QUILITY

DIGITAL MANUFACTURING PLATFORMS FOR CONNECTED SMART FACTORIES

D8.2 Market platform and Virtualized Digital Innovation Hub

Deliverable Id :	D8.2
Deliverable Name :	Market Platform and Virtualized Digital Innovation Hub Specifications (final)
Status :	FINAL
Dissemination Level :	PU
Due date of deliverable :	30/06/2020
Actual submission date :	07/09/2020
Work Package :	WP8
Organization name of lead contractor for this	Jožef Stefan Institute
deliverable :	
Author(s):	(see list of contributors)
Partner(s) contributing :	JSI, ATOS, EIT, ENG, UNP, ATLAS, NXT, VTT, FhG, MON, AIC, TTT, SYN, EPFL, TTS, TID

Abstract: This deliverable describes the concept of the QU4LITY virtualized platform and specifies/describes its stakeholders and services it will provide to its users. It also provides some groundwork for other tasks in WP8 and WP9.





	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	СО

Executive Summary

This document is the second deliverable associated with Task 8.1 "Multi-sided Market Platform Architecture and Virtualized DIH Specifications". It specifies the architecture of the QU4LITY market platform and the structure of the virtualized digital innovation hub. This way we provided the groundwork for other tasks of WP8.

The first deliverable within Task 8.1, D8.1 "Market Platform and Virtualized Digital Innovation Hub Specifications", focused on the concept and ideas about what could be offered and integrated on the virtualized platform. Among other information, D8.1 included an initial analysis of the stakeholders, internally defined user journeys, and provided a portfolio of possible services. In that regard, D8.2 also includes a more in-depth analysis of the stakeholders in order to identify the exact requirements and also accounts for any potential implications to the platform's architecture. Consequently, it provides the groundwork not only for other tasks within WP8, but also useful information for the platform's business plan, which is being developed in WP9.

The developed architecture presented in this deliverable includes the two main parts of the QU4LITY platform: the multi-sided marketplace and the virtualized DIH, where the project partners and other platform users will be able to either offer or buy solutions and services available on the platform. The platform also provides the ZDM community section, the ecosystem and networking section, which will offer potential users all the relevant information on ZDM (news, events, blogs, success stories, large scale pilots and demonstrations, participating organizations), and the option of participating in discussions, exchange of ideas and matchmaking. Finally, dedicated pages with the necessary legal information (contacts, terms and conditions, privacy notice) are included.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY Title Del. C	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

Contents

Executive Summary	2
History	4
1. Introduction	5
Scope of the deliverable	5
Relation to other WPs	5
Requirements elicitation process	7
2. QU4LITY platform stakeholder analysis and value proposition	8
Exploitation criteria12	2
3. QU4LITY solutions and services marketplace	3
Categorization1	3
Formats14	4
Authorization process1	5
4. QU4LITY Digital Innovation Hub1	7
DIH services1	7
Format19	9
5. Platform architecture20	0
Structure	0
• ZDM community2	1
Ecosystem and networking22	1
Marketplaces	2
DIH services	2
• About	3
DIHIWARE – IoT Catalogue interoperability24	4
• DIHIWARE	4
IoT Catalogue24	4
6. Conclusions and next steps22	7
List of figures	8
List of tables	9
List of Abbreviations	0
Annex I: User journeys	2
Partners:	5

Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
Del. Code	D8.2	Diss. Level	со

History

Version	Date	Modification reason	Modified by
0.1	21.4.2020	Initial ToC	Matic Eržen (JSI)
0.2	24.4.2020	Final ToC	Susanne Kuehrer (EIT)
0.3	29.4.2020	Exploitation criteria contribution	Michel Iñigo Ulloa (MON)
0.4	21.5.2020	Stakeholder analysis	Jose Crespo (ATOS)
0.5	18.6.2020	User journey contributions	Ifigeneia Metaxa (ATLAS), Šejla Trakić (NXT), Magnus Simons (VTT), Marcel Altendeitering (FhG), Alberto Miranda Garcia (ATOS), Michel Iñigo Ulloa (MON), Irati Vizcarguenaga (AIC), Martijn Rooker (TTT), Giuseppe Montalbano (SYN), Zheng Xiaochen (EPFL), Antonio Avai (TTS), Daniel Garcia Sanchez (TID), Rosamaria Maniaci (ENG), Susanne Kuehrer (EIT), Matic Eržen (ISI)
0.6	8.7.2020	First draft	Matic Eržen (JSI)
0.7	21.7.2020	Corrections, additions and supplements	Susanne Kuehrer (EIT)
0.8	29.7.2020	Platform architecture	Angelo Marguglio (ENG), Susanne Kuehrer (EIT), Matic Eržen (JSI)
0.9	4.8.2020	Second draft	Matic Eržen (JSI)
0.10	5.8.2020	DIHIWARE & IoT Catalogue interoperability revision	Rosamaria Maniaci (ENG)
0.11	6.8.2020	Third draft	Susanne Kuehrer (EIT), Matic Eržen (JSI)
0.12	31.8.2020	Authorization process and IoT Catalogue – DIHIWARE interoperability additions	Tiago Teixeria (UNP)
0.13	31.8.2020	Final corrections and review	Matic Eržen (JSI)
1.0	7.9.2020	Final format check and submission	Diego Esteban (ATOS)

Table 1: Document version history

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

1. Introduction

Scope of the deliverable

The purpose of WP8 is to facilitate the establishment of a one-shop-stop marketplace for autonomous quality ZDM solutions, which will provide a single-entry point to the project's intellectual property (IP) and results. Along with the marketplace a DIH for AQ/ZDM will be established, based on the federation, enhancement and virtualization of already available services in the digital innovation hubs of the consortium.

T8.1 "Multi-sided Market Platform Architecture and Virtualized DIH Specifications" is focusing on specifying the architecture of the multi-side market platform in terms of the technical components that it will comprise, the structuring principles that will drive their integration, and structure of various assets and services of the market platform. The goal of this task is also to specify the technical architecture and services of the digital innovation hub as well as the innovation management services it will provide.

Since the QU4LITY platform is intended to be implemented and continue to operate after the end of the project's lifetime, the focus in WP8 is on facilitating the implementation process by collecting requirements along with available services and technical components available as well as specifying the platform in such manner that its sustainability after the project's lifetime is ensured.

D8.2 Market Platform and Virtualized Digital Innovation Hub Specifications takes the basic principles presented in D8.1 and describes the specifications while accounting for the above listed goals. The deliverable thus provides the basis for the implementation of the multi-sided market platform.

Relation to other WPs

D8.2 "Market Platform and Virtualized Digital Innovation Hub Specifications" is the second and final version of the report on T8.1 "Multi-sided Market Platform Architecture and Virtualized DIH Specifications". The initial collection of the requirements' specification reported in D8.1 provided the input for D8.2, where we defined its architectural requirements in more technical detail while accounting for the projects results in the form of the publicly available and marketable ZDM solutions and services.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

The ZDM solutions within the project will provide the basis for the QU4LITY marketplace by serving as the critical mass of marketable assets. They will be leveraged in order to attract additional users of the platform, thus expanding the ZDM ecosystem. In order to ensure that these solutions conform to the ZDM and AQ paradigms, the project's WP6 focuses on the solutions' testing of compliance to standards and relevant certification processes for innovative ZDM technologies. In that regard, WP7 is as incremental as WP6 to the going-to-market process, where the cognitive manufacturing solutions for AQ are to be validated and evaluated.

The figure below represents the QU4LITY workflow and indicates the relationships between the work packages.



Figure 1: QU4LITY workflow

The solutions developed in the project are collected from WPs dealing with the digital technologies (WP3), ZDM equipment (WP4), digital platforms and engineering services (WP5). These solutions are also being tested in scope of WP6 and validated in WP7. The initial cataloguing of ZDM tools and background assets was done in WP2. The collected information in WP2 helped identifying the required format in which the solutions would be presented on the marketplace and also how they are categorized, which indicates direct correlation to this deliverable.

Also relevant to the platform specifications is the platform's business plan, which is being developed in WP9. Though the business plan development does not directly impact the architecture, it is reflected in the way how marketable content will be presented on the QU4LITY platform.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

Requirements elicitation process

The main focus within T8.1 was the identification of requirements for a ZDM virtualized market platform. In this regard, many internal discussions were conducted on how to structure the platform in a way that meets the identified stakeholders needs while also accounting for the implementation process and ensuring the platforms sustainability.

Different approaches were used in order to identify the requirements defined in this deliverable. Next to identifying and analyzing similar platforms and identifying best cases where we extracted good practices and tried to identify the value proposition for QU4LITY platform, an effort was made to collect the requirements from the consortium partners. This was accomplished via two questionnaires / contribution request documents in order to collect relevant information needed for establishing a platform concept reflecting different aspects: user journeys and DIH services.

The two efforts were done after making an analysis on what information is required in order to define the platform specifications. The user journeys provided a lot of information, relevant to both the stakeholder analysis and the platform architecture. Using the Pareto principle, we were able to identify the types of stakeholders that represent the majority of potential users of the QU4LITY platform and also their suggested logical pathways in order to access what they are looking for. The questionnaire on the DIH services was used to collect information on available services from the 5 DIH organizations in the consortium and define the service categories for the platforms DIH. The definition of the marketplace requirements was based on the collection of ZDM assets which was covering the ZDM solutions developed within the consortium. This was done in scope of work in WP2 and thus only required breaking the silos and establishment of communication between WPs as oppose to a separate information collection effort in form of a questionnaire.

Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
Del. Code	D8.2	Diss. Level	со

2. QU4LITY platform stakeholder analysis and value proposition

We performed a stakeholder analysis in order to not only understand the types of services required by the targeted users of the platform but also identify any implications to the structure of the platform's architecture. An initial analysis was already done in D8.1, but a more detailed analysis was needed in order to have a clearer outlook on the long-term business goals. As the potential business criteria options may impact the way the content is presented and also reveal any obstacles in the customer journey which could deter potential paying users (relevant for community building), it was important to understand which QU4LITY platform elements satisfy which stakeholder's requirements. Since this analysis is especially relevant for the development of the platform's business plan, the following analysis and propositions also serves as input for WP9.

The QU4LITY market platform's stakeholders have been categorized according to the typology of organization:

- Business (direct): This segment includes large companies, SMEs and startups, incubators, entrepreneurs.
- Research & innovation actors (direct): Research organizations, centers of excellence, DIHs.
- Societal (Direct): consumers.
- Public sector (indirect): government.
- Capital providers (indirect): investors.

The value proposition for each stakeholder will be built according to the analysis of the main stakeholders' needs or motivations and the specific benefits that the QU4LITY virtualized platform provides. In order to build a coherent value proposition for each of the abovementioned stakeholders, it is important to firstly identify their needs or requirements to use the QU4LITY market platform.

The stakeholders analyzed in Deliverable 8.1 were categorized into 5 main groups: business, R&I actors, societal, public sector (indirect) and capital providers (indirect). The same categorization was used to build the value proposition, but some minor changes were applied aggregating those stakeholders that share similar needs. The table below shows the different groups of stakeholders matching their related needs and motivations and considering at the same time the fact that they could be positioned on the supply and demand side due to the multi-sided business model approach. In the third column, the different QU4LITY platform elements that address the mentioned needs are outlined. The special benefits provided by the QU4LITY platform and the value proposition for each stakeholder group will be outlined in detail in D9.9, where a complete market analysis will be executed and matched with the results of T8.1.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
		Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

Table 2: Business stakeholders

Stakeholder	Needs and	Qu4lity platform element
	Requirements	
BUSINESS		
	Awareness creation	Community
	Market insights	Community: news, events
	Visioning and Strategy	Community: success stories
	development.	Services: business development
	Solutions matchmaking	Marketplaces: DS, ZDM,
	(supply and demand)	automation
	Access to Expertise	Services: lab testing, education,
		training and knowledge Transfer,
		IPR management, business
SMEs start-ups		development, marketing
incubators and	Access to Funding	Services: business development,
entrepreneurs		outreach to the QU4LITY
entrepreneurs		ecosystem
	Collaborative research	Community space / matchmaking
	Training	Services: training and knowledge
		transfer, business development,
		marketing
	Mentoring	Services: education, training and
	_	knowledge transfer services
	Collaboration	Community building services / list
		of organizations

Table 3: Research and Innovation stakeholders

Stakeholder	Needs and Requirements	Qu4lity platform element		
RESEARCH AND I	NNOVATION ACTORS			
	Awareness creation	Community		
	Market insights	Community: news, events		
	Solutions matchmaking	Marketplaces: DS, ZDM, automation		
Desearch	Access to funding	Services: business development, community building, outreach to the qu4lity ecosystem		
organizations,	Collaborative research	Community space / matchmaking		
	Training	Services: education, training and knowledge transfer services		
	Mentoring	Services: training and knowledge transfer, business development, marketing		
	Technology transfer	Services: business development services, IPR management		

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing			
QUILITY	Title	Market Platform and Virtualized Digital Date 07/09/2020 Innovation Hub Specifications		07/09/2020	
	Del. Code	D8.2	Diss. Level	СО	

Table 4: Societal stakeholders

Stakeholder	Needs and	Qu4lity platform element	
SOCIETAL	Requirements		
SUCIETAL	1		
	Awareness creation	Community	
	Visioning and market	Community: success Stories	
Interested	insights	Services: business development	
consumers	Colutions matchmaking	Marketplaces: DS, ZDM,	
	Solutions matchmaking	automation	
	Access to expertise	Services: education and training	

Table 5: Public sector stakeholders

Stakeholder	Needs and Requirements	Qu4lity platform element		
PUBLIC SECTOR				
Government and administrations	Awareness and governance	Community		
	Innovative investments	Access to private funding (QU4LITY ecosystem)		
	Enabling infrastructures	QU4LITY ecosystem		

Table 6: Capital providing stakeholders

Stakeholder	Needs a Requirements	and	Qu4lity platform element
CAPITAL PROVIDE	RS / FUNDING		
Investors	Finance provision		QU4LITY ecosystem

The identified requirements were already a good indicator on what the platform needs to provide to the ZDM ecosystem. But in order to understand the specific motivation and identify the logical pathways in which the customers come to and use the platform, a further analysis is needed. The list of requirements was supplemented by collecting user journeys within the QU4LITY consortium.

As indicated already in D8.1, the initial set of user journeys was enhanced and additional user journeys were collected within the QU4LITY consortium. In the contribution request we asked the partners to identify a persona within their organization, for whom the QU4LITY platform would be the most beneficial and would thus become the potential users of the virtualized platform.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing			
QUILITY	Title	Market Platform and Virtualized Digital Date 07/09/2020 Innovation Hub Specifications		07/09/2020	
	Del. Code	D8.2	Diss. Level	CO	

In the scope of this effort, we identified the requirements for a ZDM and AQ market platform in order to define its structure accordingly. For this purpose, user journeys were described as "easily understandable visualization of how the QU4LITY platform will be used by its different stakeholders". In the questionnaire that was attached to the contribution request we asked the partners to provide the identified personas definition, his/her goals, the touchpoints to the QU4LITY market platform and the utilized QU4LITY functionalities in the persona's journey.

The consortium consists of business actors and research & innovation actors and thus represents the majority of the platform's potential user base. The collected sample pool contains mainly user journeys from three types of stakeholders: large companies, SMEs and research organizations but also two examples from the startup ecosystem (incubator, startup).

The collected journeys elucidated some commonalities across the three stakeholder types. The personas in the collected user journeys are interested in specific technologies, depending on their background and their current work. They want to learn about ZDM, get requirements and are mainly interested in seeing how the solutions work and want to test them in controlled environments before purchasing ready-to-use solutions. The personas are also looking to download either ready-to-use code, documentation, have access to webinars, case studies, etc. (concerning their specific technologies of interest).

We identified additional user journeys and structured them internally in order to identify potential requirements from other platforms stakeholder types. However, although there are also societal, public administration and capital provider stakeholder types identified for the QU4LITY platform, they are indirect stakeholders, which will most likely represent only a small portion of the customer base.

The user journeys are provided in Annex I: User journeys of this deliverable.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing			
QUILITY	Title	Market Platform and Virtualized Digital Date 07/09/2020 Innovation Hub Specifications		07/09/2020	
	Del. Code	D8.2	Diss. Level	CO	

Exploitation criteria

The direct correlation and interdependence of work in WP8 to the work in other WPs mentioned in this deliverable, has impacted the workflow and in T8.1 we have consequently primarily focused on addressing the comments at the first review meeting of the project. In regards to that, the priority here was demolishing the work silos, which appeared during the first period of the project. Regarding the platforms' exploitation criteria, we have been working closely with both WP9, where the business plan of the platform will later be defined, and the technical team responsible for the implementation of the platform thus enabling the establishment of communication hierarchy between the involved parties. In this regard, in strong collaboration with WP9 for the purpose to avoid any overlapping, an effort in identifying possible exploitation methods was made in T8.1, to the extent to understand its implications on the technical development of the QU4LITY Market Platform.

Given the unique nature of the QU4LITY platform, where it provides a combination of two virtualized entities, the DIH and a marketplace, the exploitation criteria of the solutions and services of the platform need to be considered in the technical specification and implementation to a certain extent. As the QU4LITY Market Platform should attract as many users as possible to the platform being the meeting point of the ZDM Community, the best approach is to distinguish the content between free and premium content. Free content will be available to all interested users / customers when approaching the platform; premium content will only be available for users / customers that register to the platform. The possibility of having registered users is an architectural requirement and is therefore handled in WP8 and reported in this deliverable.

There can be different options of accessibility/involvement for registered users, such as e.g., the "pay-per-use" model (when acquiring a solution/service) or also a "membership" model (both for sales/acquisition and community building). Both models require a registration on the QU4LITY Market Platform allowing the registered user the access both to the solutions in the marketplaces and to the services in the Virtualized DIH. For a membership model an added value could be also the community building part of the platform.

In T8.1 we have dealt with the exploitation criteria only to the extent of what is necessary for the platform development. More details on the exploitation path will elaborated in WP9 and can be found in Del. 9.9 Exploitation and Sustainability Plans (Version 1).

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Date 07/09/202 Innovation Hub Specifications		07/09/2020
	Del. Code	D8.2	Diss. Level	CO

3. QU4LITY solutions and services marketplace

Given the goal of creating an ecosystem of European manufacturers, digital manufacturing solution providers, vendors of smart manufacturing solutions and other stakeholders, a critical mass of ZDM solutions and services is required in order to attract additional users to the QU4LITY marketplace, thus creating the desired ecosystem. The novel technologies developed within the project are the best representatives of the basic principles of ZDM and AQ paradigms and would therefore provide the basis for the multi-sided marketplace. This mass of provider type of stakeholders within the consortium will be leveraged to attract solution and service customers. Added value to the external stakeholders arises from the expanding ecosystem of potential customers. The external stakeholders will then be more inclined to engage in the newly developed market and sell on the QU4LITY marketplace. The platform will be utilized to sell solutions in the form of physical equipment or services provided by different vendors. It will therefore generate a market of solutions and services in the scope of the three marketplaces within it:

- Digital enablers marketplace.
- Digital automation and ZDM platforms marketplace.
- ZDM equipment solutions marketplace.

In the initial stage of the QU4LITY marketplace, only the publicly available solutions developed within the project will be hosted on the platform. An initial collection of the available ZDM tools within the project consortium was done in the scope of T2.3 "Catalogue & Analysis of ZDM Equipment, Processes and Digital Platforms" and can be found in the IoT Catalogue. More information on the interaction between the QU4LITY Market Platform and the IoT Catalogue can be found in chapter 5, when explaining the interconnection between the two and the related scopes.

Categorization

Each of the three marketplaces will host different categories of solutions. The goal is to attach each solution uploaded to the platform with appropriate tags, which would then enable the searching and filtering capabilities of the solutions catalogues. The respective categories for each of the marketplaces are:

- Digital enablers marketplace:
- Big data analytics & AI algorythms
- Fog/Edge devices
- HPC and Cloud environments/infrastructures
- Cybersecurity solutions
- Blockchain based solutions
- Connectivity & networking

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing			
QUILITY	Title	Market Platform and Virtualized Digital Date 07/09/2020 Innovation Hub Specifications		07/09/2020	
	Del. Code	D8.2	Diss. Level	CO	

- Digital automation and ZDM platforms marketplace:
- Supply chain and logistics solutions
- Augmented and mixed reality solutions
- Platforms/solutions
- Digital simulation and digital twin solutions
- ZDM equipment solutions marketplace
- Photonics solutions
- 3D printing solutions
- Robotics
- Hot stamping solutions

As the information on the marketplaces will be public, it is required that only the publicly available ZDM solutions are uploaded and offered on the platform.

A more detailed categorization of solutions in the three marketplaces will be elaborated in tasks T8.2, T8.3 and T8.4 in strong collaboration with the related work packages 3, 4 and 5 along the project lifetime and beyond. Solutions and services that will later be added to the marketplace may uncover more categories, which will be added to the existing ones as the user base grows.

Formats

In order to upload the solutions and services to one of the three marketplaces within the platform, a template had to be developed for each one of the three. Its purpose is to define the information requirements for hosting the offers of the providing stakeholders on the platform. These templates define what information is available to any visitor of the platform and what information to the registered users.

We have leveraged the questionnaire used within T2.3 for collecting information on the ZDM tools within the QU4LITY project as a starting point for defining the required templates. The information fields were altered in order to only require publicly available information that would be presentable and interesting for the platform. In this initial stage, a common template was presented to the respective WP 3, 4 and 5 leading partners as well as to the leading partner for the development of the platform in order to receive feedback on needed additions or any redundant fields. The general structure of the solution template agreed upon by all 3 WP leaders as well as by ENG is shown in Table 7. Tasks T8.2, T8.3 and T8.4 will continue working with WP3, 4 and 5 on the solutions coming from these WPs; in case new requirements arise, modifications on the solution template can be done easily.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Date 07/09/2020 Innovation Hub Specifications		07/09/2020
	Del. Code	D8.2	Diss. Level	CO

Table 7: Solution template

	Name of the solution/asset
Solution/asset description	Summary
	Description incl. image(s)
	References
Sales part	Potential applications
	Customer benefits
	Name of the organisation
Solution Owner	Type of organisation
	Contact
	Hardware/Software
specifications	Component type
	Solution/asset License
	Website
Additional Information	Documentation
	Standards in compliance

Authorization process

As the collected ZDM tools within the QU4LITY consortium were authorized by either being tested or validated within the project for compliance with ZDM and AQ (as was pointed out in Section 1), they will be uploaded to the platform directly.

Given that the mass of solution providers on the marketplace will grow beyond the project consortium, an authorization process for the marketplace is mandatory in order to provide a checkpoint for solutions being provided by third-party stakeholders. To gain permission from the solution owner in order to make it publicly available and maintain a standard of hosting only solutions relevant to ZDM and AQ, a process will be defined and implemented in the QU4LITY platform. As this process is not a priority at the initial stage of the platform, active discussions are ongoing in order to define it, also depending on when the QU4LITY platform will be opened up to third-party stakeholders.

QU4LITY-project.eu	Copyright © QU4LITY Project Consortium	15 of 55

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	СО

However, as part of Task 2.3 - Catalogue & Analysis of ZDM Equipment, Processes and Digital Platform an authorization process was defined, so to publish the catalogue of ZDM technologies, publicly available within IoT Catalogue. This authorization process already considers the possibility of the information gathered be exchanged with the QU4LITY marketplace to be used as part of WP8 activities. More details related to the authorization process used within the scope of Task 2.3 can be consulted in deliverable D2.6.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	СО

4. QU4LITY Digital Innovation Hub

DIH services

Next to providing a virtual marketplace of ZDM solutions, tools and services, the QU4LITY platform will also establish a virtualized DIH where it will provide services by pooling resources from 5 DIH organizations within the consortium. Its establishment and operation will be governed by the appropriate exploitation agreements that will be established as part of WP9.

The service portfolio reported in D8.1 was a collection of possible standalone services, which would with its wide spread be able to address companies needs at all maturity stages. The portfolio was refined to some extent, by drawing inspiration from the DIHIWARE platform (see here DIHIWARE) of the MIDIH project, which operates as a network of DIHs with the focus on offering services to manufacturing companies.

As planned and already indicated in D8.1, the QU4LITY DIH will provide 5 main types of services:

- Marketing & public relationship services.
- Lab testing and infrastructure leasing services.
- Business development services.
- Education, training and knowledge transfer services.
- IPR management services.

The further categorization of services was, as already mentioned, done by drawing inspiration from the MIDIH platform. The indicated subcategories represent all the types of services identified but might not cover the needs of QU4LITY entirely.

- Marketing & public relationship services
 - Community building
 - DIH innovation development
 - Ecosystem governance
 - Project development
 - Contract research
- Lab testing and infrastructure leasing services
 - o Ideas management and materialization
 - Provision of infrastructure
 - Technical support on scale up
 - \circ $\;$ Verification and validation
 - Data acquisition and sensing
 - o Data processing and analysis

QU4LITY-project.eu	Copyright © QU4LITY Project Consortium	17 of 55

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing			
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020	
	Del. Code	D8.2	Diss. Level	СО	

- Decision-making
- Physical-human action & interaction
- Data sharing
- Business development services
 - o Incubation acceleration support
 - Access to finance
 - Offering housing
- Education, training and knowledge transfer services
 - Process & organizational maturity
 - Human capabilities maturity
 - Skills improvement
 - Business training and education
- IPR Management services
 - Support patented product generation
 - General material of IPR
 - IPR regulation and joint projects / products
 - IPR directory
 - Licensing models

The listed categories of services reflect the initial analysis of the required services for the QU4LITY DIH. A definitive and final list of service categories as well as services will be defined in T8.5 "DIH Resources Federation and Market Platform Integration" after additional required types are identified, and the redundant ones excluded. This will be done in strong collaboration between the DIHs in the consortium and reported in D8.9 'Virtualized Digital Innovation Hub'.

The list and the effort mentioned above describes the standalone services where each service is provided by a single DIH organization. In addition to that, the platform will also offer a range of collaborative support services to the project's multi-sided market platform and wider ecosystem. Different types of support will be provided by different stakeholders, depending on the way they would like to use and benefit from the multi-side platform and related marketplaces. These services will be defined in T8.6 "Ecosystem Support Services and Third-Party Solutions Deployment". Though these services will be part of the QU4LITY platform offer, they do not have a direct implication on its architecture as they will be part of the collective offer of the QU4LITY DIH.

QU&LITY	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

Format

As for the QU4LITY market platform, the service providers of the DIH will also need to provide basic information on the respective services they are offering. In case of the collaborative support services, which will not be provided by a single DIH but by a consortium of DIHs (i.e. collaborative service), the leading partner will be defined and provide the information as they are the sole point of contact for the customer. This way, there is no confusion for the end user about who is offering the service. The service would then be provided on the basis of the agreement between the contributing partners.

A basic example template is presented here in order to indicate what basic information the contributing DIHs would provide and will be uploaded to the virtualized DIH.

	Organization
Service provider	Description
	Webpage link
	Contact person and information
	Title
Basic service information	Type of service
	Description of service
	Pricing
Additional information	Video
	Downloads

Table 8: QU4LITY DIH service example template

The above table only represents the initial sketch on how different services could be presented on the platform and also one common template does not apply to all types of services. The final specification of all templates for the different service categories will be done as part of T8.5 and reported in D8.9.

The detailed definition and provision methodology of collaborative services for ecosystem support and third-party solution deployment will be defined in T8.6 and reported in D8.11.

QU&LITY	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

5. Platform architecture

Structure

The initially proposed approach reported in D8.1 reflected the platform's goal of providing holistic support in the form of a virtualized entity, thus offering access to the marketplace of novel technologies, services and products, along with direct access to DIH services. This initial approach was refined in order to fit the main goals of the platform. This was done with the help of both stakeholder analysis and the collection of user journeys, which helped us to identify the most logical pathways used by the potential users.

The three main distinguishable parts of the platform are the QU4LITY multi-sided marketplace, the DIH services, and the community section (defined in two parts). The three cornerstones of the platform will be the main attraction points and represent a holistic, one-stop-shop approach to the ZDM and AQ space.

Given the nonlinear implementation process of the QU4LITY platform, the architecture does not represent the entire low-level parts of the platform. Given that the additions of functionalities and content to the platform will take place as the platform community grows, the lower levels of the platform are prone to enhancement in order to accommodate this growth.

The figure below represents the QU4LITY platform structure defined in scope of T8.1.





QU4LITY-project.eu	Copyright © QU4LITY Project Consortium	20 of 55

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

The subsections of the DIH services were slightly renamed in order to provide an appealing and easy to understand way of indicating which types of services are to be found there.

Here we present the main parts of the platform with their respective subparts in which the QU4LITY content will be presented:

• ZDM community

Regarding the promotion of the ZDM approach and also giving the user all the relevant information about the ZDM paradigm, i.e. what it means, how it works and the latest developments of the ZDM paradigm, the platform will involve the ZDM community section. This part will especially target any QU4LITY newcomers who are interested in ZDM and want to know how this approach may benefit them. The envisioned subparts are:

o News

The page will be filled with posts for promoting latest developments, upcoming events and all other QU4LITY or ZDM related material.

o Events

The page will catalogue upcoming events and users can find links to event pages, registration or ticket reservations.

o Blogs

Blogs written by QU4LITY content managers.

• Success stories

The visitors can read on successful implementation of QU4LITY solutions and see the real-life benefits.

• Large scale ZDM pilots and demonstrations

Visitors can read on large-scale pilots developed within the QU4LITY project.

• Explore ZDM

A page with static content of general information on e.g. webinars, references to media articles, etc.

• Ecosystem and networking

This part aims at providing support to the community, including tools for users to be able to connect, collaborate and eventually innovate or start joint ventures. The planned subparts are:

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

• Organizations

The page will catalogue all organizations registered on the platform. It will serve as a promotional channel for QU4LITY users and also for the QU4LITY ecosystem itself, indicating its size and diversity.

• Collaborate

Page devoted to discussions between the platform users.

o Innovate

Place where users can share and manage their ideas.

• Connect

Page where event matchmaking is facilitated.

• Marketplaces

Content-wise, the largest part of the platform will be the QU4LITY marketplace. It will be partitioned into the following three categories:

- Digital solutions
- ZDM equipment platforms
- Automation platforms

In the initial stage, each marketplace will host the solutions developed in the relevant WPs of the project (WP3, WP4 and WP5). Solutions from the registered third-party stakeholders and also from the QU4LITY open call winners will be uploaded to the platform after its public launch. They will be categorized appropriately to fit in the correct marketplace section during the authorization process.

Each marketplace will then catalogue the uploaded offers of equipment or solutions and will be equipped with common searching and filtering functionalities, based on the respective template for uploading solutions to each of the marketplaces to be finalized in T8.2, T8.3 and T8.4.

• DIH services

The term DIH is an already established entity type in the innovation management ecosystem. The QU4LITY platform is somewhat unique in a way it tries to address the issues in the manufacturing industry holistically under the ZDM paradigm. It involves a collaborative ecosystem of support services offered by the virtualized DIH along with the marketplaces.

The respective subparts of the virtualized DIH are the five types of services defined in Section 4, which were slightly renamed in order to give better understanding to the user regarding what to expect from them. The services will be catalogued with

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

respect to their categorization and the template for uploading them, to be finalized in T8.5.

• About

This part of the platform will be dedicated to general information about the platform, especially relevant for users uploading their solutions to the marketplace. Users can find contact information to contact QU4LITY administration office or access documentation about terms and conditions for using the platform and the collection of users' data. The planned subsections include:

- o Contact
- Terms and conditions
- Privacy notice/GDPR

The image below shows the early draft version of the QU4LITY platform landing page and serves as an indication of the design and structure of the QU4LITY virtualized platform.



Figure 3: QU4LITY platform landing page draft

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
		Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	СО

DIHIWARE – IoT Catalogue interoperability

In order to implement the platform, the QU4LITY partners participating in WP8 are leveraging their involvement in other projects within the H2020 space, where similar and relevant to QU4LITY digital tools have been developed. In this regard, the implementation of the QU4LITY market platform will be based on two digital assets owned by the QU4LITY partners. These two assets are the DIHIWARE and the IoT Catalogue.

• DIHIWARE

The DIHIWARE platform is a solution developed by the MIDIH H2020 EU project (http://midih.eu/) and currently in use in many ecosystems in Europe. The DIHIWARE offers a complete collaboration environment inspired by Enterprise Social Software. It supports both "Access to" and "Collaborate with" services, providing companies access to the latest knowledge, expertise and technology during their digital transformation paths toward piloting, testing and experimenting with new digital technologies.

The knowledge-driven services next to a catalogues management system, complemented by the collaborative and innovation side of the Platform, will create a virtual environment where providers and consumers of digital technologies are not just matching assets and needs, but they are collaborating together towards joint innovations. This environment will be the core on top of which specific customizations (environment customization, catalogue designing and dedicated user journey) will be realized based on the specific needs of the QU4LITY project.



Figure 4: DIHIWARE

• IoT Catalogue

The IoT Catalogue is a one-stop-source for Internet of Things (IoT) knowledge, innovations and technologies, aiming to help IoT stakeholders (developers, integrators, advisors, end-users, etc.) to take the most advantage of the Internet of Things for the benefit of society, businesses and individuals. As such it is an already implemented tool which operates as a collector and also disseminator of information. The IoT Catalogue already contains information on the ZDM tools, which were

QU4LITY-project.eu Co	QU4LITY-project.eu	Cop
-----------------------	--------------------	-----

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
		Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	СО		

collected within the QU4LITY project, and as such provides a good opportunity to leverage it in order to quickly feed content to the QU4LITY platform. This collection of information was done in WP2, specifically T2.3.



Figure 5: IoT Catalogue

The basis for the QU4LITY platform implementation is above mentioned DIHIWARE platform, while the IoT Catalogue will serve as a content provider (in strong connection with the cataloging activities carried out in task T2.3), but also as an external promotional channel for QU4LITY and ZDM tools in other not-ZDM focused virtual communities. The interoperability will be accomplished by the adoption of an API-based mechanism intended to enable the transferring of content among the two tools. The collaboration here will enable strong presence in the manufacturing digital space and enhance the impact of the QU4LITY platform.

Figure below shows an initial version of the json structure exported from IoT Catalogue (with information regarding a specific ZDM technology mapped within the context of T2.3), to be imported by DIHIWARE.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
		Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	CO		

⊒=	=	₽Ļ	T	۶	Code -				
1	- {								
2		"nar	ne": ppli	"IEC catio	61499 IDE and runtime platform to design and deploy on of real-time distributed application",				
3		"summary": "The component provided by nxtControl in QU4LITY is the automation platform resulting from the evolution of the IEC 61499							
		standard. It exploits the interoperability of the standard to guarantee functional independence from the specific hardware used to execute the							
4	-	"+0	00000 16"''		gics. ,				
5		"	, so comp	onent	Type:Platform"				
6		٦.	comp	0					
7	-	"ent	titi	es":	Г				
8	-	{			•				
9			"na	mes":	"NXTControl",				
10			"ty	pe":	"Developer"				
11		}	,						
12	-	{							
13			"na	mes":	"NXTControl",				
14		"type": "Owner"							
15	_	5	3						
17		l	"na	mes".	"Selja Trakic"				
18			"tv	pe":	"Contact"				
19		3		PC .					
20	-	{	,						
21			"na	mes":	"Qu4lity",				
22			"ty	pe":	"Owner"				
23] }							
24		_, "weł	nsit	e"· "	https://www.pxtcontrol.com/en/productoverview/"				
26		"trl	l":	"9".					
27	-	"sto	anda	rd":	C				
28	-	{							
29			"na	me":	"IEC 61499",				
30			"de	velop	er": "International Electrotechnical Commission"				
31		_ }							
33		des	scri	ntion	". "The TEC&phsp:61499 platform is a fully functional				
55		re	efer	ence	implementation of the standard, composed of the following key				
		el	Leme	nts:<	<pre>x/p>An object-oriented Integrated Development</pre>				
		Er	nvir	onmen	t (IDE), fully compliant with the new evolution of the IEC				
		;6	5149	9, wh	ere developers of single CPS and/or of the orchestrating				
		ir	ntel	ligen	ce governing the behaviour of their aggregation will be capable				
		01	F de	signi	ng complex applications with ease, exploiting the abstraction				
		10	ayer	s and	programming methodologies that the standard automation				
		10	ungu	uge p	roposes. Among others, the IDE will allow: conception of				

Figure 6: Json example from IoT-Catalogue

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	со		

6. Conclusions and next steps

Based on the initial analysis of the requirements of the QU4LITY platform and the architecture needed for the implementation of the platform as defined in D8.1, this deliverable provides a more in-depth analysis supporting its further development. Given the many dependencies, which had to be accounted for in scope of T8.1, the more detailed specifications of the platform were developed in order to be able to achieve a sustainable one-stop-shop for organizations looking to enter and leverage the ZDM community.

In this regard the communications between WPs established in scope of this task will remain active and the platform implementation in scope of WP8 will be done in close collaboration with WP9, where the business and exploitation plan of the QU4LITY platform will be defined. Potential implications will be reflected back to the platform development. T8.1 had to start the work on all levels doing a thorough analysis on all aspects for understanding what is necessary for the development of the market platform. And we are reporting here all what is needed for the platform making clear that we hand over the additional/overlapping work (e.g., stakeholder analysis and related value proposition) to WP9 so that they can continue.

The D8.2 (along with the D8.1) is therefore setting the scene for further work in WP8 and in that scope, details on how the marketplace content is presented will be defined in T8.2, T8.3 and T8.4, where the templates for uploading QU4LITY solutions to the marketplace will be refined. Same will be done for the DIH services in scope of T8.5.

D8.2 is also the first step in reaching the MS4 milestone, by which the assets of the market platform have to be accessible (Multi-side marketplace implemented; Assets of the different marketplaces available; D8.2, D8.4 & D8.5 available). The due date of the milestone is M24.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	CO		

List of figures

6
20
23
24
25
26

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	CO		

List of tables

Table 1: D	Document version history	. 4
Table 2: B	Business stakeholders	. 9
Table 3: R	Research and Innovation stakeholders	. 9
Table 4: S	Societal stakeholders	10
Table 5: P	Public sector stakeholders	10
Table 6: C	Capital providing stakeholders	10
Table 7: S	Solution template	15
Table 8: Q	QU4LITY DIH service example template	19

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	CO		

List of Abbreviations

- AAS Asset Administration Shell
- AI Artificial Intelligence
- API Application Programming Interface
- AQ Autonomous Quality
- AWS Amazon Web Services
- B.Sc. Bachelor of Science
- B2B Business to Business
- CIO Chief Information Officer
- CTO Chief Technology Officer
- DIH Digital Innovation Hub
- DS Digital Solutions
- DT Digital transformation
- EFFRA European Factories of the Future Research Association
- IoT Internet of Things
- IT Information Technology
- IPR Intellectual Property Rights
- IPO Initial Public Offering
- M.Sc. Master of Science
- MIDIH Manufacturing Industry Digital Innovations Hubs
- PhD Doctor of Philosophy
- R&I Research & Innovation
- ROI Return on Investment
- RTO Research and Technology Organization
- SDN Software-Defined Networking
- TSN Time-Sensitive Networking

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	CO		

- VR Virtual Reality
- VA Virtual Augmentation
- ZDM Zero Defect Manufacturing

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing				
QUILITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020		
	Del. Code	D8.2	Diss. Level	СО		

Annex I: User journeys

<u> User journey #1 (Researcher) - VTT</u>

Persona Definition

Researcher in RTO

- Seppo is a researcher in an RTO providing research and development for ZDM in manufacturing industries.
- Seppo knows the main actors in the domestic industry well, but is interested in finding customers on the European market

Goals & Objectives of the Persona

Objectives

Seppo is interested in:

- Presenting own solutions and own services to industrial and research audience
- marketing the solutions and services to distributed SME market domestically and in Europe
- Checking solutions from other solution providers acting in the same market sector.
- Checking knowhow of other research organisations
- Getting news on latest technology for ZDM.
- Finding support services for marketing.
- To find partners for new projects

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels

Seppo is aware of QU4LITY market platform through one or more of the following channels:

- Seppo heard from colleague about OU4LITY and the platform
- Seppo read about QU4LITY on LinkedIn

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

- Seppo saw a presentation about QU4LITY in a trade fair.
- Seppo visited the EFFRA web page and found a banner of QU4LITY.
- Seppo heard of QU4LITY as part of a discussion with a colleague in a manufacturing fair.
- Members of Seppo's team googled "ZDM/zero defect manufacturing/quality control" and the QU4LITY market platform page was among the top results.

QU4LITY Functionalities in the Persona's Journey

<u>Journey</u>

- Seppo visits the QU4LITY market platform and checks the marketplace for instruction on how to upload a newly developed ZDM solution to the platform.
- Seppo finds a template for applying for rights to upload the solution, fills in the application and sends it to the operator/decision maker
- The operator evaluates Seppo's solution and gives him the right to upload the solution
- Seppo uploads the solution to the marketplace
- Operator checks the description of the solution and suggests improvements
- An eager customer calls Seppo to learn more about the solution
- Seppo and the potential customer discuss on the phone on how the customer can apply and purchase the solution and related services
- A joint project is started with the customer
- A list of solutions along with their providers is listed. Clicking on each item, a short description with a list of features is shown. Documentation on the solution along with a short video is available.
- Seppo checks the community link and sees information on how big the ecosystem is.
- Seppo wants to register on the platform.
- Seppo looks for marketing services provided on the platform.
- He gets in contact with a marketing person who provides information on how to write the presentation of their company and which events to target for marketing.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

User Journey #2 (Quality Manager from the Automotive Industry) - IDSA

Persona Definition

Quality Manager

- Zilan is a Quality Manager at an automobile manufacturer.
- She has a B.Sc. and an M.Sc. in business engineering.
- Her main tasks are the introduction of quality assurance systems, the definition of standards in product development, monitoring compliance with regulations and legal guidelines and communicating the quality data to the company management.

Goals & Objectives of the Persona

Objectives

Zilan wants to access ZDM and Quality management resources and wants to be matched with technologies, equipment and expert knowledge to improve the quality control and its autonomy in the assembly line for all quality control points and to find solutions on a specific problem.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels

Zilan is aware of the QU4LITY market platform through the following channels:

- Zilan read information about QU4LITY in a LinkedIn post.
- She heard of QU4LITY during a conference.
- A consultant told Zilan about QU4LITY.

QU4LITY Functionalities in the Persona's Journey

<u>Journey</u>

- Zilan visits the home page of the platform and looks for the search feature.
- She searches for services that are specifically designed for the automotive sector.
- She filters the search results for service providers that are certified to ISO-9001 and ISO/TS 16949.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

- She chooses a service based on its ratings that were given by previous users and due to the comments of former customers.
- After gaining a first impression, Zilan wants to know more details about the service and the regarding provider. She can find this information right on the platform without having to click too often. The details are well structured and can be revised quickly.
- She also looks through the section of suggested "complementing services".
- Next she searches for a consultant to help her with a specific problem by going through the same steps.
- Zilan wants to gain more information about the cost of the services or possible brokerage fee. In the case of QU4LITY being subject to charge she wants to be made an offer and be given a presentable overview of decision leading information (e.g. ROI) to be able to decide and/or to justify the acquisition to her colleagues and supervisors.

<u>User Journey #3 (Product Manager) (TTT)</u>

Persona Definition

Product Manager

- Alex is a product manager for the IoT devices in a large IT company in the industrial department
- He has a MSc. In mechanical and electrical engineering
- He has multiple years of experience in hardware and software development for control systems and IoT devices for the manufacturing domain.
- The company has worked since a couple of years of designing and developing data collecting and communication devices for Internet of Things and Industry 4.0, and they are now close to bringing them on the market, targeting different domains, including ZDM.

Goals & Objectives of the Persona

Objectives

Alex was to gain knowledge about industrial requirements for their solution. Therefore, he would like to:

• Understand the basics of Zero Defect Manufacturing in general.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

- Gain insights on the use of data-driven approach (such as Artificial Intelligence) for ZDM and quality management in production lines.
- Collect industrial requirements from large industry that are producing products, but also from machine builders developing machines for ZDM.
- See some practical examples of Digital Twins for ZDM i.e. how a real-life system would work in terms of simulating production and identifying causes of defects ahead of time.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels

Alex is aware of the QU4LITY market platform as a single entry point for accessing ZDM and Quality Management resources in Europe. This awareness is a result of one or more of the following:

- Alex was informed about QU4LITY market platform during a conference, as part of his discussions with a colleague.
- Alex read information about QU4LITY in a widely spread LinkedIn post, written by an influencer of the Industry4.0 community.
- Alex talked with people from the QU4LITY project during a trade fair visit
- Alex saw QU4LITY listed in a public catalogue of Industy4.0 resources.

QU4LITY Functionalities in the Persona's Journey

<u>Journey</u>

- Alex visits the home page of the platform.
- He reads about QU4LITY and then selects to access the "Knowledge Base" and "Applications" menus.
- Under the "Applications" menu, different use cases are described showing what kind of applications for ZDM are being developed and deployed at different pilots and machines. Additionally, the requirements for these applications are mentioned, so Alex can identify what the requirements from the factories or the machine builders are.
- Alex is asked to register to get into direct contact with the individual plant owners or the machine builders.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

- After registration, Alex can access more technical information regarding the pilots and the machine builders and will receive contact details from the individual people.
- Reading this information from the QU4LITY platform and getting direct information from the people, enables Alex to identify direct needs from customers and prepare requirements for optimization of their products, so that it fulfils the requests from the market.

User Journey #4 (Large Enterprise Chief Information Officer) (TID)

Persona Definition

CIO of Large Enterprise

- Jamie is CIO in an automobile manufacturer that produces vehicles & vans.
- Communications within the production floor are very important, as many pieces of equipment are remotely managed and need to be supervised, by collecting enormous amounts of data in real time to avoid malfunctioning and enable Quality management and control.
- Jamie has tested several communication technologies in previous factory deployments, but encountered difficulties with both wireless (Wi-Fi has proven unreliable) and wireline, which provides the right quality required for ZDM, but it is inflexible (fixed access points have to be pre-installed and the factory wired), which it is a clear limitation as the new production designed by the CTO for this factory relies on re-configurable and movable stations that enable the production of different vehicle models.

Goals & Objectives of the Persona

Objectives

Jamie wants to learn and acquire the technologies that will enable the communications required by the new factory design:

- A catalogue of secure, reliable, and high-quality communications to enable ZDM within the factory.
- Tested wireless and wireline proposals to enable high flexibility and support reconfiguration requirements.
- A provider that can support the requirements and bring the best practices from previous deployments.

QU&LITY	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels

Jamie is aware of QU4LITY market platform through one or more of the following channels:

- Jamie saw a presentation about QU4LITY in a trade fair.
- Jamie visit the EFFRA web page and found a banner of QU4LITY.
- Jamie googled "ZDM communications for Industry4.0" and the QU4LITY market platform page was among the top results.

QU4LITY Functionalities in the Persona's Journey

<u>Journey</u>

- Jamie visits the QU4LITY market platform and notices the 5G and SDN proposals under the "Communications" section of the web site.
- Jaime can see the detailed description and functionality of the 5G and SDN ZDM solutions for manufacturers and access the data from the demos and watch the videos.
- Using the information available in the market platform, Jaime can arrange for a visit to see in a real environment a trial of the technologies.

User Journey #5 (IT Manager of an SME) - TID

Persona Definition

IT manager/architect

- Hanna is the Senior IT Manager of an SME with 2 factories located at different cities in the same country producing wheel parts for several aggro automobile manufacturers that produces tractors, reaping machines and other farming vehicles.
- Hanna is in charge of operating and maintaining the communications within the shop floor and the offices, set in a collocated building next to the manufacturing premises. Besides, she must support the Cloud Manager to keep a hybrid cloud built within a small on-premise datacentre and the services hosted at AWS, which interconnect securely all factory sites enabling the valuable aggregation of data from both production sites.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	СО

 Hanna has more than 10 years of experience in the industrial environment, working with industrial field protocols, notably PROFIBUS and PROFINET. Some years ago, migrated the shop floor communications from PROFIBUS to PROFINET to enable the new features and flexibility the latest introduced. Now, the CTO is demanding to introduce the new TSN standard capabilities to address the high demanding real time requirements from new field devices.

Goals & Objectives of the Person

Objectives

Hanna needs to learn from TSN standards and check if these are compatible with the PROFINET controllers and switches currently operating the shop floor:

- Understand TSN technology,
- Design a plan for upgrading the communication in the factories and assessing which equipment can be upgraded or if new one must be acquired,
- Find technology providers that can support assessment, equipment, validation and bring the best practices from previous deployments.
- Test if current applications would behave in the same manner as before in a controlled environment so the production activities do not suffer any outage.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels

Hanna is aware of QU4LITY market platform through one or more of the following channels:

- Hanna usually reads industrial news in Twitter and found QU4LITY in a related Hannover Messe post.
- Hanna googled "PROFINET vs TSN" and the QU4LITY market platform page was among the top results.

QU4LITY Functionalities in the Persona's Journey

<u>Journey</u>

• Hanna visits the QU4LITY market platform and finds a section for Industrial networking solutions. At that section she finds "Upgrading PROFINET to TSN" in "Upgradable plans" section of the web site.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

- Hanna finds therein useful high-level information about standards and a list of QU4LITY partners providing professional services to upgrade legacy protocols to new cutting-edge industrial technologies.
- CEA FFLOR experimental facility has a dedicated subsection showing a TSN production line for testing and how to simulate and bring own applications for testing.
- Clicking on "Contact us" she can email QU4LITY partners directly for initial contact to see if they can provide all necessary services and support to upgrade and test her company factories.

User Journey #6 (Maintenance Manager)

Persona Definition

Maintenance Manager of SME manufacturing company

- John is a Maintenance Manager in manufacturing SME that produces tools and customised products from metals and metal alloys.
- Equipment efficiency and availability is very important, as it affects product quality, planning and customer relations. The production stage is multi-process and the company has invested in digital data collection systems.
- John has worked with his team to bring the company at a good preventive maintenance level and now they feel ready to take the next steps towards digital manufacturing, predictive maintenance, Maintenance4.0 and Quality4.0.

Goals & Objectives of the Persona

Objectives

John wants to find a data analytics suite that uses the data they have been collecting in order to predict how the status of the machines affect product quality, so that he can better plan maintenance activities. In particular, he is interested on:

- Predictive analytics algorithms that he could use for assessing the time until the deterioration of the status of the machine affects significantly the quality of the produced products.
- Real examples of automated predictive analytics on machine and quality data towards Maintenance4.0 use cases.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

- Having a tool to support decision making based on the results of the predictive analytics algorithms in an automated, yet controllable way.
- Best practices and lessons learnt about deployments for maintenance management.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels

John is aware of QU4LITY market platform through one or more of the following channels:

- John saw a presentation about QU4LITY in an industrially oriented conference/forum and talked to a project representative in a B2B meeting.
- John visited the EFFRA web page and found a banner of QU4LITY.
- Members of Petra's team googled "Predictive Maintenance for Quality Management in Industry4.0" and the QU4LITY market platform page was among the top results.

QU4LITY Functionalities in the Persona's Journey

<u>Journey</u>

- John visits the QU4LITY market platform and notices the "Predictive Maintenance Solutions for increased Quality in ZDM" under the "Solutions" section of the web site.
- John sees available solutions, a short video on what he could expect as results, information about open APIs and how to reach the solution providers. He also sees testimonies of users and indications of the impact that QU4LITY solutions for ZDM could have in an industrial manufacturing environment.
- John is also able to access sample datasets, results and introductory documentation.
- Using the information available in the market platform, John is able in a few days to decide if QU4LITY solutions are suitable for his company.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

<u> User Journey #7 (Researcher) - AIC</u>

Persona Definition

Researcher

- Persona is an industrial engineer with a great interest in the automotive sector.
- He has a degree in mechanical engineering and a master's degree in automotive design and manufacturing.
- He has focused his career on enabling technologies that allow the transformation of industry in a 4.0 environment.
- Last month his group (Industrial Engineering) started a new research project on systems that allow self-regulation of a production process to reach the best quality.

Goals & Objectives of the Persona

Objectives

The researcher was to gain knowledge and skills that will ensure his successful engagement in the QU4LITY project. Therefore, he would like to:

- Understand the fundamentals and requirements of production processes in an industrial environment that ensure maximum quality in manufactured products.
- Learn about the relationships of all the variables that take part in the production process and their effects on the final quality.
- Gain insights on the use of data-driven approach (such as Artificial Intelligence) for self-regulation and quality management in production lines.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

- Persona saw a presentation about QU4LITY in a conference.
- Persona was informed about QU4LITY market platform during a conference, as part of his discussions with a colleague.
- Persona reads information about QU4LITY in LinkedIn posts or Twitter, written by an influencer of the Industry4.0 community.
- Persona saw QU4LITY listed in different webpages like EFFRA.

QU&LITY	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

Persona visits the home page of QU4LITY.

- He reads about QU4LITY and then selects to access the "Training" and "Knowledge Base" menus.
- Under the "Training" menu George accesses a 15' tutorial webinar about ZDM in the Industry 4.0 era. He is asked to register with the QU4LITY platform in order to access the webinar.
- Under the "Knowledge Base" persona reads a blog post explaining the role of and ZDM and autonomous quality. Moreover, he is able to find pointers to scientific papers presenting practical case studies of autonomous and zero-defect manufacturing.
- Persona visits the QU4LITY platform again. This time he accesses the "Case Studies" section, where he reads about the use of the QU4LITY platform autonomous quality processes in the automotive sector towards making predictions and gaining more knowledge about the processes. He is also offered with the opportunity to see a video of a practical deployment and use in the QU4LITY pilot production lines. The video depicts a case that falls directly in the scope of his projects. He has now some very good ideas about how the final deliverable of his new research project could be.

<u> User Journey #8 (Researcher) - MON</u>

Persona Definition

Researcher

- Persona is a senior innovation & technology manager with emphasis on Industry 4.0 technology for manufacturing.
- He has a BSc. in computer science engineering and MSc. in automatic, control, robotic and industrial organization.
- He works in SME developing research projects along with Industrial partners, Universities and Research Centres.
- Smart Manufacturing, Digital and Innovation strategy, data analytics, business strategy and technologies such as AI, Automation, Robotics, Big Data,

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QU&LITY	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	CO

Industrial Protocols, VR/VA, Cybersecurity IoT, additive manufacturing are the principal interests

• Along last 2 years his department has carried out research projects on Digital Twins, Blockchain, IIoT and Asset Administration Shell for development of industrial devices and production lines 4.0 to improve the productivity, manage smart contracts and services and help to reach Zero Defect Manufacturing (ZDM) and Autonomous Quality.

Goals & Objectives of the Persona

Objectives

Persona was to gain knowledge and skills that will ensure his successful engagement in that projects, specifically in IIoT, AAS and DT for ZDM and Autonomous Quality in production lines. Therefore, he would like to:

- Understand the concepts of Zero Defect Manufacturing and Autonomous Quality.
- Know the technologies and the approach of Digital Twin for Production lines.
- Gain experience on the implementation of data-drive experience monitoring manufacturing devices in production lines. Improve the knowledge of AI algorithms, interoperability connectors and Message Broker a common data dictionary.
- Carry out a pilot considering Press Machines and grinding machines.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels

Persona is aware of the QU4LITY could be a strategic project to gain experience for his department for attaining the objective of ZDM, Digital Twin and Autonomous Quality together with Industry 4.0 technologies. This awareness is a result of one or more of the following:

- Persona was informed about QU4LITY project and its market platform during a tele-conference of Smart Manufacturing and in a Machine Tool Fair
- Persona reads information about QU4LITY in brochures, project Web-Page and news in partners Web-Pages.
- Persona is interested in public IoT catalogue of Industy4.0 resources.

QU4LITY Functionalities in the Persona's Journey

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUELITY Title Market Platform and Virtualized Digital Innovation Hub Specifications Date		Date	07/09/2020	
	Del. Code	D8.2	Diss. Level	CO

<u>Journey</u>

- Persona visits the home page of the platform.
- He reads about QU4LITY project, Consortium and he subscribes newsletter. Moreover, he has a look the last news and events
- He is interested in IoT Catalogue and training session. He accesses to webinar section to know how to use a We Service app. He wants to test interoperability connectors as well as AI algorithms

<u>User Journey #9 (SME) (TTS)</u>

Persona Definition

Software Developer Team Leader

- Mark is a software developer team leader in the field of digital twin.
- He is following the whole development process from initial design phase to commissioning and maintenance of manufacturing plants as well as machinery tools.

Goals & Objectives of the Persona

Objectives

Mark wants to test in a virtual environment that machinery tools and plants work as expected in order to avoid downtime, production loss and defective parts due to process issues:

- He knows very well that it is fundamental to be continuously update on innovative technologies referring to digital twin applied to manufacturing processes.
- He is constantly looking forward to offering new services for his customers and not to lose market share.
- Mark is also interested in interoperability and standard protocols because they are key topics for implementing digital twin.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	itle Market Platform and Virtualized Digital Date 07/09/202 Innovation Hub Specifications		07/09/2020
	Del. Code	D8.2	Diss. Level	CO

- Mark attended a workshop on "Zero-defect Manufacturing" in an important fair on machinery tools
- In this workshop the QU4LITY Market Platform was presented.
- He could find the platform very easily because when checking the Internet it was ranked under the top10 on Google.

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

Mark visits the home page of QU4LITY:

- He is attracted by the "NEWS" icon.
- He is interested in the business development services and ZDM components.
- Among the news, he can find an interesting paper on an innovative technology to integrate digital twins with PLCs of a famous brand. Most of his customers are using the same PLCs.
- He registers on the QU4LITY Market Platform.
- He goes to the page reporting a short but precise description of this new technology, the main requirements, the areas of application, and a successful application case. He can also see a short movie about this technology.
- Then he can contact the company providing the new technology by email for asking an online demo always by mean of the platform.
- In addition to that, Mark also defined a list of interests to be pushed with news, interesting paper and innovative outcomes to be always up-to-date.

User Journey #10 (Research organisation) (EPFL)

Persona Definition

Researcher

- Ivan is a scientist in the Mechanical Engineering department of our university, focusing on Product Lifecycle Management and Sematic modelling etc.
- He has a MSc. in mechanical engineering and a PhD. in Industrial Engineering.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUELITY Title Market Platform and Virtualized Digital Innovation Hub Specifications		Date	07/09/2020	
	Del. Code	D8.2	Diss. Level	со

- During the past few years he has been working intensively on the application of Internet of Things and semantic modelling in manufacturing.
- Recently his group has started a new research project on Cognitive Digital Twins for smart manufacturing.

Goals & Objectives of the Persona

Ivan was to gain knowledge and skills that will ensure his successful engagement in the Cognitive Digital Twins project. Therefore, he would like to:

- Understand the state-of-the-art of digital twins, and digital models and specifications used for ZDM.
- Gain insights on the reference architectures and the role of digital twins and semantic models in the architecture.
- Obtain some practical examples of semantic models and digital twin models for ZDM i.e. how a manufacturing system is modelled, and what are the standards and specifications used to support data interoperability etc.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

Ivan is aware of the QU4LITY market platform as a single-entry point for accessing ZDM and Quality Management resources in Europe. This awareness is a result of one or more of the following:

- Ivan was informed about QU4LITY market platform from a colleague who was involved in the project.
- Ivan has been following update information about QU4LITY via the project website and social networks like LinkedIn, Twitter etc.

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

Ivan visits the home page of the platform.

- He reads about QU4LITY and then selects to access the "Training" and "Knowledge Base" menus.
- Under the "Training" menu Ivan accesses a 15' tutorial webinar about ZDM in the Industry4.0 era. He is asked to register with the QU4LITY platform in order to access the webinar.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Date 07/0 Innovation Hub Specifications		07/09/2020
	Del. Code	D8.2	Diss. Level	CO

- Under the "Knowledge Base" he reads an article introducing the QU4LITY Reference Architecture which explained the role of Digital Twins and semantic modelling in ZDM. From this article, he finds references to scientific papers introducing the detailed semantic models with practical case studies for ZDM.
 - He visits the QU4LITY platform a few days later and reads the case studies mentioned in the research papers that he read earlier. Through these cases, he gains knowledge about how the semantic models and digital twin models were implemented in those cases. Through the application results, he understands the benefits and limitations of such models, which provide basis for his future work in the new project

User Journey #11 (Research organisation) (FhG-ISST)

Persona Definition

Researcher

- Marcel has a background in computer science and business information systems
- He is a senior researcher at a research institute
- He regularly conducts research in industrial use cases and has an interest in Industry 4.0, IoT and data engineering in industrial settings.
- In particular, Marcel is interested in data quality, data exchanges and data spaces.

Goals & Objectives of the Persona

Marcel wants to learn more about

- Current developments around ZDM and Industry 4.0.
- Gain in-depth insights on topics of data engineering.
- Gain in-depth insights on topics of data analytics in manufacturing

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

Marcel is aware of the QU4LITY market platform as a single-entry point for accessing ZDM and Quality Management resources.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
		Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	СО

He knew this platform from discussions with colleagues with his institute and other research facilities.

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

Marcel visits the home page of the platform.

- Marcel logs on to the platform
- He browses through the offerings related to the topics he is interested in
- Marcel downloads some ready-to-use code and downloads it to test it in his own research.
- He reads blog posts and additional information about data engineering in IoT.
- In the Case Studies section Marcel sees the contact details of the involved partners and contacts them to get additional information.

<u>User Journey #12 (NPO Technology Transfer SME – Research and Innovation</u> <u>Actor) (SYN)</u>

Persona Definition

Project Manager

- "Mr. Green" is a project manager in a Technology Transfer SME
- He has an engineering degree and has been a researcher at the national research organization of his country for almost ten years, where he gained experience in innovation projects on the manufacturing sector
- As a project manager in a technology transfer company he tries to stay informed about the latest technological innovations that are developed in the world

Goals & Objectives of the Persona

"Mr. Green" has following goals/objectives:

- He promotes the digitization of SME that needs to innovate their manufacturing processes
- He finds difficulties on convincing SMEs on the benefits that the industry 4.0 can produce concretely on a real use case, balancing the effort and

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Market Platform and Virtualized Digital Innovation Hub Specifications Date		07/09/2020	
	Del. Code	D8.2	Diss. Level	СО

challenges associated with the introduction in the manufacturing process of new technologies.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

"Mr Green" comes across the QU4LITY market platform as a result of different processes:

- He was informed of the QU4LITY market platform during a discussion with a colleague that is involved in the QU4LITY project.
- He read information about QU4LITY in a technical article published on internet on a portal dedicated to innovation/industry4.0
- He googled "ML for ZDM and Industry4.0" and found a link to the QU4LITY

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

"Mr. Green" visits the home page of the platform.

- Navigates through the pages looking for information that describe the QU4LITY market platform
- Reading the list of services and opportunities that the QU4LITY market platform can provide, he decides to register to the portal to gain access to more details about "Case histories"
- In the following period, he finds interesting reading the articles available in the "Knowledge Base" section and periodically go back to that section to stay informed about the use of digital technologies for innovating manufacturing processes.
- Leveraging the information, he collected in the portal, "Mr. Green" can report real use-cases and experiences done by other companies to convince SMEs in the path toward digitalization.
- Periodically he monitors the products available in the "virtual marketplace" to stay informed about possible technologies that he can decide to adopt in the next innovation project he will manage.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUELITY Title Market Platform and Virtualized Digital Innovation Hub Specifications Date		Date	07/09/2020	
	Del. Code	D8.2	Diss. Level	CO

User Journey #13 (Research organisation) (ENG)

Persona Definition

Researcher on ZDM Solutions

- Giovanni is a senior researcher at a research institute.
- He regularly conducts research and is always looking for research grounded solutions and wants to expand collaboration with other organisations.

Goals & Objectives of the Persona

Giovanni has different objectives:

- Joining forces and collaborate with other organisations to bolster access to ZDM field search
- Seeking research-grounded solutions
- Getting news on ZDM

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

Giovanni became aware of the QU4LITY market platform as a single-entry point for accessing ZDM and Quality Management resources through conferences/events, social posts on the QU4LITY platform as well as through Google results when looking for "ZDM platform".

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

Giovanni visits the home page of the platform.

- He visits the public page of the QU4LITY Platform gaining info about the ecosystem and the services categories offered.
- He asks to join the platform obtaining access to the private section of the platform.
- He explores the QUALTY environment and search for an organization catalogues in order to find new contacts
- He contacts people, take an active part in the collaborative discussions, etc

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUELITY Title Market Platform and Virtualized Innovation Hub Specifications		Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

• He tries to make advantages of the provided services (solutions, traineeship, support to find investment)

User Journey #14 (Incubator) (EIT)

Persona Definition

Business Developer

- Peter is a business developer in an incubator supporting start-ups to go to the market and find investment.
- He has a master's degree in informatics and another one in business.
- He has more than 10 years' experience in incubating companies and had already one successful exit through an IPO.
- The incubator he is working for is mainly working in the area of Manufacturing SMEs and IT Solution Providers.

Goals & Objectives of the Persona

Peter has the following goals/objectives:

- He wants to support his "clients" in getting the most up-to-date information in Industry 4.0
- He wants to find already potential customers for the solution developed by his start-up.
- He needs to find public or financial investment for his start-up.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

Peter comes across the QU4LITY market platform as a result of different processes:

- He was informed about the QU4LITY market platform by one of his start-ups that was trying to find potential customers for his solution in ZDM
- In addition to that, he googled "for ZDM and Industry4.0" and found a link to the QU4LITY Platform

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUNLITY Title Del. Code	Title	Market Platform and Virtualized Digital Innovation Hub Specifications	Date	07/09/2020
	Del. Code	D8.2	Diss. Level	со

Peter visits the home page of the platform.

- Navigates through the pages looking for information that describe the QU4LITY market platform to understand what could be relevant and beneficial for his start-ups.
- Reading the list of services and solutions that the QU4LITY market platform can provide, he decides to register to the portal to gain access to more details about the IPR Management Services, which are important for his start-ups.
- He also checked the other services the QU4LITY Market Platform is offering, especially the services about Education and Training. These services are very useful for his "clients".
- Peter decided to get in contact with the service providers to see if a collaboration could be established that would be beneficial both for his incubator as well as the DIHs in the QU4LITY Platform.
- He introduces the platform to the start-ups he is mentoring that are working in the area of ZDM and AQ.

<u>User Journey #15 (Start-Up) (JSI)</u>

Persona Definition

General manager

- John is an entrepreneur, interested in predictive manufacturing and artificial intelligence.
- He has a master's degree in computer sciences and mechanical engineering.
- He is started a company and developed a software solution for a predictive and losses preventing production in manufacturing

Goals & Objectives of the Persona

John has the following goals/objectives:

- He is looking to analyse the market of predictive manufacturing.
- He wants to find already potential customers for the solution developed by his start-up.
- He needs to find public or financial investment to further develop his software.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	Market Platform and Virtualized Digital Date 07, Innovation Hub Specifications		07/09/2020
	Del. Code	D8.2	Diss. Level	СО

• He is looking for ideas on how to enhance his solution in order to compete in the market.

Touchpoints in the QU4LITY Market Platform

Touchpoints and Dissemination Channels:

John comes across the QU4LITY market platform as a result of different processes:

- He was informed about the QU4LITY market platform by a business developer in an incubator.
- He googled "predictive loss preventing manufacturing" and found a link to the QU4LITY Platform

QU4LITY Functionalities in Persona's Journey

<u>Journey</u>

John visits the home page of the platform.

- Navigates through the pages looking for information that describe the QU4LITY market platform to understand what could be relevant and beneficial for his start-up.
- Reading the list of services and solutions that the QU4LITY market platform can provide, he decides to register to the portal to gain access to more details about the Go-to-market services and finding investment opportunities.
- He also checked the other services the QU4LITY Market Platform is offering, especially the services about Education and Training.
- John visits the digital solutions marketplace and browses for solutions in the field of predictive manufacturing.
- He contacts the QU4LITY administrative office and registers to the platform in order to use the DIH services he is interested in.

	Project	QU4LITY - Digital Reality in Zero Defect Manufacturing		
QUILITY	Title	tle Market Platform and Virtualized Digital Date Innovation Hub Specifications		07/09/2020
	Del. Code	D8.2	Diss. Level	CO

Partners:

