies

Did you provide any sandbox or VM environment for your tool?

◉ Yes

◯ No

Does the sandbox/VM environment limit any feature of your tool?

◉ Yes

◯ No

How easy was it to setup your tool in the sandbox/VM?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

How is the performance of your tool in the sandbox/VM environment?

Performance is as expected. Despite the limitation of the GPU power does the tool run smoothly.

How easy was it to create a sandbox/VM within the HUBCAP Platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

How easy is it, to access and use the tool provided in the sandbox/VM?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Expectations from HUBCAP

What are your expectations regarding HUBCAP?

We expect many people will try different tools, including ours. I would expect that end-users are able to run experiments in the sandbox without any performance limitations. It was very focused on running the tools on LINUX system at the start of this project. However, most commercial software actually run on the Windows OS. So therefore, I hope that the performance of the Windows OS will be sufficient to run the required tools of the end-user.

What kind of impact are you expecting from HUBCAP on your SME?

We hope for some impact on our delivered tools, but they are very specific to the needs of the end-user.

Response to survey #2

Platform overview

What did you think of the overall HUBCAP image?

★ ★ ★ ★ ★

Is the platform layout well-arranged?

★ ★ ★ ★ ☆

Is it easy to navigate in the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Are the terms/words and content understandable?

0	1	2	3	4	5	6	7	8	9	10

Not at all   Extremely understandable
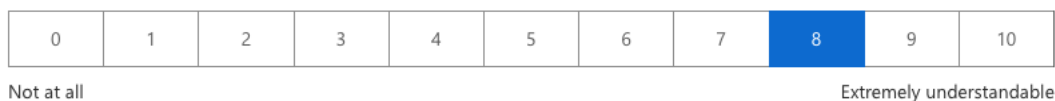
What is your overall opinion of our platform?
Can you share with us your feedback so that we can improve our platform?

All in all, the platform looks clean and intuitive to use and navigate. Fundamentally, I believe that good principles have been abode by in the design of the platform, enabling users to easily navigate the portal and find the information that they are looking for. I also appreciate the simplicity of design, i.e. not cramming too much information on pages, using large icons, simple backgrounds, a tailored search facility, etc., which all contribute to improving the user experience.

I understand that a limited amount of content is in place at this stage of development. A few issues I noticed are summarised below. In reporting them, I may play Devil's advocate, trying to put myself into the position of a new user who may know little or nothing about HUBCAP itself, and who might have stumbled across the portal by recommendation or chance.

1. *Home* Area: Good here to emphasis the "TEST BEFORE INVEST" motto. However, should there not be at least a short summary of background information on HUBCAP and its mission? Inside the blue banner: Would all readers know what "CPS" here stands for? Perhaps that could be explained in a short preceding paragraph. I wonder if "running CPS simulations" might not unintentionally convey a narrow focus, since the tools address such a wide spectrum of activities and tasks, while (co)simulations in some cases may be merely a vehicle to facilitate some model-based approach or technology. Overall, what I am missing here is a pointer to MBD / MBE. E.g. do we take for granted here that visitors know we are addressing Model-Based Engineering techniques, thus the model catalogue?

2. *Home* Area: In connection to (1), I wonder if we could get the premise of HUBCAP along with a single, carefully crafted image or diagram that contains a model, tool, HUBCAP sandbox, business case, etc. E.g. to convey the benefit of HUBCAP to users in a visual manner.

3. *Home* Area: The term SANDBOX might not mean much to some users. The important point here is perhaps to emphasise the ease-of-use of the sand-box environment, having a personalised and ready-to-play setup.

4. *Home* Area: The way that information is presented looks just a little bit blunt to me. Perhaps above the five tiles for the various areas of the site, one could add a paragraph or banner along the lines of "The HUBCAP network provides the following key services.". All tile headings are also provided by menus in the left-hand area, which is fine, but one small inconsistency I spotted is that "Support to find investment" seems to be called "Funding Opportunities" in the tile view. Perhaps those headings could be unified throughout.

5. *Send Report* button on the right-hand edge: The forms appears to be in Italian. I presume this is for internal use only?

6. *Catalogues*: Again, I would add a small paragraph under the *TOOLS* banner to explain that this section contains various tools that can be tried within the sandbox of HUBCAP, similar for models. For the user, it ought to be a priori clear which model can be used with what tool. Overall, using a large tile icon for each of the company and tool seems a neat design, I would champion that. I would, perhaps, not cut the description with "..." after three lines automatically but allow each tool at least one full sentence of description, without requiring the user to click on the tile to find out more.

7. *Catalogues*: One issue with the Catalogues is that perhaps readers will not be familiar with (a) some of the abbreviations and (b) some of the terminology used i.e. within the descriptions of the tools and models. Not to single out a particular provides, here is a random example: "Valid as Toolchain Analyzer is a model-based Validation and Testautomation Suite that enables to model a FMEA analysis and derive a test strategy from it." Would we expect the visitor to know what FMEA stands for? If so, that might narrow down the target audience. A possible solution is to embed tooltips for *all* used acronyms, even if they seem obvious. Secondly, to provide additional information via pop-up tooltips within the synopsis and various other sections.

8. *Skills and training*: For "Papers", the website provides a folder-like icon, whereas for "Training Material" some kind of list view. Minor point, but is that intended so?

9. *Funding Opportunities*: My browser (Firefox 78.2.0 ESR (64-bit)) seems to have some trouble displaying this page. I.e. I see a link that is partly covered by the right frame a "noose" what, if clicked, reveals some content. Perhaps check that this page works with the aforementioned browser.

10. *Collaboration Space*: It is perhaps too soon to see how these features are used in action, but for one I presume that some functionality to select or filter blogs may be useful, assuming there will significantly more content available and posted.

11. With the lack of content, the distinction between *Collaboration Space* and *Innovation Space* items seems not always very crisp and clear to me. E.g., "Multi Poll" not an issue for collaboration alike? What shall be summarised under those items is perhaps still subject to on-going design.

12. A few typos that I spotted on the site:

- Full-stop missing in the descriptive text of all five tiles of the *Home* area.

- "Fundings Opportunities" -> "Funding Opportunities" (Home)

- "Papers and Pubblications" -> "Papers and Publications" (Home)

- "OPENNESS EVENTS MATCHMAKING" sounds a little odd as a title. In the menu items under "Innovation ecosystem and networking", perhaps "Events Matchmaking" could just read "Matchmaking" - just a suggestion.

- In the *Innovation Space* menu, "Weigh up Decision" sounds a little strange as a menu item, too. What decision? Perhaps "Weighing up Decisions" or "Decision Support"?

Miscellaneous:

- Capitalisation perhaps ought be unified for the various headings and (sub)menu items. I.e. "Innovation ecosystem and networking" vs "Collaboration Space".

- There are a few icons at the bottom left of the website for chatting. From a usability point of view, they are perhaps easy to miss, since there is no explanation what they are for.

Company profile and tools description

How easy was it, to create the company profile in the HUBCAP platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

To create the company profile, did you find the requested information appropriate?

◉ Yes

◯ No

Did you upload pictures? How do you rate this functionality?

★ ★ ★ ★ ★

How many tools did you create, associated with your company?

VSI so far created three revisions of the RT-Tester Tools image. The older ones shall, however, be removed. We are currently working on a final image.

How easy was it, to provide the tools descriptions within the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all　　　　　　　　　　　　　　　　　　　　　　　　Extremely easy

Did you find the requested information appropriate, for the tool description?

◉ Yes

◯ No

When you finalised the creation of both company and tool description, did you find the information sufficient for the intended audience?

We are still in the process of finalising both. But the space afforded by the platforms appears in any case sufficient. Further to this, see my comment about embedding tool-tips into the website.

3rd party access to the technologies

Did you provide any sandbox or VM environment for your tool?

◉ Yes

◯ No

Does the sandbox/VM environment limit any feature of your tool?

◯ Yes

◉ No

How easy was it to setup your tool in the sandbox/VM?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all　　　　　　　　　　　　　　　　　　　　　　　　Extremely easy

How is the performance of your tool in the sandbox/VM environment?

Performance is not notably diminished inside the sandbox. Small lags are observed when using the Eclipse UI and Code Editor, for instance. Test generation and compilation are overall swift. The models deployed with HUBCAP are, however, relatively small in size, not pushing the limits of the VM hardware. Fundamentally, generation of model-based tests via SMT solving strategies can become a computational bottled-neck if used with large-size industrial models. But, as mentioned,

this does not apply for the experiment and trial made available through HUBCAP. Real-time visualisation of test signals i.e. through our observer FMU appears to works with comparable performance as on a local KVM. Otherwise, our tools do not require computationally-expensive graphics and rendering algorithms, so performance penalities related to this are not applicable.

How easy was it to create a sandbox/VM within the HUBCAP Platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

How easy is it, to access and use the tool provided in the sandbox/VM?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Expectations from HUBCAP

What are your expectations regarding HUBCAP?

As an SME, we hope to raise awareness of the model-based testing services that our company can provide, by offering a large number of interested parties from industry and academia to try out our tools and MBT approach. Prior to HUBCAP, preparing a VM trial image for 3rd-party use and experiments may not have been impossible, but a notable and perhaps questionable effort, especially if done for just a few individuals. We are expecting that our HUBCAP tools image considerably lowers the entry bar for new users of the VSI tools, removing all hurdles in terms of installation and profiting from the FMI-enabled functionality to target a larger class of application scenarios. The tutorial that we provide is carefully crafted, so that users not literate in (model-based) testing are likewise able to work through it. All this should help to disseminate model-based approaches to testing to a wider audience, and foster future industrial adoption.

What kind of impact are you expecting from HUBCAP on your SME?

A substantial amount of work has been invested by VSI to enable its tools for FMI, in particular, to create a seamless integration between the *classical* testing approach facilitate by RT-Tester, RTT Model-Based Testing, and FMI-based co-simulation. This is expected to pay off rewards in terms of offering ample scope for future collaboration, innovation and novel application scenarios of model-based testing. VSI will be open to such endeavours and welcome suggestions and potential innovations, collaborations, in particular, if funding can be secured to facilitate them over a period of time. A direct impact is moreover that trail users ought to require little to no assistance in taking their first steps with the tools, lowering the burden of our company to provide support in such cases. Ultimately, we are hoping to attract new customers for model-based testing, i.e., from companies who try out our MBT tool-chain and subsequently contact VSI to evaluate further whether it fits their needs.

Response to survey #3:

Platform overview

What did you think of the overall HUBCAP image?

★ ★ ★ ★ ☆

Is the platform layout well-arranged?

★ ★ ★ ☆ ☆

Is it easy to navigate in the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all　　　　　　　　　　　　　　　　　　　　　　Extremely easy

Are the terms/words and content understandable?

0	1	2	3	4	5	6	7	8	9	10

Not at all　　　　　　　　　　　　　　　　　　Extremely understandable
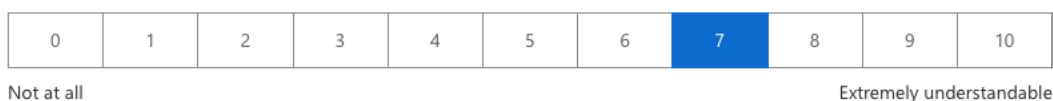
What is your overall opinion of our platform?
Can you share with us your feedback so that we can improve our platform?

The platform is well organized and offers a lot of functions. If I may suggest some modification, I suggest for the future to have a page which summarizes all the functions.

Company profile and tools description

How easy was it, to create the company profile in the HUBCAP platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all　　　　　　　　　　　　　　　　　　　　　　Extremely easy

To create the company profile, did you find the requested information appropriate?

◉ Yes

◯ No

Did you upload pictures? How do you rate this functionality?

★ ★ ★ ★ ☆

How many tools did you create, associated with your company?

One, DDSqimulator

How easy was it, to provide the tools descriptions within the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Did you find the requested information appropriate, for the tool description?

◉ Yes

○ No

When you finalised the creation of both company and tool description, did you find the information sufficient for the intended audience?

Yes, I did.

3rd party access to the technologies

Did you provide any sandbox or VM environment for your tool?

◉ Yes

○ No

Does the sandbox/VM environment limit any feature of your tool?

◉ Yes

○ No

How easy was it to setup your tool in the sandbox/VM?

0	1	2	3	4	5	**6**	7	8	9	10

Not easy at all   Extremely easy

How is the performance of your tool in the sandbox/VM environment?

The tool suffers some performance problems due to the lack of 3d hardware acceleration.

How easy was it to create a sandbox/VM within the HUBCAP Platform?

0	1	2	3	4	5	6	**7**	8	9	10

Not easy at all   Extremely easy

How easy is it, to access and use the tool provided in the sandbox/VM?

0	1	2	3	4	5	**6**	7	8	9	10

Not easy at all   Extremely easy

Expectations from HUBCAP

What are your expectations regarding HUBCAP?

I think it's a project which really could bring benefits to European SME's which want to improve their knowledge of the CPS world. The HUBCAP platform offers a great opportunity to showcase different tools, technologies and know-how available on the market and to facilitate the not only the communication with possible end users, but also the networking between the actors offering these resources.

What kind of impact are you expecting from HUBCAP on your SME?

I expect HUBCAP to be an opportunity to establish new contact with other SEME's and possibly to establish network cooperation with other HBCAP partners.

Response to survey #4:

Platform overview

What did you think of the overall HUBCAP image?

★ ★ ★ ★ ☆

Is the platform layout well-arranged?

★ ★ ★ ★ ☆

Is it easy to navigate in the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Are the terms/words and content understandable?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

What is your overall opinion of our platform?
Can you share with us your feedback so that we can improve our platform?

Looks good so far, would love to see more interaction of the current members so you can make use of all those features. At the moment it's hard to give a more profound feedback except the rather static offers. Features like collaboration space, chat or "Around me" can only really be judged if you have a good user experience of the interaction. Because of that missing experience I gave not the full score above. Maybe we can schedule an appointment where we invite people to interact with the platform...

Company profile and tools description

How easy was it, to create the company profile in the HUBCAP platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

To create the company profile, did you find the requested information appropriate?

○ Yes

○ No

Did you upload pictures? How do you rate this functionality?

★ ★ ★ ★ ☆

How many tools did you create, associated with your company?

2

How easy was it, to provide the tools descriptions within the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Did you find the requested information appropriate, for the tool description?

○ Yes

○ No

When you finalised the creation of both company and tool description, did you find the information sufficient for the intended audience?

Yes, it works - in this circumstance it would even make more sense to ask the clients if they have enough information provided to estimate the tool. I am not entirely sure, but if there is currently no tool rating like it's common in app stores it might be a good feature

3rd party access to the technologies

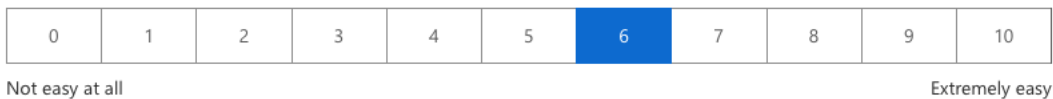**Did you provide any sandbox or VM environment for your tool?**

○ Yes

○ No

Does the sandbox/VM environment limit any feature of your tool?

○ Yes

◉ No

How easy was it to setup your tool in the sandbox/VM?

0	1	2	3	4	5	**6**	7	8	9	10

Not easy at all   Extremely easy

How is the performance of your tool in the sandbox/VM environment?

there is some issue with the keyboard layout, which is not that easy to switch because the VM does not interpret the AltGr key (German Keyboard) which would allow to access symbols like ~@€{[]} - and more. I don't know if this is fixed already... But the only workaround so far was to switch to US Keyboard.

How easy was it to create a sandbox/VM within the HUBCAP Platform?

0	1	2	3	4	5	6	7	**8**	9	10

Not easy at all   Extremely easy

How easy is it, to access and use the tool provided in the sandbox/VM?

0	1	2	3	4	5	6	7	**8**	9	10

Not easy at all   Extremely easy

Expectations from HUBCAP

What are your expectations regarding HUBCAP?

Improve Interactions of CyberPhysical Systems in a Homogenous Environment. Regarding Tool Safety this would be a big leap forward and would reduce the costs for users to qualify their toolchain for heterogenous environments.

What kind of impact are you expecting from HUBCAP on your SME?

we will see. there would be still a lot to explore of the platform and to develop support tools, which then would allow to Plug and Play with the different Sandboxes and with different tools. I suggest such Hubcap environment management should be provided by default when cloning either a raw VM Image from scratch or a preconfigured tool. So, the VM is augmented to interact with other VM and Sandboxes (but maybe these features are about to come in the right column of the VM page - I'll be excited). I am not aware of the following: that it would make sense to make many tutorial videos

in another section of the Hubcap platform (like "documentation") which would demonstrate the various use cases intended tor the platform

Response to survey #5:

Platform overview

What did you think of the overall HUBCAP image?

★ ★ ★ ★ ☆

Is the platform layout well-arranged?

★ ★ ★ ★ ☆

Is it easy to navigate in the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Are the terms/words and content understandable?

0	1	2	3	4	5	6	7	8	9	10

Not at all   Extremely understandable

What is your overall opinion of our platform?
Can you share with us your feedback so that we can improve our platform?

Search function should be improved

Company profile and tools description

How easy was it, to create the company profile in the HUBCAP platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

To create the company profile, did you find the requested information appropriate?

◉ Yes

◯ No

Did you upload pictures? How do you rate this functionality?

★ ★ ★ ★ ★

How many tools did you create, associated with your company?

1

How easy was it, to provide the tools descriptions within the platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

Did you find the requested information appropriate, for the tool description?

⦿ Yes

◯ No

When you finalised the creation of both company and tool description, did you find the information sufficient for the intended audience?

Yes, some tags or keywords would help to search for relevant components

3rd party access to the technologies

Did you provide any sandbox or VM environment for your tool?

⦿ Yes

◯ No

Does the sandbox/VM environment limit any feature of your tool?

◯ Yes

⦿ No

How easy was it to setup your tool in the sandbox/VM?

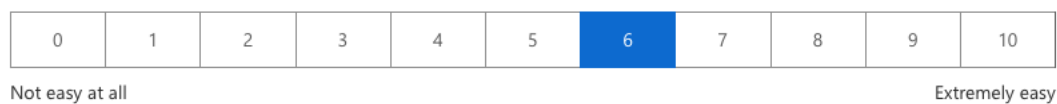| 0	1	2	3	4	5	6	7	8	9	10

Not easy at all   Extremely easy

How is the performance of your tool in the sandbox/VM environment?

Same performance as in any cloud

How easy was it to create a sandbox/VM within the HUBCAP Platform?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all　　　　　　　　　　　　　　　　　　Extremely easy

How easy is it, to access and use the tool provided in the sandbox/VM?

0	1	2	3	4	5	6	7	8	9	10

Not easy at all　　　　　　　　　　　　　　　　　　Extremely easy

Expectations from HUBCAP

What are your expectations regarding HUBCAP?

Visibility and sustainability

What kind of impact are you expecting from HUBCAP on your SME?

Increase sales