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IntelliIoT

Deliverable D6.3 Interim report on exploitation & impact creation (M18)

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EXECUTIVE SUMMARY

This deliverable, being the first version of the interim report on exploitation & impact creation, introduces the activities of Task 6.3 in the IntelloT project until M18. During this period the exploitation framework and processes for impact creation were setup and stakeholder engagement was started to organize the first iteration of exploitation workshops in the duration of the project. It is important to mention that this task will report every six months from now an updated version of the deliverable. The main activity until M18 was carrying out the workshops. Future activities are described in Chapter 2 and in the Outlook Section of this document such as a summary of industrial and scientific dissemination activities and exploitation plans for the project results.

Briefly summarized the exploitation workshops generated the following findings. It turned out that concerning most prominent challenges the topic on data-sharing, governance and privacy issues are common for the area of manufacturing and healthcare. User centric aspects like technology training and usability were mentions for the agriculture and healthcare domain. Cost effective solutions are important in the agriculture domain when low-margin businesses are addressed.

For the topic of business model adaptation, the workshop in the agricultural domain stands out for highlighting the potential towards more novel approaches like freemium or pay-by-use models established in the B2C market. Expert feedback for the manufacturing domain suggests that innovative usage of data will drive the transform to a more service-oriented industry.

In the ongoing development and decisions concerning the projects innovation potential, the consortium will take those findings into account to consider the view of industry experts. The next actions of Task 6.3 are the collection of exploitable technologies and the development of their market potential and business models respectively.

1 INTRODUCTION

This deliverable is intended to report on exploitation and impact creation methods and strategies that the IntellioT consortium will follow, as well as the relevant activities until M18 of the project.

1.1 Overview

Chapter 1 introduces the objectives of the task and defines the scope of the work as defined in the proposal. Together with Task 6.1 the stakeholders of the project are identified and described in the presentation of results from the first iteration of exploitation workshops (performed during the first half of the project; see Chapter 3).

Chapter 2 introduces the impact creation framework used during the project. The three-pillar approach structures the different dimensions (i) results, (ii) stakeholder, and (iii) business strategy. During Task 6.3 activities, and along these pillars, different activities are performed, following the methodology presented in Section 3.2. The target of developing an exploitation plan/strategy for the outcomes and results of the project will be supported by the methods and activities described there. This document will include the individual exploitation insight for every member of the IntellioT consortium, outlining each members' organizational background, foreseen exploitable results, and individual exploitation strategy. Potential joint exploitation plans will also be included in future versions of this report.

Apart from defining the framework, Chapter 3 summarizes the first iteration of a series of exploitation workshops performed in the reporting period. The workshops were organized per use case area, since participating stakeholder were clustered by industry. The scope of the workshop was to source-in external opinions about future domain challenges and business model evolution considering emerging technologies in IoT. The most relevant findings are described, and topic cluster are listed for the two focus areas.

Finally, Chapter 4 gives an outlook on the upcoming activities in Task 6.3 which will be presented in future versions of this report.

1.2 Scope and objective of this deliverable

The purpose of deliverable D6.3 – "Interim report on exploitation & impact creation (M18)" is to define a solid exploitation strategy and plan regarding the activities that IntellioT will engage in the context of Work Package 6 to raise awareness about the project results and findings to all key stakeholders, and to ensure the exploitation and sustainability of the project after its lifetime. Said activities are aligned with Objective 6 of the project, that aims to "*Promote and exploit the IntellioT framework through contribution to standards and open source as well as by building an active IoT ecosystem supported by two Open Calls and focused dissemination and exploitation activities.*"

In this context, this deliverable presents the exploitation activities which identifies, organises, and defines the management of the promotion of the IntellioT project. It is based on the preliminary exploitation plan drafted on the project proposal and adds relevant material on the impact creation strategy followed in the project.

The deliverable objectives are to engage with relevant target stakeholder for project's exploitable results and map those outcomes with end-users and market needs as sketched in Figure 1.



Figure 1: Bidirectional dependency between projects outcome and stakeholder needs.

The implementation progress of the exploitation activities will be presented in the periodic reports of the project as described in Table 1 below.

Table 1: Summary of deliverables on Exploitation & Impact Creation

Deliverable Number	Deliverable Title	Lead	Type	Dissemination Level	Due Date
D6.3	Interim report on exploitation & impact creation	TTC	Report	Public	18
D6.6	Interim report on exploitation & impact creation	TTC	Report	Public	24
D6.7	Interim report on exploitation & impact creation	TTC	Report	Public	30
D6.8	Final report on exploitation & impact creation	TTC	Report	Public	36

The European IPR Helpdesk defines Communication as "a strategically planned process that starts at the outset of the action and continues throughout its entire lifetime, aimed at promoting the action and its results", Dissemination as "the public disclosure of the results" and Exploitation as "the utilisation of results in further research activities [...], or in developing, creating, and marketing a product or process, or in creating and providing a service, or in standardisation activities".

Following these guidelines, deliverable D6.3 and its updated versions will present the results & findings of the following activities that will be carried out within Task 6.3:

1. identify **exploitable/marketable results** in terms of software, hardware, and services,
2. analyze market opportunities and competition related to each exploitable/marketable result
3. compile a SWOT analysis for each **potential exploitation opportunity**
4. position partners and their selected products/services in relation to potential customers,
5. identify pricing in relation to continued implementation costs within a marketing and sales plan

6. describe an action plan to fulfil exploitation.

Key stakeholders of the IntelloT target audience have been grouped across the use-case domains: Agriculture, Healthcare, and Manufacturing. A more in-depth description about targeted stakeholder is given in section 2.3 of this document, as well as in Deliverable D2.1 - "Use case specification & Open Call definition (first version)" - which provided the first version of user group definitions, end-user needs, and open-call definition.

The IntelloT exploitation will be split into two paths: (i) The first path will seek to define a longer-term vision for IntelloT which partners can shape as they see fit (joint exploitation); (ii) The second path will seek to enable each partner to take the project results and exploit them to their own ends (individual exploitation).

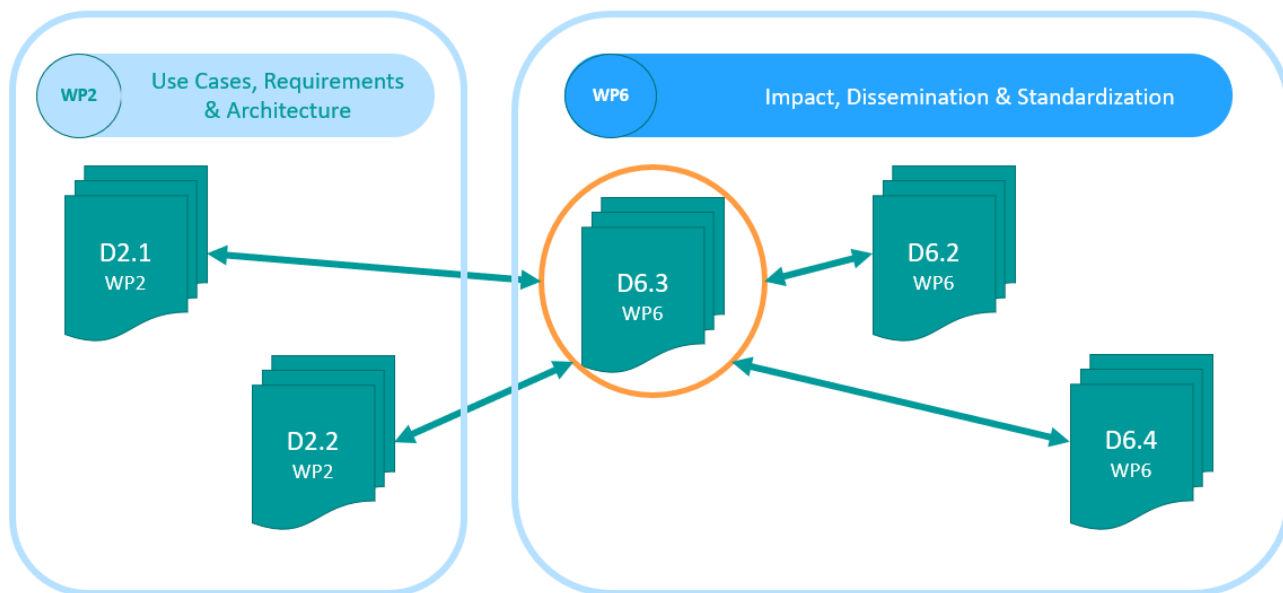
In order to define the joint exploitation, while maximising the IntelloT impact, the subsequent steps will be followed until the end of the project and updated in consecutive versions of the deliverable:

- Definition of the overall IntelloT value proposition
- Identification of potential business models
- Analysis of the possibility, likelihood, pitfalls, and benefits of each model
- Reconciliation of the model with the joint sustainability plan and individual plans
- Reconciliation of the model with the technical plan
- Definition of a business plan for the solution delivery.

1.3 Relation with other IntelloT deliverables

This document on impact creation and exploitation does not stand on its own. The report is closely related to the other documents in this project and those links are depicted in Figure 2. In the current stage of the project (M18) the major work packages related to the activities in Task 6.3 are WP2 and Tasks 6.1 and 6.4 out of WP6. In particular, **D2.1 on "Use case specification & Open Call definition"** identified end-users and target market for the individual use-cases. Here we refer to Sections 2.1.4, 2.2.4 and 2.3.4 for those end-user groups and markets for the agriculture, healthcare, and manufacturing domain. **D2.2 concerning "Technology Analysis & Requirements Specification"** reflect in Section 2.3 on the business drivers for the use-case domains.

WP6 as well contains relevant information for the topic of this document. Namely, **D6.2 on "Dissemination & ecosystem building"** describes the broader stakeholder spectrum and summarizes the outcomes for the end-user workshops held in the first phase of the project IntelloT. Furthermore, **D6.4 on "Standardization"** describes an important path on exploiting the results of the project towards a wider industrial uptake through standardization bodies and groups in Europe and beyond.



IntellioT

Figure 2: Relation of D6.3 to other project deliverables.

The next chapter describes the goals of Task 6.3 in more detail. Additionally, the framework and methodology to achieve these goals are briefly described. In addition, stakeholder categories relevant for the activities are identified and listed.

2 EXPLOITATION AND IMPACT CREATION METHODOLOGY

The following section provides an overall methodology and fundamental generic knowledge to support the exploitation of research results generated by IntellioT. It does not intend to be exhaustive: instead, there is a stronger focus on the particular exploitation paths which are a-priori more relevant for IntellioT. In fact, Exploitation work will go on along all the project duration and will be refined in further deliverables including D6.6/D.6.7 – "Interim report on exploitation & impact creation (M24/M30)" and D6.8 – "Final report on exploitation & impact creation (M36)".

Research and innovation have been placed at the centre of the Horizon Europe strategy to promote smart, sustainable, and inclusive growth. While one can debate what constitutes a healthy relation of industry and basic research, there is no doubt that a knowledge-based society prospers with the innovativeness of its engineers and the skills of its scientists. In the Horizon Europe funding program, EC puts a focus on closely linking basic research and application, and applied research with industry, SMEs, and start-ups. The outputs of EU projects, being by nature strongly research-based, are usually not ready for commercial exploitation without further work; that's why it is important to plan in advance the steps needed for making future exploitation easier.

The exploitation strategy defines application segments of the innovation, economic size of the target markets and their geographic coverage. It identifies potential users and stakeholders and sets objectives for addressing and involving them in the project. It compares their needs to the kind of problem the proposed solution solves and outlines why this solution is better than existing ones in terms of benefits to users and society at large. It talks about the knowledge (IPR) the project will generate compared to the state of the art or what is commercially available today. Finally, at the end of the project, it shall be clear which further actions shall be taken both in terms of scientific and commercial follow up. Options range from further internal research, collaborative research, internal product development, internal service creation, licensing, assignment, joint venture, to creating a spin-off, or supporting standardization activities.

2.1 Overall aim within IntellioT

Overall objectives of the exploitation task are: (i) fostering exploitation by ensuring contacts to stakeholders; (ii) identifying their needs, making sure the project outcomes provide answers to those needs; (iii) identifying the potential competitive advantage of IntellioT, and finally; (iv) developing an exploitation plan strategy that takes advantage of it.

The objective of this section is to provide an overview of the methodological approach for the development of the exploitation strategy throughout the project and to summarize the first exploitation activities that have taken place so far. It is basically the overall framework and basic tools to be used throughout the project to develop a sound exploitation plan.

2.2 Framework and Methodology

The basic framework adopted is aimed at putting in connections projects outcomes with stakeholders needs to provide the ground for the business strategy. Ensuring that project's outcomes answer specific needs of relevant stakeholders is necessary for success. Even though the methodology uses different tools or techniques to structure the information, the basic framework is built on three pillars: (i) project's outcomes; (ii) stakeholders, and; (iii) business strategy. Figure 3 depicts the pillars constituting the activities in T6.3. Results and outcomes are identified during the project as they are identified by partners due to their market potential. The stakeholder engagement started early in the project to gather end-user and future market needs and this engagement will continue during the duration of IntellioT. Finally, the third

pillar on business strategies will be defined pre-dominantly when the individual results and jointly outcomes are defined.



Figure 3: Major pillars used to exploit and create impact in IntellioT

In the following paragraphs, we introduce with some more details the methodology which is then applied to IntellioT. Important exploitation approaches and tools typically evolve from proposal to the end of the project and comprise:

- A target **Outcome Table** describes the features of the method / product / service that are the outcome of the project. Throughout the project the comparison to the state of the art or to commercial solutions shall be further refined and target values can be compared to validated results.
- A **Stakeholder Matrix** has become the standard tool for giving a comprehensive picture of the community of researchers, potential users, buyers, and influencers in an application field. On top, this information is the basis for defining target groups in dissemination and communication planning.
- **Application Fields** shall be selected based on the above performance indicators. Selection criteria need to be disclosed and discussed. It may be recommendable to focus on two or three application areas and do a rather detailed analysis there.
- **Target Market Sectors** to clarify the market to which project's results are aimed.
- **SWOT Analysis** highlighting strengths and weaknesses of the solutions produced.
- **Lean Business Canvas**, to summarize the main elements of the business strategy

Table 2 briefly summarizes the methodology followed in the above activities.

Table 2: Methodology followed in the exploitation framework.

Exploitation framework pillars	Tools	Description
Outcomes / Results (joint and individual)	Outcome Table	Identifies project’s outcomes, will evolve throughout the project.
Stakeholder	Matrix / Target Sector Analysis	Lists stakeholders and their perceived needs. Each need is matched with the outcome answering the need.
Business Strategy	Business Canvas	Leveraging also on information about market, the Canvas is used to put together the different components upon which business strategy is built.

2.3 Identified Stakeholder Groups

The IntelloT consortium identifies the following main stakeholder groups that are relevant for the exploitation of the project results (Figure 4):

- Technical & technology experts such as application developers who may build up on the IntelloT framework, technology service providers (including security specialists, ICT administrators, operators, auditors, integrators, data protection officers etc.) that can exploit IntelloT results for improving their services, as well as experts in standards development and open-source communities that we influence to integrate project results,
- Domain- and technology field experts including scientific and research organisations,
- End-user groups of the three use cases, e.g., patients, healthcare providers, farmers, agriculture OEMs, manufacturing plant operators, or machine vendors, and
- Business and policy makers working to either establish, or update and evolve upon their respective strategies.



Figure 4: Identified stakeholder groups

Chapter 3 below summarizes the results of three exploitation workshops held in the first period of Task 6.3. The workshops were conducted to source in expert views concerning the future challenges in each use case domain and their views how existing business models are expected to change due to technology changes in the field.

3 EXPLOITATION WORKSHOPS

3.1 Individual stakeholder identification process

Adopting a Design Thinking¹ approach (a human-centred approach to innovation) in identifying appropriate sample of stakeholder, we adapted a method called "People and Connection Map" originally noted as stakeholder spider-gram. The template is shown in Figure 5 and was utilized to organize individual stakeholder in the use-case areas into categories like their countries as well as their sphere of action. The individual candidates were categorized into international, national, regional/local in the first place. In addition, whenever possible the consortium tried to capture a broad variety of countries for each use case domain.

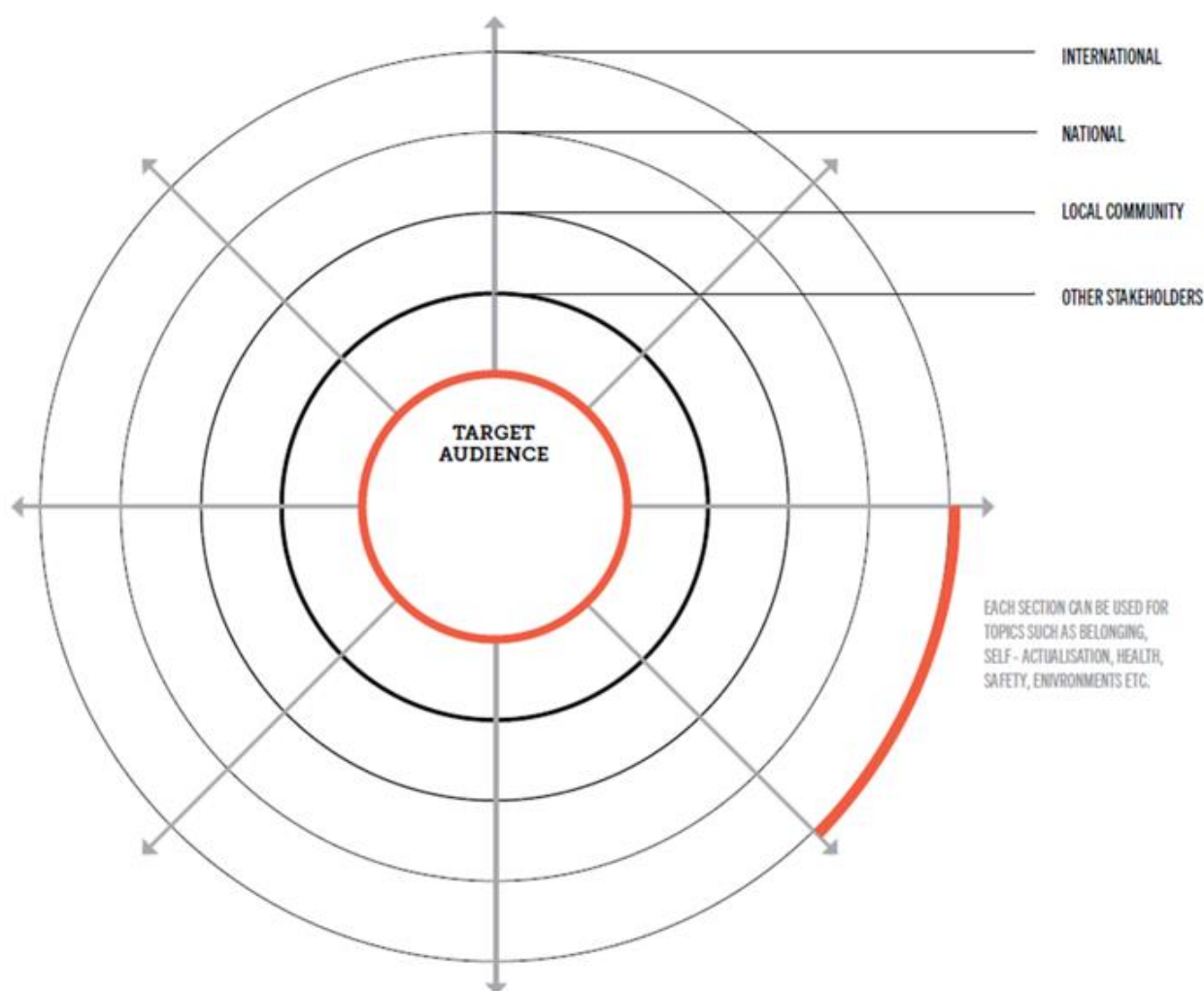


Figure 5: People and Connection Map to structure the stakeholder of IntellioT.

¹Brown, T. (2008). Design thinking. Harvard business review, 86(6), 84.

Finally, the consortium selected individual companies or institutions out of their research partner or business network, and these were invited to participate the exploitation workshops.

Task 6.3 organized and moderated three individual workshops for each use case domain in the project since the problem statement of target domain/industry differ significantly w.r.t. challenges and the flexibility concerning business model development. Table 3 summarizes the appointed dates of the three workshops as well as the number of invitations the consortium sent out to individual experts.

Table 3: Exploitation Workshops - Meeting dates & invitations

Workshop Focus	Date	Number of Invitations sent
UC1 - Agriculture	22. March 2022	14
UC2 - Healthcare	13. December 2021	11
UC3 - Manufacturing	15. December 2021	21

3.2 Design Thinking Methods

During the workshop we utilized methods out of the Design Thinking toolbox to structure the process and discussions. The workshop itself was scheduled for three hours and organized as virtual meeting due to COVID measures and to keep the burden of participation as low as possible.

Table 4 shows the structure of the agenda setup for the workshops highlighting (in bold) the major topics and discussion points during the meeting.

Table 4: Agenda of the Exploitation Workshops

<i>Schedule</i>	<i>Agenda Topic</i>
14:00 - 14:15	Welcome & Introduction
14:15 - 14:30	Round-Call
14:30 - 14:50	Setting the Stage (Workshop Goals, Scope)
14:50 - 15:20	Market Needs - Pain Points & Future Challenges
15:20 - 15:35	Coffee Break
15:35 - 16:00	Discussion on Market Needs / Insights
16:00 - 16:30	Existing & Future Business Models w.r.t. Domain Challenges
16:30 - 16:50	Discussion on Business Model Innovation / Insights
16:50 - 17:00	Wrap-Up

During the workshop two brainstorming techniques were utilized to foster the expert’s discussion and statement. Firstly, towards pain points and future challenges the participants were asked to name topics out of their domain, which they judge as most important points to mention. Later during the discussion, those topics, and statements were refined and furthermore clustered to group related ideas.

Secondly, towards business models and their potential evolution we used a creative brainstorming technique called SCAMPER², that helps teams explore ideas from different perspectives. The technique an easy and direct method for creative thinking and problem-solving through several techniques or question types; (S) substitute, (C) combine, (A) adapt, (M) modify, (P) put to another use, (E) eliminate and (R) reverse. These types can be used to explore problems from seven perspectives. Here we adapted the SCAMPER technique to discuss the potential changes on established and existing business models in the relevant market of healthcare, manufacturing, and agriculture.

Since the workshop was organized as a virtual meeting, we could use online collaboration tools, namely MIRO, to let the experts work on the prepared boards to collect their thoughts. In the next section the outcomes of this process are shown, and the following figures depict the results in addition to a summary of the discussions in each of the domain workshops.

3.3 Results and Findings

This section summarizes the major results and findings of the workshops most relevant for the developments in the project IntelloT. In general, since the consortium targeted a bottom-up approach then it comes to challenges, during the introduction at the beginning, the individual use-cases were presented only very briefly. This high-level introduction should avoid a later biased discussion focused on the presentation of the use-cases itself. As a compromise we accepted the outcome to be more broadly with individual statements outside the scope of the project IntelloT.

Since the deliverable is designed to be public, the transcripts are summarized, and a condensed presentation of the results was compiled. Moreover, individuals who participated will not made public to respect their privacy. To differentiate the statements and put them into scope, we will refer to the affiliation of the participant in the remaining part of Chapter 3.

3.3.1 USE-CASE DOMAIN AGRICULTURE

The selected stakeholders in the area of agriculture comprise eight **international** companies and associations, four **national** companies out of three different countries and two **regional or local** stakeholder including one farmer that already participated the end-user workshop. Figure 6 illustrates the stakeholder map and the companies listed were identified as most appropriate target group for the workshop.

² Serrat, O. (2017). The SCAMPER technique. In Knowledge Solutions (pp. 311-314). Springer, Singapore.

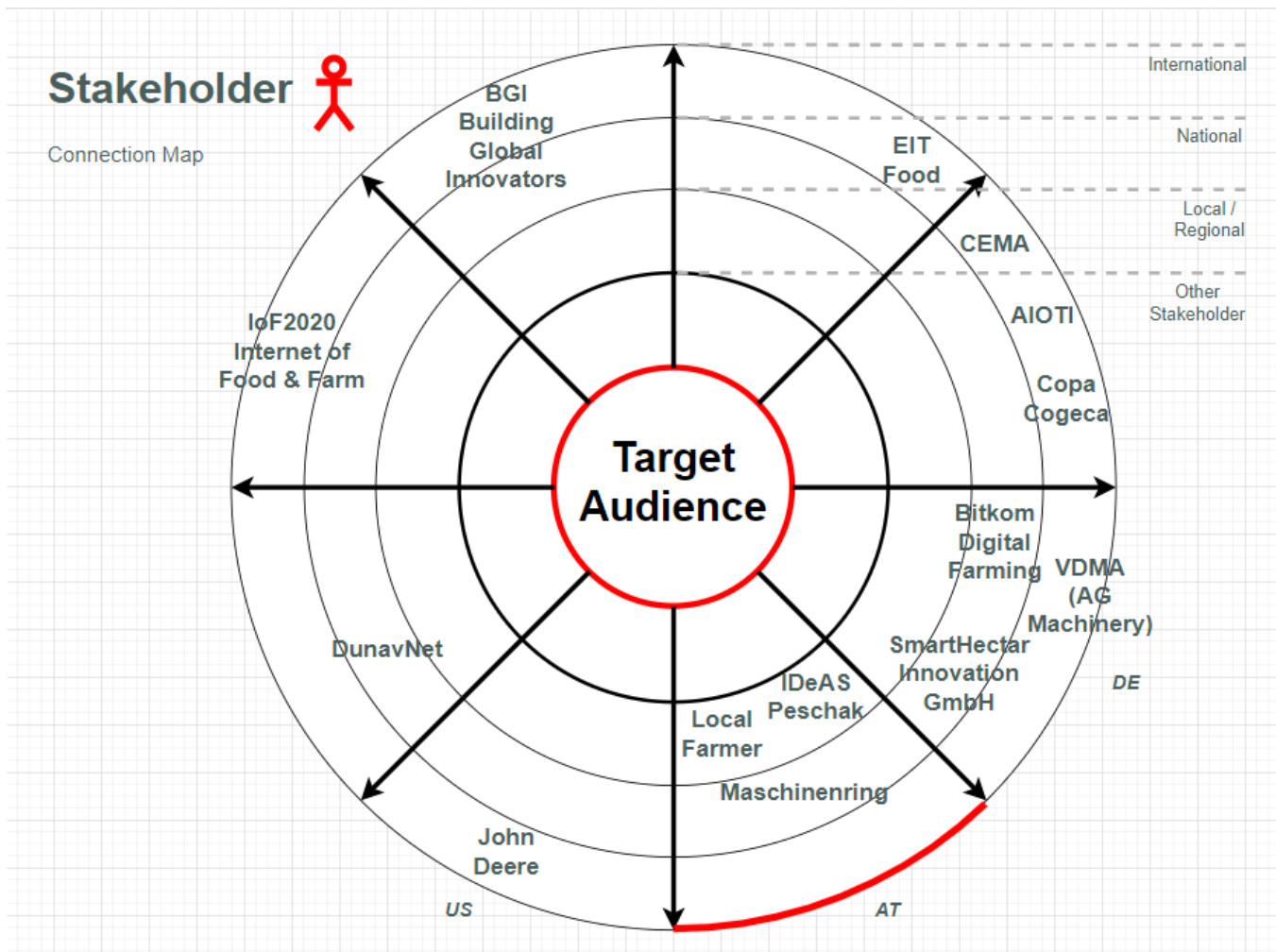


Figure 6: Stakeholder / Target Audience Exploitation WS Agriculture

Pain Points & Future Challenges:

The outcomes of brainstorming on pain point and future challenges in the field of agriculture can be clustered into the following topics:

- Costs of technologies and return on investment
- Technology adoption on two main dimensions namely human and equipment
- Data semantics and capturing expert knowledge
- Supporting the user due to appropriate GUI and user-friendly design
- Selection of appropriate level of assistance / granularity of technical solution

Figure 8 depicts the Miro³ board generated during the collaborative session in the first part of the workshop, which comprises the thoughts of the participants depicted in the form of virtual notes. During the

³ <https://miro.com/>
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discussions that followed, the items were explained in the group and where properly clustered into the beforementioned areas.

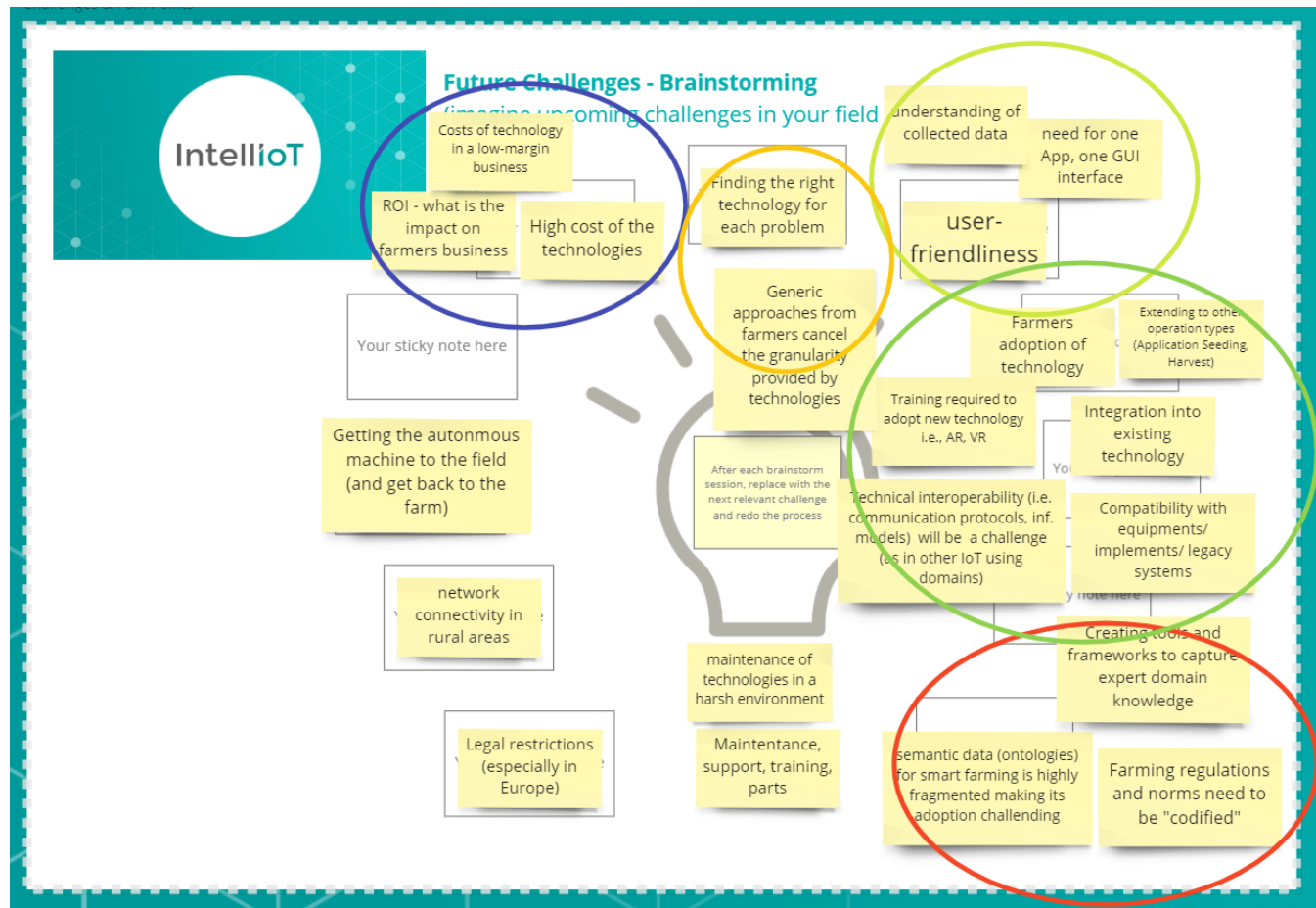


Figure 7: Identified pain points and future challenges for the agriculture domain.

Out of the extensive list and statements during the discussion, the consortium selected the following pain points or problems as most interesting for the future technical development in IntellioT:

- Foster adoption of technology by farmer via easy integration/compatibility with existing technologies & appropriate technology trainings provided by OEMs
- Cost of technology in low-margin business – considering return of investment (ROI)
- Increased flexibility through automation – harvesting window, less error prone processes
- User-friendliness of solutions and easy digestible data insights

The second part of the workshop was focused on a discussion on existing and future business models. Here the experts were asked to brainstorm on their expectation of business model innovations in the face of technology advances and upcoming innovations in the agricultural industry.

Future Business Models / Business Model Innovation:

Figure 8 depicts the findings following the SCAMPER method during the discussion. The directions around established business models in the industry characterize the type of change.

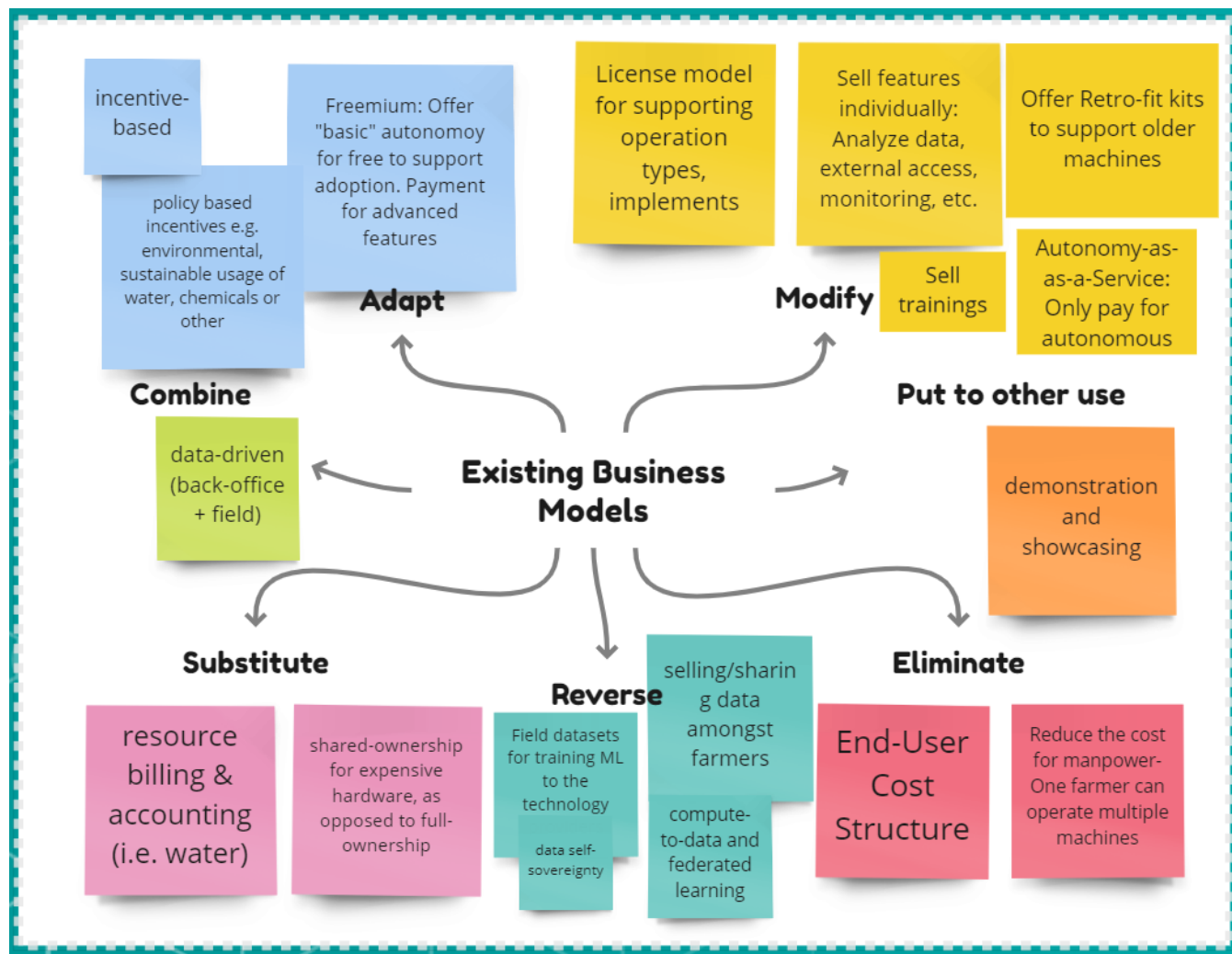


Figure 8: Miro Board on business model evaluation for the agricultural domain.

For example, in the upper left corner modifications of existing models are shown. A licensing model for a novel implement (e.g., for harvesting crops) could extend existing revenue streams for OEMs like John Deere or companies selling accessory equipment to farmers. Another possibility would be to offer pay-per-use models for specific autonomous functionalities to increase the flexibility of end-users concerning their operational costs.

From the discussion and expert statements during the second part of the workshop the consortium selected the following relevant for upcoming activities on exploiting results of the project:

- Autonomy as a Service Model
- Licence Model for specific operation types/services
- Offer "basic" autonomy for free to support adoption, payment for advanced features
- Policy based incentives e.g., environmental, sustainable usage of water, chemicals

These potential business model evolutions will be taken into account in the process of developing the exploitation plan later in the project.

3.3.2 USE-CASE DOMAIN HEALTHCARE

The selected stakeholders in the area of healthcare comprised seven **international** companies and associations, three **national** companies each from a different country and one **regional** innovation hub situated in Barcelona. Figure 9 depicts the stakeholder map and the entities listed were identified as most appropriate target group for the workshop.

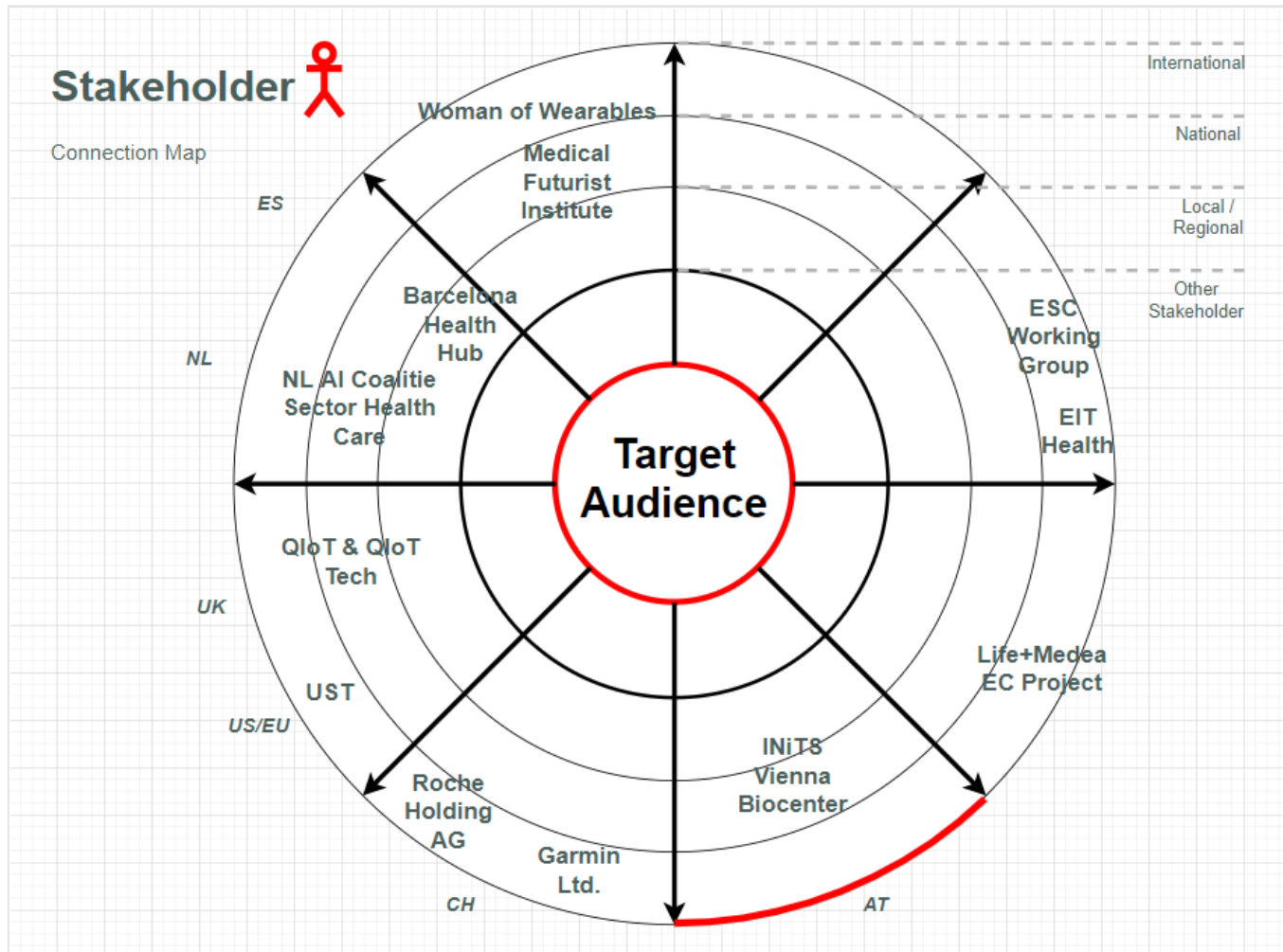


Figure 9: Stakeholder / Target Audience Exploitation WS Healthcare

Pain Points & Future Challenges:

The outcomes of brainstorming on pain point and future challenges in the healthcare domain can be clustered into the following topics:

- Commercializing data, privacy preserving technologies
- Data translation & actionable insights
- Patience ability to use the technology, proper training for intended patient interaction
- Age specific of wearable devices, preventing unintended use of devices

The first and second cluster on commercializing data, privacy and data translation into actionable insights are heavily linked since one presupposes the other. The discussion pointed to regulatory challenges to be tackled specifically around the acceptance of artificial intelligence in a decision-making process. This topic itself is a research area on trustworthiness of AI methods and the consortium members are following the activities of the European Commission on policy and regulatory activities. However, within the healthcare use case the ethical issues on privacy and patient data are covered in D1.3 "Ethics Management Plan" and data management is covered in D1.1 on "Initial Quality, Innovation and Data Management Plan".

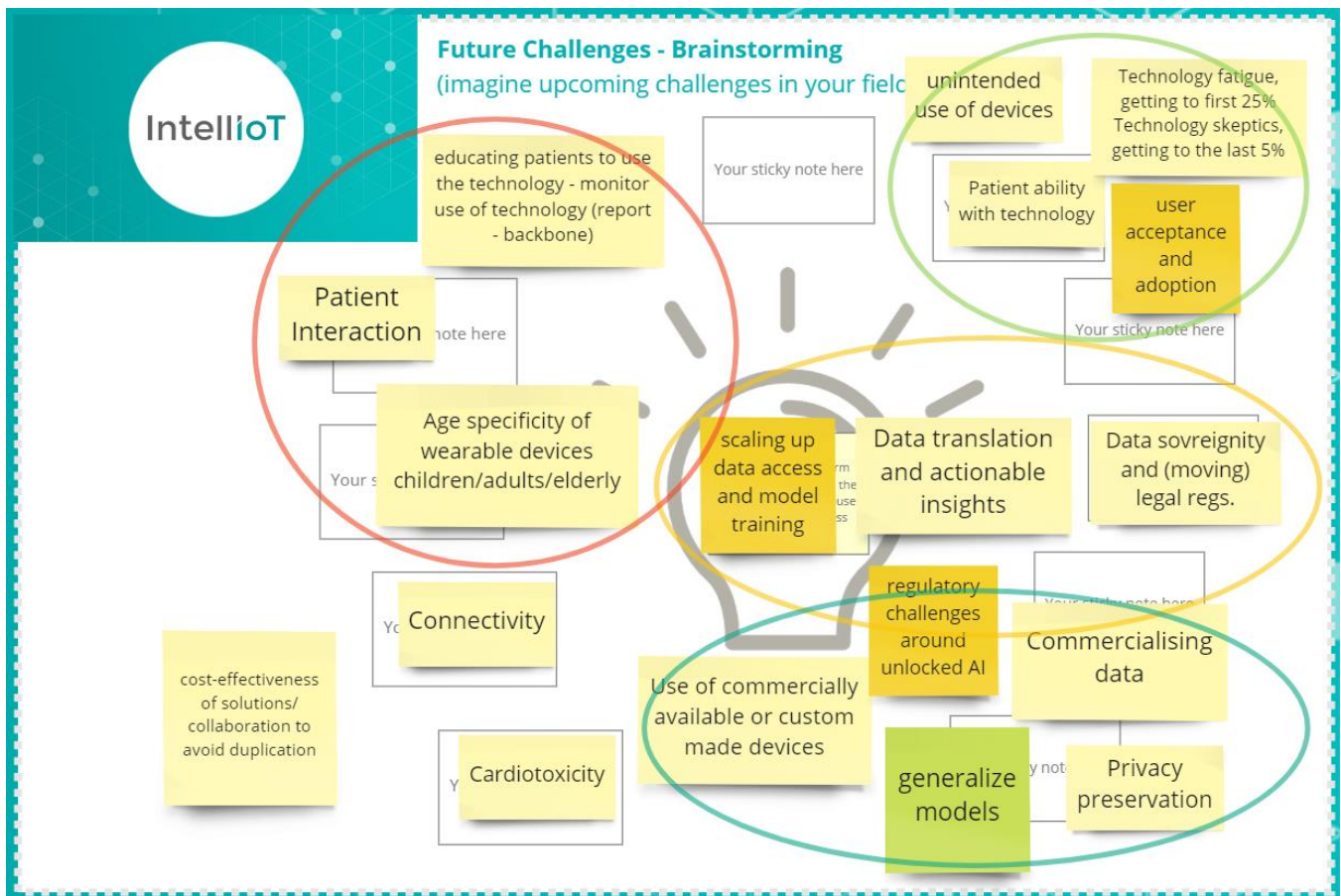


Figure 10: Identified pain points and future challenges for the healthcare domain

Therefore, for the duration of the project these challenges are tackled and regarding exploitation the participants are aware of the issues when it comes to commercializing the project results in the healthcare industry.

The second part of the workshop was initially intended to be focused on a discussion on existing and future business models. However, the present experts suggested to focus on prioritizing market needs and characterizing the problems in the market instead. To utilize the external participants, we decided to adapt the foreseen process for this particular workshop.

Prioritizing Market Needs:

The most important topics discussed during the second session were as follows:

- Privacy preservation for patients and their data when it comes to commercial solutions.

This was considered as technical problem as well as an issue affected by legislation and regulations. From a technical point of view, technologies like distributed ledger were suggested as solution when it comes to data governance in multiple dimensions (authenticity, trust, privacy, etc.). The legislation aspects are external factors given by governments and here today different rules between countries prevent commercial solutions to enter markets globally. As an example, the UK was mentioned in comparison to France, such that data exchange between doctors are still tricky.

- Data structures with build in trust mechanisms and validation capabilities

The topic was classified as technical one and emphasises the need for technologies that can verify the quality of the data provided by patients. The example was given by the CEO of QIoT a company that provide smart asthma inhaler. Monitoring the feedback of the patient with the application and the usage of the device could give valuable insights into the data quality due to variations in human interaction behaviour.

- Accurate data models and reliable signals from medical devices

The availability of medical grade devices for smart healthcare solutions like those targeted in the project's use case is still limiting the market potentials. The director of innovation of UST, a provider of digital technology headquartered in the US, suggested that manufacturer will catch up quickly in providing more smart sensor technologies for this area with IOT capabilities embedded.

- Interactive / Preventive features for patient feedback

This topic emphasises the importance of user engagement with smart healthcare solutions. The interaction design must motivate patients to give regular feedback necessary to harvest sufficient data samples for the applications backbone (e.g., training models, deriving trends, etc.). By combining interaction statistics and medical data additional reports and dashboards can be utilized to motivate or if done inappropriately prevent the end-user of interacting with the healthcare solution.

Figure 11 illustrates the findings and selected priority points from the discussion with the experts in the healthcare domain. The topics together with the identified challenges for the first part of the workshop will be further analysed in the group of project partners and similar to other use case areas the findings will influence the technical development as well as the exploitation activities in the next month.

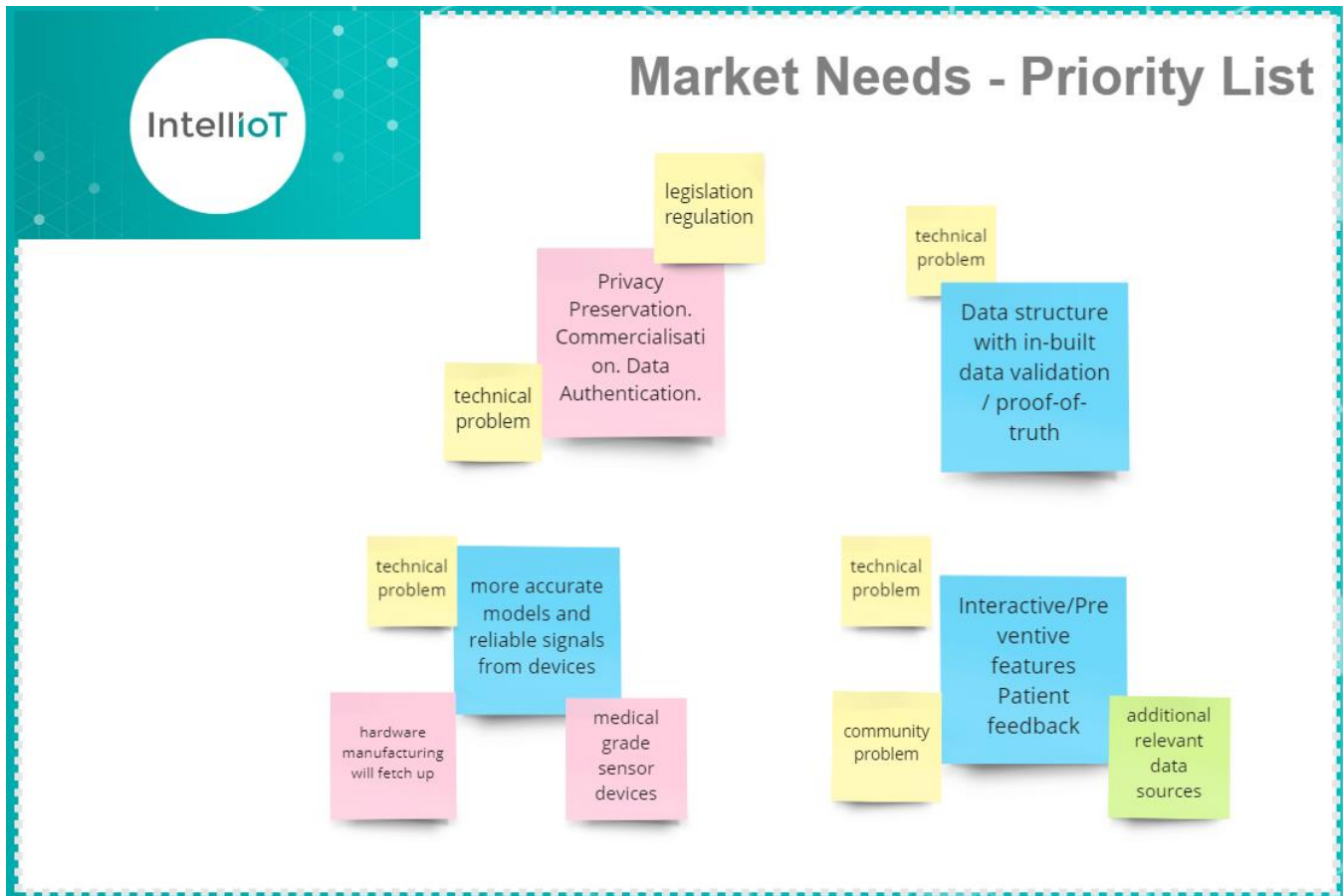


Figure 11: Take away and findings on prioritizing market needs w.r.t. healthcare use case

3.3.3 USE-CASE DOMAIN MANUFACTURING

The selected stakeholders in the area of manufacturing comprised eight **international** companies and associations, 13 **national** companies out of six different countries. Figure 12 on the next page illustrates the stakeholder map and the companies listed were identified as most appropriate target group for the workshop.

Pain Points & Future Challenges:

The outcomes of brainstorming on pain point and future challenges in the area of manufacturing can be clustered into the following topics:

- Data availability, Quality of Data, Data Democracy & Transparency
- Resilience, cybersecurity, and sustainable value/supply chains
- Flexible reconfiguration, automatic component integration/replacement
- Importance of UC description, mapping to „smart manufacturing UC (IEC TC65 WG23)

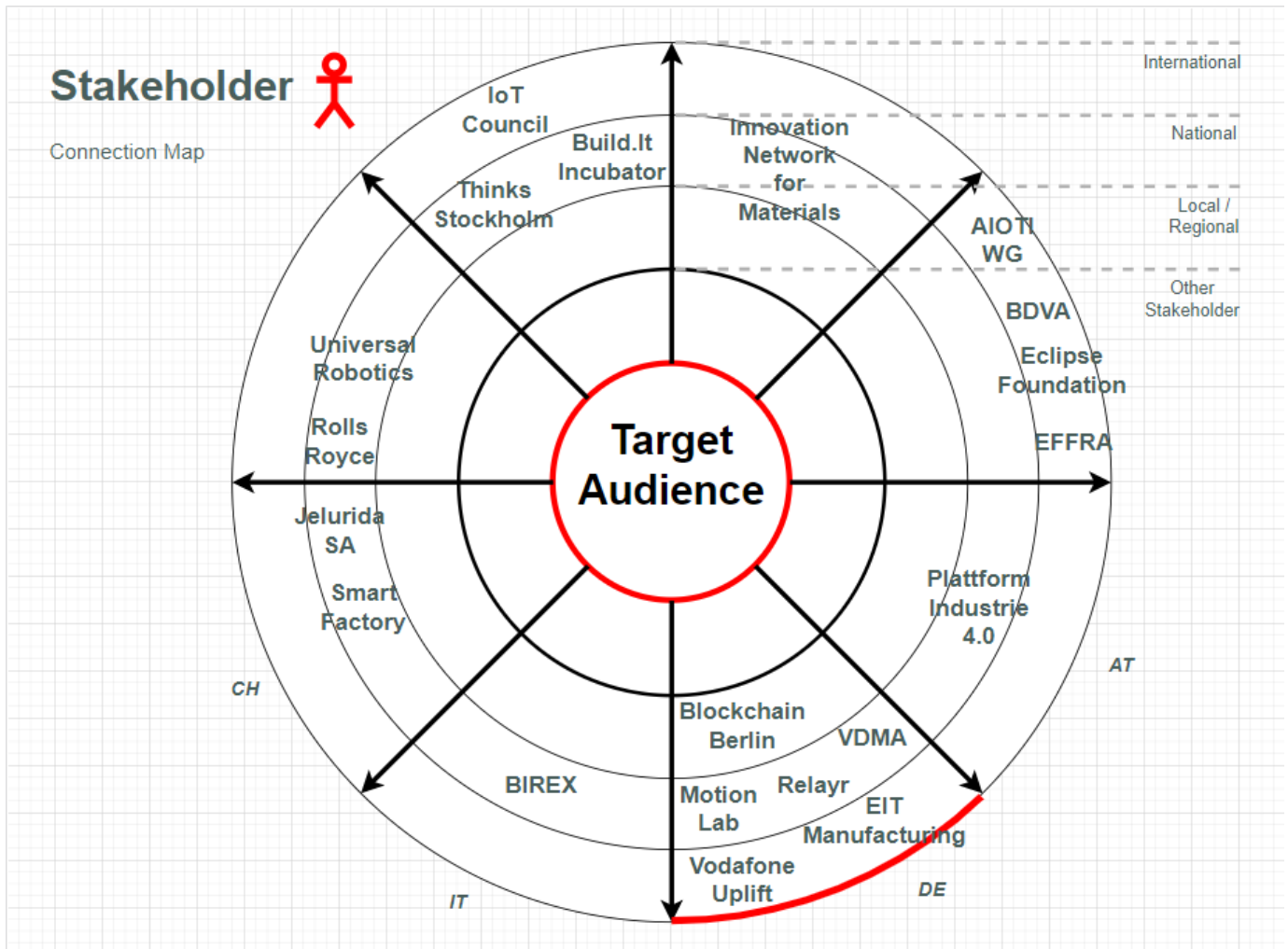


Figure 12: Stakeholder / Target Audience Exploitation WS Manufacturing

One interesting aspect was raised by one representative of EFFRA. Concerning the first cluster on data availability the discussion was about balancing openness and ecosystem building w.r.t manufacturing data with the legitimate interest of companies to make a business out of it. Here even with best practices and standards available for seamless data sharing, the company might not do it in order to safeguard their product or service.

Concerning data quality or usefulness of datasets one representative of VDMA highlighted the topic of having vast amount of data samples without relevant discriminatory power for the problem at hand. A manufacturing machine operates many months or even years without failure. Predicting a breakdown for this machine based on data models would require at least several failure events to be useful for training these models.

Flexibility in manufacturing processes seems to be a challenge for many years ahead. Today's processes are also due to cost pressure for European companies very optimized and complex. Changing the process parameter requires expensive ramp-up time such that in a manufacturing line with multiple different steps involved lot-size-one remains hard to achieve. Figure 13 illustrates the clustered challenges identified by the experts during the first session of the workshop.

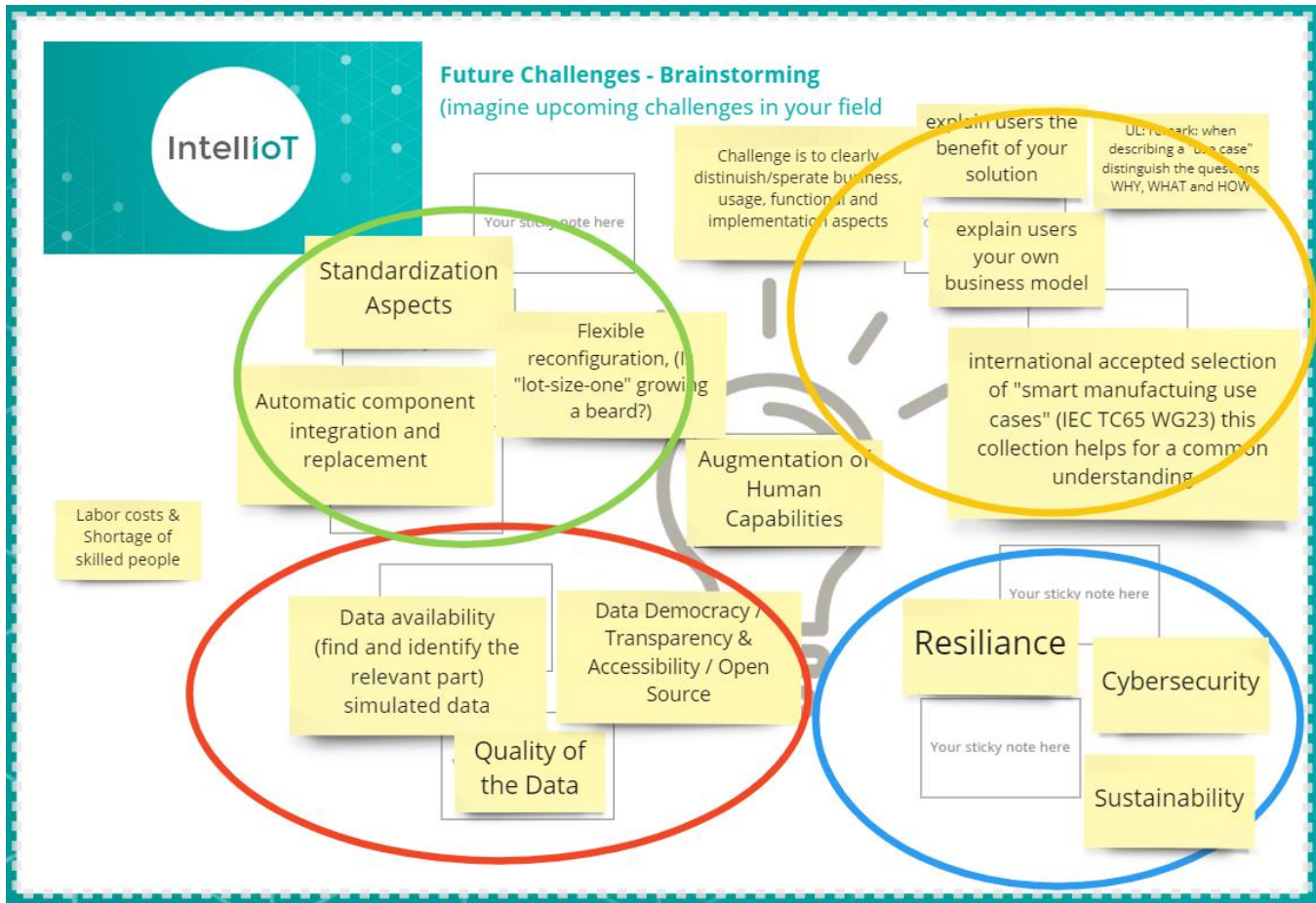


Figure 13: Identified pain points and future challenges for the manufacturing domain.

The second part of the workshop was similar to the agriculture WS focused on a discussion on existing and future business models. Here the experts were asked to brainstorm on their expectation of business model innovations in the face of technology advances and upcoming innovations in the manufacturing industry.

Future Business Models / Business Model Innovation:

Figure 14 depicts the findings following the SCAMPER method during the discussion. This time the majority of statements targeted a modification or adaptation of the existing business models in the industry. From the second part the consortium selected the following topics relevant for upcoming activities on exploiting results of the project. These potential business model evolutions will be considered in the process of developing the exploitation plan later in the project.

- Rethink the interaction within customer-supplier relationship
- Servitization - from product to services
- Shift in risk exposure to the supplier, exploration of multi-sided market models
- Explore impact of data on new business models, e.g., data provider in the center

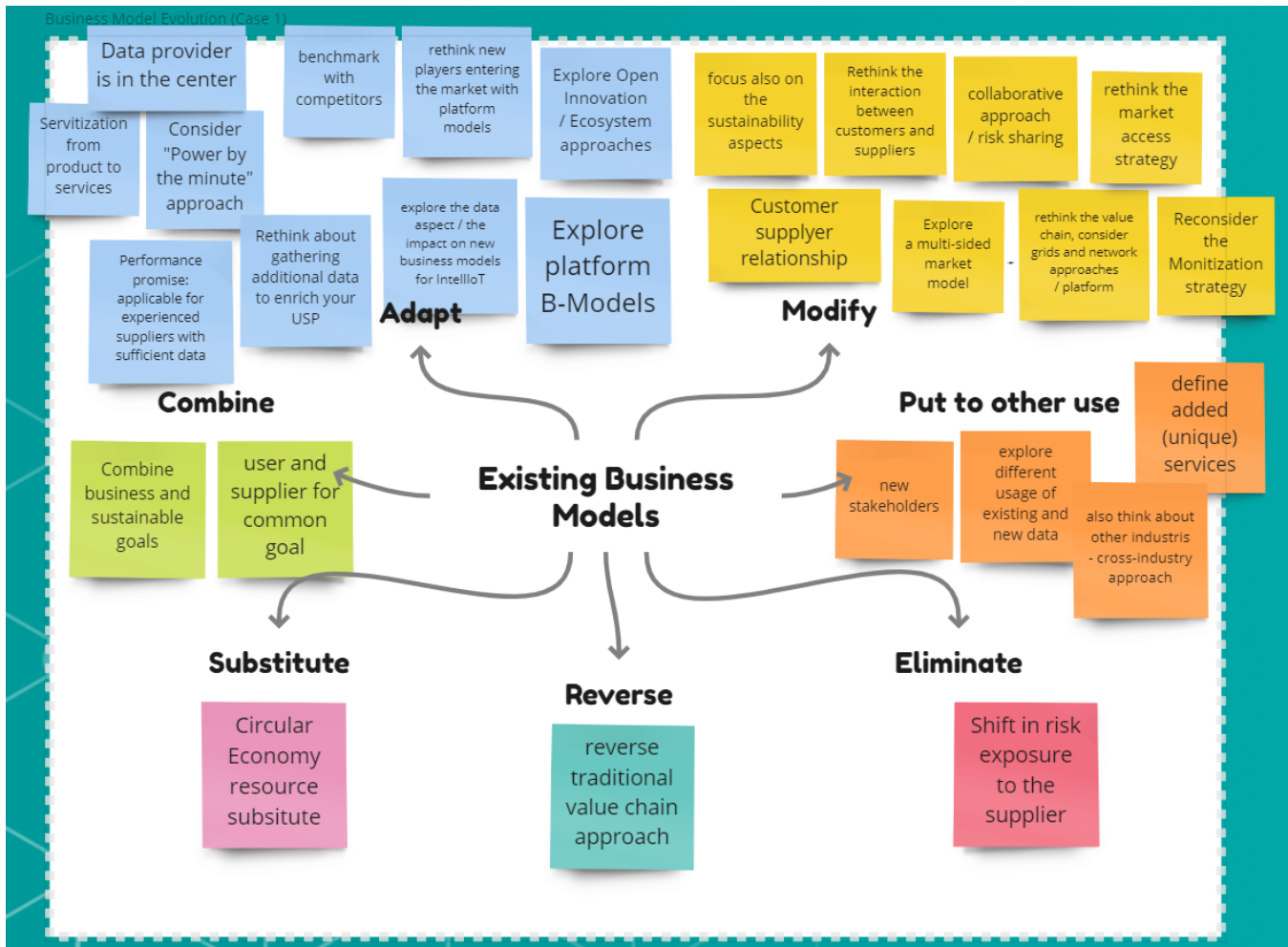


Figure 14: Miro Board on business model evaluation for the manufacturing domain.

One highlight of the discussion was on rethinking the relation between customer and supplier in the manufacturing value chain. This aspect touches the modification path as well as the eliminate path at the bottom right corner of Figure 14. The shift in risk exposure to the supplier transforms the business relation between both parties. As an example, suppose the supplier gets responsible for the performance of the machine. That fact has an impact on the IoT technologies to provide such a service and consequently also affects the revenue streams. When it comes to AI and machine learning for services like maintenance similar transformations in responsibilities are possible, according to a representative of VDMA.

Most prominently one trend dominated the discussion and is reflected in the statements in the top left corner. The transition from a product to a service-oriented business and the importance of data in the center of future innovations in this domain. One conclusion of the discussion between the experts and project participants was that services will foster the data sharing and consequently enable multi-sided market models where a value chain might get a grid or network of individual companies. The findings from the discussion will influence the plans for exploiting the project results in the second half of the project.

4 OUTLOOK AND NEXT ACTIONS

The current interim report on exploitation & impact creation, as presented herein, serves as a basis for the upcoming versions of this deliverable and defining future opportunities and possibilities for increasing the impact of the expected project results. It also harmonizes the actions needed for promoting and raising awareness among the partners by looking into the findings of the three exploitation workshops.

Tangible and intangible exploitable results of the project IntellioT will be collected among the scientific and industrial partner in the consortium as well as the participants of the open calls in the project. Academic institutions, in theory, might expect to have limited opportunities for the exploitation of project results. Nevertheless, they play an important role for further research on the basis of successful deployments. Large enterprises and SMEs are expected to have a more "close to market" opportunity for deliverable exploitation and their intervention is greater where there are tangible deliverables like technologies or service solutions in the scope of NGIoT. The results of these activities will be presented in one of the future versions of this deliverable.

During the next activities in Task 6.3 we will follow the described process and methods outlined in Section 2.2. Together with the outcomes and insights from the end-user workshops and further analysis of the target market the consortium will facilitate the long-term sustainability of the IntellioT framework as well as systems deployed through the use. Therefore, we will create and maintain the project's exploitation process, which will include the following aspects:

- Identifying the main individual and joint exploitable results, knowledge, products
- Estimate their potential target markets.
- Timetable for commercial use and the need/possibilities for IPR protection.
- Preparation of partners' individual exploitation plans in-line with their business/research agenda.
- Business plans for the project results that analyze and quantify financials (e.g., investments and operating costs) as well as risks and opportunities through a SWOT analysis.
- Preparatory activities for the joint exploitation, such as the establishment of exploitation and/or IPR agreements between the partners.

The results and achievements of these activities will be added into the updated versions of this deliverable as outlined in Table 1.