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CROSS FERTILISATION THROUGH ALIGNMENT, SYNCHRONISATION AND EXCHANGES FOR IoT

H2020 – CREATE-IoT Project

Deliverable 01.06

Workshop on Evaluation of IoT FA based on common methodologies and KPIs

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Summary				
No and name	**D01.06 Workshop on Evaluation of IoT FA based on common methodologies and KPIs**			
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DoW	This deliverable summarizes the proceedings, discussions and results of the Workshop on Evaluation of IoT FA based on common methodologies and KPIs ("Evaluation Workshop). The workshop was a common event where the IoT LSPs have discussed the most recent progress regarding the definition, operationalization and applicability of a set of KPIs to be applied to the whole of the IoT European Large-Scale Pilots Programme.			
Comments				

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1. EXECUTIVE SUMMARY

1.1 Publishable summary

The evaluation workshop based on common methodologies and KPIs was held on the 29th November 2018 via audio conference and has summarised the information collected via telephone conferences, questionnaires, presentations and document exchanges among the IoT European Large-Scale-Pilots Programme projects. The workshop is a follow up of the workshop held in Bilbao in June 2018 and consisted of a common event where the LSPs discussed the most recent progress regarding the definition, viability and applicability of a set of common (horizontal) KPIs that will apply to the overall European IoT Large-Scale-Pilots programme. A common methodological performance framework involving each LSP and spanning the whole of the IoT European Large-Scale Pilots Programme is needed of paramount importance to track the progress of each LSP and make sure that the overall Programme effectively tackles the challenges, and reach the objectives, set out by the European Commission in the initial call and Work Programme.

1.2 Non-publishable information

None, the document is public.

2. INTRODUCTION

2.1 Purpose and target group

This workshop was a common event where the IoT large-scale pilot projects have discussed the most recent progress regarding the definition, operationalization and applicability of a set of KPIs to be applied to the whole of the IoT European Large-Scale Pilots Programme.

2.2 Contributions of partners

IDC contributed to the organization of the event, several preparatory calls and presentations prior to the event, the content of the document, and the presentations during the event.
SINTEF has contributed to the organization of the event, the discussion and the presentation during the event.
ATOS has contributed to the organization of the event, the preparation of the online survey and the presentation during the event.
IDATE has contributed to the discussion and the presentation during the event.

2.3 Relations to other activities in the project

This event has been organized within the framework of activities of CREATE-IoT WP01 (Coordination and Support to the IoT Focus Areas). It has also benefited from contributions stemming from on-going activities of CREATE-IoT WP02 (IoT Large-Scale Pilots Ecosystems Arena for Sharing Common Approaches), the individual efforts of each IoT LSP and the IoT Activity Group AG01 (IoT Focus Area sustainability).

3. WORKSHOP SUMMARY

This section presents a short summary of the IoT Evaluation Workshop based on common methodologies and KPIs that was held on the 29th November 2018. The slides of the presentations, with all the details, are available in the e-Room of CREATE-IoT and of the IoT European Large-Scale Pilots Programme.

3.1 Objectives and Format

The IoT Evaluation Workshop represented the endpoint of a collaborative and iterative process devoted to the identification, operationalization and selection of a series of KPIs to measure the LSPs contribution and impact on the IoT European Large-Scale Pilots Programme and guide the LSPs towards their specific objectives, while making sure that the overall Programme effectively tackles the challenges and reach the objectives set out by the European Commission in the initial call and Work Programme.

The overall objective of the Workshop was to:

- Present the shared set of common methodologies and KPIs;
- Collect the necessary feedback from all the interested parties (the LSPs in the first place but also the European Commission and other relevant stakeholders of the IoT European Large-Scale Pilots Programme);
- Introduce the necessary corrective measures and improvements;
- Validate the final methodological framework and the final set of KPIs in view of its actual implementations in the course of the remainder of the projects' lifetime.

The ultimate goal of the workshop was therefore to trim down the initial list of KPIs as devised by the individual large-scale pilot projects in their deliverables and by CREATE-IoT in D01.04 and D02.03 and obtain a short, manageable, actionable list of a select number of indicators that will be fully shared throughout the whole Programme and to which all the Programme's participants can commit and feel comfortable with.

The workshop took place virtually to minimise participants' logistical and travel costs and ensure the participation of all relevant stakeholders in a flexible way. It involved both key stakeholders from within the CREATE-IoT project and the IoT European Large-Scale Pilots Programme as well as from the larger European IoT ecosystem. The European Commission was also involved and actively participated in the discussion and in the facilitation of the workshop's results.

The workshop's organization and implementation consisted of two main parts:

- The first part was devoted to a key-note presentation outlining the most significant findings of CREATE-IoT in terms of common methodologies and KPIs. The Key-note presentation was delivered by CREATE-IoT partners having directly worked on common methodologies and KPIs under WP01, Task 01.02 ("Common Methodologies and KPIs") and WP02 Task 02.02 ("Validation Methodologies, best practices and business models").
- The second part focused on the IoT European Large-Scale Pilots Programme as whole with the aim to discuss, validate and extract those KPIs that can be of help for the overall Programme and for the European Commission to measure and assess the impact of the whole project and programme in the light not only of the large-scale pilot projects-specific needs and/or the IoT Focus Area's needs, but also with respect to the impact vis-à-vis the overall Work Programme.

The workshop was preceded and followed by an online survey established by CREATE-IoT. The survey aimed at capturing initial food for thoughts and additional, detailed feedback to complement the discussions carried out during the workshop and better frame the next steps.

3.2 The Process

3.2.1 The initial list of KPIs

The starting point of the identification of common methodologies and KPIs for the overall IoT European Large-Scale Pilots Programme was the initial list of KPIs presented in D01.04 (Common methodology and KPIs for design, testing and validation). The list presented a comprehensive set of KPIs organized along a top-down theoretical framework consisting of three distinct levels.

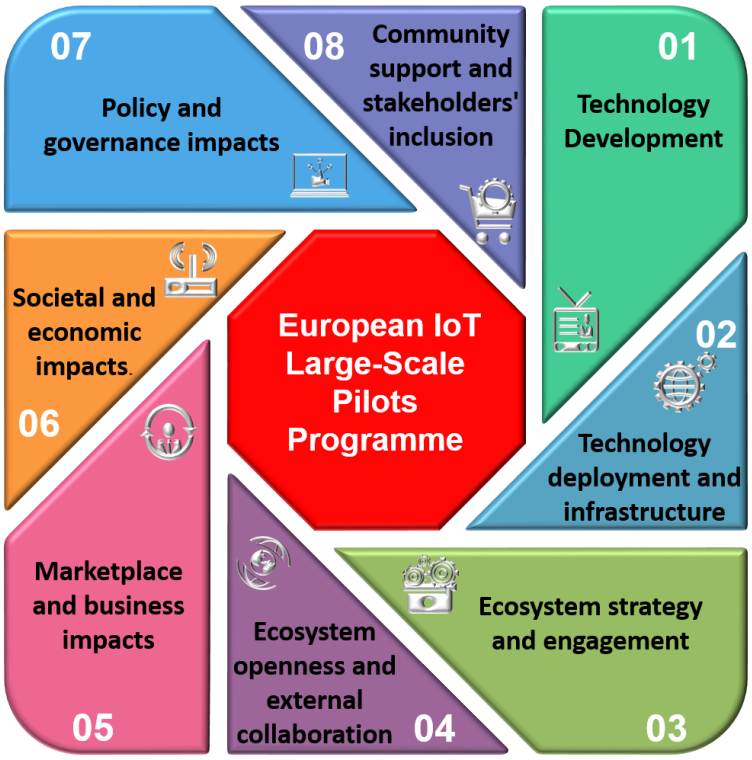


Figure 1. The Cornerstone: Eight KPIs Dimensions identified in D01.04

- A first level outlining a series of "dimensions" identifying "where" the impacts are going to exert their effects;
- A second level with number of "fields", that is a series of more specific and circumscribed sub-areas assign to each dimension to further narrow down, and better delimit, the impact spheres;
- A third level of specific, measurable metrics associated to each field – the actual KPIs.

Figure 1 above presents a graphical representation of the eight dimensions, the first level of the common methodological framework, identified in D01.04. The eight dimensions are:

- **Dimension 1**: Technology development measuring the type of support and the effects generated by the IoT European Large Large-Scale Pilots Programme on ICT vendor and suppliers of IoT technology.
- **Dimension 2**: Technology deployment and infrastructure measuring the degree of adoption, integration and performance of IoT technology across the LSPs and the whole Programme.

- **Dimension 3**: Ecosystem strategy and engagement measuring the extent to which an ecosystem strategy is in place and how well it is followed by the LSPs.
- **Dimension 4**: Ecosystem Openness and External Collaboration measuring the degree of openness and accessibility of the LSPs ecosystem for third parties outside the Programme.
- **Dimension 5**: Marketplace and business impacts measuring the LSPs' readiness for business transactions in terms of business effectiveness but also in terms of security and trust.
- **Dimension 6**: Societal and economic impacts measuring the LSPs' societal and economic impacts in the short and long-term.
- **Dimension 7**: Policy and governance impacts measuring the LSPs impact to the existing national and European policy issues related to IoT
- **Dimension 8**: Community support and stakeholders' inclusion measuring how LSPs demonstrations are going to be actually adopted by the community in the long run.

For each of the above-listed dimensions, a number of second-level "fields" were identified and, to each field, a 3rd-level KPI list was assigned. A graphical representation of dimensions, fields and KPIs is offered in Figure 2 below.

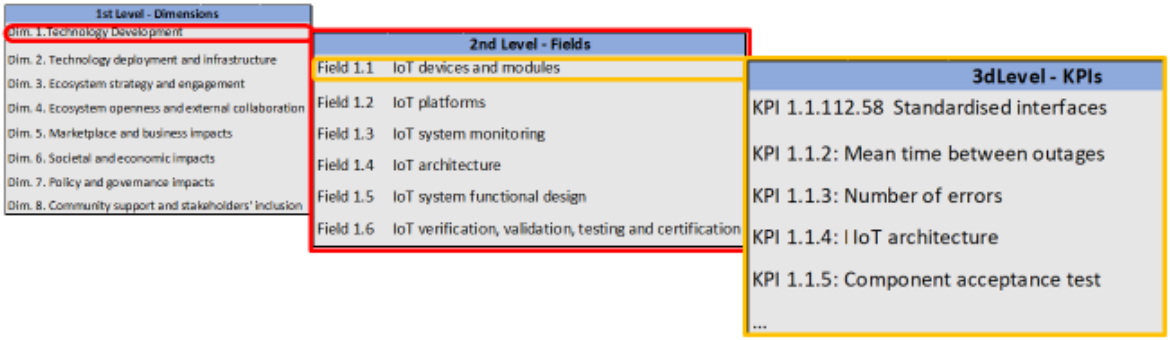


Figure 2. The hierarchical structure of dimensions, fields and KPIs

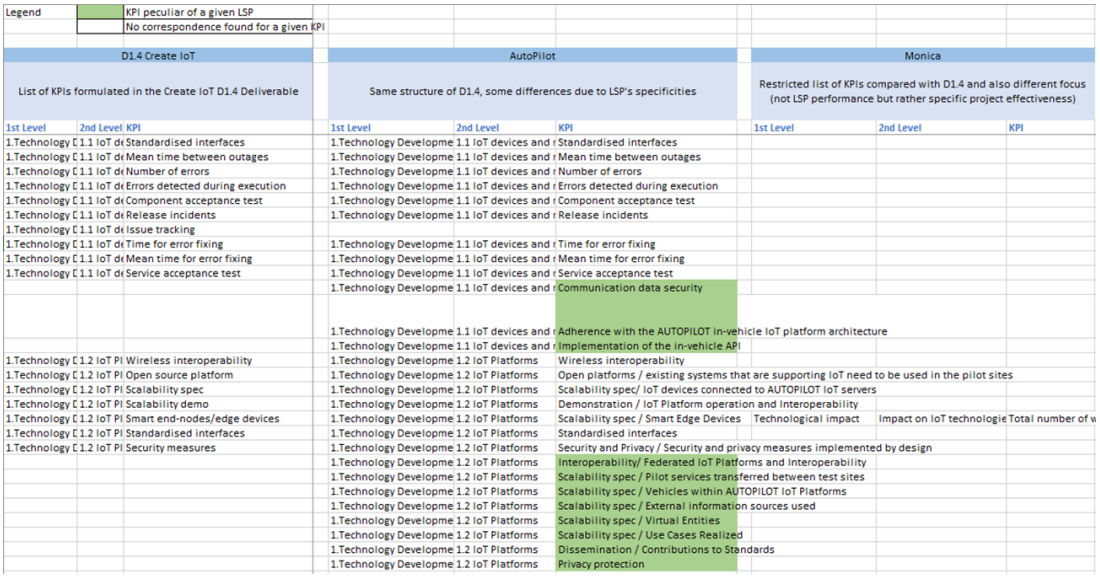
The third level consisted in the actual KPIs, which were identified through an iterative process in collaboration with the IoT European Large Large-Scale Pilots Programme projects.

3.2.2 The Interaction with the LSPs

The first step of interaction consisted in contacting each LSP and obtain their existing list of KPIs as designed and devised by their own DoW and subsequent modifications. Upon receipt of the LSPs KPIs lists, a series of individual calls between CREATE-IoT and each IoT European Large Large-Scale Pilots Programme project were organized to discuss the list and request clarifications, where necessary.

- The KPIs lists received from the IoT European Large Large-Scale Pilots Programme projects were carefully checked for consistency at individual level (i.e. for each LSP), at Programme level (i.e. across the five LSPs) and were thoroughly compared with the initial list of KPIs presented by CREATE-IoT in D01.04.
- This exercise let to an in-depth and systematic comparison of all the KPIs available at a specific point in time and provided a first, comprehensive overview of all the indicators designed at project and programme level.

The results were summarized in an Excel file that was circulated to all IoT European Large Large-Scale Pilots Programme projects for further checking and validation. The Excel file had the following form:



Legend		KPI peculiar of a given LSP
		No correspondence found for a given KPI

D1.4 Create IoT			AutoPilot			Monica		
List of KPIs formulated in the Create IoT D1.4 Deliverable			Same structure of D1.4, some differences due to LSP's specificities			Restricted list of KPIs compared with D1.4 and also different focus (not LSP performance but rather specific project effectiveness)		
1st Level	2nd Level	KPI	1st Level	2nd Level	KPI	1st Level	2nd Level	KPI
1.Technology D	1.1 IoT de	Standardised interfaces	1.Technology Developme	1.1 IoT devices and r	Standardised interfaces			
1.Technology D	1.1 IoT de	Mean time between outages	1.Technology Developme	1.1 IoT devices and r	Mean time between outages			
1.Technology D	1.1 IoT de	Number of errors	1.Technology Developme	1.1 IoT devices and r	Number of errors			
1.Technology D	1.1 IoT de	Errors detected during execution	1.Technology Developme	1.1 IoT devices and r	Errors detected during execution			
1.Technology D	1.1 IoT de	Component acceptance test	1.Technology Developme	1.1 IoT devices and r	Component acceptance test			
1.Technology D	1.1 IoT de	Release incidents	1.Technology Developme	1.1 IoT devices and r	Release incidents			
1.Technology D	1.1 IoT de	Issue tracking						
1.Technology D	1.1 IoT de	Time for error fixing	1.Technology Developme	1.1 IoT devices and r	Time for error fixing			
1.Technology D	1.1 IoT de	Mean time for error fixing	1.Technology Developme	1.1 IoT devices and r	Mean time for error fixing			
1.Technology D	1.1 IoT de	Service acceptance test	1.Technology Developme	1.1 IoT devices and r	Service acceptance test			
			1.Technology Developme	1.1 IoT devices and r	Communication data security			
			1.Technology Developme	1.1 IoT devices and r	Adherence with the AUTOPILOT in-vehicle IoT platform architecture			
			1.Technology Developme	1.1 IoT devices and r	Implementation of the in-vehicle API			
1.Technology D	1.2 IoT Pl	Wireless interoperability	1.Technology Developme	1.2 IoT Platforms	Wireless interoperability			
1.Technology D	1.2 IoT Pl	Open source platform	1.Technology Developme	1.2 IoT Platforms	Open platforms / existing systems that are supporting IoT need to be used in the pilot sites			
1.Technology D	1.2 IoT Pl	Scalability spec	1.Technology Developme	1.2 IoT Platforms	Scalability spec/ IoT devices connected to AUTOPILOT IoT servers			
1.Technology D	1.2 IoT Pl	Scalability demo	1.Technology Developme	1.2 IoT Platforms	Demonstration / IoT Platform operation and Interoperability			
1.Technology D	1.2 IoT Pl	Smart end-nodes/edge devices	1.Technology Developme	1.2 IoT Platforms	Scalability spec / Smart Edge Devices	Technological impact	Impact on IoT technologie	Total number of w
1.Technology D	1.2 IoT Pl	Standardised interfaces	1.Technology Developme	1.2 IoT Platforms	Standardised interfaces			
1.Technology D	1.2 IoT Pl	Security measures	1.Technology Developme	1.2 IoT Platforms	Security and Privacy / Security and privacy measures implemented by design			
			1.Technology Developme	1.2 IoT Platforms	Interoperability/ Federated IoT Platforms and Interoperability			
			1.Technology Developme	1.2 IoT Platforms	Scalability spec / Pilot services transferred between test sites			
			1.Technology Developme	1.2 IoT Platforms	Scalability spec / Vehicles within AUTOPILOT IoT Platforms			
			1.Technology Developme	1.2 IoT Platforms	Scalability spec / External information sources used			
			1.Technology Developme	1.2 IoT Platforms	Scalability spec / Virtual Entities			
			1.Technology Developme	1.2 IoT Platforms	Scalability spec / Use Cases Realized			
			1.Technology Developme	1.2 IoT Platforms	Dissemination / Contributions to Standards			
			1.Technology Developme	1.2 IoT Platforms	Privacy protection			

Figure 3. Comparison between CREATE-IoT KPIs list and each LSPs KPIs list

The second step of interactions took place in April and early May 2018: CREATE-IoT contacted and carried out a series of one-to-one calls and in-depth interviews with:

- MONICA, on 24th April 2018
- IoF2020, on 26th April 2018
- ACTIVAGE, on 27th April 2018
- SYNCHRONICITY, on 4th May 2018.
- AUTOPILOT, on June 5th, 2018.

Each interview with the IoT European Large Large-Scale Pilots Programme projects lasted at least one hour and was based on a detailed questionnaire. The questionnaire was structured in a way to capture the latest developments in the update of the KPIs list by each LSPs with the aim to:

- Get a better understanding of how each IoT European Large Large-Scale Pilots Programme project handles the performance evaluation and the impact of the project vis-à-vis the overall programme and the wider ecosystem in Europe;
- Identify potential points of contact and exchange between the CREATE-IoT's general methodological KPIs framework and the KPIs devised by the LSPs in order to finalize the general framework and make it beneficial for the LSPs and the overall Programme.

Finally, all LSPs met in person at the IoT Week 2018 in Bilbao in early June 2018 to provide further update on the KPI development status. All aforementioned outcomes and analysis were disclosed and presented to all IoT European Large Large-Scale Pilots Programme projects, together with a first proposal of common KPI categories and metrics and explained in detail in deliverable D02.03.

3.2.3 The Comparative Analysis and the new List of Domains

The first draft proposal of common KPIs, including a detailed description and metrics, was further analysed by CREATE-IoT restricting the number of KPIs to be measured and particularizing them to the domain area they are covering. To further strengthen the analysis, and make sure that all initial IoT European Large Large-Scale Pilots Programme projects interests are covered by at least one domain, a further merge of the initial 8 domains was adopted leaving to the following, final list of domains:

Table 1: Refined list of KPI dimensions.

No	Initial domain	New proposal of KPI domains
1	Technology development	IoT Technology and standards validation, up-scaling, replicability and sustainability
2	Technology deployment and infrastructure	
3	Marketplace and business impacts	Business opportunities, economic, environmental and societal impacts
4	Societal and economic impacts	
5	Ecosystem strategy and engagement	Ecosystem openness, development and value chain actors' involvement
6	Ecosystem openness and external collaboration	
7	Policy and governance impacts	General acceptability, user validation, perceived value and benefits
8	Community support and stakeholders' inclusion	

Each domain was assigned a long list of KPIs and their relevance was tested with each IoT European Large Large-Scale Pilots Programme project through an online survey.

Table 2. KPI shortlist map with IoT European Large Large-Scale Pilots Programme impacts and IoT large-scale pilot projects' interests.

KPI Name	Programme Impact	SYNCHRONICITY	AUTOPILOT	ACTIVAGE	IoF2020	MONICA
IoT Technology and standards validation, up-scaling, replicability and sustainability						
Standardised interfaces	1,4,7					
Open source platform	1,6,7					
Privacy and security aspects	3,7					
Market-ready IoT solutions	3,5,6					
Number of open data sets	1,6,7					
Business opportunities, economic, environmental and societal impacts						
User impact	2,3,6					
Social	3,4,5					
Ecosystem openness, development and value chain actors involvement						
Interoperability	3,4,6,7					
Discovery	3					
Collaboration strategy	1,2,3,4					
Established demonstration site	1,2,5					
General acceptability, user validation, perceived value and benefits						
Active users	3					
User involvement	3					

These metrics are currently aligned with all the involved axis in this analysis, namely:

- CREATE-IoT view on horizontally measurable IoT areas
- IoT European Large Large-Scale Pilots Programme projects particular needs with respect to their domain specific constraints
- EC expectative on impact to be measured by pilots

The explicit mapping of all these three axes is explained in the table below. Per each metric on the analysis, the correspondence with the programme impacts and the relevance to each IoT European Large Large-Scale Pilots Programme project is described.

Colouring codes indicate (**GREEN**) those IoT European Large Large-Scale Pilots Programme projects explicitly agreeing with the metric (or proposing it), (**RED**) LSPs reluctant to include the metric in the evaluation process initially and (**BLANK**) metric not yet evaluated for IoT European Large Large-Scale Pilots Programme projects, as it is introduced in this report for next period discussion.

3.3 The Workshop's Discussions

Armed with above-mentioned analysis, CREATE-IoT proceeded with the organization of the workshop involving all LSPs and collecting their feedback on which KPI to select to address the needs of the IoT European Large-Scale Pilots Programme, as well as the individual requirements of each IoT European Large Large-Scale Pilots Programme project.

3.3.1 The Validation of Domain I - IoT Technology and standards validation, up-scaling, replicability and sustainability

For the first domain (IoT Technology and Standard), CREATE-IoT developed the following KPIs:

KPI Name	Definition	Proposed Metrics	H. Impact areas	Targeted impacts by KPI
Standardised interfaces	Number of standard interfaces for easy implementation.	Number of standard interfaces per component per pilot	1-4	1 Significant contribution to IoT standards
	Counting of standards developed or applied in LSP to raise machine interoperability	Number of organizations Count companies by standardization bodies like CEMA, AIOTI or ETSI	1-4	2 Implementation of IoT machine interoperability through standards
Open platforms	IoT Open source standards & platforms supported by LSP	Percentage of IoT open standards and platforms implemented/used against the total number of standards implemented (?) (or simply open platforms number?)	4	3 Implementation of open platforms contributing to EU IoT ecosystems
Privacy & security aspects	Check of GDPR compliance by new IoT solutions	Likert scale of overall GDPR compliance of IoT solutions per pilot/total project (e.g.complete/ mixed/ acceptable/ low / inexistent)	1	4 Development of GDPR-compliant solutions ensuring privacy and security
Number of market-ready IoT solutions	The number of products or services developed by the LSP ready for commercial launch	Number of products/services by pilot / Total LSP	6	5 Creation of new IoT business opportunities through market-ready solutions
Number of open data sets	Open data used/ provided by the LSPs	Number of open data sets in use by pilot / total project	7	6 Development of sustainable European IoT ecosystem through the provision of open data sets

The discussion unveiled a general consensus on the open platforms KPIs (although with the need to change the metrics with a ration of open to proprietary platforms), on the privacy and security aspects KPIs and the market ready solutions KPIs and on the open data sets KPIs. As for the standard interfaces, the discussion focused on the significance and pertinence of measuring the actual number of standard interfaces and will require additional one-to-one discussions with the LSP to come to a final consensus.

Subsequent feedback obtained separately by AUTOPILOT points to the relevance of the whole domain I, whose actual denomination (and possibly some specific KPIs) will have to be renamed and readjusted to capture the LSPs' nature and role. In particular, the contribution to IoT standards and the implementation to machine interoperability as well as the way to measure the creation of new IoT-related business opportunities and the development of open data sets will have to be discussed on a one-to-one basis in January 2019.

3.3.2 The Validation of Domain II - Domain II - Business opportunities and social impacts

For the second domain (Business opportunities and social impacts), the following KPIs were submitted to the LSPs.

KPI Name	Definition	Proposed Metrics	Horizontal Impact areas	Targeted impacts by KPI
Business opportunities by stakeholder segment	Ability for LSP's to transform the market creating sustainable business models	Number of validated and sustainable business models.	2	Exploration and validation of new industry and business processes and innovative business models validated in the context of the pilots.
	Business models replicability/scalability	Number of successful business models replicated in other verticals beyond initial application	2	Exploration and validation of new industry and business processes and innovative business models validated in the context of the pilots.
Social Impact	LSPs' ability to improve end-users' quality of life, working conditions, health, lifestyle, etc Or/and jobs creation.	Improved quality of life for end users	5	Improvement of citizens' quality of life, in the public and private spheres, in terms of autonomy, convenience and comfort, participatory approaches, health and lifestyle, and access to services.

The LSPs expressed general consensus on the Business Opportunities KPIs with the need to further specify an individual indicator to better capture replicability and scalability. For the social impacts, the KPI proposed by CREATE-IoT was deemed adequate by the involved LSPs. With specific reference to the replicability and scalability of business models, as well as with regards to the measurability of social impacts and in particular to the perceived and actual safety for users, further discussion is needed with AUTOPILOT and with the other IoT European Large Large-Scale Pilots Programme projects.

3.3.3 The Validation of Domain III - Ecosystem openness, development and value chain actors' involvement

The third domain focused on the ecosystem and CREATE-IoT proposed the following KPIs:

KPI Name	Definition	Proposed Metrics	H. impact areas	Targeted impacts by KPI
Ecosystem openness	Level of interoperability with third parties	Combined indicator of the number of open APIs and Devices supported by pilot / total project	7	1 Demonstrating the feasibility and viability of IoT ecosystems based on interoperable solutions
Ecosystem development	Level of Involvement of value chain stakeholders	Number of ecosystem partners involved by pilot/ total per LSP	7	2 Promoting the ecosystem development by involving all stakeholders typologies in the value chains
SMEs inclusion	Ability to involve SMEs	N. of SMEs involved by pilot/total per LSP / and as % of total partners	7, 6	3 Promoting the ecosystem inclusiveness by demonstrating the viability of SMEs inclusion
Ecosystem promotion	Extension of demonstration sites	N. of pilot sites with implemented IoT solution open to visitors	7, 6	4 Promoting the ecosystem development by demonstrating IoT technology solutions to stakeholders

The KPIs outlined under this domain did not pose major challenges for the participating LSPs and were all accepted as suitable to be measured at the level of the overall IoT European Large-Scale Pilots Programme. However, further discussion is needed to better define how to measure the level of interoperability with third parties and on how to measure the ecosystem promotion to visitors and third parties.

Discussions with LSPs are also needed to better define ecosystem openness to avoid possible overlapping redundancy with the concept of sustainability covered in Domain I and with respect to the feasibility and viability of IoT ecosystems based on interoperable solutions.

3.3.4 The Validation of Domain IV - User acceptance and accessibility

For the fourth domain (User acceptance and accessibility), the workshop's participants discussed the suitability and applicability of the following indicators:

KPI Name	Definition	Proposed Metrics	Horizontal Impact areas	Targeted impacts by KPI
User acceptance	Acceptability of data protection, privacy and trust scheme	Likert scale for user acceptance	3	User acceptance validation addressing privacy, security, vulnerability, liability, identification of user needs, concerns and expectations of the IoT solutions
	User satisfaction	Likert scale for user satisfaction	3	User acceptance validation addressing privacy, security, vulnerability, liability, identification of user needs, concerns and expectations of the IoT solutions
User Accessibility	Compliance of interface with the W3C Content Accessibility Guidelines (WCAG 2.1)	Likert scale on level of compliance (complete/ mixed/ low / inexistent)	3	User acceptance validation addressing privacy, security, vulnerability, liability, identification of user needs, concerns and expectations of the IoT solutions

The KPIs presented under Domain IV will be measured though the metrics proposed by CREATE-IoT. Further clarification however is requested to define compliance of interface with the W3C Content Accessibility Guidelines and to determine how to successfully measure user acceptance in some specific focus areas such as the automated driving domain. Additional discussions will therefore be hold in January 2019.

4. CONCLUSIONS

4.1 Summary of the Discussion

The Evaluation Workshop on Common Methodologies and KPIs, revealed a high level of interaction and cooperation among the LSPs and between the LSPs and CREATE-IoT.

It allowed to thoroughly discuss, describe, trim down and select a viable number of indicators which are going to be shared by all LSPs and help the European Commission to monitor the progress towards the achievement of the IoT European Large-Scale Pilots Programme objectives. The workshop's discussions also highlighted the convergence of interests between the LSPs, CREATE-IoT and the European Commission. As repeatedly stated by the latter, the mapping of the impacts at the overall programme level will have to be based on criteria already incorporated by each LSP so that common indicators can be identified, and aggregated impacts successfully measured.

4.2 Next Steps

The most concrete outcome of the workshop was the confirmation by the participants of the overall validity of the common methodological approach for the impact measurement of the individual IoT large-scale pilot projects and the IoT European Large-Scale Pilots Programme as a whole.

On this basis, CREATE-IoT will pursue the following activities within the framework of WP01, Task 01.02 – Common Methodologies and KPIs – and of WP02, Task 02.02 – Validation methodologies, best practices, and business models.

- Consolidation of survey results and integration with the IoT European Large-Scale Pilots Programme projects' feedback already provided during the workshop;
- Series of one-to-one telephone calls/interviews with individual IoT European Large-Scale Pilots Programme projects to clarify possible doubts and obtain complementing input on the changes to introduce to the latest version of the KPI list.
- Consolidate and finalize the KPI list, share it among the LSPs and the European Commission and obtain formal approval for the actual implementation of the list.

The above-mentioned actions will take place between the end of 2018 and the first two months of 2019. Upon this, CREATE-IoT will:

- Coordinate with the IoT European Large-Scale Pilots Programme projects to proceed with the measurement of the KPIs as agreed and monitor the actual measurement of the KPIs by each IoT European Large-Scale Pilots Programme project until the end of 2019;
- Report the results of the KPIs measurement highlighting the impact generated by the IoT European Large-Scale Pilots Programme projects on the overall programme;
- Further communicating and disseminating the impact results through CREATE-IoT's communication and dissemination activities under the project's WP07.