D9.2 – Action Plan

For months 7 to 12 (Apr 2017 – Sep 2017)

Project Acronym	NIMBLE
Project Title	Collaboration Network for Industry, Manufacturing, Business and Logistics in Europe
Project Number	723810 (H2020)
Work Package	WP9: Project Management
Responsible author	Wernher Behrendt (Salzburg Research)
Dissemination Level	Restricted
Contractual Delivery Date	31.03.2017
Actual Delivery Date	19.06.2017
Version	V.1.0

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723810

Table of contents

Document Information

Project	NIMBLE (H2020-723810)
Identifier	NIMBLE-D9.2
Author(s):	Wernher Behrendt (Salzburg Research) (ed), WP and Task leaders
Document title:	Six-monthly Action Plan for M07 – M12
Source Filename:	NIMBLE_D9_2_Action Plan_FINAL.docx
Dissemination level	Restricted

Document context information

Work package/Task	Task 9.1
Responsible person and project partner:	Wernher Behrendt (Salzburg Research)

Quality Assurance / Review

Name / QA / Release / Comment	W. Behrendt as editor

Citation information

Official citation	NIMBLE Consortium (2017), D9.2 Action plan for Month 7 - 12.

Document History

V	Name	Date	Remark
0.1	W. Behrendt	01.03.2017	First draft of D9.2
0.2	All	15.03.2017	Action plans coordinated by task leaders provided on NIMBLE collaboration platform
0.3	W. Behrendt (ed.)	06.04.2017	Discussion of action plan in Consortium Meeting
0.4	Violeta Damjanovic-Behrendt	05.05.2017	Transfer of Action Plan from platform to Word and adding missing information
0.5	W. Behrendt (ed.)	17.06.2017	Adding coordinator's comments to plan
1.0	W. Behrendt (ed.)	19.06.2017	Submission to Commission Portal

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NIMBLE in a Nutshell

NIMBLE is the collaboration Network for Industry, Manufacturing, Business and Logistics in Europe. It will develop the infrastructure for a cloud-based, Industrie 4.0, Internet-of-things-enabled B2B platform on which European manufacturing firms can register, publish machine-readable catalogs for products and services, search for suitable supply chain partners, negotiate contracts and supply logistics. Participating companies can establish private and secure B2B and M2M information exchange channels to optimise business workflows. The infrastructure will be developed as open source software under an Apache-type, permissive license. The governance model is a federation of platforms for multi-sided trade, with mandatory interoperation functions and optional added-value business functions that can be provided by third parties. This will foster the growth of a net-centric business ecosystem for sustainable innovation and fair competition as envisaged by the Digital Agenda 2020. Prospective NIMBLE providers can take the open source infrastructure and bundle it with sectorial, regional or functional added value services and launch a new platform in the federation. The project started in October 2016 and will last for 36 months.

Executive Summary

This is an administrative deliverable setting out the work of the consortium for months 7 to 12 of the NIMBLE project (1st April 2017 to 30th September, 2017). Only work packages and tasks that are active in the current planning scope of the project are reported. These are WP1 (Requirements), WP2 (Specifications), WP3 (Core Services), WP4 (Experimentation), WP6 (Security), WP8 (Dissemination) and Management (WP9).

WP1 will be closed during this period and WP4 is starting towards the end of this period.

In month 10, the first review of the project will take place.

1 Action Plan for WP1 – Use Case Requirements

Tasks in WP 1

WP1	Use Case Requirements and Collaboration Design	Duration
T1.1	White Goods Service Supply Chain - Requirements and Collaboration Design	M01 – M06
T1.2	Eco Houses Supply Chain - Requirements and Collaboration Design	M01 – M06
T1.3	Textile Manufacturing Supply Chain - Requirements and Collaboration Design	M01 – M06
T1.4	Childcare Furniture Supply Chain - Requirements and Collaboration Design	M01 – M07
T1.5	Business Models and Collaboration Patterns in Supply Chains	M01 – M08

Task durations and efforts in WP1

WP1	Use Case Requirements and Collaboration Design												
T1.1	White Goods Service Supply Chain - Requirements and Collaboration Design	3	3	2	2	1	1	0	0	0	0	0	0
T1.2	Eco Houses Supply Chain - Requirements and Collaboration Design	3	3	3	2	1	1	0	0	0	0	0	0
T1.3	Textile Manufacturing Supply Chain - Requirements and Collaboration Design	3	3	3	3	1	1	0	0	0	0	0	0
T1.4	Childcare Furniture Supply Chain - Requirements and Collaboration Design	3	3	3	3	2	2	2	0	0	0	0	0
T1.5	Business Models and Collaboration Patterns in Supply Chains	2	2	2	2	2	2	2	2	0	0	0	0

Efforts per task and partner

Partner No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Partner	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T1.1			2	1	1		5					3			0		
T1.2				2	1			5					2			3	
T1.3				1	1				6					3			3
T1.4				1	1					6	6				4		
T1.5	3		3	3	4							2					1
TOTAL	3	0	5	8	8	0	5	5	6	6	6	5	2	3	4	3	4

Tasks T1.1 to T1.3 were active for the first 6 months of the project and are now closed.
Task T1.4 is active for one more month, closing in M07.
Task T1.5 is active for two more months, closing in M08.
The work package closes in M08.

1.1 Action Plan for T1.4 – Childcare Furniture Use Case – closing month M07

Month M07

Partner	What is planned?	Expected Result
MICUNA:	Final updates to D1.1 use case description	D1.1 Chapter on furniture use case
UB:	Final improvements to D1.1	D1.1 submission (WP lead)
LTU:	Finalising summary of collaboration patterns in T1.1	Input to D1.1 Chapter on furniture use case
AIDIMME:	Finalising D1.1 Chapter on childcare furniture	D1.1 Chapter on furniture use case
FEVAMA:	Finalising D1.1 Chapter on childcare furniture	D1.1 Chapter on furniture use case

We obtained permission from the PO to issue D1.1 in M07 (email 15/03/2017).

1.2 Action Plan for T1.5 – Business Models and Collaboration Patterns in Supply Chains

Terms of reference: from the description of work:

Task 1.5: Business Models and Collaboration Patterns in Supply Chains - Lead: LTU (technical requirements specification for business model analysis); Strongly involved: SRFG (requirements specification), SRDC (requirements specification), UB (requirements specification); Other: HOL, ENEA

Task 1.5 strongly collaborates with the first four tasks of WP1, and through a joint requirements consolidation phase, it creates business models and collaboration patterns for easing and speeding up the use of the NIMBLE platform (e.g. to easy registration process, steep up business transactions and negotiation). T1.5 performs through the following three steps: *Firstly, the key actors* in each of the four use cases will be identified, and interviews will be conducted focusing on existing information exchange flow, and future needs, i.e. internal value creation and capturing in the use cases. The analysis will sum up expectations on value creation and requirements that each actor has on the platform so that an aggregated understanding of business and collaboration models can be achieved. *Secondly, for researching further knowledge about business models and collaboration pattern* in Internet-based supply chains, analysis of the requirements will identify *key mechanisms* impacting on long-term sustainability in the Internet and IoT-based business ecosystem. *Finally, a framework of combined models* (based on consolidated requirements) will be used for exploration and exploitation of the four use cases that will contribute to *identification of new collaboration opportunities and conditions* as well as development of an action plan for development of *dynamic value creation and capturing*. The action plan will also include *value creation from the social aspects* such as diversity, equality, and environment/ milieu.

Person months: SRFG: 3, SRDC: 3; UB: 3; LTU: 4; HOL: 2; ENEA 1.

Month M07

Partner	What is planned?	Expected Result
SRFG:	Close collaboration around D1.2 “Requirements for Business Models and Collaboration Patterns in Supply Chains”	Input to D1.2
SRDC:	n.a	n.a
UB	Close collaboration around D1.2	Input to D1.2
LTU	Consolidated analysis of collaboration patterns and business models from D1.1 (T1.1 - T1.4) Analysis of data collection from the four use cases	Draft D1.2 Input to Prototype for collaborations and business models
HOL	n.a	n.a
ENEA	n.a	n.a

Month M08

Partner	What is planned?	Expected Result
SRFG:	QA: Understandability of D1.2	Input to D1.2
SRDC:	n.a	n.a
UB	QA: Understandability of D1.2	Input to D1.2
LTU	Finalising D1.2 Design of prototype.	A report containing requirements specification for business models and collaboration patterns. Prototype of collaboration and business models.
HOL	n.a	n.a
ENEA	n.a	n.a.

1.3 State of play in WP1

There have been workshops on user requirements with all use case partners and draft versions of these requirements were made available to implementation partners via the project’s internal collaborative platform.

A hackathon in M06 consolidated the part of requirements that are already implemented and a consortium meeting in M07 will give the opportunity to gain fuller understanding of user needs vs. current specification and implementation.

1.4 Expected outcomes

There are two deliverables coming out of WP1:

D1.1 is the requirements specification with a focus on the four use cases, and a description of the generic requirements of the platform.

D1.2 describes the business models and collaboration patterns that the platform should support, thus giving a perspective on requirements from a business or enterprise angle.

The deliverables will be issued in M08, at the close of the work package. Intermediate versions are already in use to inform WP2 (specifications) and WP3 (implementation).

2 WP2 Specification

Tasks

WP2	Platform Technology Specification	Duration
T2.1	Platform Architecture Specification and Component Design	M01 – M08
T2.2	Semantic Modelling of Manufacturing Collaboration Assets	M01 – M12
T2.3	Design of an Open API for the NIMBLE Platform	M03 – M15
T2.4	User Experience Design for Fast System Adoption	M05 – M15

Task durations and efforts for WP2 (months / person months)

WP2	Platform Technology Specification															
T2.1	Platform Architecture Specification and Component Design	5	5	5	5	5	4	4	3	0	0	0	0	0	0	0	0
T2.2	Semantic Modelling of Manufacturing Collaboration Assets	2	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0
T2.4	Design of an Open API for the NIMBLE Platform	0	0	2	2	2	2	2	2	2	2	1	1	1	1	1	0
T2.5	User Experience Design for Fast System Adoption	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	0

Objectives: This technical WP designs the NIMBLE federated platform and ensures the soundness of the planned collaboration infrastructure.

Dependencies: *T2.5* (User Experience Design for Fast System Adoption) is a prerequisite for WP3, in particular, *T3.7* (User Front-End Prototyping for Fast System Adoption).

Erratum:

In the proposal, a numbering error occurred: T2.4 should be T2.3 and T2.5 should be T2.4.

2.1 Action Plan for T2.1 – Platform Architecture

Efforts per task T2.1 and partner

Part. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ppartici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T2.1	6	12	8	4	-	-	-	-	-	-	-	5	-	-	-	-	1

Task 2.1: Platform Architecture Specification and Component Design - Lead: IBM (design of cloud services, data analytics); Strongly involved: SRFG (privacy and security aspects in IoT), SRDC (components for cloud-based collaboration); Other: HOL, UB, ENEA

This task designs and specifies the NIMBLE federated architecture, including its core components, the complements that can change over time and the interfaces. Task T2.1 is led by IBM ISRAEL, and they will put special emphasis on specifying the cloud computing architecture and data analytics component. The task leader's work in T2.1 will be complemented by technical experiences of other technical partners: SRFG, SRDC, UB, HOL and ENEA. As discussed in the section on the *Technical concept,* the NIMBLE architecture is based on the IIRA architecture that includes a three-tier implementation pattern: the edge tier, the platform tier and the enterprise tier. Federated collaboration via the NIMBLE platform will be mainly developed on top of existing open source projects, e.g. projects under the Apache permissive open source license.

2.1.1 State of play in T2.1

Work in T2.1 has progressed well and was in close contact with WP1 (requirements) and fed directly into mock-ups and prototype implementations of core services.

D2.1 has been issued twice to partners and is on course for completion in time.

The use of a Docker-based microservices architecture for the first prototype was agreed after some debate, but it is likely that the first operational version of the NIMBLE platform will use the Cloudfoundry & Bluemix environment provided by IBM. The trade-off between the two approaches is that microservices offer more lightweight solutions whereas the Cloudfoundry / Bluemix environment provides more functionality off the shelf, for the price of using more computational resources.

2.1.2 Action plan for months M07 – M08

Partner	What is planned?	Expected Result
SRFG	Collaborating in the finalization of the architecture; Extending UAA component specification based on requirements; Finalizing the first versions of security components	Sub-chapter in D2.1 on UAA and basic security and privacy features; UAA specification, which states the basis for the first prototype implementation; Security specification, ver. 1
IBM	Finalizing architecture deliverable; Consolidation into a first draft architecture; Adding deployment section to the draft architecture document	Final D2.1 and its submission;
SRDC	Contributing to the specification of registry components; Detailed design of individual technical components; Collaborating in the finalization of the NIMBLE architecture; Analysis of relevant reference architectures (collaboration with IBM)	Company and product registry; Contribution to the overall design considering the relationship to reference architectures; Final D2.1; Contribution to relationship definitions among system components with respect to connectivity;
UB	Analysis of asset models / specification	Specification of mediation and map-

	of components for semantic mediation, annotation and mapping; Collaborating in the finalization of the architecture;	ping components in D2.1;
HOL	Collaborating in the finalization of the architecture; Design of the HOL's components for NIMBLE	Final D2.1; Technical specifications for the integration of HOL's components into NIMBLE (D2.1)
ENEA	Specification of a test environment for new NIMBLE components; Collaborating in the finalization of the architecture; Design of the TeBES wrapper for NIMBLE	Specification of the test environment Final D2.1; A set of technical specifications for integrating the TeBES wrapper into NIMBLE

2.1.3 Expected outcomes

- UAA component specification (SRFG)
- Basic privacy and security components (SRFG)
- Catalogue registry and publishing of products or services (SRDC)
- Specification of the test bed platform for NIMBLE (ENEA)
- Deployment infrastructure (design stage) (IBM)
- Component design specifications (HOL)
- D2.1 (NIMBLE core services architecture) at the end of Month M08 (IBM)

2.2 Action Plan for T2.2 Semantic Modelling

Task 2.2: Semantic Modelling of Manufacturing Collaboration Assets - Lead: UB (designing semantic mediation for federated collaboration); Strongly involved: SRDC; Other: SRFG, AID, ENEA

This task designs and specifies the Asset Virtualization component, as a part of Data Management Framework of the NIMBLE platform tier. T2.2 develops data models for representation of various types of tangible resources (e.g. products, IoT-enabled devices) and intangible resources (services, production plans, catalogues). For example, in T2.2 we analyse domain-specific ontologies such as AID's furniture ontology, textile ontology (MODA-ML), and other widely used product ontologies to link various data models with each other (e.g. (i) SKOS (Simple Knowledge Organization System) could be used as the thesaurus modelling formalism, (ii) ONTO-PDM ontology is based on STEP-PDM and IEC 62264 standards, and could be used to provide a semantic layer to business, design and manufacturing product-related information, (iii) Manufacturing ontology used in ADACOR architecture and its alignment to DOLCE, (iv) GoodRelation ontology (http://purl.org/goodrelations/), etc.) We will maintain all relevant data elements and their links via the Semantic Metadata Repository (SMDR). In T2.2 we will adapt the Semantic Mediator of UB by populating it with initial industry-specific data models.

Effort allocation:

Part. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Partici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T2.2	3	-	6	9	-	-	-	-	-	-	3	-	-	-	-	-	3

2.2.1 State of play in T2.2

We have identified UBL (for business processes) and eClass (for product taxonomies) as important starting points for the NIMBLE core ontology. We have also identified the connecting points between these core ontologies and domain-specific ontologies required for the four use cases. Additionally, we have conceptualised how the semantic mediator can be customised for different applications. We have also defined catalogue ingestion techniques that are being implemented in T3.2 (catalogue ingestion).

2.2.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Continue to integrate domain vocabularies from use cases	Enhanced semantic index for catalogues
SRDC	Make eClass and UBL subsets available and align them as a basis for a business process ontology in NIMBLE; RDF representation for catalogue schema and its extensions to cover product variations and elements;	Semantic process models aligned with eClass
UB	Design the Asset Virtualisation Component on the basis of the Semantic Mediator and make it usable with the emerging NIMBLE ontology; First draft of business process ontology.	Specification of the semantic mediator specialised for NIMBLE
AID	Links between the emerging NIMBLE ontology and the furniture ontology	Extended furniture ontology aligned with business process ontology in NIMBLE
ENEA	Links between the emerging NIMBLE ontology and Moda-ML Textile Ontology	Extended Moda-ML ontology aligned with business process ontology in NIMBLE

2.2.3 Action plan for months M10 - M12

Partner	What is planned?	Expected Result
SRFG	Extend the domain vocabularies by new use cases that are expected to come from exter-	Continuous improvement and extension of the semantic indices for

	nal early adopters	catalogues
SRDC	Extend the business process ontology where needed	NIMBLE business process ontology specified as part of D2.2
UB	Write up D2.2	NIMBLE specification of collaboration assets and full version of D2.2
AID	Contribution to D2.2: Furniture Concepts	Furniture ontology as part of D2.2
ENEA	Contribution to D2.2: Textile manufacturing Concepts	Textile manufacture ontology as part of D2.2

2.2.4 Expected outcomes

- Core NIMBLE ontology (SRFG, SRDC, UB)
- Business process model aligned with core ontology (SRDC)
- Integration of domain ontologies (textile, furniture, buildings, white goods) (SRFG, UB, SRDC)
- Conceptual model for semantic mediation (UB)

2.3 Action Plan for T2.3 – Design of an Open API

Task 2.3 Design of an Open API for the NIMBLE Platform - Lead: IBM (design of cloud services for an Open API); Strongly involved: SRDC (design of cloud-based collaboration), HOL (design of product lifecycle management); Other: SRFG, UB, AID, BALANCE, DOM, ENEA

Task T2.3 designs and specifies an Open API in NIMBLE, which will provide access to all collected data, during all lifecycle phases. Open API will be based on the O-LM – IoT Product LifeCycle Management (PLM) standard (HOL) of the Open Group.

Effort allocation:

Part. No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Participant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T2.3	3	4	4	1	-	-	-	-	-	-	1	3	2	2	-	-	1

2.3.1 State of play in T2.3

This task is at present still on a low activity level, and is expected to ramp up between M09 and M15, once the core business services are in place and hence, interface requirements will be better understood,

2.3.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Integrate API documentation generator into the core services via Swagger Ma-	First API specifications to be downloaded as HTML from a running core

	ven Plugin; Contribution to D2.3	service instance.
IBM	Analyze existing component capabilities that should be externalized	Initial structure of D2.3
SRDC	Specification of the Catalogue Ingestion and Business Process Design and Execution APIs	Initial version of the APIs
UB		
AID	Evaluation of the functionalities provided by the Open API	Initial version of the APIs
HOL	Evaluation of API service for uploading data over the platform or external service registration	Initial version of the APIs
BAL	Evaluation of the functionalities provided by the Open API	Initial version of the APIs
DOM	Evaluation of the functionalities provided by the Open API	Initial version of the APIs
ENEA	Design of the API to support the integration of TeBES in NIMBLE platform	A set of UML documents to be used for the implementation in T3.8

2.3.3 Action plan for months M10 – M12

Partner	**What is planned?**	**Expected Result**
SRFG	Create a publishable documentation of the Open API specification in NIMBLE to be shared with the community outside of the project team. Contribution to D2.3	First release of the NIMBLE Open API specification.
IBM	Collect all the information gathered previously; Evolve the federation aspects of the platform	Improved version of D2.3
SRDC	Improvement of the API considering the federation aspect	Updates on the API specification
UB		
AID	Evaluation of the functionalities provided by the Open API	Updates on the API specification
HOL	Evaluation of the functionalities provided by the Open API	Updates on the API specification
BAL	Evaluation of the functionalities provided by the Open API	Updates on the API specification
DOM	Evaluation of the functionalities provided by the Open API	Updates on the API specification
ENEA		

2.3.4 Expected outcomes

The first official version of the open API is expected for M15 and therefore, a prototype that is ready for experimentation should be available at the end of M12.

2.4 Action Plan for T2.4 – User Experience Design

Task 2.4 User Experience Design for Fast System Adoption - Lead: SRFG (UXD design); Strongly involved: IBM (cloud services), SRDC, HOL (PLM design specificities); Other: UB, WHR, LIND, PIA, MIC

T2.4 designs and specifies user experiences (UXD) through standard HCI design methods, and adds additional aspects as perceived by users from the use cases. The high adoption rates needed for an Internet platform to become successful, places a strong requirement on its EASE-OF-USE. Our approach to user experience design will be strictly focused on getting manufacturing SMEs with little platform experience on-board, as fast as possible. We will push for the “one-click-to get-it-done” philosophy and we will employ crowdsourcing approaches wherever it is possible to share knowledge, data formats and infrastructures.

Effort allocation:

Part. No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Partici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T2.4	4	3	3	1	-	-	1	1	1	1	1	3	-	-	1	-	-

Preparatory activities

T3.7 started in M03 and is based on the design and specifications from T2.4.

First mock-ups created for core services (registration, adding catalog, search, negotiation, contracting, execution of business transaction) => SRFG, SRDC

Meeting at Lindbäcks 14.12.16 - 16.12.16 for early user feedback => SRFG, BAL, UB, LIND.

2.4.1 State of play in T2.4

For the core business services, a number of clickable mock-ups was produced and presented at workshops with the end users and during on-line meetings.

2.4.2 Action plan for months M07 – M09

Partner	**What is planned?**	**Expected Result**
SRFG	Definition, prioritization and evaluation of new UI components for T3.7	Moving from mock-ups to HTML-based UI components
IBM	Collaborate on "cloudifying" and interaction	Contribute to the deployment

	with cloud based services	
SRDC	Use case specific mock-up designs and feedback collection	A set of mock-ups
UB		
WHR	Scope definition for scenario 1 and 2	Scenario definition
LIND	Evaluation of the user experience and contribution on improvement	User experience & adoption requirements
PIA	Evaluation of the user experience and contribution on improvement	User experience & adoption requirements
MIC	Evaluation of the user experience and contribution on improvement	User experience
AID	Detection of user needs to achieve an easy and agile adoption of NIMBLE	Adoption requirements
HOL	Definition of UX requirements for Product Lifecycle Management UI components	UX requirement sheet
FEVA	Evaluation of the needs of the providers to adopt NIMBLE	Adoption requirements

2.4.3 Action plan for months M10 – M12

Partner	**What is planned?**	**Expected Result**
SRFG	Evaluation of new UI components using expert methods (e.g. heuristic evaluation) and user feedback, UI improvements with regards to the adoption requirements, Setup of an initial D2.4 version	Updates on the UX design; Contribution to D2.4
IBM	Collaborate on D2.4	Contributions to D2.4
SRDC	Iterative design based on the feedback collected on the UI implementations	Updates on the UX design; Contributions to D2.4
UB	Collaborate on D2.4	Contributions to D2.4
WHR	(Use case specific) feedback on the prototype and UX using reporting methods	Bug reports and feature requests
LIND	(Use case specific) feedback on the prototype and UX using reporting methods	Bug reports and feature requests
PIA	(Use case specific) feedback on the prototype and UX using reporting methods	Bug reports and feature requests
MIC	(Use case specific) feedback on the prototype and UX using reporting methods	Bug reports and feature requests
AID	Feedback on the prototype and UX with regards to the realization of the adoption requirements using reporting methods	Bug reports and feature requests
HOL	Feedback on the prototype and UX with regards to Prod-	Bug reports and fea-

	uct Lifecycle Management using reporting methods	ture requests
FEVA	Feedback on the prototype and UX with regards to the realization of the adoption requirements using reporting methods	Bug reports and feature requests

2.4.4 Expected outcomes

As we proceed through T2.4 the mock-ups will be replaced by HTML-based UI components. This happens in close interaction with T3.7 which can be seen as the implementation task for the mock-ups/designs in 2.4.

There will be clickable mock-ups and demonstrators presented at the first review in M10.

3 WP3 Implementation

WP3	Core Business Services for the NIMBLE Platform	Duration
T3.1	Core Platform Infrastructure	M03 – M08
T3.2	Catalogue Ingestion and Semantic Annotation	M03 – M10
T3.3	Product and Service Search Engine and Search Mediator	M03 – M12
T3.4	Business process and supply chain negotiation support	M05 – M12
T3.5	“Distributed Automation” for Production Data Sharing	M07 – M14
T3.6	Lifecycle Data Management and Analytics	M07 – M18
T3.7	User Front-End Prototyping for Fast System Adoption	M03 – M18
T3.8	Tool for Collaboration Setup and Interoperability Testing	M03 – M18

Task durations for WP3 in months

WP3	Core Business Services for the NIMBLE Platform																			
T3.1	Core Platform Infrastructure	0	0	2	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0
T3.2	Catalogue Ingestion and Semantic Annotation	0	0	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0
T3.3	Product and Service Search Engine and Search Mediator	0	0	1	1	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0
T3.4	Business process and supply chain negotiation support	0	0	0	0	2	2	2	2	2	3	3	0	0	0	0	0	0	0	0
T3.5	"Distributed Automation" for Production Data Sharing	0	0	0	0	0	0	2	2	2	2	2	2	2	0	0	0	0	0	0
T3.6	Lifecycle Data Management and Analytics	0	0	0	0	0	0	2	2	2	2	2	2	2	3	2	2	2	0	
T3.7	User Front-End Prototyping for Fast System Adoption	0	0	2	2	2	1	1	1	2	2	2	2	1	1	1	1	1	1	0
T3.8	Tool for Collaboration Setup and Interoperability Testing	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0

Distribution of efforts over partners and tasks in WP3

Part. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Partici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T3.1	2	12	3														
T3.2	3		6	3							2						2
T3.3			4	6							2	6					
T3.4	6		10	2													
T3.5				3							2	8		3			
T3.6	3	4		6							2	8	2				
T3.7	6	3	3								2	3	3	3			
T3.8	2	1							1		3	2		1			6
TO-TAL	22	20	26	20	0	0	0	0	1	0	13	27	5	7	0	0	8

Objectives: WP3 implements the NIMBLE platform infrastructure and its core components supporting catalogue ingestion, search, negotiation, collaboration, and interoperability testing.

Deliverables (brief description and month of delivery)

D3.1 (M07) Core Platform Infrastructure. A short report with a link to open-source demonstrator (OSD).

D3.2 (M09) Catalogue Ingestion and Semantic Annotation. A short report with a link to OSD.

D3.3 (M10) Product and Service Search Engine and Search Mediator. A short report with a link to OSD.

D3.4 (M12) Supply Chain Negotiation Support. A short report with a link to OSD.

D3.5 (M13) Distributed Automation: Channel Management for Production Data Sharing. A short report with a link to OSD.

D3.6 (M18) Data Analytics. A short report with a link to OSD.

D3.7 (M18) User Front-End Prototype. A short report with a link to OSD.

D3.8 (M18) Tool for Collaboration Setup and Interoperability Testing. A short report with a link to OSD.

3.1 Action Plan for T3.1 – Core Platform Infrastructure

Task 3.1 Core Platform Infrastructure - Lead: IBM (implementation of core infrastructure and cloud services); Strongly involved: SRDC (cloud-based collaboration), HOL (PLM); Other: SRFG

This task implements the necessary *Cloud Infrastructure* and basic services required for companies to get registered on the NIMBLE collaboration platform. Task T3.1 will be initiated by setting up and configuring the *Cloud Foundry,* which will host all the entities needed for the complete operation of the platform. In the next phase, T3.1 will continue with setting up the *Messaging and Communication Framework,* connecting the platform users with each other through the publish/ subscribe modality based on the technology selection decisions from T2.1. Furthermore, initial version of the *Data Management Framework* will be established by setting up the data management tools required in the use cases in addition to the *Semantic Metadata Repository (SMDR)* from T2.2. On top of this initial structure the registration mechanism will be deployed along with the *Searching and Publishing* functionalities to be delivered in T3.2 and T3.3.

Effort allocation:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Participant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T3.1	2	12	3														

3.1.1 State of play in T3.1

Much of the core platform services has been implemented and will be finalised in M07 and M08.

3.1.2 Action plan for months M07 – M08

Partner	What is planned?	Expected Result
SRFG	Work on deployment to IBM Bluemix (i.e. CloudFoundry) and public availability of single components.	First prototype of the platform is publicly available.
IBM	Definition of the first version of the platform, orchestrating all relevant components	Submission of D3.1 and producing a platform demo
SRDC	Deployment of Camunda into microservice architecture Wrapping Catalogue Ingestion component as microservice	Business Process and Catalogue Ingestion components are placed in the microservice architecture.

3.1.3 Expected outcomes

The core infrastructure for the NIMBLE platform is up and running and ready to be extended by concrete business functions.

3.2 Action Plan for T3.2 – Catalogue Ingestion

Task 3.2 Catalogue Ingestion and Semantic Annotation - Lead: SRDC (implementation); Strongly involved: UB (semantic annotation methods), SRFG (catalogue ingestion); Other: AID, ENEA

Before any commercial activity can take place, registered companies need to be able to publish their services and products, which can be then become discoverable on the platform. Products and services offered are normally represented in digital form as catalogues. Output of the task is the *Product and Service Publishing Tool:* digital catalogues become semantically annotated for product and service categories, and the whole information bundle can be published. It also ensures the compliance of publishing processes with UBL and GS1 catalogue profiles, as well as integration with GS1 GDSN. When reaching this stage, a company participating in the platform is registered, visible and has its services or products offered via the NIMBLE collaborative platform.

Effort allocation:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Partici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
	3		6	3							2						2

3.2.1 State of play in T3.2

There are several strands of work in this task: one is the exploration of the eCl@ss product taxonomy as the semantic basis for any catalogue ingestion. Then, we deal with combining the existing furniture and textile products ontologies with eCl@ss. For these semantic enrichments, we use the Marmotta Linked Data Server.

3.2.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Ongoing work on Catalogue Ingestion	Prototype supporting Catalogue Ingestion and Catalogue Search
SRDC	Implementation of the Catalogue Registry Enhancing the Catalogue Registry for product variations Initial structure of D3.2	The first release of the Catalogue Registry
UB	Concept for the integration of annotation in semantic search. Draft implementation in search function.	Semantic annotation and search support
AID	Analysis of the furniture taxonomy for Catalogue Registry and Catalogue Ingestion	Integration of the furniture taxonomy with the NIMBLE catalogue representation
ENEA	Support for annotation of textile concepts within the Catalogue Ingestion tool	The ability to annotate a textile catalogue with concepts present in OntoMODA, and to support search functionality

3.2.3 Action plan for month M10

Partner	What is planned?	Expected Result
SRFG	Collaboration on D3.2	Final D3.2
SRDC	Implementation of metadata ingestion mechanism from sector-specific ontologies Finalization of D3.2	Extension of Catalogue Registry supporting sector-specific product category taxonomies Submitted D3.2
UB	Implementation of the annotation in semantic search.	Access to semantically annotated data
AID	Support for the implementation of the Catalogue Ingestion	Catalogue Ingestion tool
ENEA	Support for the implementation of the Catalogue Ingestion	Catalogue Ingestion tool

3.2.4 Expected outcomes

The outcome of T3.2 is a general tool that is capable of ingesting document based or web-based product catalogues and that can create a semantically enriched description of a company's products so that they become searchable by machines. The output will be a software demonstrator in M10.

3.3 Action Plan for T3.3 – Product and Service Search Engine

Part. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Participant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T3.3			4	6							2	6					

Task 3.3 Product and Service Search Engine and Search Mediator - Lead: UB (implementation of semantic search methods); Strongly involved: SRDC (implementation), HOL (implementation of semantic mediators for the platform); Other: AID

Although the *Catalogue Registry* maintains both *Offline Catalogues* and *Real-Time Catalogues*, T3.3 settings up the first version of the registry addressing only the *Offline Catalogues*. Different modalities of search services, such as keyword-based search, faceted search, semantic search on the registry as well as presentation modules for catalogues will be delivered through intuitive user interfaces. Search services will still be capable of processing structured query inputs represented in different data models.

3.3.1 State of play in T3.3

Progress in T3.3 has been slow because more effort was devoted to the data modelling in T2.2 and we expect that we will have to extend T3.3 to month 15 and possibly even to M18.

Aside from the modelling that has to precede implementation, it is also becoming clear that several of the partners are not able to provide the level of staffing that the project plan foresaw. The lower staffing levels will affect WP3 overall and will mean that functionality will be added at a slower pace than originally anticipated.

3.3.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRDC	Integration of Catalogue Registry with Marmotta-based search;	Faceted search modality is available
UB	Draft of the GUI based on PrimeFaces; Connection of semantic search with Marmotta database; Coordination of the Solr integration for the review.	
AID	Detail evaluation of user interfaces for product and service searching;	GUI testing

	Consideration of Furniture particularities for products and services;	
HOL		

3.3.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRDC	Search capabilities for business processes	Semantic search mechanism is extended considering business processes
UB	Iteration with the use cases and improvement of the front end. Fixing bugs and finalization of the required data sources	Ontology based search mechanism
AID		.
HOL		

3.3.4 Expected outcomes

A basic, semantic search facility for products and services will be deployed as planned, in M10 and will be enhanced in the following 8 months, up to M18.

3.4 Action Plan for T3.4 – Business and Supply Chain Support

Task 3.4 Business Process and Supply Chain Negotiation Support - Lead: SRDC (implementation of the *Collaborative Process Modelling Tool*); Strongly involved: SRFG (development of the negotiation mechanisms); Other: UB

In the first phase, T3.4 develops the *Collaborative Process Modelling Tool* with the goal to realize *Business Process as a Service* model. It will be implemented either by developing the business process modelling functionality from scratch or configuring open-source software that will serve as a cloud service. In the second phase, the *Collaborative Process Modelling Tool* will be supplemented with two functionalities, such as the *negotiation mechanisms* enabling business actors to reach an agreement on data sharing scenarios during the business process execution, and the *matchmaking capabilities* supporting the negotiation process to its closing. The *Collaborative Process Modelling Tool* will become full-fledged, once populated with the business templates in T5.7.

The Negotiation Tool will enable business actors to reach an agreement on data sharing scenarios during the business process execution. *The Matchmaking Tool* will provide the continuation of the negotiation process by recommending alternative business actors with the potential to respond to particular business needs. It will assist business actors in finding suitable partners for their businesses based on various criteria. The *Collaborative Process Modelling Tool* will provide simple templates, as ready-to-run business process constructs for particular supply chain operations, as well as combinations of these steps. In this way, small enterprises

will be able to create custom business process templates if predefined templates do not meet their specific needs.

Effort allocation:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Participant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T3.4	6		10	2													

3.4.1 State of play in T3.4

This task is in delay because we are not able to work in parallel at the planned intensity. However, it is likely that the delay will not influence overall progress too severely because we do have the basic functionality of the platform in place and will be able to add further capabilities while users are still learning to exploit the basic functions.

We would need to extend this task to M18 which is the planned end of WP3.

3.4.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Implementation of negotiation services for progressive data sharing; Integrating negotiation services with the Business Process Design and Execution component;	Data channels can be configured while designing data flows within the business processes;
SRDC	Implementation of execution part of Business Process Design and Execution component;	Execution part of the tool is completed;
UB	Enhancing negotiation mechanism with matchmaking services powered by the search services from T3.2;	Negotiation services are integrated with matchmaking capabilities

3.4.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Collaboration on D3.4; Implementation of negotiation services for progressive data sharing; Integrating negotiation services with the Business Process Design and Execution component;	Tools and services for negotiation
SRDC	Populating the modeling tool with the business process templates; Integration with the platform communica-	The tool is populated with common and use case specific business process templates;

	tion service (chat, or email exchange); Integration with Data Sharing service; Collaboration on D3.4;	Implementation of the Business Process Design and Execution component; D3.4 submitted
UB	Matchmaking services improvement	Tools and services for matchmaking

3.4.4 Expected outcomes

The outcome of this task will be an extensible library of business process templates that can be adopted by users and tailored to their specific supply chain needs.

3.5 Action Plan for T3.5 – Distributed Automation for Production Data Sharing

Description of Work

Task 3.5 “Distributed Automation” for Production Data Sharing - Lead: HOL (implementation of data *channel management* for shared data); Strongly involved: UB; Other: DOM, AID

When a supply chain gets established via the NIMBLE federated platform, the partners may agree on a certain degree of mutual insight into each other’s production schedules, and may even share “live” production data. This is a highly sensitive issue for many companies, and the current policy for many firms is to keep production data strictly secret. *NOTE: This project is not about changing the social attitudes of CEOs, but we can provide tools that demonstrate measurable utility for certain supply chain data sharing scenarios. The core idea here is the notion of data channel management for shared data in the supply chain.* Two partners can agree at a fine-granular level about what data they will share with whom and when, and at what level of abstraction or aggregation this data will be exposed. The management of such data channels can then be delegated to software agents that enact the company’s data sharing policies as defined.

3.5.1 State of play in T3.5

This task only starts in Month 7 and lasts until Month 15.

There are two lines of investigation: Holonix is introducing the notion of a product avatar, mainly for LCM (Task 3.6), and wants to view information channels between enterprises (Task 3.5) by using this metaphor. UB is trying to introduce their Semantic Mediator as a support tool to the product avatar.

In combination with WP6 (security & privacy) we will need to see how the product avatar approach can handle the necessary privacy and security features. It is also to be discussed how the product avatar will be connected to the core business services including the business processes.

3.5.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
UB	Introducing the SeMED tool to the task	Support based on semantic

		mediator
AID	Support for data sharing between industrial environments (e.g. legacy system (ERP, PLM)) and NIMBLE	Legacy data integration
HOL	Environment configuration with discussed components using Dockers	A basic communication between components
DOM	Support for the textile use case interoperability issues	Legacy data integration

3.5.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
UB	Information modelling of the Product Avatar;	Contribution to the Product Avatar tool
AID	Support for data sharing between industrial environments (e.g. legacy system (ERP, PLM)) and NIMBLE	Contribution to the Product Avatar tool
HOL	Integration services development and testing	Product Avatar tool
DOM	Support to the textile use case interoperability issues and a more generalized solution	Contribution to the Product Avatar tool

3.5.4 Expected outcomes

Firstly, a management tool for establishing M2M data channels and access rights across companies, using the platform as data conduit.

Secondly, the same channel management tool, but involving the platform only for the management while keeping the data private between the parties.

Thirdly, a combination of the data channel management tool with the Product Avatar System.

Only the first two aspects are expected to be operational after M12. The third option will be available after M18.

3.6 Action Plan for T3.6 - Lifecycle Data Management and Analytics

Description of Work

Task 3.6 Lifecycle Data Management and Analytics - Lead: HOL (implementation of lifecycle data management features); Strongly involved: UB (developing analytics for lifecycle data management); Other participants: SRFG, IBM, AID, BALANCE

Task T3.6 extends the *Data Management Framework* in NIMBLE, by adding lifecycle data management capabilities. We will improve the results obtained in previous research projects by developing an infrastructure for searching and retrieving of data from all lifecycle phases. On top of this framework, we will deliver customizable visualization services (e.g. location of product parts during the inbound logistics processes) as well as analysis-driven decision making capabilities (e.g. analysis of delivery times in order to assess the performance of a particular supplier).

3.6.1 State of play in T3.6

This task only starts in Month 7 and lasts until Month 18.

Holonix is introducing the notion of a product avatar (aka “digital twin”) as a metaphor for product related life cycle data management.

3.6.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Contribute to the evolving design	Contribution to the deliverable
IBM	Contribute to the evolving design	Contribution to the deliverable
UB	Clarification of the task and concept draft for analysis in the Lindbäcks/PodComp case	Contribution to the deliverable
AID	Analysis of product data in particular End-Of-Life information and possible integration through NIMBLE	Main product EOL valuable information
HOL	Mockup creation for Product Avatar definition	Product Avatar
BAL	Investigate relationship with Life-cycle estimation model	Contribution to the deliverable

3.6.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Ensure alignment with core services	Product avatar design is aligned with core platform
IBM	Support cloud services back-end	Contribute to component deployment
UB	Support tool for analysis in the Lindbäcks/PodComp case	Formulas and approach for analysis
AID	Analysis of product data in particular End-Of-Life information and possible integration through NIMBLE	Report on experimentation with the product avatar in the furniture business
HOL	Mockup creation for Product Avatar definition	Product Avatar
BAL	Investigate relationship with Life-cycle estimation model	Contribution to the deliverable

3.6.4 Expected outcomes

Tools to manage the data associated with products, from beginning of life (manufacturing) to middle of life (in use) and end of life (recycling). The use of the digital twin metaphor (“product avatar”) is being explored.

3.7 Action Plan for T3.7 – User Front-End Prototyping

Efforts planned for T3.7

Part. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Partici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T3.7	6	3	3								2	3	3	3			

From the DOA: Task 3.7 User Front-End Prototyping for Fast System Adoption – Lead: SRFG (implementing UX front-ends); **Strongly involved:** IBM (cloud services), SRDC (developing UX-based cloud collaboration); **Other participants:** HOL, AID, BALANCE, DOM

In order to ensure high adoption rates, we must put specific emphasis on user front-ends that accelerate the moving of manufacturing SMEs, from a traditional web presence to a cloud-aware, IoT-enabled business collaboration ecosystem of European proportions. Task T3.7 implements user front-ends based on design and specifications from T2.4.

3.7.1 State of play in T3.7

We are progressing continuously by first creating clickable mock-ups and then developing web-based GUIs from the mock-ups.

3.7.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Improvement of high fidelity core service UIs, Development of new UI components as they arise in T2.4	High fidelity prototype
IBM	Contribute to cloud deployment and integration with cloud based services	Contribution to demonstration and deployment
SRDC	Development of Catalog Ingestion UI and BP Execution UI	UIs for Catalogue Ingestion and BP Execution
AID	Evaluation of suitability of mockups/prototype for fast system adoption, Comments and improvement suggestions on mockups/prototype	Contribution on mockup definition and prototype improvement
HOL	Definition of technical requirements for Product Lifecycle Management UI components	Technical requirement sheet
BAL	Definition of technical requirements for Lifecycle Performance Assessment UI components	Technical requirement sheet
DOM	Test and customization (if needed) of the UI for the textile use case	Contribution on mockup definition and prototype improvement

3.7.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Mockups and first integration of Product Lifecycle Management and Lifecycle Performance Assessment UI components (v1)	Extension of high fidelity prototype
IBM	Contribute to federation aspects	Contribution to demonstration and deployment
UB	Development of BP Design UI	UIs for the BP Design
AID	no immediate involvement	-
HOL	Comments and improvement suggestions on Product Lifecycle Management mockups and UI components; Implementation and testing of Data Access Gateway (for WHR);	Contribution on mockup definition and prototype improvement
BAL	Comments and improvement suggestions on Performance Assessment mockups and UI components	Contribution on mockup definition and prototype improvement
DOM	Test and customization (if needed) of the UI for the textile use case	Contribution on prototype improvement

3.7.4 Expected outcomes

At the end of M12, the majority of user interface components should be available. However, there is still another six-month period planned for finalisation of the user interfaces.

3.8 Action Plan for T3.8 – Interoperability Testing Tool

Part. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Participant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T3.8	2	1							1		3	2		1			6

From the DOA: Task 3.8 Tool for Collaboration Setup and Interoperability Testing - Lead: ENEA (); **Strongly involved:** AID; **Other participants:** SRFG, IBM, PIA, AID, DOM

T3.8 is led by the ENEA group that has an extended experience in interoperability testing for fashion industry (for example, the CEN Validator for WS eBIZ has been supplied by ENEA). In T3.8, ENEA brings to the project their *TeBES (Test Bed Environment for Standard based Interoperability)*, a modular on-line test bed for testing system interoperability and standard conformance. Beyond specification conformance, the system is able to implement complex testing plans as well as interoperability testing across multiple step collaboration. In addition, another testing system, born from the standardised CEN GITB architecture, is fully configurable to implement complex testing plans described through standard based descriptors

(TAML language and others). In NIMBLE, this tool (system) will be updated to be delivered as set of open source services fuelled through testing plans automatically generated from business model patterns to facilitate collaboration setting up.

3.8.1 State of play in T3.8

ENEA is currently developing the tool for interoperability testing mainly in the textile domain in which they already have experience.

Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Support for the invocation of TeBES in NIMBLE	Testing the first prototypes of the interfaces
IBM	Support for the cloud deployment	Testing the first prototypes of the interfaces
PIA	Testing for the textile use case	Testing the first prototypes of the interfaces
AID	Support in the definition of the interfaces in the integration of TeBES tool in NIMBLE. The first definition of a test will be implemented through TeBES	Adequacy of designed interfaces, understanding of tools involved in the integration process and definition of the first test plan
HOL	Support for the invocation of TeBES in NIMBLE	Testing the first prototypes of the interfaces
DOM	Testing for the textile use case	Testing the first prototypes of the interfaces
ENEA	Definition and development of the interfaces enhancing the integration of the TeBES tool for test bedding into the NIMBLE platform; Identification of the path from a general Business Case (from WP1) to a specific test plan using the general NIMBLE ontology and the sectorial ontologies.	First prototypes of the interfaces The definition of a set of tools enabling the process from a general business case (e.g. the acquisition process of a product) into a specific test plan (to test the acquisition process of 50 meters of fabric a meter of wood for furniture).

3.8.2 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Support for the invocation of TeBES in NIMBLE	Improved services
IBM	Support cloud deployment	Improved services
PIA	Testing for the textile use case	Improved services
AID	Support for the invocation of TeBES in NIMBLE	Improved services
HOL	Support for the invocation of TeBES in NIMBLE	Improved services
DOM	Testing for the textile use case	Improved services
ENEA	Support for the invocation of TeBES in NIMBLE	Improved services

3.8.3 Expected outcomes

We expect the findings from the textile application to be transferrable to the furniture use case, within the NIMBLE platform. The expected outcome is that TEBES is included in NIMBLE and can be used in the textile and furniture use cases.

4 WP4 – Use Case Experimentation

WP4	Use Case Experimentation, First-Round Validation and Evolution	Duration
T4.1	Platform User Experience from a Buyer's Point of View	M11-16
T4.2	Platform User Experience from a Supplier's Point of View	M12-17
T4.3	Platform User Experience from a Data Sharer's Point of View	M13-17
T4.4	Platform User Experience from a Logistics Supplier's Point of View	M14-18
T4.5	Platform User Experience from a Retailer's Point of View	M15-19

WP4	Use Case Experimentation, First-Round Validation and Evolution																					
T4.1	Platform User Experience from a Buyer's Point of View	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	0	0	0	0	0
T4.2	Platform User Experience from a Supplier's Point of View	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	0	0	0
T4.3	Platform User Experience from a Data Sharer's Point of View	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	4	0	0	0
T4.4	Platform User Experience from a Logistics Supplier's Point of View	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	3	3	3	0	0
T4.5	Platform User Experience from a Retailer's Point of View	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	3	2	0

SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA	
1				3		2	2	2	2	1	1		1	1	1	1	**18**
1				2		2	2	2	2	1	1		2	3	1	2	**21**
3				2		2	2	2	2	1	1		1	1	1	1	**19**
1				2		1	1	1	1	3	1		1	1	1	1	**15**
1				2		1	1	1	1	1	1		1	1	1	1	**13**
7	**0**	**0**	**0**	**11**	**0**	**8**	**8**	**8**	**8**	**7**	**5**	**0**	**6**	**7**	**5**	**6**	**86**

4.1.1 State of play in T4.1 and T4.2

In the current action plan, this WP will only be active in tasks 4.1 and 4.2 and only in M11 and M12, respectively.

4.1.2 Action plan for months M07 – M09

No activities are planned.

4.1.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
LTU	Capture of user feedback from experimentation	Report for further development
WHR	Not active in this phase	n.a.
LIND	Experimentation in the LIND supply chain	Experience feedback
PIA	Not active in this phase	n.a.
MIC	Experimentation in the MIC supply chain	Experience feedback
AID	Support in experimentation with MIC	Experience feedback
HOL	Not active in this phase	n.a.
DOM	Not active in this phase	n.a.
FEVA	Experimentation in the MIC supply chain	Experience feedback
BLAT	Experimentation in the LIND supply chain	Experience feedback
ENEA	Not active in this phase	n.a.

4.1.4 Expected outcomes

The partners involved are the use case partners and their scientific / technical mentors.

Ultimately, the purpose of this phase is to gain experience with the platform and to test it for suitability for different major roles in the business processes (buyer, seller, etc).

Only approximately 10% of the planned effort for this WP fall into the current action plan so a more detailed plan will follow for the forthcoming 3rd six-month period (M13-M18).

5 WP6 – Security

WP6 Trust, Security, Privacy and Reputation

T6.1 Security and Privacy Requirements

T6.2 Design and Implementation of Security and Privacy for Core Business Services

T6.3 Trust and Reputation Management

T6.4 Information Quality Management Tools

Efforts per task and per partner

Part. No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Partici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T6.1	2		1			1	1	1	1	1	1	1	1	1	1	1	
T6.2	6	3	2														
T6.3	4		2	4		4											
T6.4	4		4	4		4											
TO-TAL	16	3	9	8	0	9	1	1	1	1	1	1	1	1	1	1	0

Duration of tasks in WP6

WP6	**Trust, Security, Privacy and Reputation**																					
T6.1	Security and Privacy Requirements	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
T6.2	Design and Implementation of Security and Privacy for Core Business Services	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	
T6.3	Trust and Reputation Management	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	
T6.4	Advanced Trust, Security, Privacy and Reputation Management Tools	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1		
WP7	**Use Case Validation**																					

Deliverables (brief description and month of delivery)

D6.1 (M13) Security and Privacy Requirements. A report summarizing privacy and security requirements.

D6.2 (M13) Security and Privacy - Implementation Report. A design and implementation report on privacy and security services.

D6.3 (M17) Trust and Reputation Management in a large scale B2B Platform. A report on trust and management aspects implemented on the platform.

D6.4 (M32) Information Quality Management. A guide book for fostering platform information quality.

5.1 Action Plan for T6.1 – Privacy and Security Requirements

T6.1 "Privacy and Security Requirements", Months M01 - M13

(From the DoW) Task 6.1 starts with the definition of privacy and security requirements of the platform, which are specifically aligned to the four use cases in NIMBLE. Our method for collecting security and privacy requirements includes analysis of attack vectors, considering the attackers' perspective, and the definition of attack trees. For data privacy, we will specifically cover categories of requirements on (i) privacy based on trust, (ii) privacy based on individual user action/ business transaction over the platform, (iii) privacy based on collaboration with the cloud provider, and (iv) privacy based on collaboration with other collaborative network members (actors). The analysis and selection of security and privacy requirements to be addressed by the platform developers will be jointly in collaboration with the domain-experienced use case partners. A special requirement for NIMBLE will be to implement a fine-granular access control system for the Negotiation Tool to enable platform participants to dynamically share data from the Data Management Framework, as well as data streams across the Messaging and Communication Framework.

Person months:

Partici-pant	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T6.1	2		1			1	1	1	1	1	1	1	1	1	1	1	

5.1.1 State of play in T6.1

Security requirements were partly extracted from the requirements documents of WP1 and partly derived from desktop research on platform security.

5.1.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG:	Security requirements extraction and analysis (based on WP1-WP3); Security requirements classification and specification (SecureMl; UML Sec tools) STRIDE analysis based on designed components and services;	A set of specified and classified security requirements; Draft of Report D6.1
SRDC:	Collaborating on security requirements specification	A set of security requirements Draft of Report D6.1
INN:	Collaborating on security requirements specification	A set of security requirements Draft of Report D6.1
WHR:	Detection of privacy and security issues from a user point of view	Use case specific security requirements

LIND:	Detection of privacy and security issues from a user point of view	Use case specific security requirements
PIA:	Detection of privacy and security issues from a user point of view	Use case specific security requirements
MIC:	Detection of privacy and security issues from a user point of view	Use case specific security requirements
AID:	Detection of privacy and security issues from a user point of view	Use case specific security requirements
HOL:	Contributions to T6.1	Draft ofReport D6.1
BAL:	Contributions to T6.1	Draft of Report D6.1
DOM:	Detection of privacy and security issues from a user point of view	Use case security requirements
FEVA:	Detection of privacy and security issues from a user point of view	Use case security requirements
BLAT:	Detection of privacy and security issues from a user point of view	Use case specific security requirements

5.1.3 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG:	Finalizing the report	A set of security requirements; Merging the UCs- and platform-related security and privacy requirements; Planning security features of the platform Report D6.1
SRDC:	Contributing to the report	A set of security requirements; Merging the UCs- and platform-related security and privacy requirements; Report D6.1
INN:	Contributing to the report	A set of security requirements; Merging the UCs- and platform-related security and privacy requirements; Report D6.1
WHR:	UC specific security requirements - checking for the completeness	Use case specific security requirements
LIND:	UC specific security requirements - checking for the completeness	Use case specific security requirements
PIA:	UC specific security requirements - checking for the completeness	Use case specific security requirements
MIC:	UC specific security requirements - checking for the completeness	Use case specific security requirements
AID:	UC specific security requirements -	Use case specific security requirements

	checking for the completeness	
HOL:	Contributing to the report and checking for the completeness	Report D6.1
BAL:	Contributing to the report and checking for the completeness	Use case specific security requirements
DOM:	UC specific security requirements - checking for the completeness	Use case specific security requirements
FEVA:	UC specific security requirements - checking for the completeness	Use case specific security requirements
BLAT:	UC specific security requirements - checking for the completeness	Use case specific security requirements

5.1.4 Expected outcomes

In M13, the requirements document for security on the NIMBLE platform will be issued so the coming 6-month period will be mostly devoted to the requirements specification of D6.1.

5.2 Action Plan for T6.2 – Design and Implementation of Security and Privacy for Core Business Services

T6.2 "Design and Implementation of Security and Privacy for Core Business Services", Months M04 - M14

(From the DoW) T6.2 will closely interact with WP3 in developing the core business services platform in NIMBLE. Based on the requirements specified in T6.1, selected privacy and security measures will be implemented, by making use of existing toolsets and libraries as much as possible. This includes e.g. the User Account and Authentication (UAA) from Cloud Foundry. On top of them, the platform-specific authorisation, authentication and the self-service registration procedures will be built. To achieve a trustable platform, best practices for securing web applications such as those developed by OWASP (see https://www.owasp.org) will be adopted. Furthermore, algorithms such as Identity-Based Encryption (IBE) will contribute to T3.5 for secure data sharing.

Person months: SRFG: 6, IBM: 3, SRDC: 2

5.2.1 State of play in T6.2

Currently basic security features are implemented as the core services of the NIMBLE platform is being developed and more advanced features will be implemented once D6.1 (security requirements) is issued (M13).

5.2.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG:	UAA-based authentication; AGILE IDM's dynamic access controls; IBE	Security tools and services integrated with NIMBLE core services

SRDC:	Collaborating on general design of security mechanisms	Security mechanisms and definitions
IBM:	Collaborating on cloud related security mechanisms	Cloud security mechanisms

5.2.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG:	Security mechanisms testing and validation	Security tools and services integrated with NIMBLE cores services
SRDC:	Collaborating on general design of security mechanisms	Security tools and services integrated with NIMBLE cores services
IBM:	Testing and re-design of cloud related security mechanisms	Security tools and services integrated with NIMBLE cores services

5.2.4 Expected outcomes

A good level of security features of the NIMBLE platform after M12 will be available, in time for experimentation done by external parties.

5.3 Action Plan for T6.3 – Trust and Reputation Management

T6.3 “Trust and Reputation Management”, Months M06 - M19

(From the DoW) T6.3 will combine several trust and reputational approaches such as (i) work by INN on trust-based discovery for Web of Things marketplaces (VUGG14) that was explored in COMPOSE, and presented as a topic of interest for the W3C Web of Things Interest Group (task force on Security, Privacy and Resilience), and (ii) will explore state-of-the-art GT models for building up reputations for trust or ruthlessness in business. Reputation of the platform itself will be achieved by the use of mature open source software and stable cloud platforms, as well as transparent data management mechanisms (e.g. audit logging). Reputation levels of platform users will be based on platform interaction activity and (bilateral) user rating. The outcomes of T6.3 will be summarized in D6.3, and published as research papers. Person months: SRFG: 4, SRDC: 2, UB: 4, INN: 4

5.3.1 State of play in T6.3

This task started officially in M06 and will last until M19. So in practice, we are starting this task in this period and it will end just after the next period.

5.3.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG:	Design of trust features	the first draft trust models; paper in preparation
SRDC:	Design of trust features (based on iSurf results)	draft trust models created; paper in preparation

UB:	The first outline on how data quality refers to trust and reputation management	n.a.
INN:	designing trust features (based on the results from COMPOSE)	A set of initial trust features

5.3.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG:	Design of trust features	the first trust models implemented and integrated with the NIMBLE services; paper published
SRDC:	Design of trust features (based on iSurf results)	the first trust models implemented and integrated with the NIMBLE services; paper published
UB:	The first outline on how data quality refers to trust and reputation manage-ment	A Section in D6.3 about information quality
INN:	Design of trust features (based on the results from COMPOSE)	the first trust models implemented and integrated with the NIMBLE services; paper published

5.3.4 Expected outcomes

A first draft report will be issued, covering the notions of trust, privacy, security, information quality and reputation within the NIMBLE platform.

6 Work Package 8 - Dissemination

Work Package Leader: Alessio Gugliotta (INN)

WP8 NIMBLE Platform Adoption - Communication - Exploitation

T8.1 Dissemination and Communication Planning, Setup and Management

T8.2 Scientific and Technical Communication

T8.3 Raising Awareness in Open Source Communities

T8.4 AMBASSADOR Programme for Early Adopters and Stakeholders

T8.5 Nimble Platform SEED Programme for Federated Platforms

T8.6 Web Site, Social Media and Strategic PR

T8.7 Innovation, Exploitation and Standardisation

Efforts per task and per partner

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	SRFG	IBM	SRDC	UB	LTU	INN	WHR	LIND	PIA	MIC	AID	HOL	BAL	DOM	FEVA	BLAT	ENEA
T8.1	2	1	1			4					1						1
T8.2	3	3	3	3	2	2	1				3	2	2	1	1		2
T8.3	3	2	2			1					1	1					
T8.4	4			1		6	1	1	2	1	2				3		2
T8.5	2			1		6						2					
T8.6	2		1			6									1		
T8.7	2	2	1	1	1	6	1	1	1	1	1	2	1	1	1	1	2

6.1 Action Plan for T8.1 – Dissemination & Communication Management

(From the DoW) **Task 8.1: Dissemination and Communication Planning, Website Setup and Management - Lead:** INN (dissemination); **Strongly involved:** SRFG (project coordination); **Other:** IBM, SRDC, AID, ENEA

T8.1 defines the detailed *Dissemination and Communication Plan* with information and timings for dissemination and exploitation activities. This plan will provide the roadmap for promoting the project results, fostering new platform creation (*Platform SEED Programme*) and driving platform adoption (*AMBASSADOR Programme*). It will set targets for these activities, which will be monitored and evaluated on an annual basis against the key metrics (e.g. number of users, number of expressions of interest, newsletter subscribers, etc.). In addition, a

project website with content tailored to different audience including platform users will be published in T8.1. Website analytics will track audience engagement.

6.1.1 State of play in T8.1

INN is supervising all the planned activities (that are implemented in the other WP8 tasks), monitor the achievement of the KPIs and will periodically update the dissemination plan in order to revise existing and/or include new activities.

In parallell, SFRG and INN will manage the project website which will be continuously updated till the end of the project.

6.1.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
INN	Management of website, including contents updating and management of the blog; Promoting & monitoring dissemination activities of all partners, including periodic summary of past actions and future opportunities	Dissemination material update Foster partners' participation in dissemination activities Collect metrics about dissemination activities
SRFG	Hosting and co-management of website, including contents updating and management of the blog;	Up-to-date web site Blogs Entry point to NIMBLE System
IBM	Hosting of the NIMBLE operational platform	NIMBLE Platform
SRDC	Support via technical blogs, Events in Turkey	Blogs, Events
AID	Support via technical blogs, Events in Spain	Blogs, Events
ENEA	Support via technical blogs, Events in Italy	Blogs, Events

6.1.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
INN	Management of website, including contents updating and management of the blog; Promoting & monitoring dissemination activities of all partners, including periodic summary of past actions and future opportunities	Dissemination material update Foster partners' participation in dissemination activities Collect metrics about dissemination activities
SRFG	Hosting and co-management of website, including contents updating and management of the blog;	Up-to-date web site Blogs Entry point to NIMBLE System
IBM	Hosting of the NIMBLE operational platform	NIMBLE Platform
SRDC	Support via technical blogs, Events in Turkey	Blogs, Events

AID	Support via technical blogs, Events in Spain	Blogs, Events
ENEA	Support via technical blogs, Events in Italy	Blogs, Events

6.1.4 Expected outcomes

The goal at M12 is for NIMBLE to have been present at a variety of workshops and dissemination events and to be able to quantify the increasing interest in the platform.

6.2 Action Plan for T8.2 – Scientific & Technical Communication

(From the DoW) **Task 8.2 Scientific and Technical Communication - Lead:** SRFG (project coordination); **Strongly involved:** research partners: IBM, SRDC, UB, AID; **Other participants:** ALL

Task T8.2 fosters the presentation of innovations, technical developments and impacts at target events. It also deals with the publication of findings in peer-reviewed, scientifically sound channels (min. 1 per deliverable).

6.2.1 State of play in T8.2

Salzburg Research will coordinate this task and will identify suitable targets. Particularly in the first six months, all partners will contribute to finding appropriate events and publications. As with any R&D project, scientific communication in the first six months can only focus on early findings typically around topics such as requirements and specification. In line with our open access, open source approach we will also make designs and code openly available. For this purpose an open source project has already been set up on github:

https://github.com/nimble-platform

Since security is a specifically important topic for managing a large scale B2B platform, partners will also address the security aspects right from the beginning, setting out challenges that NIMBLE will have to address. Here, an early publication is also planned, pending to acceptance through peer review.

6.2.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Preparing manuscript for IEEE Software/ Microservices	Publication in March/April 2018 (M18/M19)
IBM	Lead & co-authoring of technical papers	Papers
SRDC	Lead & co-authoring of technical papers	Papers
UB	Lead & co-authoring of technical papers	Papers
LTU	Authoring of papers about collaboration	Papers
INN	Seeking opportunities for scientific dissemination and reporting collected info to partners	Support for paper writing
WHR	Participation at trade fairs and conferences, e.g. FIWARE Summit Utrecht	Impact testimonies for NIMBLE
AID	Participation in conferences and trade fairs,	Papers, Impact testimonies for

	e.g. Encaja 2017	NIMBLE
HOL	Participation in conferences and networking events	Presentations of NIMBLE technology
BAL	Participation in conferences and networking events	Presentations of NIMBLE technology
DOM	Participation to the B2B match event in Bologna in June. Seeking for other dissemination opportunities.	Presentations of NIMBLE technology; Impact testimonies for NIMBLE
FEVA	Participation in conferences and trade fairs, e.g. Encaja 2017	Papers, Impact testimonies for NIMBLE
ENEA	Participation in conferences and standards events	Presentations of NIMBLE technology

6.2.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Lead & co-authoring of technical papers	Papers
IBM	Lead & co-authoring of technical papers	Papers
SRDC	Lead & co-authoring of technical papers	Papers
UB	Lead & co-authoring of technical papers	Papers
LTU	Authoring of papers about collaboration	Papers
INN	Seeking opportunities for scientific dissemination and reporting collected info to partners	Support for paper writing
WHR	Participation at trade fairs	Impact testimonies for NIMBLE
AID	Participation in conferences and trade fairs, e.g. Encaja 2017	Papers, Impact testimonies for NIMBLE
HOL	Participation in conferences and networking events	Presentations of NIMBLE technology
BAL	Participation in conferences and networking events	Presentations of NIMBLE technology
DOM	Participation to the B2B match event in Bologna in June. Seeking for other dissemination opportunities.	Presentations of NIMBLE technology; Impact testimonies for NIMBLE
FEVA	Participation in conferences and trade fairs	Papers, Impact testimonies
ENEA	Participation in conferences and standards events	Presentations of NIMBLE technology

6.2.4 Expected outcomes

As NIMBLE gathers momentum, partners will present results in their respective communities on the one hand, and in particular, with a view to attracting the interest of potential users of the NIMBLE platform. Hence the expected outcome is a significant growth in leads that can be followed up by the AMBASSADOR and SEED programmes.

6.3 Action Plan for T8.3 – Awareness in Open Source Communities

(From the DoW) **Task 8.3 Raising Awareness in Open Source Communities - Lead:** SRFG (open source evangelism); **Strongly involved:** IBM, SRDC; **Other participants:** INN, AID, HOL

SRFG, IBM, and SRDC are already active in a number of Apache, Eclipse and Github open source communities and will introduce NIMBLE concepts, specifications and source code to these communities to motivate independent developers to contribute to NIMBLE components.

This is an important activity – experience in other projects has shown that in excess of 100 additional person months can be leveraged over a period of three years; this corresponds to a market equivalent of 1 million € plus the additional networking effects via these developer communities. It is necessary for very good developers to be present in these communities to guide newcomers and to maintain the meritocratic governance of these communities. The other commercial software companies (HOL, BALANCE, DOM) have declared their interest in also becoming active in Open Source, as part of their innovation portfolio.

6.3.1 State of play in T8.3

An open source project was set up on github:

https://github.com/nimble-platform

At present, there are only the main NIMBLE developers present, but we will increasingly make the code repository better known so that other developers can join in the effort.

We previously put incubation as an Apache project very high on the agenda. This was motivated by our perceived need for genuine software development at the time of writing the proposal. It now seems that NIMBLE is more likely to contribute to existing projects because NIMBLE itself is already making use of existing open source software. We therefore keep the option of incubation open, but at present, it does not seem on the critical path of the project.

6.3.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Managing the github repositories and helping interested developers to become active on NIMBLE. Contributing to adjacent open source projects	Steady increase of external developers contributions to the github repository. Contribution to relevant OSS
IBM	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.
SRDC	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.

INN	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.
AID	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.
HOL	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.

6.3.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Managing the github repositories and helping interested developers to become active on NIMBLE. Contributing to adjacent open source projects	Steady increase of external developers contributions to the github repository. Contribution to relevant OSS
IBM	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.
SRDC	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.
INN	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.
AID	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.
HOL	Seeking opportunities for the project dissemination to open source communities	Steady increase of external developers contributions to the github repository.

6.3.4 Expected outcomes

In the coming period, we do not expect a large increase in external contributions to the NIMBLE open source repositories. It will be more important for NIMBLE developers to become known in some of the existing communities from which we are already drawing benefits and to whom we can possibly contribute to improve or adapt existing OSS to our needs.

6.4 Action Plan for T8.4 – AMBASSADOR Programme for Early Adopters and Stakeholders

(From the DoW) **Task 8.4 AMBASSADOR Programme for Early Adopters and Stakeholders - Lead:** INN (dissemination); **Strongly involved:** SRFG (product management); **Other participants and their role:** UB, WHR, LIND, PIA, MIC, AID, FEVA, ENEA

Creation of communication and support materials that aim to convert platform users into recruiters to fuel growth in user numbers. The AMBASSDOR Programme will create incentives for the users to recruit their own supply chain partner networks, by providing evidence of the benefits of collaborative usage of the platform. The programme will initially be delivered to early adopters (up to 200), mainly through workshops (minimum 2 per use case), and will be complemented with online content, newsletters, social media tools, and specifically created "user support and training area" of the project website. Feedback from this early adopter training will help us refine website content (including toolkits, guides, etc.), resulting in offering content for converting the platform users into recruiters. KPIs will include quantitative measures (e.g. number of platform user recruitment rates) and qualitative measures based on user feedback. Industry associations and intermediaries with access to business networks and communities will also participate in the early AMBASSADOR Programme encouraging these business networks to further promote the NIMBLE platform.

In order to contribute to the AMBASSADOR programme for early adopters and stakeholders, ENEA will take advantage of its knowledge of a number of initiatives of awareness creation on technologies (the last one is the European *Energy Made to Measure campaign*, promoted by EURATEX with the participation of ENEA as the key partner and coordinator for Italy. This promotion led ENEA to organization of 21 events in Europe -6 in Italy- with more than 300 firms deeply involved.

An adoption update on the T8.4 outcomes will be issued quarterly to the Commission, and a live counter will be established at the website.

6.4.1 State of play in T8.4

INN in cooperation with the use case partners has started arranging a first series of workshops (at least 1 for each use case, by **M08**), where NIMBLE platform requirements, business models and collaboration patterns will be presented and discussed with potential platform users (engaged in the use case partners' networks) in order to be validated and improved. Reference use and business models and cooperation patterns will be finalised as a main outcome of the workshops. Workshops with Micuna and Lindbäcks have already taken place. Whirlpool and Piacenza have taken part in relevant trade fairs, and further workshops are being planned.

With the input from all partners, INN will carry on a continuous community building activity, in order to engage a wide number of stakeholders (Supply Chain Partners, Intermediaries, Innovation Ecosystems, Technology Transfer Agencies, Expert Networks, Industry Associations, Software Developers and Open Source Community, Scientific Community, Other Regional/National/EU Projects). A shared CRM is being set up, that can be used to seek relevant organisations for all the project dissemination and communication activities.

6.4.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Supporting the AMBASSADOR programme	Supporting workshops
UB	Supporting the AMBASSADOR programme	Supporting workshops
INN	Focus on organizing the first series of AMBASSADOR workshops, starting from workshops co-organized with use case partners.	at least 2 workshops with use cases

WHR	Supporting the AMBASSADOR programme	Supporting workshops
LIND	Use case workshop with suppliers in June 2017	Awareness of NIMBLE in the Lindbäcks supply chain
PIA	Supporting the AMBASSADOR programme	Supporting workshops
MIC	Use case workshop with wood sector in Spain in May 2017	Awareness of NIMBLE in the MICUNA supply chain
AID	Use case workshop with wood sector in Spain in May 2017	Awareness of NIMBLE among Spanish Furniture Builders
FEVA	Use case workshop with wood sector in Spain in May 2017	Awareness of NIMBLE among Spanish Furniture Builders
ENEA	Supporting the AMBASSADOR programme	Supporting workshops

6.4.3 Action plan for months M10 – M12

Partner	**What is planned?**	**Expected Result**
SRFG	Supporting the AMBASSADOR programme	Supporting workshops
UB	Supporting the AMBASSADOR programme	Supporting workshops
INN	Engaging with industry and industry associations (intermediaries), not currently piloted in NIMBLE	at least 1 workshop with intermediaries
WHR	One workshop related to the use case scenario	Service technicians joining NIMBLE
LIND	One workshop related to the use case scenario	Supply chain partners joining NIMBLE
PIA	One workshop related to the use case scenario	Supply chain partners joining NIMBLE
MIC	One workshop related to the use case scenario	Supply chain partners joining NIMBLE
AID	Support for sector specific workshops	Training programme for NIMBLE uptake in Spanish Furniture sector
FEVA	Sector specific workshop	Training programme for NIMBLE uptake in Spanish Furniture sector
ENEA	Support for sector specific workshops	Offering NIMBLE training

6.4.4 Expected outcomes

We expect a steady growth in adopters of NIMBLE through the multitude of activities implemented by the partners.

6.5 Action Plan for T8.5 – NIMBLE Platform SEED Programme for Federated Platforms

(From the DoW) **Task 8.5 NIMBLE Platform SEED Programme for Federated Platforms - Lead:** INN (dissemination); **Strongly involved:** SRFG (product management.); **Other:** IBM**,** SRDC, UB, HOL

The Platform SEED Programme will foster the creation of new platforms for new supply chains, industry sectors or geographies. The SEED Programme will be delivered to intermediaries, and potential platform owners and/or developers. The emphasis is to encourage the creation and success of new platforms rather than the recruitment of users to an existing platform. KPIs will include quantitative measures (e.g. leads pipeline, number of active negotiations, use of tools, etc.) and qualitative measures based on user feedback. The programme will be built around the following elements:

- A roadshow targeted at organisations (minimum of 3 per represented Member State). The content of the programme will include overview of the project, description of core and value-added services, platform demos, use cases highlighting impacts and benefits, presentation of toolkits and launch manual. A roadshow would also include training workshops on platform use, integration and the AMBASSADOR Programme where appropriate. The roadshow will “piggyback” on other events, conferences or meetings and will also be delivered to single interested contacts.
- A final EU-level end-of-project event with at least 100 invitees from EU and regional level intermediaries, policy-makers etc. This extended version of the roadshow will explore the project in more detail but maintain the emphasis on promoting platform creation and federation.
- Networking, demos and presentations at industry events (especially Hannover 2017, 2018 and 2019).
- Creation of a platform feasibility and impact assessment tool to support the business case for NIMBLE.
- NIMBLE platform launch guide, which will take potential platform developers through every step from concept to launch.
- Training for business consultants, advisors and other intermediary reps on how to promote and use of the tools, write business plans and obtain funding for platform development (as part of the roadshow or separately, according to demand)
- The consortium will use this methodology to produce at least one joint business plan for the post-funding exploitation of the project, possibly setting up a joint venture between several partners for the commercial roll out of the NIMBLE platform.

6.5.1 State of play in T8.5

We have made first contacts with groups that might be interested in adopting NIMBLE. One particularly important group are those who already run B2B platforms of some sort. Although the actual SEED programme activities will start later in the project, we are in the process of initiating discussions.

6.5.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Initial talks with several German-language trade platforms (e.g. “Wer liefert was”)	Indication of interest; understanding of requirements from platform point of view

UB	Initiating talks with regional or sectorial platforms	LOIs
INN	Initiating talks with regional or sectorial platforms	LOIs
HOL	Initiating talks with regional or sectorial platforms	LOIs

6.5.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Initiating talks with regional or sectorial platforms	LOIs
UB	Initiating talks with regional or sectorial platforms	LOIs
INN	Initiating talks with regional or sectorial platforms	LOIs
HOL	Initiating talks with regional or sectorial platforms	LOIs

6.5.4 Expected outcomes

We should have expressions of interest from several (more than one, less than 10) commercial entities, who see a business opportunity in running a NIMBLE platform.

6.6 Action Plan for T8.6 – Social Media and Strategic PR

(From the DoW) **Task 8.6 Social Media and Strategic PR - Lead:** INN (dissemination); **Strongly involved participants:** SRFG (project coordinator); **Other participants:** SRDC, FEVA

Alongside the materials and campaigns at the heart of the AMBASSADOR and SEED Programmes, the project will also engage in more general, less targeted communication activities that will also support the project's dissemination and exploitation by promoting the work and results to a wider audience:

- The project's brand (logo, visual identity, key messages, etc.) will help to maintain consistency in all aspects of the project's communications and support wider recognition of the project.
- Social media activity to promote awareness and interest in a wide range of organisations and businesses.
- Strategic PR (articles in national, local and trade press) and a standard project press kit
- Communications will be evaluated using standard metrics and web analytics

This task will have no written report except summaries in the annual management reports. The actual activity will happen in the Web, in social and in traditional media.

6.6.1 State of play in T8.6

We have got a twitter account @NimbleProject, which we believe is adequate at this point in time. We use it to report on events where NIMBLE partners are taking part and where NIMBLE is being presented in some form.

On the developers' side, we are encouraging the NIMBLE team to switch their github accounts to "public" so that they can be seen in order to prove that there is a strong community behind the open source effort of NIMBLE.

6.6.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Regular features/news about NIMBLE technical development and progress in functionality	Raised awareness in target communities
SRDC	Regular features/news about NIMBLE technical development and progress in functionality	Raised awareness in target communities
INN	Launch and promotion of selected social channels for the project (twitter / linkedin); Revision and adaptation/evolution of the dissemination material according to new available contents and precise partners' request (e.g. to fit a specific conferences); The 1st project newsletter	Building a social community and following
FEVA	Promoting the Micuna use case and its significance for furniture manufacturing in Europe and Spain, vis-à-vis NIMBLE	Building a social community and following

6.6.3 Action plan for months M10 – M12

Partner	What is planned?	Expected Result
SRFG	Regular features/news about NIMBLE technical development and progress in functionality	Raised awareness in target communities
SRDC	Regular features/news about NIMBLE technical development and progress in functionality	Raised awareness in target communities
INN	Maintenance of project' social channels	Building a social community and following
FEVA	Promoting the Micuna use case and its significance for furniture manufacturing in Europe and Spain, vis-à-vis NIMBLE	Building a social community and following

6.6.4 Expected outcomes

We expect steady growth in interest in NIMBLE over the first year, and significant growth rates thereafter.

6.7 Action Plan for T8.7 – Innovation, Exploitation & Standards

(From the DoW) **Task 8.7 Innovation, Exploitation and Standardisation - Lead:** INN (Innovation management, see *Section 3.2.1: Management structure and decision making*); **Strongly involved participants and their role:** SRFG (product management), HOL (standardization activities); **Other participants:** IBM, SRDC, UB, LTU, WHR, LIND, PIA, MIC, AID, BALANCE, DOM, FEVA, BLAT, ENEA

This task will continuously analyse the market and develop possible business cases, identifying success factors, drivers and market opportunities for the successful introduction of the project products into the pan-European manufacturing, IoT and ICT markets. The task will catalogue innovative, protectable and patentable results from the project. Means for legal protection will include: copyright, patents, utility models and industrial secret. A technology watch will be carried out permanently, collecting the IPs that could interfere with the project and bringing to discussions any IP consideration. Furthermore, this task will manage the business indicators for the identified innovation, assessing spin-off planning for spill-over opportunities. This task will be performed in a strong collaboration between the *Product Manager* (SRFG, Georg Güntner) and the *Innovation Manager* (INN, Alessio Gugliotta). T8.7 will issue an annual update to the Consortium's exploitation plans.

6.7.1 State of play in T8.7

In the course of working on D1.2 (collaboration patterns) we also studied the strategies of successful Internet platforms for recruiting their large user and customer bases. It has become clear that many of the successful platforms spent immense amounts of money essentially "buying" their customer base. Only very few platforms became successful through organic (fast) growth. One possible path to success is the implementation of forward-looking standards that promise sustainability of the initial investment that is necessary to join NIMBLE. Another strategy is to offer some of our novel technology components to existing B2B platforms as long as they are willing to comply with the open API proposed by NIMBLE. In task 8.7 we need to explore which affordable strategies will help us reach our targets.

6.7.2 Action plan for months M07 – M09

Partner	What is planned?	Expected Result
SRFG	Study of Internet platform growth strategies	Promising strategies
IBM	Cloud-related improvements of adoption rates	Increasing adoption rates
SRDC	Study of business process support tools	Feedback from companies
UB	Study of information quality benchmarks	Quality benchmarks for the NIMBLE platform
LTU	Study of business models and collaboration patterns	Sustainable collaboration patterns and business models
INN	First release of the project exploitation plan with main focus on: market analysis, identifying key project assets and innovative aspects.	Exploitation plan
WHR	Support from the perspective of large scale white goods manufacturing and service sector	Input to exploitation

LIND	Support from the perspective of a mid-sized manufacturer with a significant supply chain	Innovative aspects of NIMBLE
PIA	Support from the perspective of the textile sector	Innovative aspects of NIMBLE
MIC	Support from the perspective of the furniture sector	Innovative aspects of NIMBLE
AID	Support from the perspective of the furniture sector	Innovative aspects of NIMBLE
HOL	Study of competitors' digital twin solutions	Innovative aspects of NIMBLE
BAL	Applications of NIMBLE in maritime sector	Innovative aspects of NIMBLE
DOM	Support from the perspective of the textile sector	Innovative aspects of NIMBLE
FEVA	Support from the perspective of the furniture sector	Innovative aspects of NIMBLE
BLAT	Evangelist for smaller SMEs to join NIMBLE	Innovative aspects of NIMBLE
ENEA	Study of relevant standards	Innovative aspects of NIMBLE

6.7.3 Action plan for months M10 – M12

Partner	**What is planned?**	**Expected Result**
SRFG	Study of Internet platform growth strategies	Promising strategies
IBM	Cloud-related improvements of adoption rates	Increasing adoption rates
SRDC	Study of business process support tools	Feedback from companies
UB	Study of information quality benchmarks	Quality benchmarks for the NIMBLE platform
LTU	Study of business models and collaboration patterns	Sustainable collaboration patterns and business models
INN	First release of the project exploitation plan with main focus on: market analysis, identifying key project assets and innovative aspects.	Exploitation plan
WHR	Support from the perspective of large scale white goods manufacturing and service sector	Input to exploitation
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PIA	Support from the perspective of the textile sector	Innovative aspects of NIMBLE
MIC	Support from the perspective of the furniture sector	Innovative aspects of NIMBLE
AID	Support from the perspective of the furniture sector	Innovative aspects of NIMBLE
HOL	Study of competitors' digital twin solutions	Innovative aspects of NIMBLE

BAL	Applications of NIMBLE in maritime sector	Innovative aspects of NIMBLE
DOM	Support from the perspective of the textile sector	Innovative aspects of NIMBLE
FEVA	Support from the perspective of the furniture sector	Innovative aspects of NIMBLE
BLAT	Evangelist for smaller SMEs to join NIMBLE	Innovative aspects of NIMBLE
ENEA	Study of relevant standards	Innovative aspects of NIMBLE

6.7.4 Expected outcomes

We will issue a NIMBLE-specific exploitation plan that takes into account several aspects in which innovation could take place that is relevant to an Internet Platform as envisaged with NIMBLE.

7 Work Package 9 – Project Management

The action plan for project management is fully covered by the articles of the Grant Agreement and by the Description of the Action.