WHITE-LABEL SHOP FOR DIGITAL INTELLIGENT ASSISTANCE AND HUMAN-AI COLLABORATION IN MANUFACTURING

Title	D1.1 Joint WASABI Requirements – initial report
Document Owners	SINTEF
Contributors	SINTEF, MEWS, KU Leuven
Dissemination	Public
Date	31/08/2023
Version	1.1

Co-funded by the Horizon Europe programme
of the European Union under Grant Agreement
№ 101092176

VERSION HISTORY

Nr.	Date	Author (Organization)	Description
0.1	25/08/2023	SINTEF	First version
0.2	28/08/2023	SINTEF	Include comments from partners
0.3	29/08/2023	SINTEF	Updated version after quality check
1.0	31/08/2023	SINTEF	Submitted version
1.1	04/09/2023	SINTEF	Updated version removing potentially sensitive information on us case partner. resubmit

REVIEWERS

Name	Organization
Ioakeim FOTOGLOU Dena ARABSOLGAR	Syxis
Mina FOOSHERIAN	BIBA

DISCLAIMER

ACKNOWLEDGEMENT

This document is a deliverable of the WASABI project. This project has received funding from the European Union's Horizon Europe programme under grant agreement N° 101092176

CONTENT

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

WASABI focuses on intelligent digital assistance solutions because they help humans achieve their goals without marginalizing them - this will contribute to human-centered manufacturing. The WASABI vision is that digital assistance and conversational AI become standard practices to reach sustainability goals in manufacturing. Humans will use it, for instance, to identify and assess opportunities to turn waste into a resource and to reorganize work to minimize carbon footprints. Access to these benefits will be as simple as selecting and configuring Apps from an online store, and interoperability minimizes vendor lock-in and maximizes information valorization. New AI-focused training services for employees will be a general practice too. They let workers experience solutions and teach them about AI's capabilities, risks, and limitations in manufacturing. Digital assistance solutions will blend into Europe's emerging legal framework for AI, and they will be affordable and manageable even for small producers.

The scope of D1.1 is to report the work performed in the context of T1.1 "Situation analysis and use case detailing", T1.2 "Use case de-risking and concretization" and T1.3 "Evaluation of expected benefits for use cases". The overall objective of this document is to provide the outline of the requirement analysis to help structure the technical analysis and development of intelligent digital assistance solutions. D1.1 is a collection of testable requirements, accompanying stakeholder needs, wants, and believes, starting KPIs for the evaluation, and the expected measurable benefits.

The WASABI project is structured around five use case partners: CROMA (sterilization of surgical equipment), EPISCAN (production of personal protective equipment), REINOVA (testing and validation of e-mobility components), SILK-BIO (solubilization and casting of silk fiber) and TRIMEK (metrology systems, solutions, and machines). All use case partners contributed to the process or requirement elicitation through a combination of self reporting and joint workshops (digitally or physically) following templates for information collection,

The report describes the use case partners one by one. For all there is a high-level description of the use case partner, a situational analysis of their goals, functional requirements, system technical requirements, additional requirements, if any, and expected benefits and related KPIs.

Following the use case partner description there is a joint analysis of the white-label shop, focusing on the issues the use case partners need more information and a discussion on. Legal requirements are also discussed jointly because the use case partners had few unique needs.

The report ends with some conclusions. The most important is that the while the exact details of the user needs and wants vary, the overall goal for the digital assistant is process support. The users have different procedures they want followed, often to the letter, and use of the digital assistant is intended to ease that process. In addition, all users face documentation requirements as to whether their process has been followed or not. Their expected goals supported this. With regards to the white-label shop the analysis indicate that the use case partners have unclear and differing expectations to the white-label shop, thus there is a need for joint WP1 and WP3 work to clarify that. Regarding legal matters the use case partners had few unique requirements, but the legal requirements in GDPR, the forthcoming AI Act and others must be followed. This gives significant requirements to the development teams.

1. INTRODUCTION

This document presents the requirements of the WASABI project regarding the five different use cases partners, analyses of the current situations at the use case partners, and the expected measurable benefits and related KPIs that are defined for the evaluation of the solution.

1.1 Purpose and Objectives

This report is the initial description of use case requirements in WASABI. It outlines the situation for the use case partners in WASABI at the start of the project, the report being written in M6 of a 48-month project. According to the Description of Action, this deliverable should be a: "*Collection of testable requirements, accompanying stakeholder needs, wants, and believes, starting KPIs for the evaluation and the expected measurable benefits.* Most importantly, it should be a starting point for developing the various other components of WASABI in WP2 and WP3. This report is that, but the reader should take into account that this deliverable is not the only one describing use case partners, as deliverable D1.2 is written in parallel with this one. There is some overlap between these two deliverables, primarily in the method section and the description of the situation of the use case partners.

1.2 Relation to other WPs and Tasks

This deliverable uses no other deliverable as input but relies on data collection as outlined in section 2, "Approaches and Methods" and is done as part of the work of the following tasks:

- Task 1.1: Situation analysis and use case detailing
- Task 1.2: Use case de-risking and concretization
- Task 1.3: Evaluation of expected benefits for use cases

It should be mentioned that this is the first version of the "Joint WASABI Requirements". There will be important updates in M15 and M24.

Figure 1 shows how D1.1 is related to other WPs and Tasks.

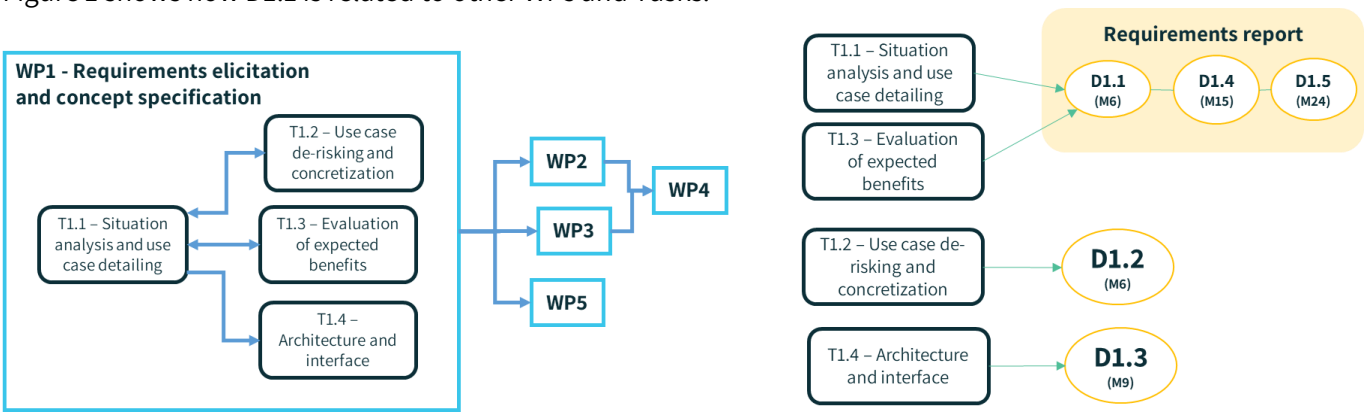

Figure 1: Relation to other WPs and Tasks

2. APPROACH AND METHODS

2.1 Overall overview of data collection

This data collection was jointly undertaken for both D1.1 and D1.2, and it was conducted by several partners working collaboratively. All data has been uploaded to the WASABI repository and is available there.

The data was collected from the use case partners in the period of May-August 2023 as a combination of:

- Self-reported descriptions of each use case partner at the kick-off meeting and following a template in May
- Workshops (physical or digital) with use case partners and researchers in June/July
- Individual follow-up questions and completion of some forms in August as needed

Data was collected in this order, with self-reported data being used as preparation and input for the workshops. The workshops themselves employed a set of methods described in section 2.2. Follow-up with the use case partners was done as needed as part of the finalization of this report. The majority of the data was generated in the workshops in dialogue with the use case partners.

2.2 Detailed description of data collection by topic

2.2.1 Self-reported descriptions

Use case partners were all introduced at the kick-off meeting in April 2023. The presentations from the meeting have been used both in the description of the use case and for illustrations. Some use case partners also provided technical descriptions of their process, these have been uploaded to the repository and are referenced where appropriate.

As a preparation for the data collection in workshops with each partner, a template for self-description was sent to all partners (template available at the WASABI project repository). This template asked for the following information:

- The overall idea of the use case
- Situation analysis
- De-risking (risk analysis)
- Functional requirements
- System technical requirements
- Additional requirements
- Expected benefits and related KPIs

In this way, both researchers and use case partners prepared for the workshops by developing and completing the forms. All use case partners completed the forms before the workshop, and the forms were uploaded to the repository.

2.2.2 Workshops

The workshops were conducted either as a set of digital workshops of two-hour discussions or as physical workshops for two-day meetings at the premises of the use case partner. If the workshops were physical, a visit to the premises and the production site was included. In all cases, manager and worker representatives were invited and participated, as well as technical personnel as needed. From the researchers' side, SINTEF and MEWS were always present, while researchers from other partners participated as much as possible and according to their needs for information.

Physical workshops were conducted in:

- REINOVA (20th-21st June 2023)
- SILK-BIO (22nd-23rd June 2023)
- CROMA (27th-28th June 2023)

Digital workshops:

- EPISCAN (14th, 29th June, 9th, 10th August)
- TRIMEK (26th, 29th June)

The Digital workshops were recorded, and recordings and transcriptions were uploaded to the project repository.

Broadly speaking, the topics covered were the same as the self-reported descriptions. However, several different methods and data collection strategies were employed and are described in detail further below. In addition to the topics from the self-reported descriptions, we also carried out a short analysis of the white-label shop.

2.2.3 Overall idea and situation analysis: Value stream analysis

Based on the information in the self-reported descriptions, SINTEF and MEWS prepared a value stream analysis of the situation. This initial understanding was presented with the Klaxoon tool, a program for supporting digital meetings in the form of a digital online board. With Klaxoon, drawings could be made, ideas expressed and noted, and various files with information could be uploaded. A Klaxoon board was prepared for all use cases, and it was shown and discussed with use case partners. Based on this, both the "As-Is" analysis and the "To-Be" analysis were conducted. The To-Be is presented in D1.2 in the form of process mapping and analysis combined with user dialogs to demonstrate how the use case partner could benefit from a digital assistant. For the use case partners which were visited physically; illustrative pictures were taken as permitted and included in the As-is description.

It should be noted that the Klaxoon tool was always updated and adjusted during the workshops, filling the role of information repository as well as a tool for QA and correcting misunderstandings. The process mapping and analysis that was finalized as a set of "To-Be" figures relied heavily on the work with the Klaxoon. The same was true for other topics where Klaxoon was used as a note board for all workshop participants. This use of Klaxoon was done in both the physical and digital workshops.

2.2.4 Functional requirements

Functional requirements were discussed as part of the overall analysis of each use case partner, guided by the overall question, "If the system is to function in this use case, which requirements must be met?". No specific method apart from dialogue was followed.

2.2.5 System technical requirements

In addition to the initial requirements in the self-report, this was discussed in the workshop following a template developed by SYXIS. The template collected information on: Data sets (several questions), data format, data transfers, standardization and data model, deployment of component and platform software and tools, and existing infrastructure. The completed templates have been uploaded to the repository for each use case partner.

2.2.6 Additional requirements

Additional requirements were discussed in the workshops as part of risk management (a risk could be translated into a requirement). A special focus was given from the researchers on possible resistance to the adoption of new systems and ethical and GDPR issues. Possible resistance was covered in the risk process.

2.2.7 Evaluation of expected benefits

The evaluation of expected benefits followed the methodology and the principles of evaluation for the COALA project. The work was carried out as part of the Task 3.1. Task T1.3 is centered around the definition of change monitoring and management as well as the assessment of use cases. Its primary objectives include:

- Enhancing the Objective Key Results (OKRs) initially outlined in the project proposal to assess the project's performance, impact, and acceptance of its outcomes.
- Establishing the baseline KPIs for each use case to serve as a reference for evaluation.

This task is supported by the information presented in Section 2 of this deliverable, which focuses on devising specific methods and metrics for evaluating trust in the digital intelligent assistant, the usability of the WASABI solution, and the enhancement of worker performance and satisfaction. We have investigated the latter through an ethnographic observation study conducted at the factories of CROMA, REINOVA, SILK-BIO, TRIMEK and EPISCAN.

In order to accomplish the objectives outlined above, we have conducted multiple workshops, initially with each business partner individually and subsequently with the technical partners. In these workshops, we initiated the process by assigning tasks to each business partner where they outlined the following:

- Expected benefits from WASABI
- The most pertinent capability related to each benefit
- The category to which the benefit belongs (as categorized in Table 1)
- The value of the benefit (High, Medium, Low)
- The timeframe for realizing the benefit: Short (within a few months, less than six months), Medium (within six months), Long (after approximately a year)
- Primary KPI
- Baseline for this KPI
- Direct relevance of the benefit to WASABI
- Alignment with the proposal's indicators (Trust, Usability, Performance, Satisfaction)
- Owner
- Examples

Benefits category	Acronym
Business: Customer satisfaction, business growth, improved branding, etc..	BUS
Environmental sustainability	ENSU
Financial: Increase of revenue, decrease of costs, etc..	FIN
Health and safety	HESA
Operational: Improved effectiveness & efficiency, improve change & release process, etc..	OPR
Organizational: Better performance & compliance, future readiness, closure alignment to organizational goals, etc..	ORG
Technology: Improved quality of deployment, integration, outcomes	TECH

Table 1: Benefits categories

During each workshop session, we collaborated with our business partners (CROMA, REINOVA, SILK-BIO, TRIMEK, and EPISCAN) along with their respective technical counterparts to collectively assess the benefits they had documented. In the subsequent sections, we will share the outcomes of these workshops for each individual business use case.

2.2.8 Analysis of white-label shop

The vision of WASABI is that: «*Digital assistance and conversational AI become standard practices to reach sustainability goals in manufacturing*» and *access to these benefits will be as simple as selecting and configuring Apps from an online store, and interoperability minimizes vendor lock-in and maximizes information valorization. New AI-focused training services for employees will be a general practice too.*"

In the discussions, the use case partners had no problem understanding the first part and the usefulness of a conversational assistant and seeing possibilities in how to employ it. The idea of employing other assistants, especially selecting and training them themselves, was more difficult to understand.

In the project, this key goal is to be realized:

- **RO 3.1: Federated white-label shop for digital assistance solutions**: An online shop built with open source software and in-built shared dataspace for shop instances. Grants access to a wide range of software, hardware, and non-technical services needed for sustainability and resilience-oriented assistance solutions.
- **RO 3.2: Skill-interoperability demonstrator**: A prototype presenting how different digital assistant frameworks could use the same skill. This result will suggest how standardization could increase the adoption of digital assistants in the industry. (KER 6)

In order to acquire some information about the possibilities for such a system, the following exercise was carried out in the workshops:

First, the vision and the idea behind the white-label shop was presented. The metaphor "Google play"/ App store was used to explain to people what such a shop could be. Then we asked the participants to answer the following:

- *Regarding the white-label shop, what would be the most important aspects? What are your key questions? Please write them as «post-its» (on Klaxoon). Note: We will NOT answer (none of us). We do not need to agree/rank/align on anything. Just questions- but you can follow up with more questions?*

This resulted in a set of questions that gives us some insight into what the use case partners see as the main concerns that should be met for such a tool to be useful. It is not technical requirements; it is more a set of concerns.

3. USE CASES

3.1 CROMA

CROMA Gio.Batta España (CROMA) is a leading company in the construction and management of sterilization centers serving public and private hospitals. They combine the management of the sterilization process with the management of surgical instruments according to the surgical specialties performed in each hospital.

CROMA Gio.Batta España's use case in WASABI is the Sterilization Centre managed by CROMA at the Burgos University Hospital, Burgos, Castilla y Leon, Spain.

Sterilization is the process of reconditioning medical devices (surgical instruments) after they have been used between surgeries. Sterilization results in the (almost) total destruction of any microbial form, i.e., the killing of all pathogenic microorganisms in both their vegetative and spore forms. A material is considered sterile if the sterility assurance level (SAL) is less than 10-6, i.e., when the probability of finding a microorganism is less than one in a million. Sterilization is, therefore, one of the main steps in the process of preventing and controlling hospital infections.

3.1.1 Situation analysis and use case detailing

As a sterilization center responsible for handling, maintaining, cleaning, and sterilizing medical equipment, there are very strict operational procedures at CROMA. Accordingly, the use case is characterized by several quality control steps during the overall sterilization process. For WASABI, two overall objectives are identified for CROMA:

- Supporting operators in different types of quality control during the overall sterilization process, such as checking and registering whether a specific instrument is present in a set of instruments.
- Give suggestions regarding instruments that need to be taken out of the process to be repaired.

The AS-IS sterilization process at CROMA Sterilization Centre at the Burgos University Hospital consists of the following main steps/areas:

1. Acceptance of instruments collected after surgery.
2. Manual washing
3. Automated washing
4. Packing
5. Sterilization
6. Warehouse/Delivery

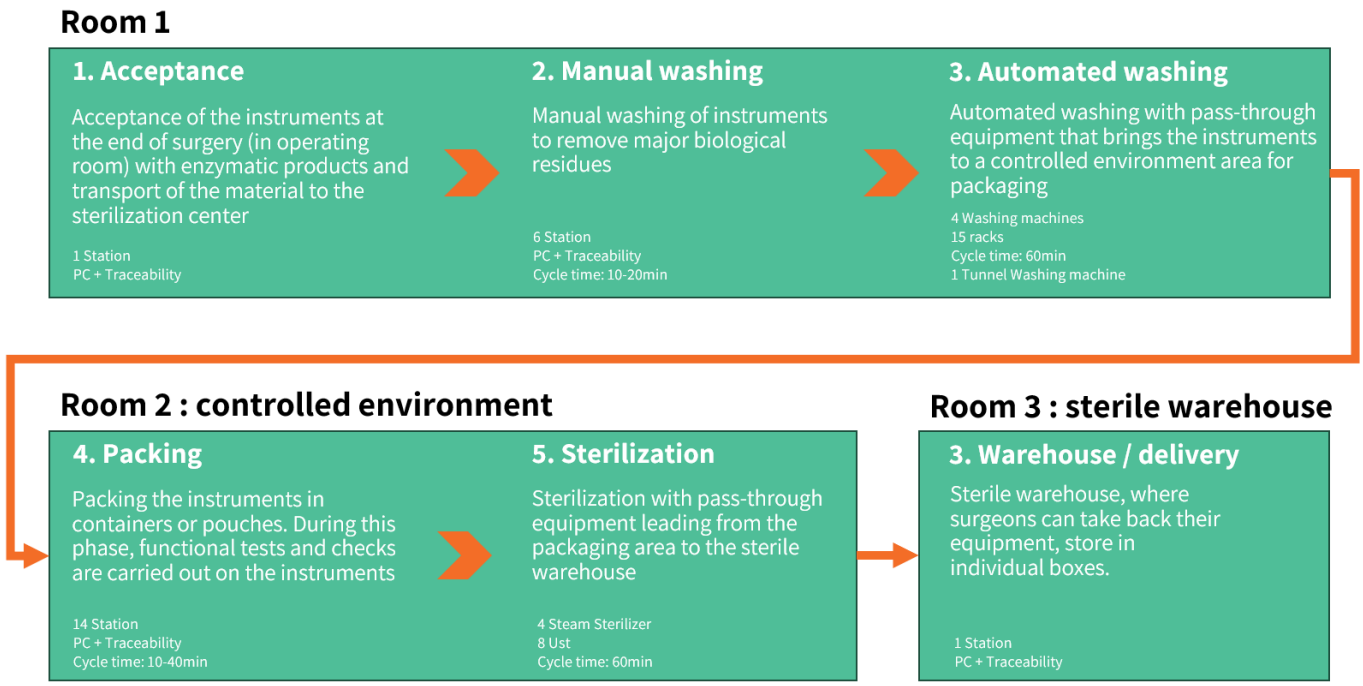

Figure 2: CROMA As-Is process

Figure 3: Acceptance of the instruments and transport of the material to the sterilization centre

Figure 4: Manual washing of instruments

Figure 5: Automated washing with pass-through equipment that brings the instruments to packaging area

Figure 6: Packing of instruments in containers or pouches

Figure 7: Sterilization with pass-through equipment leading from the packaging area to the sterile warehouse

Figure 8: Sterile instruments are stored in boxes in sterile warehouse

3.1.2 Functional requirements

- Management of checklists. Either dictated by the system that knows, for example, a list or by voice recognition of the operator who perhaps identifies a tool on a list.
- Completion of a worksheet with saving of data; for example, an operator fills in a production sheet verbally communicating the parameters to be entered.
- Voice communication in a noisy environment
- Communicate with Instacount
- Understand native language (Spanish)
- Handle noise in the washing area
- Operators must be able to use their hands freely during the processes but are already operating touchscreen PCs to search in the set list for each instrument

The sterilization process is strongly linked to the operators' manual activity and their interaction with the equipment."

3.1.3 System technical requirements

Connectivity with current software systems

- System for equipment
- Aesculap's Instacount instrument tracking software (most important)

3.1.4 Additional requirements

Since the washing area was noisy operators might want to use some sort of airplugs/airpods to listen to the instructions from the DA. The system was expected to run on a tablet/phone and be able to communicate with such devices.

Beyond that no additional requirements were mentioned in the kick-off meeting presentation, the self-reported descriptions or in the workshop discussions. A short discussion on personal data and GDPR yielded no specific additional requirements, save the general requirements of adherence to the relevant regulatory requirements. See also section 5 for a discussion of those.

3.1.5 Expected benefits and related KPIs

In this section, we present the results of the evaluation of benefits for CROMA.

#	Benefits	Cat	Value (Low/Medium/High)	When (Short/Medium/Long)	KPI	Base	Target	Indicator (Perf/ Impact/ Accept/ Trust/ Usability)
1	Increased speed of technician's tasks	OPR	Medium - High	Short *(3/4 months)*	#Boxes processed **/day**	300 - 350	+ 10-15%	Perf.
2	Reduced risk of error	OPR	High	Short	#Incidence reported per month	~ 62	- 50 %	Perf.
3	Reduced training time for new employees	ORG	Medium	Short	Training Time	4 weeks	2-3 weeks	Perf.

4	Make better use of human resources - **free up time**	FIN	Medium	Long	Free time	30 min / day	40 min / day	Perf.
5	Higher employee satisfaction (potential benefit)	HESA	High	Medium	User satisfaction	No base	TBD with CROMA	Satisfaction
6	Establishing a new value-chain for discorded equipment	OPR	Medium	Medium	New value chain	No base	Existence or not	Imp.

Table 2: Benefits and KPIs provided by CROMA

In the table we can observe that most of the expected benefits are linked to operational performance. **In this way, WASABI could boost productivity in several aspects of production.**

Let's complete this analysis by suggesting means and methods to concretely evaluate these benefits:

1. **Increased speed of technician's tasks:**
   a. Time tracking: Measure the time taken to complete tasks with and without the assistant. Compare the data to quantify the increase in speed,
   b. Benchmarking: Compare task completion times against industry benchmarks to assess the impact of increased speed.
2. **Reduced risk of error:**
   a. Error tracking: Compare the number of errors made before and after implementing the assistant. Quantify the reduction in error rate,
   b. Quality Assurance: Measure the improvement in product or process quality as a result of reduced errors.
3. **Reduced training time for new employees:**
   a. Onboarding Time: Track the time it takes for new employees to become proficient in their tasks. Compare this data before and after the assistant's implementation.
4. **Make better use of human resources:**
   a. Time Allocation: Analyze how employees allocate their time before and after the assistant's introduction. Measure the increase in time available for higher-value tasks,
   b. Task Distribution: Monitor whether employees can handle more tasks simultaneously due to time savings.
5. **Higher employee satisfaction:**
   a. Surveys: Conduct employee satisfaction surveys to gather feedback on their experience using the assistant. Compare satisfaction levels before and after implementation,
   b. Retention Rate: Monitor employee retention rates to assess whether improved satisfaction leads to better employee retention.
6. **Establishing a new value-chain for discarded equipment:**
   a. Revenue Generation: Track the revenue generated from repurposing discarded equipment. Compare this revenue to the costs of the assistant's implementation,
   b. Number of Transactions: Count the number of transactions involving repurposed equipment and evaluate growth over time.

Following is the mapping of identified benefits according to their value and expected term:

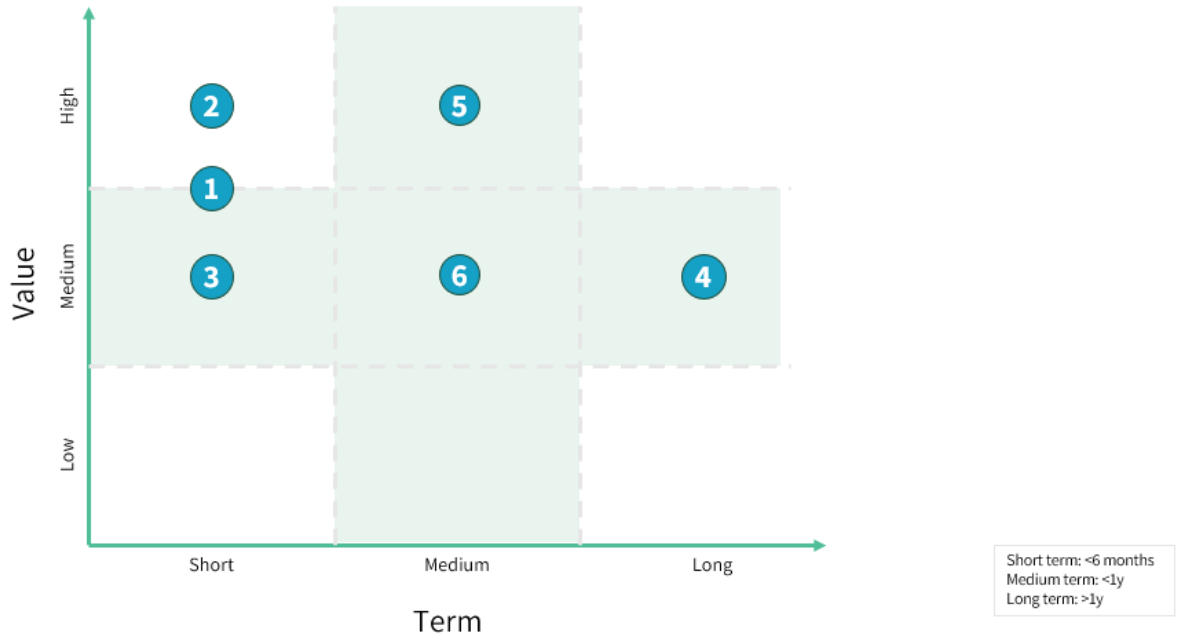

Figure 9: Mapping of the CROMA benefits

Here, we can see that the expected benefits already mapped are all high value-added. Furthermore, most of them could be observed in a shorter timeframe.

Excluding benefit number 4, which is to make better use of free time. In the long term, WASABI could save operators time, which could be used to carry out other tasks, organize tasks more efficiently or take more regular breaks. However, before WASABI can potentially save operators a considerable amount of time, there's a whole phase of getting to grips with and mastering the tool, which can take some time.

What's more, we can see that benefits 1 and 5 can be contradictory. In fact, the time saved by WASABI could be used either to give operators more time and improve their satisfaction, or to increase productivity.

3.2 EPISCAN

EPISCAN is a Canarian-based company that produces personal protective equipment (PPE). The PPEs of EPISCAN have been approved by the Spanish Agency for Medicines and Health Products (AEMPS). EPISCAN currently has 11 workers employed and a typical annual turnover of 2.339.645,54 euros.

3.2.1 Situation analysis and use case detailing

The main products produced by EPISCAN are masks (surgical and FFP2 without exhalation valves). These are produced in two separate production lines at EPISCAN's facilities. Masks are produced in very high volumes. In the surgical mask production line, a total of 35,000 masks can be produced in an 8-hour working day. In the FFP2 mask production line, a total of 15,000 masks can be produced in an 8-hour working day.

Surgical mask production line

Here is the as-is process of surgical mask production. For each step, numbers refer to specific points on the production line, Figure 10.

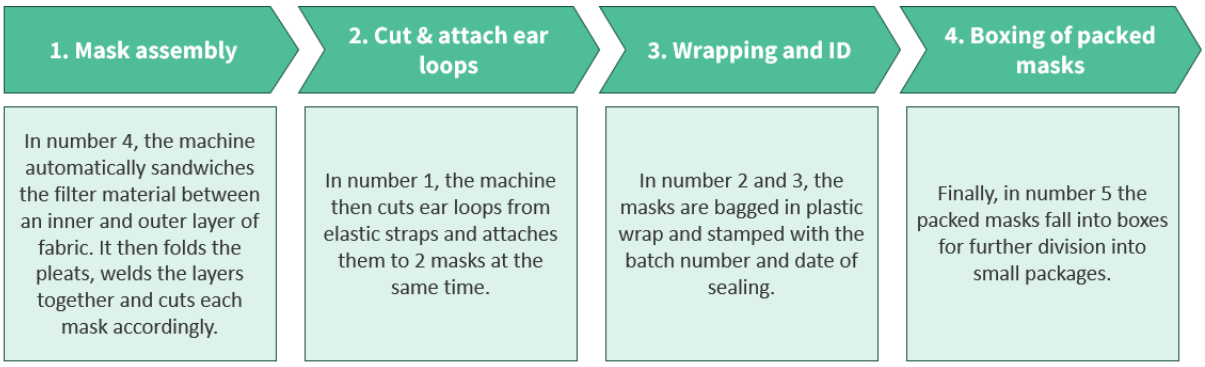

Figure 10: EPISCANs As-Is process - Surgical mask

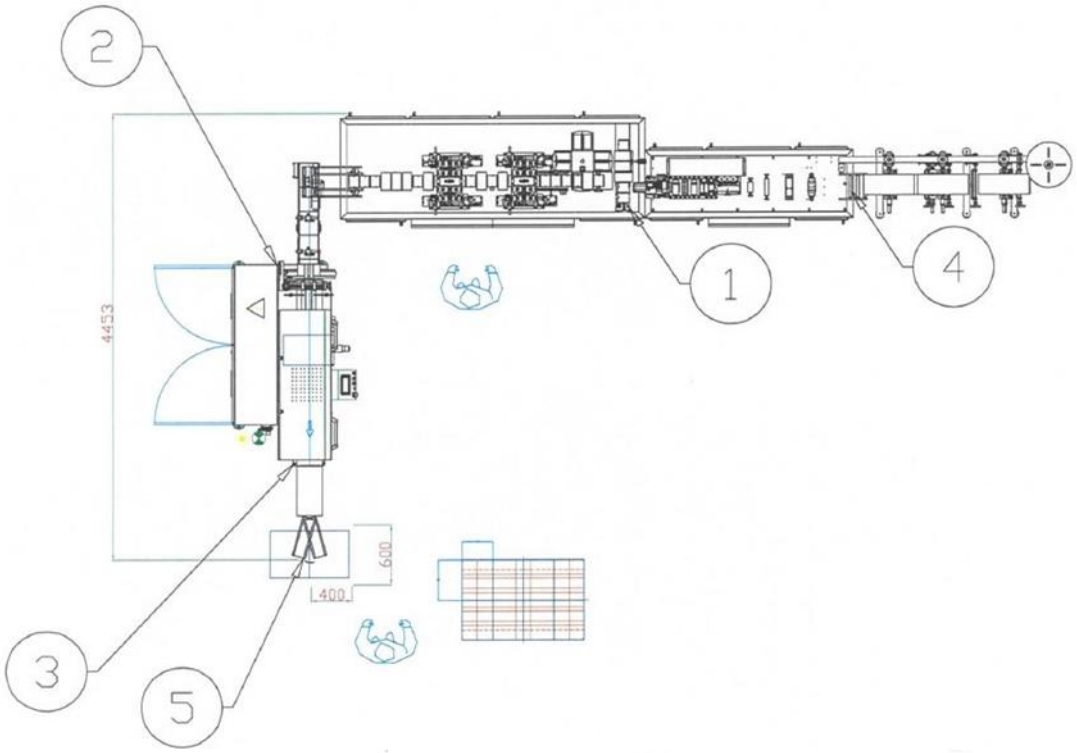

Figure 11: EPISCAN Surgical mask production line

FFP2 mask production line

Here is the as-is process of FFP2 mask production:

1. Mask assembly	2. Cut & attach ear loops	3. Wrapping and ID	4. Boxing of packed masks
First, the machine automatically intercalates the 5 layers. It then welds the layers together.	Several masks are sealed from this welded layer and stamped with the EPISCAN logo and batch number.	The machine then cuts ear loops from elastic straps and attaches them. Finally, each mask is then cut and the pleats are folded accordingly.	As well as with surgical masks, the masks are bagged in plastic wrap and fall into boxes for further division into small packages.

Figure 12: EPISCAN As-Is process – FFP2 mask

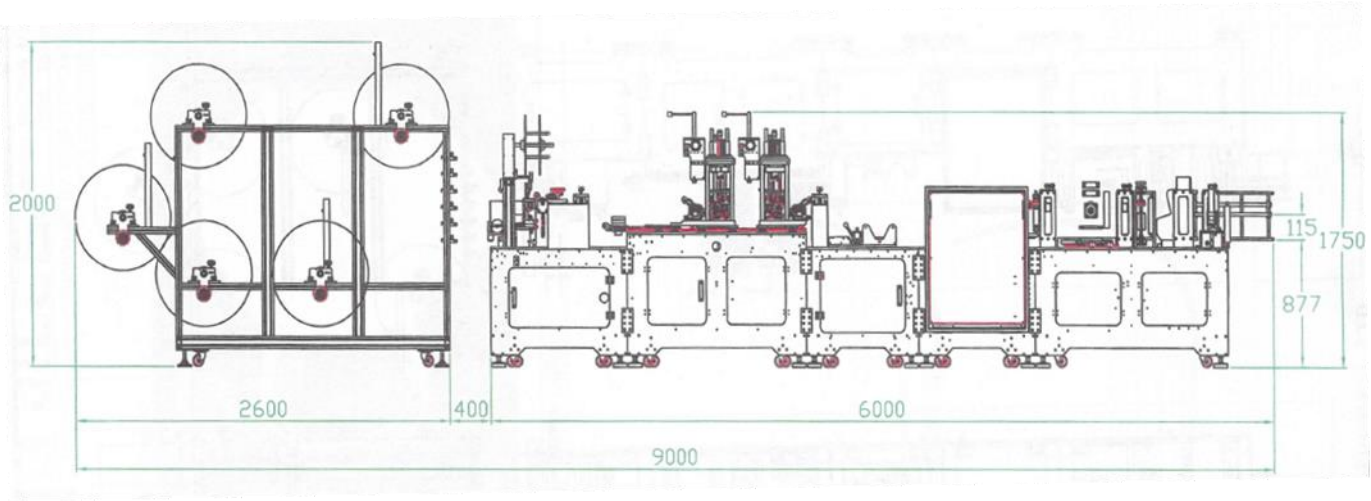

Figure 13: EPISCAN FFP2 mask production line

For each 8-hour working day (production shift), EPISCAN needs to keep track of and document data related to mask production. Today, there are three ways data from the production lines are maintained:

1) **Production shift document:** A document (paper sheet) to be filled by the technicians for each production shift
2) **Excel file:** An Excel file with data from all production shifts, manually entered based on the production sheet documents
3) **Odoo:** an ERP software, updated based on the Excel file.

The **production shift document** has to be filled by the technician in charge of each production shift. In the document, the technician notes down the following:

- The material quantity required for the production shift:
  - The first part of the document details the amount of material that is already in the manufacturing plant and the amount of material withdrawn from the warehouse necessary in the manufacturing shift.
- The material quantity used and at which time (hour of the day) it was changed
  - The second part of the document explains when it was necessary to change the material, specifying the time, quantity, and number of masks produced at the time of the change.
- The total number of masks produced
- The registered waste after the production shift is over, specified as to whether it is reusable, unusable, or useable for donation or testing, plastic and flow packs
- The name of the technician in charge of the production shift
- The production date
- The batch number of the masks produced in the production shift
- Any incidents that occurred during the production shift
- Maintenance work that had to be carried out on the production line

The **Excel file** is updated once a week by the production manager with (1) all production shift documents and (2) the invoices for the provision of materials.

Odoo is an open-source ERP software in use by EPISCAN since January 2022. EPISCAN's production manager uses the manufacturing module and the warehouse management module. The warehouse management module is updated each time EPISCAN receives the provision of materials. In the manufacturing module, the production

managers enter the total number of masks produced, and then ODOO automatically calculates the material used in kilograms. Odoo also generates graphs from the production data entered.

The overall objectives and vision related to WASABI for EPISCAN concerns the following two areas:

- Support in progress reporting during and after each production shift
- Training of new employees in operating the two production lines

3.2.2 Functional requirements

- Collect vocal input from operators
- Store data input from operators
- Transmit input from operators to an Excel sheet
- Ability to show videos and/or photos for a basic use of the machines.
- Present learning cases for operational training (procedural instructions)
- Smaller learning cases (nuggets) should be linked to a larger in order to teach all operations and measure overall progress
- Understand native language (Spanish)
- Understand other languages for rapid onboarding of non-native speakers

3.2.3 System technical requirements

- Read/Write to Excel. EPISCAN has suggested to not integrate the digital assistant with the production lines nor the OODO software, keeping all communication through the Excel sheet that the ODOO software reads. Information from the production lines should then be communicated by voice by the operators to the DA, which writes this information to the Excel sheet.
- Provide information on production status when required by production management

3.2.4 Additional requirements

No additional requirements were mentioned in the kick-off meeting presentation, the self-reported descriptions or in the workshop discussions. A short discussion on personal data and GDPR yielded no specific additional requirements, save the general requirements of adherence to the relevant regulatory requirements. See also section 5 for a discussion of those.

3.2.5 Expected benefits and related KPIs

In this section, we present the results of the evaluation of benefits for EPISCAN.

#	Benefits	Cat	Value (Low/Medium/High)	When (Short/Medium/Long)	KPI	Base	Target	Indicator (Perf/ Impact/ Accept/ Trust/ Usability)
1	Reducing training times for workers in manufacturing processes.	ORG	High	Medium (6 months)	Training time	Need info on current employee training	TBD with EPISCAN	Performance
2	Having all production and raw material information integrated into Odoo	ORG	High	*Short*	Information available into Odoo	TBD with EPISCAN	TBD with EPISCAN	Impact
3	Accelerate the digital transformation of EPISCAN's business lines.	ORG	Medium/High	Short	Number/percentage of employees using the DA	N/A	100%	Acceptance/ Usability
4	Easier/improved access to management information on production	OPR	High	Short	Satisfaction survey	No Base	Easier	Performance
5	Improved/reduced waste of raw material (possible new value chains?)	ENSU	Low	Long	Current material consumption per mask/ production shift	TBD with EPISCAN	8 %	Impact
6	Reduce operators time spent on non-value adding activities (reporting/writing on documents)	OPR	High	Short	Number of documents that were used to write down mask data / number of times Coala is used to	1 document per shift	0 documents per shift	Performance

Table 3: Benefits and KPIs provided by EPISCAN

Most of the benefits are organizational. This means that WASABI will enable EPISCAN to structure its process, and thus enable operators to be more efficient.

Let's complete this analysis by suggesting means and methods to concretely evaluate these benefits:

1. **Reduced training time for workers in manufacturing processes:**
   a. Onboarding Time: Track the time it takes for new employees to become proficient in their tasks. Compare this data before and after the assistant's implementation.
2. **Having all production and raw material information integrated into Odoo:**
   a. Information available on Odoo: Check and track all information available into Odoo is the best way to see if all information needed in correctly integrated into Odoo by WASABI.
3. **Accelerate the digital transformation of EPISCAN's business lines:**
   a. Use rate of the Digital Assistant (DA): The target of the project is that all operators use the WASABI DA.
4. **Easier / improved access to management information on production:**
   a. Satisfaction survey: A satisfaction survey in order to ask operators if they now have access to all management information on production. This kind of KPI do not need a base, because they people we asked already know the as-is situation and will compare with it.
   b. Information retrieval time: Measure and then compare the time it takes to access relevant information with and without the assistant.
   c. Data accuracy: Assess the data accuracy and reliability of data retrieved by the assistant
   d. Decision-making: Evaluate if managers/supervisors are able to make quicker and more informed decisions based on the improved access to production information.
5. **Improved/reduced waste of raw material:**
   a. Material consumption: Measure the reduction in raw material consumption after implementing the assistant and compare this to the one before the use of the DA.
   b. Costs savings: Calculate the costs savings achieved due to reduced raw material waste.

6. **Reduce operators time spent on non-value adding activities:**
    a. Time tracking: Measure the time operators spend on non-value adding activities before and after using the assistant,
    b. Task Reallocation: Evaluate if operators can spend more time on value-adding tasks due to reduced time spent on non-value adding activities.

Following is the mapping of identified benefits according to their value and expected term:

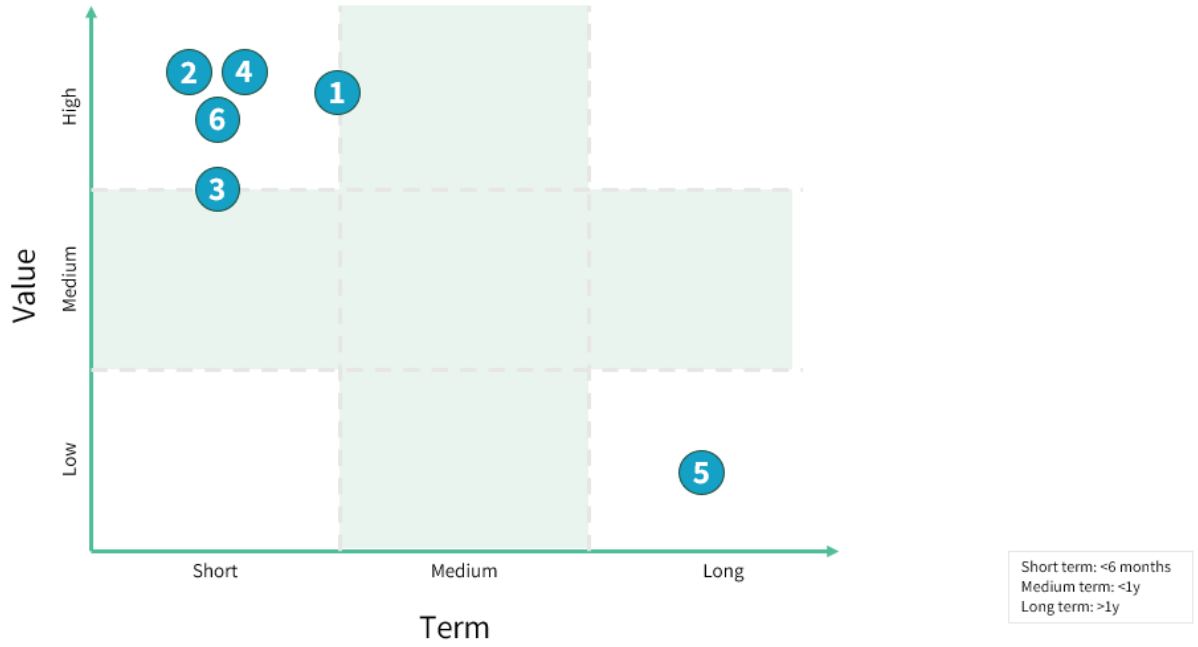

Figure 14: Mapping of the EPISCAN benefits

Here, we can see that the expected benefits are all high value-added. Furthermore, most of them could be observed in the short term.

Except for benefit number 5, which is to reduce waste of raw material. In the long term, WASABI could help to improve use of raw material and reduce waste. **However**, **this benefit is indirect to the use of WASABI** and is derived from better information about the raw materials. To become observable, this benefit requires time in order to use WASABI in the most effective way.

3.3 REINOVA

REINOVA provides testing and validation of e-mobility components such as modules and battery packs. They specialize in consultancy, training, and other electric mobility services to support customers in the transition to electricity with innovative processes and methods.

Their services consist of analysis of design, materials, structure, and competitors. Environmental impacts are also assessed. Electromagnetic compatibility testing with high-performance technologies and equipment is a part of their expertise.

Figure 15: Pictures from REINOVAs facility

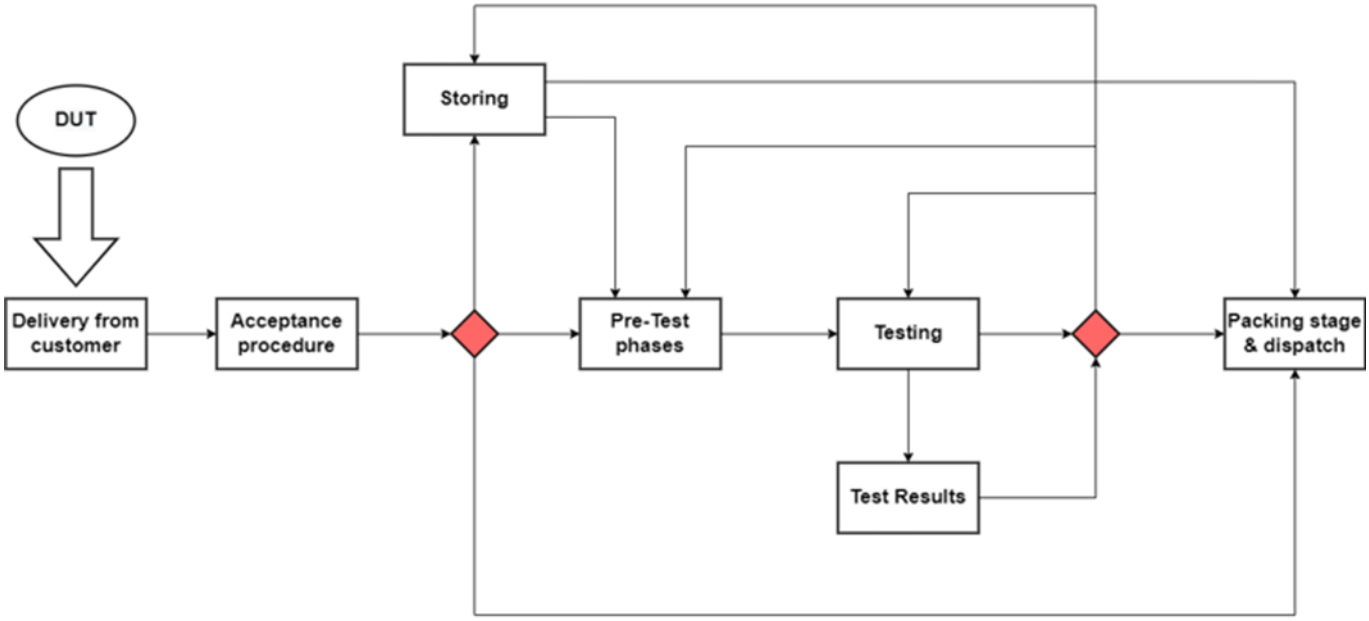

Figure 16: REINOVA As-Is process

3.3.1 Situation analysis and use case detailing

The digital assistant should aim to assist technicians and engineers in a laboratory setting where advanced test machines are running, often long-lasting, tests on various devices (Device Under Tests, DUT). By providing real-time status updates and presenting retrospective data, the digital assistant can contribute to the safety of the work environment and improve work efficiency in general.

The digital assistant will be linked to the testing machines through APIs and provide alerts in case of any irregular incidents, thus allowing technicians and engineers to respond quickly and prevent potential accidents. The goal is also to provide real-time status updates on the machines, allowing users to track the progress of tests and make informed decisions. Adding additional input to the user for decision support is also of interest.

Retrospective analysis based on historical data will also be made available, allowing users to analyze past performance and identify areas for improvement. This can help to optimize the testing process and improve efficiency.

The digital assistant is to be implemented in a laboratory setting to assist technicians, operational engineers, and test engineers in performing tests on customer devices. The assistant should support two :

Alarm and Emergency Notification: The assistant notifies users (or user groups) about alarms from tests and emergencies from devices, such as fire and gas events or sensor faults. REINOVA currently has a Telegram Bot service for this purpose but feels there is a need for upgrade.

Machine Status Request: Users should be able to query the assistant about the status of a particular machine or the overall status of the laboratory.

Currently, a mobile app prototype, which is based on the Telegram BOT platform with [1]similar functionalities is in use, and users can send requests to the bot and receive emergency notifications. This process can be improved [2]by:

- Implementing more sophisticated responses, increasing the amount of information provided, and suggesting possible solutions in case of faults or malfunctions.
- Another potential new feature is implementing power consumption information from machines, allowing the assistant to warn about abnormal statuses.

The main elements involved in providing data to the assistant are the test machines situated in the laboratory. Each machine has its own data communication protocol which must exchange data with a “wrapper” software that communicates with the assistant. By using this upgraded assistant integrated with the DA, users can be more effective in using the laboratory and develop their ability to take action on less severe faults that currently require intervention by personnel.

The operational context is a warehouse laboratory where industrial testing of large electrical components, such as electrical car batteries, takes place. These tests are conducted using huge machines and can last for years. Despite the size of the machines and the duration of the tests, the laboratory is not too loud.

In the same building as the laboratory, there are offices where other personnel work. These individuals may be indirectly involved in different aspects of the testing process, or they may have other roles within the organization.

Overall, the environment is characterized by a combination of industrial testing and office work. The laboratory provides a controlled environment for conducting long-lasting tests on large electrical components, while the offices provide a space for a variety of personnel to carry out their work.

3.3.2 Functional requirements

The operations of REINOVA are centered around executing advanced testing performed by large-sized machines on a variety of components in a large laboratory setting. Test operators and engineers apply their area of competence to prepare, supervise, and assess the operations.

[1] A description of this platform has been uploaded on the WASABI project repository for inspection as needed.
[2] The idea is not to replace the Telegram platform, but to add functionality via a DA.

The case of REINOVA is divided into two use-case scenarios:

1. A need for notifications and procedural support if an incident is under development, if there is an emergency incident taking place, and the ability to access essential information throughout the lifespan of the incident.
    a. Also, procedural support is requested in terms of which actions to execute in a given event is a desired feature.
2. The provision of step-by-step process support during any given DUT-procedure.

In the frame of scenario 1, the digital assistant will provide alert distribution, decision support, and work instructions:

- The digital assistant will provide alert distribution to user roles.
    - The system must support the ability for a user to assign an alarm to a different user or user role. This is in order to provide the ability to delegate based on available resources and competencies. At the moment no definition of user roles exists.
    - The alarms should preferably provide as much contextual information as possible. Currently, the information provided in the app is very limited.
- Decision support – provide suggestions for steps taken in the context of the alarm.
- Work instructions – provide suggestions for steps taken in the context of the given work procedure.

In the frame of scenario 2, the digital assistant will provide process guidance and decision-making support:

- The digital assistant should be able to suggest the need to initiate the start of a process based on data from the internal ERP system, ALPS.
- The digital assistant should provide instructions for the steps of the initiated process.
    - Logging of the steps is done by the digital assistant at the user's request.
- Upon request the assistant should respond with the main status of the given machine (e.g., "running a test", "not running", "ready", "emergency") and the status of its sub-items (e.g., sensor readings). In case of machine malfunction, the assistant can also provide the user with the required actions to restore operational status.

3.3.3 System technical requirements

- The digital assistant should provide alert distribution to different user roles and be able to differentiate based on different attributes.
    - This functionality will depend on an integration, most likely via an API, to the system currently in use (the Telegram bot app).
- The alarms should provide as much contextual information as possible.
    - In some cases, this might depend on an API to the actual testing machines in the laboratory.
- Decision support – provide suggestions for steps taken in the context of alarms.
    - Requires written procedures by REINOVA.
- Work instructions – provide suggestions for steps taken in the context of a given work procedure.
    - Requires written procedures by REINOVA.
- The digital assistant must support Android.
- The assistant must have an authentication procedure (i.e., SSO with AZURE).
    - The main software can be located on the company server.

3.3.4 Additional requirements

Social Related Requirements

- Involve users in the development and implementation process:
  - Involve user groups and take their feedback into account.
- Develop an implementation plan to provide training and support.
- Obtain leadership buy-in:
  - Crucial for the successful adoption of new technology. Leaders can promote the benefits of the technology, provide resources for its implementation, and encourage its use among employees.
- Ensure alignment with company values:
  - This can help ensure that it is well-received by employees and integrated into the company's operations in a way that is consistent with its overall mission and goals.

Ethics Related Requirements

- Transparency:
  - Helps build trust with users and ensure that they are fully informed about the technology and its potential impacts.
- Privacy:
  - Ensure that personal data is collected, stored, and used in a responsible manner and that users have control over their own data in compliance with GDPR and national law.
- Accountability:
  - Strive towards awareness of possible adverse impacts that may arise and commit to addressing them in a timely and effective manner.

User and Usability Related Requirements

- Training
- Voice input
- Support for Italian

3.3.5 Expected benefits and related KPIs

In this section, we present the results of the evaluation of benefits for REINOVA.

#	Benefits	Cat	Value (Low/Medium/High)	When (Short/Medium/Long)	KPI	Base	Target	Indicator (Perf/ Impact/ Accep/ Trust/ Usability)
1	Reduced cycle time / TTM	OPR	Low	Medium	Downtime Ratio = (Technical Downtime / total capacity) x 100	TBD with REINOVA	TBD with REINOVA	Perf
2	Increased speed of technician's tasks	OPR	High	Short	Task Completion Time = (Total time taken by all technicians to complete the task) / Total number of completed tasks	TBD with REINOVA	- 10-15 %	Perf
3	Reduced risk of error	OPR	High	Short	Average time difference between two consecutive errors	TBD with REINOVA	x 2	Usability
4	Make technicians autonomous	OPR	High	Short	Measure of the support request from the lab engineers and technicians	TBD with REINOVA	TBD with REINOVA	Trust

5	Optimize daily work's planification	OPR	Medium	Long	Daily Work Plan Compliance = (Number of Completed Tasks as Planned / Total Number of Planned Tasks) x 100	TBD with REINOVA	TBD with REINOVA	Perf
6	Increase exchange of information with laboratory technicians	OPR	Medium	Medium	TBD with REINOVA	TBD with REINOVA	TBD with REINOVA	TBD
7	Help PMs on tests definition stage	OPR	Low	Long	Time of the tests definition stage for PMs	TBD with REINOVA	- 20%	Perf.
8	Minimize electric power consumption	ENSU	Low	Medium	Electric consumption	TBD with REINOVA	- 5%	Perf.

Table 4: Benefits and KPIs provided by REINOVA

We can see here that most of the expected benefits are linked to operational performance. **In this way, WASABI could boost productivity in several aspects of production.** In addition, one of the high value benefits is linked to the error rate, it means that **WASABI will also improve data and work quality.**

Let's complete this analysis by suggesting means and methods to concretely evaluate these benefits:

1. **Reduced cycle time / TTM:**
2. **Increased speed of technician's tasks:**
    a. Time tracking: Measure the time taken to complete tasks with and without the assistant. Compare the data to quantify the increase in speed,
    b. Benchmarking: Compare task completion times against industry benchmarks to assess the impact of increased speed.
3. **Reduced risk of error:**
    a. Error tracking: Compare the number of errors made before and after implementing the assistant. Quantify the reduction in error rate,
    b. Quality Assurance: Measure the improvement in product or process quality as a result of reduced errors.
4. **Make technicians autonomous:**
    a. Task Completion: Measure the percentage of tasks that technicians can complete without external assistance. Compare this metric before and after implementing the assistant.
    b. Skill Development: Monitor technicians' skill development over time as they become more autonomous in complex tasks
5. **Optimize daily's work planification:**
    a. Efficiency of Scheduling: Measure the accuracy of work plans created with and without the assistant. Evaluate how well tasks are aligned with available resources.
    b. Resource Utilization: Track resource utilization (time, equipment, personnel) and assess if there's an improvement in utilization rates.
6. **Increase exchange of information with laboratory technicians:**
    a. Communication Metrics: Measure the frequency and quality of communication between manufacturing and laboratory teams before and after the assistant's implementation.
    b. Collaboration Metrics: Assess improvements in cross-functional collaboration and information sharing.
7. **Help PMs on tests definition stage:**

a. Test Development Time: Measure the time it takes for project managers to define tests before and after using the assistant. Quantify time savings.
b. Test Accuracy: Evaluate the accuracy of test definitions and how often they need adjustments or revisions.

8. **Minimize electric power consumption:**
   a. Power Consumption Tracking: Monitor power consumption levels in manufacturing processes before and after implementing the assistant.
   b. Energy Efficiency Metrics: Calculate energy efficiency ratios for different processes to evaluate improvements in consumption.

Following is the mapping of identified benefits according to their value and expected term:

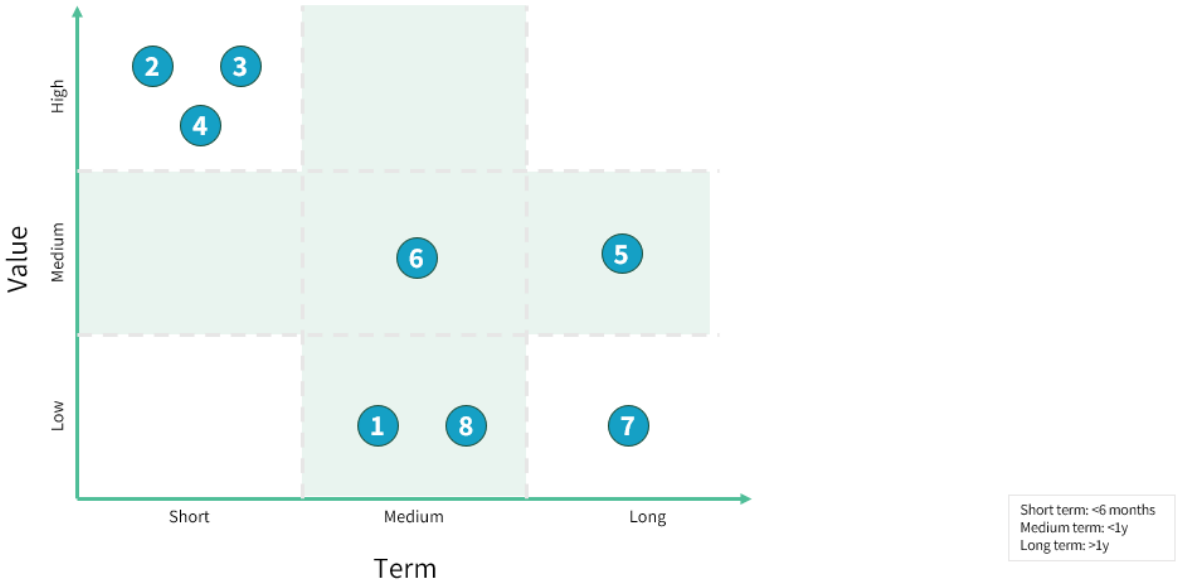

Figure 17: Mapping of the REINOVA benefits

Here, we can see that benefits 2, 3 and 4, consisting respectively in increasing the speed with which the technician completes tasks, reducing the risk of technician error and increasing technician autonomy, are **short-term high value-added benefits whose effects can be rapidly seen**.

Conversely, benefits 1, 7, 8 and 9, aimed at reducing TTM, helping managers to define tests, limiting energy consumption, and reducing the carbon footprint, are low value-added benefits whose effects may take some time to be seen. In fact, **these benefits are indirect to the use of WASABI** and derive above all from the productivity and time savings that WASABI can enable. To be observable, these benefits require REINOVA to find a new cruising speed with WASABI, and therefore time.

3.4 SILK-BIO

SILK-BIO is challenging the status quo in regenerative medicine by leveraging silk as a powerful, scalable, and biocompatible scaffold material. SILK-BIO is targeting different clinical indications in the orthopedic, vascular, and drug release markets via several technology platforms.

Several clinical needs remain unmet, particularly in orthopedics, vascular surgery, and sports medicine. No regenerative platform has so far been able to solve them all properly.

SILK-BIO has created a set of technologies that exploit the mechanical flexibility and regenerative capacity of silk fibroin. SILK-BIO is currently at a clinical stage with a guide for nerve repair and advancing other preclinical assets in rotator cuff repair, vascular and bone grafting, and drug release indications.

3.4.1 Situation analysis and use case detailing

The digital assistant will support the process of solubilization and casting of silk fiber. The digital assistant will support the operators' manual activity and their interaction with the equipment involved. Potentially, it can be applied in all process steps where the operator has to make a check or where he has to give a confirmation of activity. This is today done by an operator writing up steps performed and actions taken on a piece of paper, documenting each step of the procedure, and signing off the paper when the process/subprocess has been completed. There are at least 15 such subprocesses to be documented for each "production batch". All documentation is then entered manually into a spreadsheet. It is necessary to keep the documentation for years to be able to retrieve it and present it when clients, customers, authorities, or other with a right-to-know asks.

Pictures in Figure 18 and Figure 19 illustrate the situation as is:

Figure 18: Measuring process at SILK-BIO

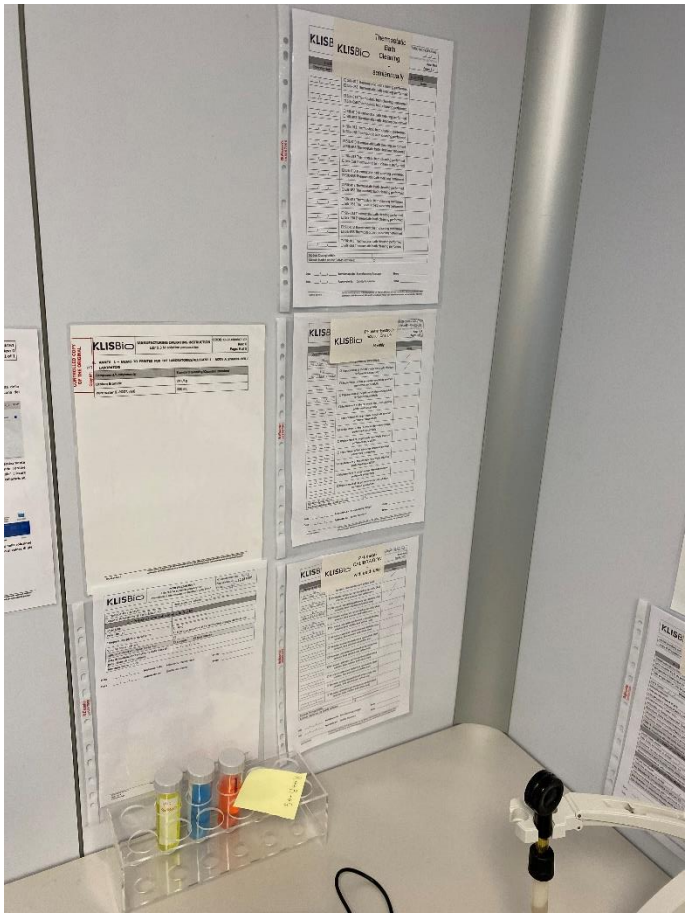

Figure 19: Wall of documentation at SILK-BIO

The operator follows the process and registers max and min measurements. Afterwards, this is documented on the sheets and signed. The signed sheet is put back into the plastic folder for later entry into an electronic system. From an organizational point of view, the process would not change as the process is bound by specific steps. The documentation process could, however, be supported by a digital assistant, allowing the operator to register steps and confirm actions along the way. Also, cycle time, traceability maintenance, and safe handling would benefit.

The process that the digital assistant will support is that of solubilization and casting of silk fiber. The digital assistant will support the operators' manual activity and their interaction with the equipment involved. Potentially, it can be applied in all process steps where the operator has to make a check or where he has to give a confirmation of activity.

From an organizational point of view, the process would not change as the process is bound by specific steps. However, cycle time, traceability maintenance, and safe handling would benefit.

The implementation of the digital assistant aims to improve the cycle time of a process, provide traceability, reduce manual documentation, and increase safety in several ways. So,e examples being:

- Improving cycle time: A digital assistant can provide real-time information and guidance to users. This can reduce the need for manual documentation and significantly reduce the cycle time of a process, making it faster and more efficient.

- Providing traceability: A digital assistant can provide real-time tracking and monitoring, making it easy to track and trace, and perform analysis in retrospect. This can help to improve traceability and provide greater visibility into the process.
- Reducing manual documentation: The digital assistant can reduce the need for manual documentation by capturing vocal inputs from the user and storing data in a digital format. This can save time and reduce the risk of errors associated with manual documentation.
- Increasing safety: A digital assistant can help to improve safety by providing real-time instructions to users, helping them to identify and address potential safety issues before they become a problem.

3.4.2 Functional requirements

- The digital assistant must provide descriptions of each step, and task instructions where needed.
- It must be able to save data and provide data input from earlier steps by request.
- Experienced users must be able to perform the process without unnecessary prompts from the DA, meaning a role-based modes of functioning.

3.4.3 System technical requirements

- Support for detailed procedures.
- Support for changing of procedures.
- Digital data storage in compliance with medical standards.

3.4.4 Additional requirements

No additional requirements were mentioned in the kick-off meeting presentation, the self-reported descriptions or in the workshop discussions. A short discussion on personal data and GDPR yielded no specific additional requirements, save the general requirements of adherence to the relevant regulatory requirements. See also section 5 for a discussion of those.

3.4.5 Expected Benefits and related KPIs

In this section, we present the results of the evaluation of benefits for SILK-BIO.

The first thing we can observe is that most of the expected benefits are linked to operational performance. **In this way, WASABI could boost productivity in several aspects of production.**

#	Benefits	Cat	Value (Low/Medium/High)	When (Short/Medium/Long)	KPI	Base	Target	Indicator (Perf/ Impact/ Accep/ Trust/ Usability)
1	Reduced cycle time	OPR	Medium	Short	Time spent for each cycle	TBD with SILK-BIO	- 10-15 %	Perf.
2	Increased speed of technician's tasks (reporting mostly)	OPR	Medium	Short	Time spent on each task	N	>50% reduction (for reporting)	Perf.
3	Reduced risk of error (when operators report)	OPR	High	Short	# errors	TBD with SILK-BIO	- 50 %	Perf.
4	Increased safe handling	OPR	High	Short	# workplaces to fill in worksheets	10	2	Perf.
5	Decreased rate of discarded material	OPR	Medium	Medium	# discarded material at each step	TBD with SILK-BIO	TBD with SILK-BIO	Perf.

6	Increased operator's satisfaction score	HUM	High	Medium	Satisfaction survey	TBD with SILK-BIO	TBD with SILK-BIO	Impact
7	Reduce material consumption (gloves, paper, …)	ENSU	Medium	Short	# gloves, paper used	TBD with SIL-BIO	> 60% paper + gloves reduction	Perf.

Table 5: Benefits and KPIs provided by SILK-BIO

Following is the mapping of identified benefits according to their value and expected term:

Let's complete this analysis by suggesting means and methods to concretely evaluate these benefits:

1. **Reduce cycle time:**
    a. Time tracking: Measure the time taken for one cycle before and after the implementation of the digital assistant. Compare the data to quantify the increase in speed,
    b. Benchmarking: Compare cycle times against industry benchmarks to assess the impact of increased speed.
2. **Increased speed of technician's tasks:**
    a. Time tracking: Measure the time taken to complete tasks with and without the assistant. Compare the data to quantify the increase in speed,
    b. Benchmarking: Compare task completion times against industry benchmarks to assess the impact of increased speed.
3. **Reduced risk of error:**
    a. Error tracking: Compare the number of errors made before and after implementing the assistant. Quantify the reduction in error rate,
    b. Quality Assurance: Measure the improvement in product or process quality as a result of reduced errors.
4. **Increased safe handling:**
    a. Incident reports: Compare the number of incidents related to equipment handling before and after the assistant's implementation,
    b. Severity assessment: Analyze the severity of incidents and accidents to determine if there is a reduction in severity after using the assistant.
5. **Decrease rate of discarded material:**
6. **Material waste measurement: Measure the quantity of discarded materials before and after implementing the assistant to assess the reduction in waste**
7. **Increase operator's satisfaction:**
    a. Surveys: Conduct employee satisfaction surveys to gather feedback on their experience using the assistant. Compare satisfaction levels before and after implementation,
    b. Retention Rate: Monitor employee retention rates to assess whether improved satisfaction leads to better employee retention.
8. **Reduce material consumption:**
    a. Paper & gloves consumption: track the consumption of paper before and after WASABI will enable to see if the use of the digital assistant enables to reduce material consumption,

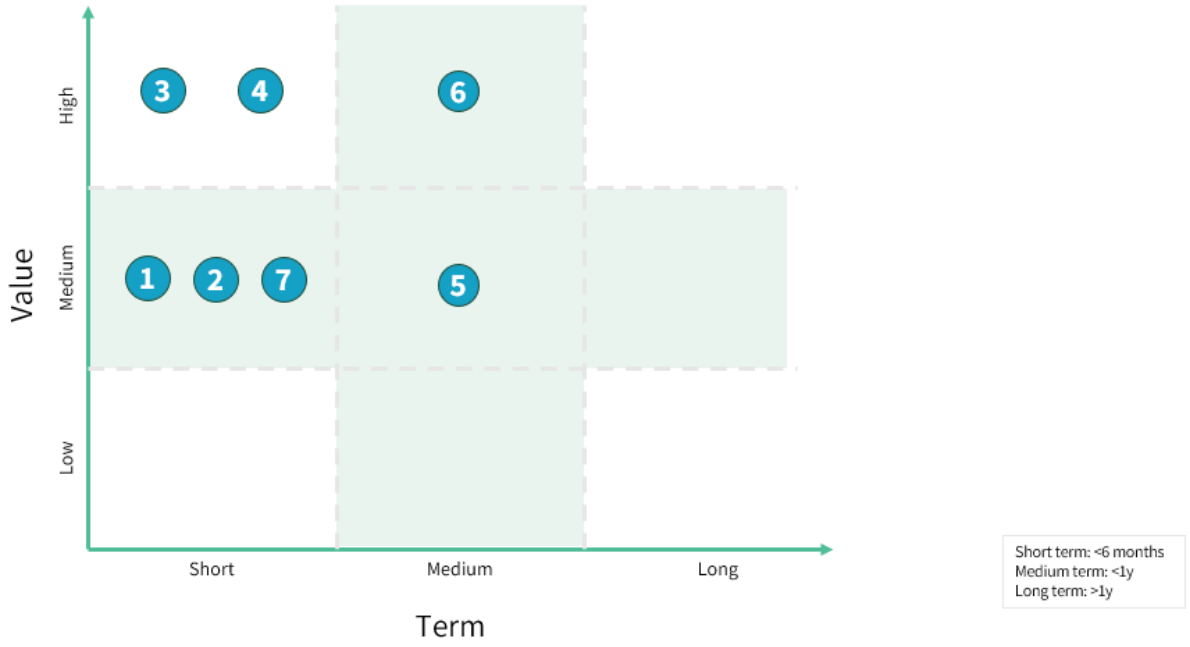

Figure 20: Mapping of the SILK-BIO benefits

Here, we can see that **all the expected benefits are in a short-time frame**. This means that the effect of these benefits can be observed quickly. Indeed, most of these benefits are direct benefits of using WASABI.

In addition, **these benefits are all high value-added to the SILK-BIO process**. This means that these benefits have a major impact on the operation of the chain and can generate significant savings.

3.5 TRIMEK

TRIMEK specializes in metrology systems, solutions, and machines. They design and manufacture Coordinate Measuring Machines (CMMs) of different models and sizes and have developed the M3 software for the capture and analysis of point clouds. The CMMs measure the geometry of physical objects by sensing discrete points on the surface with a probe. The typical 3D "bridge" CMM allows probe movement along three axes, X, Y, and Z, which are orthogonal to each other in a three-dimensional Cartesian coordinate system.

Figure 21: Machines for measuring 3D objects

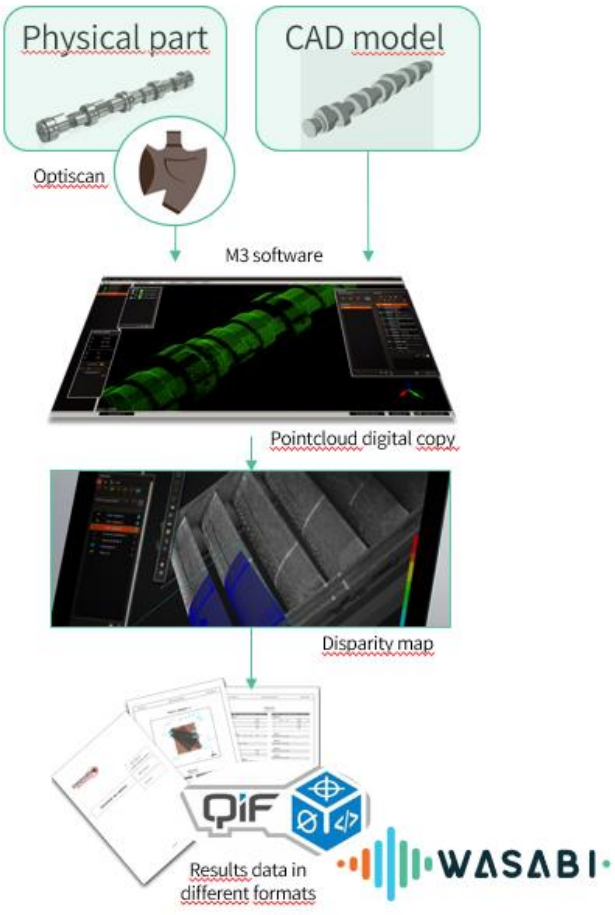

Figure 22: AS-IS Measurement process with CAD and M3 software

3.5.1 Situation analysis and use case detailing

On one side, TRIMEK will use its M3 solution to dimensionally analyse components or artifacts of TRIMEK processes that are no longer in proper conditions (defective or decalibrated), to determine if they can be fixed and reused by other manufacturing SMEs or midcaps. Based on input from the M3 system the digital assistant will suggest a template for the decision process. After measuring or analysing, the digital assistant will reply if the part differs from the aimed part, if it can be remanufactured for reuse, if it needs to be calibrated, or if it needs to be used for other purposes.

The digital assistant will guide the process of assessing the reuse of defective or uncalibrated parts used in the TRIMEK pilot. The digital assistant should serve as a middle point between the M3 software results and the reUse management platform. The data generated is dimensional metrology data about the part and can be presented in different formats. The digital assistant should be capable of understanding this information to assess how the part can be reused.

On the other side, TRIMEKs clients are the users of the M3 software to measure different types of pieces in the coordinate measuring machine, where each part might have a different procedure for dimensional inspection. Moreover, the clients are not trained in metrology as such, and the task can be challenging. The idea is to develop different "templates" for different tasks to be performed during the inspection of the different types of

components. The assistant will assist in deciding the adequate template for a particular task and once decided, provide support in completing the steps of that template. This will function both as a support for the client and new personnel as well as a validation protocol to guarantee that the task is performed in a correct and safe manner.

For the use case 'augmented waste management and utilization', WASABI will incorporate dimensional measurement techniques into its scrap handling processes. The utilization of the digital assistant will contribute to improvements in the M3 process. The goal is increasing the catalogue of services provided by TRIMEK and contributing more to the circular economy.

The other use case, 'assisted quality assurance for sustainable products,' aims to improve workers' skills and understanding in operating the machine. This will result in a faster measurement process with fewer human errors, leading to increased productivity and time savings. The service could be sold to TRIMEK customers, resolving logistics and cost issues for TRIMEK. It should be noted that decisions about scrapping and scrap usage depends on the measurement process being reliable and high quality. Therefore this case is to a large degree a prerequisite for realizing the scrap use case.

3.5.2 Functional requirements

- Oral guidance for each step in the process
- Support for oral commands, i.e., "next step" or "what is parameter X on machine Y?"
- Providing suitable process support by choosing the correct template for the given job at hand. The template selection process will be based on a rule-based algorithm.

3.5.3 System technical requirements

- Integration with the TRIMEK M3 system
- Authentication

3.5.4 Additional requirements

No additional requirements were mentioned in the kick-off meeting presentation, the self-reported descriptions or in the workshop discussions. A short discussion on personal data and GDPR yielded no specific additional requirements, save the general requirements of adherence to the relevant regulatory requirements. See also section 5 for a discussion of those.

3.5.5 Expected benefits and related KPIs

In this section, we present the results of the evaluation of benefits for TRIMEK.

#	Benefits	Cat	Value (Low/Medium/High)	When (Short/Medium/Long)	KPI	Base	Target	Indicator (Perf/ Impact/ Accept/ Trust/ Usability)
1	Increased speed of unspecialized technician's tasks	OPR	High	Medium (6 months)	Speed in metrology task programming	3 days approx.	+ 20%	Perf.
2	Reduced risk of error in the use of the software	OPR	High	Medium (6 months)	Error risk in the use of the software	TBD	- 20%	Perf.
3	Reduced training time for new users	ORG	High	Medium (6 months)	Training time	5 days approx.	- 20%	Impact

4	Higher employee satisfaction (potential benefit)	HESA	Medium	Medium (6 months)	Employee satisfaction	TBD	+ 15%	Impact
5	Establishing a new value-chain for discorded equipment	OPR	Medium	Short (4 months)	Decalibrated device is calibrated for the comercial circuit	Component is waste	Component is reused	Usability

Table 6: Benefits and KPIs provided by TRIMEK.

Let's complete this analysis by suggesting means and methods to concretely evaluate these benefits:

1. **Increased speed of technician's tasks:**
    a. Time tracking: Measure the time taken to complete tasks with and without the assistant. Compare the data to quantify the increase in speed,
    b. Benchmarking: Compare task completion times against industry benchmarks to assess the impact of increased speed.
2. **Reduced risk of error:**
    a. Error tracking: Compare the number of errors made before and after implementing the assistant. Quantify the reduction in error rate,
    b. Quality Assurance: Measure the improvement in product or process quality as a result of reduced errors.
3. **Reduced training time for new employees:**
    a. Onboarding Time: Track the time it takes for new employees to become proficient in their tasks. Compare this data before and after the assistant's implementation.
4. **Make better use of human resources:**
    a. Time Allocation: Analyze how employees allocate their time before and after the assistant's introduction. Measure the increase in time available for higher-value tasks,
    b. Task Distribution: Monitor whether employees can handle more tasks simultaneously due to time savings.
5. **Higher employee satisfaction:**
    a. Surveys: Conduct employee satisfaction surveys to gather feedback on their experience using the assistant. Compare satisfaction levels before and after implementation,
    b. Retention Rate: Monitor employee retention rates to assess whether improved satisfaction leads to better employee retention.
6. **Establishing a new value-chain for discarded equipment:**
    a. Revenue Generation: Track the revenue generated from repurposing discarded equipment. Compare this revenue to the costs of the assistant's implementation,
    b. Number of Transactions: Count the number of transactions involving repurposed equipment and evaluate growth over time.
7. **Unspecialized personnel can execute metrology tasks:**
    a. Training Time: Measure the time it takes for unspecialized personnel to become proficient in performing metrology tasks with the assistance of the digital assistant.
    b. Task Success Rate: Track the success rate of unspecialized personnel in performing metrology tasks with the assistance of the assistant. Compare this to the success rate without the assistant.

Following is the mapping of identified benefits according to their value and expected term:

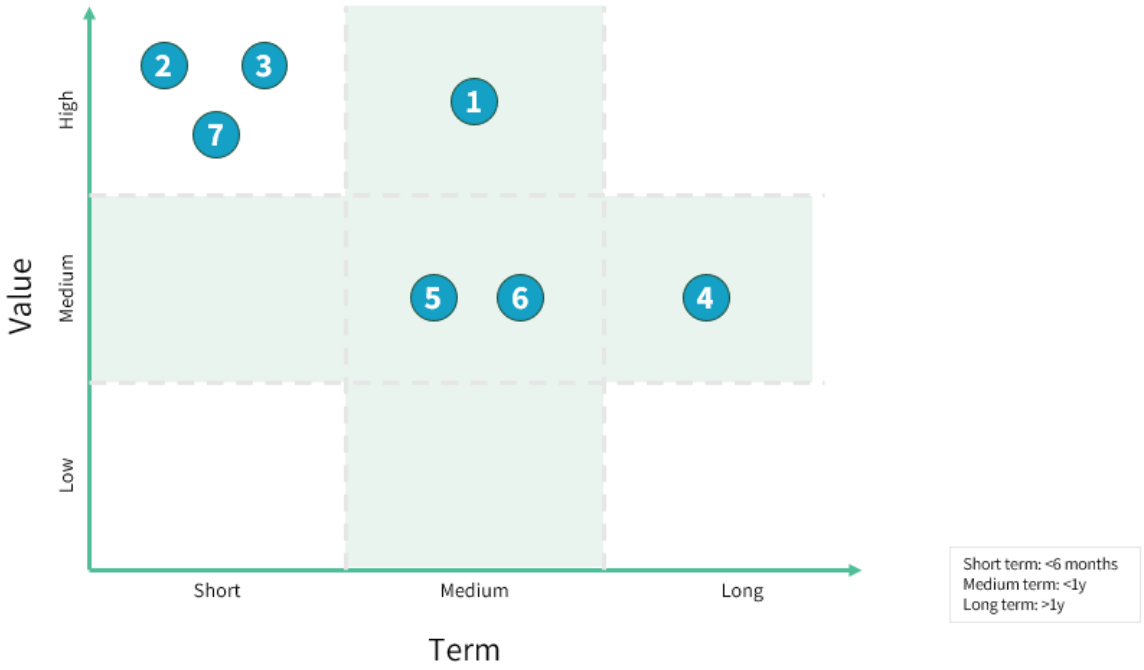

Figure 23: Mapping of the TRIMEK benefits

We can see that benefits 1 and 5 can be contradictory. In fact, the time saved by WASABI could be used either to give operators more time and improve their satisfaction, or to increase productivity.

The ability of customers to perform tests themselves using the WASABI digital assistant is the most important indicator of how well the digital assistant is working. In TRIMEK's case, this is also an observable short-term benefit, representative of the project's success.

4. WHITE-LABEL SHOP

4.1 Method

Having performed the procedure outlined in 2.2.8 in the workshops with the use case partners, an overview of questions was created. We have grouped the questions into seven categories and one undefined class afterward. All questions are listed below.

4.2 List of questions

4.2.1 Questions on Generic issues

- What is the aim of the white-label shop?
- Why a totally new white-label shop and not an existing one? What will be the differences?
- What is the language of the white-label shop?
- What other assistant will be offered apart from COALA?
- How should we integrate the open-call results into the white-label shop?
- How will the use cases be integrated into the white-label shop?
- How can others benefit from my experience stored in the shop instances?
- How will white-label shop increase company X productiviy?

These issues are not primarily technical. They range from the basic question of “why (the aim), what’s in it for me and others” to more practical issues like language and use case integration.

4.2.2 Questions on Business models

- How should non-technical services be made available for the white-label shop?
- Focus on particular sectors? (manufacturing services, healthcare)
- Propose a service pay per use or subscription?
- Will the shop aim only at companies? B2B or B2C?
- How is customer support working?
- Will it be possible to order totally new services?
- Does the shop suggest additional services like “training” after an assistant is chosen?
- What is the business model behind the store?
- Is there any possibility of making B2B connections through the store and maybe selling customizations?
- The store should minimize the vendor lock-in, but how can one use our application which is tailored to our use case?
- Which indirect benefits can companies draw from the shared dataspace?
- Who will be the user of the shop?
- Is the application going to be published after the name of the specific company that designed it?
- Will all services involve COALA software?
- How will the shop be funded? (Apple App store takes percentages of app sales)
- Will there be any refund possibilities if the purchased solution doesn’t work as intended?
- Will it be possible to ask for new products/services?

There is some overlap, which we haven’t removed. These questions focus on the business side of the white-label shop. Will there be lock-ins, what kind of new offers will be available, how do users pay, who are the intended customers, and what

services will be available. This is not requirements, at least not technical requirements, but it is questions the user needs some answers to before major use can take place. There is also some overlap with the next questions, on apps.

4.2.3 Questions on Apps

- Tailor-made or existing solutions?
- What kind of apps will the shop contain?
- How can it involve customers? Preliminary survey to suggest apps?
- How to order a new product?
- How to communicate the value of apps from the development point of view?
- How to choose the right apps/services from the shop?
- Will the shop offer any guidance on what to buy?
- Will there be pre-defined packages (functions, devices) available in the shop?
- Who is in charge of the maintenance of the marketplace?
- Who will develop the IA services?
- What are the shop instances? Is it related to the different digital assistant frameworks?
- Who decides who has access to each shop instance?
- Will there be demo versions available before buying?
- Will suggestions for apps that are realized be partly credited to the ones who ask for that particular functionality?

These questions focus on the content of what is offered and the interaction with the client. Are solutions tailor-made or prepackaged? Who delivers, how should we pay (and for what), who develops the solutions, what assistance can I have in finding the relevant solution, and so on. Some of these questions clearly border on the questions of business models.

4.2.4 Questions on Data

- How to establish connectivity with data sources?
- How to assess the usability of internal data for AI?
- Does the solution need a Learn Management System (LMS)?
- How will the data be integrated or changed to fit in the shared database?
- Do we need a LMS for training?

The focus of these questions is data flow to and from the solution. There are two questions on LMS; this may be due to a misunderstanding of who is learning skills. The skill learning in WASABI is not for humans but for the AIs. Hence, LMS is unlikely to be relevant.

4.2.5 Questions on End users

- What skills would be most valuable for AI training?
- How to establish trust in the customer business?
- How to know which vendor to trust?
- How to create trust in end-users?
- Who orders something from the shop?
- What does the shop user need to know? (technical background)
- How should training be carried out? (job site, online, computer-based training?)
- Should the training be individual or generic (scope: shop or COALA)?
- What is the minimum requirement of personal training for workers? (scope: shop or COALA)

- The customer will have the possibility to choose the developer company ?
- Training how? In-house, online, synchronous/asynchronous, web-based/computer-based/device-based?

These questions consider the perspective of the end-users. We can note that the word “training” here is interpreted differently; some focus on training for humans, some on training of the AI. The word training should probably be used with some prefix or something to indicate which form of training it is.

4.2.6 Requirements

- Will there be technical constraints/requirements for developers concerning the store?
- Needed certificates or guarantees? (medical sector)
- How should we place orders for “future” solutions? Is it possible?

4.2.7 Unclassified questions

- How to pay (invoices) with procurement systems?
- What would be the value of a functionality that could automatically create a training program based on a written procedure?

These two questions are at least bordering on business model issues, but they are rather specific questions and more subsets.

4.3 Overall discussion

The exercise demonstrated a lot of different concerns and questions regarding the purpose and usefulness of a white-label shop, the usability, business model, content, data, and connectivity of such a solution. This points to several issues that a white-label shop needs to address before it can operate successfully. What it doesn’t provide are technical requirements.

On the one hand, this is positive for development since it gives developers freedom to develop. The end users are currently not able to provide input on this issue. They probably need examples and demonstrations before they can do so. However, some solutions might block or promote some business models/app development and so on. The developer team should, therefore, at least try to avoid indirectly choosing some business model by designing a system that easily lends itself to one particular mode.

For the WASABI project, it is clearly necessary to continue the discussion on the white-label shop. Some of the questions can be answered/commented, and this should probably be followed up on. Then, it is necessary to offer some demonstration to the end users. Based on this, a new collection of requirements could be done before M15.

5. LEGAL KEY REQUIREMENTS FOR DATA PROTECTION-BY-DESIGN, SECURITY, LIABILITY AND ETHICS

5.1 Legal requirements for data protection-by-design

The central premise of the WASABI solution as a digital assistance technology for manufacturing, focusing on assistants that are also conversational agents gives rise to several requirements for **data protection-by-design**. Use-cases working with and working on the digital assistants will have to foresee the appropriate technical and organization measures to implement data protection principles and integrate necessary safeguards to meet data protection requirements and protect data subjects.[3] In many cases, these data subjects will be workers interfacing or otherwise interacting with the assistant. The use of these assistants by workers will in all likelihood result in a **processing of personal data** when the worker is identified in the manufacturing process or through their use of the voice assistant (either due to the content of their interactions with the assistant or by a potential analysis of their speech. It should be noted that for several of the use case partners such identification is logged and must be possible by other laws (regulating health products and processes), but the system should still **protect against abusive/intrusive/errorbased or other random identification** not part of a formal business process for which there is no lawful basis and/or no legitimate purpose for the processing. With regards to the lawfulness of the processing, partners should be aware of the **lawful basis** on which their processing is based and particularly that a legal obligation can only be a lawful basis for processing if the processing is *necessary* for the legal obligation.[4]

The measures required by data protection by design are dependent on the **state of the art, implementation cost** and the **circumstances of the processing/use** of the personal data as well as the risks posed by the processing. Processing in these situations refers to the use of personal data by the digital assistant or, for the purposes of the use-cases in the WASABI project, for the development of the digital assistant.

The required measures may include a **wide set of actions** from participants in the WASABI project and in the use cases (e.g., employee training on data processing, pseudonymizing or anonymizing[5] data, proper data storage formats, etc.). As such, we will not detail every possible specific action, but rather set out the goals which the technical and organization measures (both in the project and for the solution) should achieve under the applicable European legislation. The measures must implement data protection principles in an effective manner to be considered sufficient, but the participants have an otherwise broad discretion in which measures to use.[6]

Particularly important to all use cases in the WASABI project, and for human-machine interactions, is the principle of **transparency**. It should be clear to workers when their personal data is collected and used.[7] In addition, the design should promote **fairness** by supporting the rights and freedoms of the workers/data subjects as well as preventing unfair (unjustifiably detrimental, discriminatory or misleading) data processing.[8] The use cases should also consider the **purpose limitation** principle and take technical and organizational measures to ensure that the data is collected for specified, explicit and legitimate purposes and not further processed in a way that is incompatible with those set-out purposes.[9]Finally, **other principles** in data protection legislation such as the lawfulness and accuracy of the processing, the minimization of data processing and the limitation of the storage

[3] Art. 25 GDPR; European Data Protection Board, *guidelines 4/2019 on article 25 data protection by Design and by Default*, 20/10/2020, 6
[4] Art. 6, c) GDPR
[5] Although it should be noted that proper anonymization technically places the anonymous data outside of the application scope of the GDPR.
[6] Art. 25 GDPR; European Data Protection Board, *guidelines 4/2019 on article 25 data protection by Design and by Default*, 20/10/2020, 7
[7] Art. 25 GDPR; European Data Protection Board, *guidelines 4/2019 on article 25 data protection by Design and by Default*, 20/10/2020, 15-16
[8] Art. 25 GDPR; European Data Protection Board, *guidelines 4/2019 on article 25 data protection by Design and by Default*, 20/10/2020, 17-19
[9] Art. 25 GDPR; European Data Protection Board, *guidelines 4/2019 on article 25 data protection by Design and by Default*, 20/10/2020, 19-20

of the data should also be implemented in the design along with appropriate security measures to maintain the integrity and confidentiality of the data.

Aside from the digital assistant in the manufacturing environment, WASABI also intends to create a **distribution channel** for digital assistance solutions through Prestashop. Here as well, privacy-by-design will have to be taken into consideration during the project and in subsequent developments to ensure that the resulting platform is compliant with EU regulations.

Finally, it should be noted that data protection law also requires that appropriate technical and organizational measures are taken to ensure a **level of security proportionate to the risk** of the data processing.[10] This obligation again takes into account the state of the art, costs and circumstances of the processing. Possible security measures include pseudonymization or encryption of personal data, using resilient systems to ensure confidentiality, integrity and availability of the personal data, the testing of security effectiveness, etc.

). It should be noted that for several of the use case partners such identification is logged and must be possible by other laws (regulating health products and processes), but the system should still **protect against abusive/intrusive/errorbased or other random identification** not part of a formal business process for which there is no lawful basis and/or no legitimate purpose for the processing. With regards to the lawfulness of the processing, partners should be aware of the **lawful basis** on which their processing is based and particularly that a legal obligation can only be a lawful basis for processing if the processing is *necessary* for the legal obligation.[11]

5.2 Considerations for the EU AI Act

In addition to complying with existing data protection legislation, WASABI and its different use cases will also need to take into account the upcoming EU legislation on AI systems. Particularly important is the upcoming **EU AI Act**[12] which, as of the time of writing this deliverable, has entered trilogue discussions between the EU instances.[13] This Act may become applicable to the WASABI solution during, or shortly after, the project. Although the specific obligations in the Act must still be finalized, it is clear from the positions of the different EU institutions that the Act will take a **risk-based approach**. Some specific AI systems will be entirely prohibited[14], whereas high-risk AI systems will be subject to **several obligations** such as an appropriate risk management system, rules on data and data governance as well as rules on their technical documentation and transparency towards users.[15] Both providers of high-risk AI systems and users of high-risk AI systems may be subject to obligations as a result.[16] Finally, AI systems which are intended to interact with natural persons may also be subject to **transparency obligations** to inform those persons (e.g. workers using the assistant) that they are interacting with an AI system.[17]

To prepare for this upcoming legislation, the different parties involved in the WASABI use cases can track the ongoing negotiations on the AI Act and provisionally **assess if their specific solutions qualify as high-risk** under the proposed texts. This can be done by evaluating if the specific solution/use case falls under the categories listed

[10] Art. 32 GDPR

[11] Art. 6, c) GDPR

[12] EUROPEAN COMMISSION, "Proposal for a regulation of the European Parliament and of the Council laying down harmonized rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts' (Proposal)", COM(2021) 206 final (hereafter "AI Act Proposal")

[13] The initial proposal for the text of the AI Act by the European Commission will be the basis for the legal requirements set out in this text, although future discussions within the project may reflect negotiations on the Act at the EU institutions and/or the final agreed upon wording of the proposal depending on the status of the negotiations.

[14] In the AI Act Proposal this includes for example. However, this list should not be considered final or unchangeable while the trilogue negotiations are ongoing.

[15] Art. 5 and 6, and Chapter II, Title III AI Act Proposal

[16] Chapter III, Title III AI Act Proposal

[17] Art. 52 AI Act Proposal

in Annex III of the AI Act proposal. For example, the developed solution in use case 2 on assisted workforce management might be considered high-risk if it is used to make a decision on contract termination, on task allocation, or for monitoring or evaluating the performance of workers.[18] Similarly, an AI solution may also be considered high-risk if it is a safety component in a product that must undergo a third-party conformity assessment to be placed on the market under the legislation listed in Annex II.A of the AI Act (e.g. Machinery, Pressure Equipment, Personal Protective equipment, medical devices, etc.).[19] A solution is considered a safety component if it fulfils a safety function or if its failure would endanger the health and safety of a person or property.[20] If the AI solution qualifies as high-risk, the participants involved in the use case will have to fulfil the obligations set out by the AI Act.

5.3 Liability and product safety

Each participant in the project should also be aware of the **liability** regime(s) applicable to them. This applies both between participants in the project, for liability which they may incur during the execution of the project, as well as for each participant in their interactions with non-project parties. The rules on contractual and extra-contractual liability are traditionally **determined on a national level** and are not (fully) harmonized in the European Union. This means that every participant will have to assess which national liability regimes apply to them (based on how the chosen applicable law in their contracts, where they perform their activities and/or are likely to cause damages). However, the rather national nature of liability regimes has not prevented limited **harmonization effects from the EU level**. The determination of applicable law between contractual parties under the Rome 1 Regulation[21] and of jurisdiction in the Brussels 1bis Regulation[22] ,for example, can have a significant effect on parties' liability. Similarly, the EU Sale of Goods Directive[23] and the Digital Content Directive[24] provide consumers with additional recourse if goods do not conform to the contract or do not work properly.
EU-legislation also provides parties suffering **non-contractual damages** alternative regimes to more easily recover damages in certain situations. These regimes in particular could be relevant for the use cases since they are less likely to have contracts in place directly with consumers. The **Directive on Liability for Defective Products**[25] allows an injured person to claim damages when a defective product is put into circulation by a producer. The European Commission has recently published a proposal to revise this Product Liability Directive.[26] This includes the explicit inclusion of **digital services and software**, as well as provisions to alleviate the **burden of proof** for injured persons such as an obligation of the producer to disclose relevant evidence to the injured person under certain circumstances and a presumption of defectiveness under certain conditions.[27] Participants in the project should be aware of these changing rules on product liability. Finally, the **General Product Safety Regulation**[28] ("GPSR") will also apply and replace the General Product Safety Directive (and the Food Imitating Product Directive) on December 13th 2024. This Regulation will apply to products and risks not regulated in other

[18] Art. 6 and Annex III, 4 (b) AI Act Proposal
[19] Art. 6 and Annex II. A AI Act Proposal
[20] Art. 2 (14) AI Act proposal
[21] Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations
[22] Regulation (EU) No 1215/2012 of the European Parliament and of the Council of 12 December 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters (recast)
[23] Directive (EU) 2019/771 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the sale of goods, amending Regulation (EU) 2017/2394 and Directive 2009/22/EC, and repealing Directive 1999/44/EC
[24] Directive (EU) 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services
[25] Act of 25 February 1991 concerning liability for defective products, *BS* 22 March 1991.
[26] EUROPEAN COMMISSION, 'Proposal for a Directive of the European Parliament and of the Council on liability for defective products, European Commission, COM(2022) 495 final, 2022 (Hereafter "revised PLD")
[27] Art. 8 and 9 revised PLD
[28] Regulation (EU) 2023/988 of the European Parliament and of the Council of 10 May 2023 on general product safety, amending Regulation (EU) No 1025/2012 of the European Parliament and of the Council and Directive (EU) 2020/1828 of the European Parliament and the Council, and repealing Directive 2001/95/EC of the European Parliament and of the Council and Council Directive 87/357/EEC

EU legislation and aims to provide a **basic protection** to consumers. The text of the GPSR includes wording to ensure that products remain safe even with **evolving technologies**, including for example when they undergo software updates or when the product evolves or learns.[29] Manufacturers under the GPSR must ensure that their products are designed and manufactured in accordance with **general safety requirements**.[30] Those requirements are dependent on an assessment which takes into account, among others, the characteristics of the product, its effect, the presentation of the product, its security features and, as mentioned before, its evolving, learning and predictive functionalities.[31] Participants in the project should also take this general product safety obligation into account when developing systems.

Parties should also be aware that the **use of an AI system**, which might make recommendations or even autonomous decisions, does not necessarily free them from any liability that incur as a result of those recommendations or decision. Damage caused by AI systems does, however, result in situations in which injured parties may have more **difficulties proving a fault** of the user of the system. The opacity and complexity of many AI systems can severely complicate the proof of a fault by the user. To address these concerns and provide injured parties with protection similar to the protection they enjoy for "regular" products, the European Commission has also published a proposal for an AI **Liability Directive**[32]. The AI Liability Directive would introduce disclosure requirements for certain parties (e.g., providers) and a presumption of causality for fault-based liability. A court may, for example, order the **disclosure of relevant evidence** about a high-risk AI system suspected of having caused damage, provided that the claimant or potential claimant meets certain requirements.[33] A failure to disclose or preserve evidence as ordered by the court may also result in a presumed non-compliance with the duties of care that the evidence was intended to prove. Similarly, **presumptions of a causal link** between the fault of the defendant and the output of the AI system, and **presumption of causality** are also included in the AI Liability Directive, although these require several conditions to be met.[34] Participants in the project should again be aware of these changing rules and adequately prepare for these.

5.4 Ethics

To complement the legal requirements that may apply to the different AI systems and solutions in the use cases, participants should also consider the **ethical aspects** of developing and using AI systems. This can include ensuring that the AI system is trustworthy, for example by using the AI HLEG's Assessment List for Trustworthy AI (**ALTAI)** to evaluate the systems and design process in a team working on the use case. Use cases can opt to have a more thorough evaluation of those criteria that are especially noteworthy in the manufacturing environment, such as the transparency of the AI systems, their technical robustness and safety, or the accountability that is taken for the AI systems. In addition to the ALTAI, **other tools** can also be used by the participants in the use cases to include ethics in the design of the AI systems. Various toolkits are publicly available to evaluate blind spots in the design process or in the AI system and to ensure that ethics are considered in the project.[35] Participants can also create an ethics board to discuss ethical concerns in the project before starting tests or training with the AI systems. In conclusion, it is important for participants in the project to keep the ethical aspects and impacts of the project in mind and have discussions as well as ethical checks in place. These discussions and checks can be supported by the various tools mentioned above.

[29] Art. 6 (h) and 13 GPSR; https://commission.europa.eu/business-economy-euro/product-safety-and-requirements/product-safety/general-product-safety-regulation_en
[30] Art. 9 GPSR
[31] Art. 6 GPSR
[32] EUROPEAN COMMISSION, "Proposal for a Directive of the European Parliament and of the Council on adapting non-contractual civil liability rules to artificial intelligence", COM(2022) 496 final (hereafter: "AI Liability Directive")
[33] Art.3 AI Liability Directive
[34] Art. 4 AI Liability Directive
[35] A collection of tools related to AI ethics can for example be found at: https://data-en-maatschappij.ai/en/tools

6. CONCLUSIONS

6.1 Overall goals for the use case partners

While the exact details of the user needs and wants vary, the overall goal for the digital assistant is simply: process support. The users have different procedures they want followed, often to the letter, and use of the digital assistant is intended to ease that process. In addition, all users face documentation requirements as to whether their process has been followed or not. The digital assistant offers a solution to that as well, by logging which steps have been followed at what time by whom. We should note that recording data physically on paper is common practice, and while the use case partners want to get rid of it, it has so far not been possible. It should be noted that while onboarding and training is indeed an issue, the training issue is simply to learn to follow the procedures. For several use case partners, the procedures must be strictly followed; otherwise, the work cannot be accepted. Medical equipment must be sterilized according to procedure, medical devices likewise, dimensional measurements of a manufactured piece need to be done correctly. Alarm management is likewise procedure oriented, and finally production of masks (again medical) needs to be done according to standards and procedures. Overall, the five use case partners have very little leeway regarding following their procedures.

This then gives the primary functional requirement of the DA. It must be able to follow and document progress in a pre-defined process. Broadly, this will include information about what is to be done, confirmation that it is done, logging of the progress continuously, some checks and loops and repetition at critical points, and confirmation of learning. The TRIMEK case is unique because it is the clients of TRIMEK who should be following procedures, which makes it more complicated to design the correct system. Also, their adherence to the procedures might be more challenging to ascertain.

6.2 The White Label Shop must be discussed with the partners

Both the initial self-report, the presentations at the kick-off meeting and the following discussions in the workshops indicate that the use case partners have unclear and differing expectations to the White Label Shop. There is therefore a clear need for further information and discussion about this both as a concept and as an actual solution. It is important that WP3 and WP start these discussions jointly as soon as possible.

6.3 What benefits can be expected from DA?

The use case partners were all able to identify several benefits from the DA. They were quite varied, but most of these were operational and/or organizational and improved performance. The expected benefits from the digital assistant ended up as various performance improvements. Part of this was better adherence to procedures, and easier documentation of procedures and work processes. Regarding the OKR the use case partner in general held that introducing the digital assistant should result in reaching the OKRs, but the expected benefits were fewer for environmental goals.

6.4 Legal requirements, personal data and ethics

The use case partners had in general limited requirements for personal data, ethics and similar functionalities. One reason was probably that several of the partners had to log who had conducted the actual work and have the information available for inspections by clients or authorities. Thus, it was not seen as particularly important that a worker could be identified by the system as the one having done a job. However, there should be a difference

between the more random/hostile/erroneous leakage of personal information and the formal release of such information as part of a formal information seeking process. Therefore, the requirements and the discussion in section 5 is very relevant for the development process in all use cases. There is a clear need for the developers in WASABI to follow up the requirements and document the process. This probably should include analysis according to the AI Act. Finally, the use case partners should be informed about and participate in the process as needed in order to get the needed information and make the various assessments in the process.