Deliverable 5.2
Report on Constituency Building Workshops

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¹ R=Report, DE=Websites, patents filling, etc., O=Other  
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Executive Summary

This deliverable serves as an entry point to the more in-depth record of the constituency building workshop discussions which can be found in dedicated reports (see reference section). The focus here is on a brief summary of intent, organisation, attendees and major findings.

Three constituency building events were held during the course of the Road2CPS project:

1. The “Future platforms” workshop in Turin, Italy, October 2015
2. The “Smart Cyber-Physical Systems Clustering Event” in Vienna, Austria, April 2016
3. The “Smart Destination Workshop: Digitizing European Business and Society” in Palma de Mallorca, Spain, October 2016

The three workshops enabled to establish a committed community of experts from various fields and backgrounds, interacting throughout the project lifetime. Some of them were recurrent participants in the Road2CPS events, others joined along, amounting to almost 120 persons with a fairly equal repartition between academia, industry (of which 30% SMEs) and administration/ funding agencies. The repartition between countries was the following: Austria (3), Belgium (6), Estonia (1), Finland (6), France (13), Germany (23), Greece (2), Ireland (1), Italy (8), Netherland (3), Norway (2), Poland (1), Portugal (3), Romania (1), Spain (28), Sweden (6), Switzerland (1), Turkey (1), UK (8), USA (1). The workshops were held half-yearly enabling the assessment of specific findings and revise directions accordingly.

In the first roadmapping workshop held in Paris (June 2015) the concept of platforms was acknowledged as having a tremendous role in the structuration of the CPS field as such and of the domains Road2CPS intended to investigate (energy and transport, smart cities, health and manufacturing), as well as on the structuration of business ecosystems. It was thus decided to focus the first constituency building workshop to be held in Turin on this key notion (Future Platforms Workshop). It provided an interesting opportunity to enable cross-fertilisations between platform offers and demand side needs. The position of Europe was deemed threatened by US pervasiveness in the field of consumer platforms. Although Europe features already promising assets, these need to be federated behind major industrial actors. Platform offers need to gain outreach towards SMEs. Programs such as I4MS promise to help in that direction, indeed acting as matchmaker between supply and demand sides to form the premises of sustainable ecosystems at regional level.

During the second workshop (SmartCPS Clustering Event), these findings were discussed with ongoing ICT and IoT projects under the H2020 and Artemis/ECSEL umbrella. The event took place in Vienna soon after the release of a new version of the ARTEMIS-IA Strategic Research Agenda (SRA), offering strong momentum to this meeting. The focus was on assessing the coverage of the current EU project portfolio and the means to inducing a stronger cooperation between projects (and platforms) across Europe. First of all, it was underlined that large Innovation Action projects do provide valuable impacts in tool integration, interoperability, or advances in heterogeneous systems, to name a few. These have both
vertical (domain) and horizontal (value chain) impacts. Sustained by high TRL funding, their respective platforms are starting to gain attraction from SMEs through the open calls of cascade funding projects (see e.g. EuroCPS). Important steps have been taken towards building a more efficient research-to-innovation pipeline. The very ends of the pipeline (research and commercialisation) however do remain in need for important deliberate funding supports. Too much focus on higher TRLs could have detrimental effects in the long run on research projects at lower TRLs for the CPS field (or ICT in general). Turning to existing dedicated instruments (e.g. FET), which feature sizeable amounts of funding but have broad scopes and very high expectations for disruptive advances, is not an easy target to help carrying on the fundamental technological research which the CPS challenges ahead call for (e.g. formal validation of security and trust for autonomous systems). In addition, if platforms are attractive seeds from which to grow ecosystems, one should not miss to remember their attractiveness is subjected to a continuous intake from novel users, business models and ideas. To this aim, it is needed to help continuous education and professional skill learning, as well as ways to grant European user/customer an important involvement level in these experiments all along the pipeline (as the GAFAs have understood perfectly). Now, clear instruments lack to help in this direction. The EC is believed to have an important role here to find the appropriate balance for a smooth uptake of novel ideas and improvement in practices, skills, standards and usages.

At the time of the SmartCPS Clustering Event (April 2016), the reflexion on Digital Innovation Hubs and Competence Centres (DIH-CC) was soon to be given a strong impulse with the launch of the Digitising European Industry program. Acknowledged as being pivotal in the dissemination of platforms and know-how, the DIH-CC usually grow from existing research and technology structures and clusters active at regional level. The EC objective here is to federate the efforts among these initiatives and help those at lower development stages gain quicker momentum. Methodological guidelines and best practices need to be gathered to accelerate the process across the EU28. To this aim the Road2CPS consortium thought a relevant case study would consist in understanding the evolution of a novel sector, which has so far not been under the direct umbrella of the Digitising European Industry (in contrast to transport, manufacturing or health). The purpose of the third and last constituency building event was thus set to reach out to the stakeholders involved in the emerging Smart Tourism / Smart Destinations area. The domain was chosen for its very high rate in new technology adoption and business model ongoing evolution. Also thanks to the Road2CPS consortium network there was a very nice opportunity to successfully gather all the actors of a particularly relevant initiative in Spain called Smart Destination, developed in coordination with regional and local administrative, research and technology public and private actors. The workshop was held in Palma de Mallorca at the heart of the implementation of this initiative for the Balearic Islands. This event also enabled to complement the Road2CPS community with experts from the Smart Cities and IoT related domains.

From the presentations given during the Smart Destinations Workshop, the tourism sector appeared as exemplary of the digitisation taking place: large deployment of device-centric infrastructures, gathering massive amounts of data, guided with the ambition to turn this data mining into informed decision-support models, while caring for a balance between legitimate economic growth goals and the well-being of
citizens and our environmental preservation. This was an ideal field of investigation for DIH-CC. Two main recommendations could be formulated: 1) what prevents a profitable coordination between initiatives and the uptake of a strong service-oriented business sector is the data model and infrastructure fragmentation. It is one of the major challenges ahead, which can be assigned to the DIH-CC network in general: working on pragmatic solutions towards common capabilities to enable information extraction from data, across systems and for all digitising domains. This calls for a shared semantics framework among data producers and consumers (multimodal transport, waste management, tourist needs and behaviours, resident feedback, energy grids, etc.). 2) the second recommendation is to mitigate the potentially detrimental societal impacts created by our current hasty pace in technological adoption and infrastructure deployment. The subsequent risks are the digital divide among the population and the overall rejection from a distrustful society. In response to these 2 aspects, some foreseen funding lines are: 1) to enable the sustainability and evolution of both infrastructures deployed and the emerging ecosystem throughout their lifetime, 2) to give citizens an edge in the digitisation process to seize opportunities for an improved well-being, a cleaner environment and jobs/professional skills enhancements.

These appear as rather long-term preoccupations, but should be a reminder for society to turn all the energy and impulse perceived throughout all these very interesting events into commendable societal changes.
1 Introduction

This document provides an overview of the constituency building workshops that were held during the course of the Road2CPS project. These workshops intended to federate actors of the CPS field and gather their perspectives on current and foreseeable trends, promising breakthroughs and existing barriers in a large panel of applicative domains. The inputs gathered help build a picture of the current CPS innovation landscape and potential actionable recommendations for the forthcoming years. These events have also helped tighten the links between current actors in the field and raised awareness for a growing number of future actors in the field.

This deliverable was kept deliberately short to serve as entry point to the more in-depth records of the workshop interactions contained in each of the workshops dedicated report (see reference section). The focus here is on a brief summary of intent, organisation, attendees and major findings.

In total three events were held:

- “Future platforms workshop” in Turin, Italy, October 2015
- The “Smart Cyber-Physical Systems Clustering Event” in Vienna, Austria, April 2016
- The “Smart Destination Workshop: Digitizing European Business and Society” in Palma de Mallorca, Spain, October 2016

The three workshops enabled to establish a committed community of experts from various fields and backgrounds, interacting throughout the project lifetime. Some of them were recurrent participants in the Road2CPS events, others joined along, amounting to almost 120 persons with a fairly equal repartition between academia, industry (of which 30% SMEs) and administration/ funding agencies. The repartition between countries was the following: Austria (3), Belgium (6), Estonia (1), Finland (6), France (13), Germany (23), Greece (2), Ireland (1), Italy (8), Netherland (3), Norway (2), Poland (1), Portugal (3), Romania (1), Spain (28), Sweden (6), Switzerland (1), Turkey (1), UK (8), USA (1). The workshops were held half-yearly enabling the assessment of specific findings and revise directions accordingly.
2 The “Future platforms” workshop

2.1 Context, venue, intent

The Road2CPS Workshop on Future Platforms was held October 8th 2015 in Turin, Italy.

The workshop was set to discuss platform concepts and success stories in relation to industrial demand and customer needs, gathering 35 experts from industry, academia and policymaking with knowledge and experience in Open Platforms and Architectures, both horizontal (cross-sectorial) and vertical (domain-oriented).

The objective of the workshop was to stimulate discussions on platform concepts, alignment of the work of different European initiatives to ensure coherence of results, matching supply and demand as well as extending the Road2CPS community for future activities.

In more detail, the different sessions were aimed at:

- understanding the offer (i.e. platforms resulting from projects funded by the EC but not only)
- understanding the demands and needs coming from different domains: manufacturing, automotive, energy, smart cities
- panel discussion and interactive sector-driven session (in groups), sharing outcomes; checking potential gaps from platforms vs. needs

7 presentations from the platform supply side (a view on existing/developing platforms) were held:
- Crystal (Christian El Salloum, AVL LIST GmbH)
- Arrowhead (Pär-Erik Martinsson, Lulea University)
- Virtual Fort Knox (Ursula Rauschecker, Fraunhofer-IPA)
- FITMAN (Sergio Gusmeroli, TXT)
- FIWARE (Nuria de Lama, Atos)
- Industrial Ring 4.0: A platform for the Catalan Smart Industry (Sergi Fuiguerola, i2CAT)
- HANA Platform (Raik Hartung, SAP)

Regarding the platforms demand side (a view on the sectorial requirements and needs) 5 presentations were given:

- CPSoS (Christian Sonntag, Eutexoo)
- Manufacturing/Automotive (Óscar Lazaro, Innovalia)
- Energy (Alexander von Jagwitz, Baumgroup)
- Smart Cities (Lanfranco Marasso, Engineering)
- Manufacturing /FoF (Sergio Gusmeroli, Politecnico di Milano)

### 2.2 Main findings

The different presentations from the **platforms providers** revealed strong similarities in terms of technological conception but also economic success factors. The presentations all indicated that there is a strong need for openness, interoperability/standardisation and flexibility, for early user/customer involvement, as well as the right business concept behind it. It was noted, that EU-funding can considerably help by bringing the right stakeholders (sometimes also competitors) together, to agree on standardised approaches and build the ecosystem for successful implementation.

A key outcome of the session was that many promising approaches have been taken and further investment could help both, the platform maturation, and the strengthening of the related ecosystem. The participants pointed out, that non-European competition is massive, and that immediate action is required in order for Europe not to fall behind.

The presentations focussing on **different domains** informed about domain specific demands and needs but also identified a large number of common cross-domain topics. Depending on differences in e.g. conservatism of the sector or ownership of the service provided, varying requirements were highlighted. Nevertheless, next to specific functionalities, the interoperability, modularity, openness, user-friendliness and cost play a major role for all domains.

The panel discussion as well as the interactive session focused mainly on the most pressing needs (technological solutions as well as requirements for a successful implementation) and actions to be taken. A short analysis comparing domain specific but also cross-domain demand and offer to identify the current gaps was conducted. It became clear, that there are already promising solutions in place, of which some
are being tested by customers already, nevertheless, further developments and maturation are urgently needed to fulfil the requirements sufficiently.

A need for regulation has been expressed for various domains, but care has to be taken to not hinder developing new markets. Privacy is a key issue from domains collecting personal data (energy, transport smart city). The market should drive standardisation especially in the area of interoperability and at the same time prevent proprietary solutions. There is a need to engage further with industry and specifically SMEs and the building of the innovation ecosystem around the stakeholders is also seen to be a key issue. Initiatives like I4MS are pointed out to be a good start into the right direction, and should be continued or even enhanced. An ecosystem of users also needs to be developed in order to sustain new platforms.

From all presentations and activities during the day it became clear, that there is a need for key actors in Europe to come together to compete with US platforms which currently dominate the market. EU-funding as well as industry commitment can massively help to generate the right standards and interfaces. Moreover, EU-projects are a good way to bring the relevant stakeholders together, enter into dialogue and create the innovation ecosystem for a sustainable value proposition.
3 The “Smart Cyber-Physical Systems Clustering Event”

3.1 Context, venue, intent

The Road2CPS Clustering and Communication Event was held April 14th 2016 in Vienna, Austria.

The workshop brought together over 120 experts from the fields of Cyber-Physical Systems (CPS) and presented 16 projects that had been funded under the first call of Horizon2020 complemented by three ARTEMIS and ECSEL projects. An analysis of the project portfolio is available from the Workshop full report (see reference section).

The aim of the Road2CPS Clustering and Communication Event, held in the frame of the ARTEMIS-IA Spring Event and back-to-back to the CPS week, was to bring together experts from the fields of Cyber-Physical Systems (CPS) from projects that had been funded under H2020 and ARTEMIS/ECSEL. Each project presented their aims and key outcomes. This raising of awareness of activities going on within the various projects provided an overview of the coverage of the research activities across the domain. This was particularly relevant and pertinent, as the new ARTEMIS-IA Strategic Research Agenda had been announced on the day before highlighting a number of priority areas.

![Figure 2 Introducing the sessions during the “Smart Cyber-Physical Systems Clustering Event” in Vienna](image)
A synergy & discussion session was then held with the aim to:

- Identify synergies and put forward ideas for co-operation across projects and across the H2020 work programme.
- Identify if all the key research priorities were being covered, highlight key gaps and whether appropriate resources (i.e. funding) were being targeted at specific areas.
- Identify how the EC could better support collaboration/exploitation of synergies.
- Identify if Europe is doing enough to get over the valley of death to get research to the marketplace.
- Consider if all the right people are engaged, e.g. demand side, the commercialisation people, customers, etc.
- Identify if the activities presented could be linked to digital platforms and digital innovation hubs.
- Identify barriers for industry, e.g. standards for interoperability, socio-technical issues such as developing trust, needs for raising public awareness, needs for regulation for safety and privacy and legal support for Service Level Agreements and liability.

The meeting highlighted a number of areas where there were opportunities for collaboration and also promoted fruitful discussions between projects both in the meeting and post meeting.

3.2 Main findings

The meeting was very successful in raising awareness of the activities being performed and highlighted that the areas being addressed within the project portfolio provide good coverage of the research, development and innovation needs across the domain. The timing of the meeting was also very pertinent with the launch of the new ARTEMIS-IA Strategic Research Agenda and the Digitising European Industry Initiative with many synergies being apparent.

Notably there was a mix of higher TRL activities being addressed by the ARTEMIS-IA and ECSEL large scale projects addressing key industrial topics such as integration of tools for safety-critical systems development, interoperability, factory automation and maintenance systems. Underpinning and extending this H2020 projects are performing novel work in the areas of verification and validation to deal with the new reality of not being able to predict all eventualities in autonomous applications such as cars, and to deal with key issues such as guaranteeing safety and security in a world, which is becoming increasingly vulnerable to cyber-attack. A number of projects are addressing multicore processors to maximise application performance and to provide trusted computation when mixed-criticality applications are implemented.

To get past the valley of death and successfully introduce technologies it is notable that the CRYSTAL and CP-SETIS projects that address interoperability and standardisation provide a model for similar proposed actions within the agenda for Digitising European Industry. Likewise, the Innovation Hubs projects, CPSE
Labs and EuroCPS, that target engagement with SMEs to raise awareness, transfer skills and provide access to the latest technologies, also directly support Europe’s goal of Digitising European Industry.

Looking to the future the roadmapping activities being performed in projects such as Road2CPS and CPSoS have an important role to play in bringing together the constituency around CPS and in providing recommendations for future research needs. The markets for CPS are global and the CPS Summit and TAMS4CPS projects are identifying areas within CPS where it may be possible to collaborate with the US to tackle common problems and work jointly to bring together critical mass. Here it is also important to address barriers that exist to technology roll out through harmonisation of standards, regulation for privacy and approaches to liability at a worldwide level.

The discussion identified that there is always a need for more money. A question is whether the targeting of the existing funds is appropriate. It was felt that there had been a major shift in funding with more being targeted at higher TRL activities, e.g. a large amount of money was being put into large scale pilots and as a consequence there was less funding available for research projects at a lower TRL. It was, however, noted that other funding schemes exist to support more fundamental research such as Future Emerging Technologies (FET), which has considerable funding. It was also highlighted that the Strategic Research Agenda put forward by the ARTEMIS-IA has many topics and building blocks. The amount of funding required to address all the areas in the Agenda would be considerable and not possible to support. Therefore, some targeting of resources is needed so there will always be areas, which could be considered to be gaps. Although the activities funded are producing very good results and keeping Europe ahead there is a need to support research work looking longer term. Notably the current H2020 programme is targeted much more at Research and Innovation and so is much closer to market. In response to the question of whether enough was being done to get over the valley of death it was highlighted that a key aim of the ARTEMIS projects was to directly address the valley of death. Here there has been considerable success through the large projects that have been funded. It was acknowledged however, that considerable funding is required in order to commercialise the outcomes of R&I projects and get uptake within industry. The outcomes from some projects were at a much higher TRL addressing industry needs, which made them far more attractive for uptake with a consequence of drawing in more of the innovation pipeline. The role of the innovation hubs is seen as being important to transfer results to SMEs and also to provide access to platforms and knowhow. There was some discussion on platforms. Large-scale initiatives are needed as evidenced by the ARTEMIS projects. Although access to platforms is being provided via the Innovation Hubs much more work is needed to promote European platforms and build an ecosystem around new evolving platforms. This is something that will need further funding. A number of barriers exist and the new Digitising European Industry initiative is trying to remove these by supporting standards for interoperability and by addressing regulatory and legal issues. It was noted that there is a need for education, to not only address sociotechnical issues and develop trust, but also there is a fundamental need for education to keep upskilling the workforce as the technology rapidly evolves.
4 The “Smart Destination” workshop

4.1 Context, venue, intent

The Road2CPS Workshop on Smart Destinations was held October 11th 2016 in Palma de Mallorca, Spain. The workshop originated from the Road2CPS consortium aim to review a new emerging domain, Smart Destination/Tourism, which appeared both very dynamic and CPS-relevant, albeit not as visible as more established domains such as smart factory, smart mobility or smart cities. The workshop preparatory actions confirmed this initial intuition: the development of this sector is characterised by an increasing adoption of new technologies among which CPS is a key enabler, and by a deliberate impulse of a whole ecosystem (private and public actors). The latter is in strong resonance with the current EC initiatives to foster digitizing industry via networks of regional Digital Innovation Hubs (DIH) and Competence Centres (CC). Thus, collecting the views of some important actors involved in digitising tourism was a very interesting and topical opportunity for Road2CPS.
The workshop provided an overview of how such a digitisation is taking place in a particularly active region, the Balearic Islands, which has invested its long experience of tourism challenge management into a pioneering approach called “Smart Islands”. Its aim is to sustain a digital growth of this sector while enhancing the residents’ well-being. This features crosscutting issues such as questioning the role of innovative technologies, planning the development of sustainable infrastructures, reflecting on resilience strategies for cities which see large seasonal population flows, aiming to pave the way towards circular economy. A key point, which was acknowledged throughout the day, was the importance of new technologies to provide valuable data by which more informed decision-making process can be set up and assessed, in contrast to the past decades. More generally, the phenomenon of digitisation and the deployment of Cyber-Physical Systems (CPS) technologies and the Internet of Things (IoT) is expected to increase substantially over the next decades, holding great potential for novel applications, innovative products and services as well as new business models. CPS and IoT technologies increase the ability to predict behaviour and can thus be used to reengineer business processes, e.g. designing them more sustainable, using available resources more efficiently and effectively – in line with the concept of circular economy.

Against this background, this all-day workshop brought together about 40 experts from academia, industry, municipalities and policy-making to learn about and discuss new concepts, frameworks, challenges and opportunities for smart destinations and sustainable tourism facilitated by digitisation efforts. It was further set to align specific challenges faced by cities and regions whose economic and labour market profiles are marked by tourism and the corresponding opportunities offered by CPS and IoT technologies.

CPS experts as well as end-users and businesses ranging from start-ups to large enterprises were invited to participate and contribute to discussions on visionary scenarios, disruptive innovations and their impact on the business ecosystem.

The objectives of the workshop were to stimulate:

- Visionary scenarios on the role and priorities for CPS and IoT technologies to support the evolution towards more sustainable tourism in smart destinations
- Foster exchange on CPS innovation perspectives and generating future business strategies
- Aligning priorities and reflection on European initiatives and circular economy aspects to ensure the coherence of results
- Assessing the impact on the business models of long established sectors such as the tourism economy
More than twelve presentations\(^3\) were held and covered:

- An overview of the current status of Road2CPS activities
- An account of ongoing EC initiatives pertaining to DIH and CC to set the context
- In-depth accounts of the public stakeholders impulse regarding the Smart Island initiative at all administration levels (national, regional, cities)
- The prominent roles played by clusters (Turistec, Balears.T) and private companies from the service and industrial sectors
- Ongoing research and innovation projects in the tourism sector or in related domains such as Smart Cities, which share common preoccupations

4.2 Main findings

All participants and speakers appreciated the workshop. It was seen as an interesting opportunity to bridge the gap between communities, involved in various sectors (smart manufacturing, smart cities, tourism, circular economy) and belonging to a diverse ecosystem (public stakeholders, clusters, academia, SMEs). The tourism sector appears exemplary for the ongoing digitisation: large deployment of device-centric infrastructures, gathering massive amounts of data, guided with the ambition to turn this data mining into informed decision-support models, while caring for a balance between legitimate economic growth goals and the well-being of citizens and our environmental preservation.

The recent EC initiative of promoting the advent of networks of Digital Innovation Hubs and Competence Centres will find an ideal field of investigation here. The Smart Destination initiative and its local declinations like Smart Island Mallorca, in deed represent already examples of such innovation hubs. The experience gathered from ongoing experiments in the Balearics should provide valuable information on what technology can bring to the sector and what lies ahead to achieve a sustainable ecosystem.

The group discussions enabled to formulate some recommendations. From a technological viewpoint, the major drawback of the fast deployment of device-centric infrastructures is the insufficient preparation ahead of time of shared data models suitable for a better interoperability between systems. The advent of a fragmented landscape is a risk. This does not mean one should count for a convergence in the systems being deployed, rather strive for common capabilities to extract information from data, across systems. When the goal is to be able to build better-informed process management for a city or a territory the problem is on the semantics of data and the extraction of information from various sources (multimodal transport, waste management, tourists needs and behaviours, resident feedback, energy grids, etc.).

\(^3\) All presentations are available on the Road2CPS website under ‘resources’: www.road2cps.eu
seems to be a pressing challenge ahead, where a European impulse transcending local disparities could have a major impact.

Another important element was acknowledged: the mind-set factor in this digitisation process. Sure enough, the companies and entrepreneurs need to adopt lean management procedures to promote horizontal thinking and collaborations. However, citizens as well need to be involved. Whenever parts of the population in Europe feel being excluded from the digitisation benefits, the risk of a digital divide is present. Promoting resident involvement in field experiments, gathering social studies specialists and giving populations feedback means is vital in such endeavours. This also presents an opportunity to close the loop with the e-democracy and e-administration initiatives taken concurrently. Efforts should be dedicated to build trust in these systems. It was noted that privacy and security issues were not much taken into account in the presentations made throughout the day: the haste in which digitisation is taking place in a techno-push approach needs to be tamed with informed management procedures regarding trustworthiness, privacy issues and feedback procedures. From an economic standpoint, it is important to be able to provide future customers with the role they deserve in the design and deployment process of such initiatives: a fair evaluation of the deployed systems is at stake here.

Foreseen funding lines in this respect are 1) how to enable the sustainability and evolution of both infrastructures deployed and the emerging ecosystem throughout their lifetime, 2) how to give citizens an edge in the digitisation process to seize opportunities for an improved well-being, a cleaner environment and jobs/professional skills enhancements. These appear as rather long-term preoccupations, but should be a reminder for society to turn all the energy and impulse perceived throughout these very interesting events into commendable societal changes.
5 Conclusions

5.1 Support of Roadmapping activities

The three constituency building workshops provided both momentum and direct inputs to the Road2CPS roadmapping activities. The “Future Platforms Workshop” for instance provided the early inputs on the barriers, success factors and challenges ahead for CPS platforms and reference architectures as well as for successful ecosystem uptake. The participants were asked to assess and map – (at the level of four different domains: Smart Cities, Energy, Manufacturing and Transport) industrial needs & demands versus existing solutions and platforms, with a view on identifying gaps. Through the interactive session and result of the discussion of the groups, a valuable list of challenges that should be addressed in the future could be retrieved. The lively group sessions resulted in synthetic discussion accounts formulated in posters.

A similar process was conducted in the subsequent events, i.e. overall setting the scene presentations and parallel working group sessions in a brainstorming fashion. The presence of our Project Officer Werner Steinhögl in some of these events was an added value to interact directly with the EC point of view.

The SmartCPS Clustering Event in Vienna enabled to assess the value of the DIH-CC for the uptake of digital platforms in Europe. The funding focus on the TRL scale was discussed. It is worth noting that the balanced audience of these events enabled to have an informed view of priorities, non-biased towards either end (industrial or academic) of the research-to-innovation pipeline. Lastly, the Smart Destinations workshop turned out to be a good opportunity to take a close look at the actions of an emerging DIH in a given sector (smart tourism) and reflect on the potential discrepancies over the haste in which digitising is taking place.

In summary, various types of inputs were gathered through the series of constituency building events: success stories, gap assessments, business and administrative perspectives. The community gathered through the events and via telephone and email interactions proved to be very committed to help and express their views on the various CPS topics and digitisation challenges. This is a very encouraging element in the grand challenge of Digitising European Industry: the actors are eager, the scene is set and some light has been shed on the paths to follow.
5.2 Delivery of recommendations to the European Commission

The core role platforms play to aggregate actors and serve as seeds for thriving ecosystems was acknowledged by all participants throughout this journey. The role of Digital Innovation Hubs and Competence Centres as access providers and catalysts for platform federation across domains in Europe is seen as prominent. The experience of the Smart Destination initiative in the tourism sector, as well as the ongoing SME oriented experiments which open calls permit provide valuable lessons.

Two main recommendations could be formulated:

1) What prevents a profitable coordination between initiatives and the uptake of a strong service-oriented business sector is the data model and infrastructure fragmentation. It is one of the major challenges ahead, which can be assigned to the DIH-CC network in general: working on pragmatic solutions towards common capabilities to enable information extraction from data, across systems and for all digitising domains. This calls for a shared semantics framework among data producers (multimodal transport, waste management, tourist needs and behaviours, resident feedback, energy grids, etc.).

2) The second recommendation is to mitigate the potentially detrimental societal impacts created by our current hasty pace in technological adoption and infrastructure deployment. The subsequent risks are the digital divide among the population and the overall rejection from a distrustful society. In response to these two aspects, some foreseen funding lines are: 1) how to enable the sustainability and evolution of both infrastructures deployed and the emerging ecosystem throughout their lifetime, 2) how to give citizens an edge in the digitisation process to seize opportunities for an improved well-being, a cleaner environment and jobs/professional skills enhancements.

A network of DIH-CCs backed up by professional schools and universities for life-long skill learning (technical as well as entrepreneurial) could be a good solution, if properly balanced along the research-to-innovation pipeline and involving user/customer/citizen throughout. The accounts of the experiences gathered in the Road2CPS constituency building workshops reports can serve as methodological guidelines to further enrich and tune the DIH-CC network in the EU28. The focus on funding higher TRLs made these first steps possible, yet both ends of the pipeline should be taken into account: also research and education which condition to a large extent a successful commercialisation of products and services for hopefully empowered citizens.
6 References

