



NEWBITS

Project Acronym: **NEWBITS**

Project Title: New business models for ITS

Project Number: 723974

Topic: **MG.6.3-2016**

Type of Action: **CSA**

D6.2 Definition of NNP

(Version 1.0, 14/02/2018)

Deliverable:	D6.2 Definition of NNP
Work Package:	WP6 NEWBITS Network
Due Date:	31/01/2018 (originally)
Submission Date:	14/02/2018
Start Date of Project:	01/10/2016
Duration of Project:	30 Months
Organisation Responsible of Deliverable:	INTELSPACE SA
Version:	1.0
Status:	Final
Author name(s):	INTELSPACE SA
Reviewer(s):	ORT
Nature:	☒ R – Report ☐ P – Prototype ☐ D – Demonstrator ☐ O – Other
Dissemination level:	☐ PU – Public ☒ CO – Confidential, only for members of the consortium (including the Commission) ☐ RE – Restricted to a group specified by the consortium (including the Commission Services)

Revision history			
Version	Date	Modified by	Comments
0.1	15/06/2017	INTELSPACE SA	first draft
0.2	15/10/2017	INTELSPACE SA	upgraded draft
0.3	05/02/2018	INTELSPACE SA	working draft
0.4	07/02/2018	INTELSPACE SA	Comments ideas from the 1 st technical INTEL-ORT included
0.5	09/02/2018	ORTELIO	Inclusion of content, revision
0.6	13/02/2018	INTELSPACE SA	Accepting revisions by ORT and ORT addressing comments.
1.0	14/02/2018	ORTELIO	Final edition, submission

Table of Contents

List of Figures	5
List of Tables	6
Abbreviations	7
Abstract	8
1. Introduction – NNP and Cols definition (D6.1)	9
2. NNP Important Features and Tools	10
2.1 Kickstarter.com	10
2.2 Indiegogo.com	12
2.3 CIPTEC Crowdsourcing Platform	13
2.4 ICOS: Intelligent City Software and Solutions	14
2.5 CloudFunding platform	16
2.6 Stackoverflow.com.....	17
3. NNP Platform Structure.....	19
3.1 NNP Set of Tools to Support WPs.....	23
3.2 NNP Content Management System.....	23
3.3 NNP Networking Space	24
3.4 NNP Showcase of ITS and C-ITS applications.....	24
3.5 NNP Crowdsourcing	25
3.6 Data Protection	25
3.7 Software Development Applications and Tools to be used	26
4. NNP Proposed Functions.....	27
4.1 Info Publishing	27
4.2 Social / Community:.....	27
4.3 Internal Tools:	27
4.4 Research Assisting:	28
4.5 Crowdsourcing module	28
5. NNP Users and their Roles	29
5.1 NNP: Groups of Users	29
5.2 NNP: Foreseen Roles Hierarchy	29
5.3 Key Characteristics per Role	30
5.4 Summary of Roles per Col Tier	31
5.5 Privileges per Role.....	32
6. NNP Use Cases - Scenarios	33
6.1 All tiers	33

6.2	Tier 1: Supporting internally NEWBITS WPs	34
6.3	Tier 2: As an advanced group of C-ITS experts	37
6.4	Tier 3: Open to all to promote C-ITS.....	41
7.	NNP Mockups	44
7.1	Home page	44
7.2	Tier 1: Internal NEWBITS area	44
7.3	Tier 2: ITS experts	45
7.4	Tier 3: All users	48
	References	49

List of Figures

Figure 1: Structure of the NEWBITS Cols	9
Figure 2: KickStarter.com screenshot [1]	11
Figure 3: Kickstarter.com process [2]	11
Figure 4: Indiegogo.com part of screenshot [3]	12
Figure 5: Features differentiating Indiegogo and Kickstarter	13
Figure 6: CIPTEC Platform Screenshot [5]	14
Figure 7: ICOS Platform Screenshot [7]	15
Figure 8: CloudFunding platform part of screenshot [8]	16
Figure 9: Stackoverflow.com screenshot [9]	17
Figure 10: NNP to support four COIs and three tiers per COI	21
Figure 11: Iterative structured process to define NNP functions	22
Figure 12 NNP Core Functions	22
Figure 13: NNP tools to support WPs implementation	23
Figure 14: NNP Content Management System	23
Figure 15: NNP Networking space	24
Figure 16: NNP Showcase of ITS and C-ITS applications	25
Figure 17: NNP Crowdsourcing functions	25
Figure 18: NNP Software development application and tools	26
Figure 19: Groups of Users	29
Figure 20: NNP Foreseen Roles Hierarchy	29
Figure 21: All tiers - Scenario A: Col member creates a new account	33
Figure 22: All tiers - Scenario B: Member wishes to opt out from the Col	34
Figure 23: Tier1 - Processes flow	34
Figure 24: T1 - Scenario A: Publish a post (article)	35
Figure 25: T1 - Scenario B: Discussions / Forum	35
Figure 26: T1 - Scenario C: Wiki Creation	36
Figure 27: T1 - Scenario D: WPL, CSL wants to perform an online survey	36
Figure 28: T1 - Scenario E: ownCloud integration	37
Figure 29: T2 - Processes flow	37
Figure 30: T2 - Scenario A: Posting of new collaboration opportunities to members	38
Figure 31: T2 - Scenario B: Express of interest to participate in a published initiative	39
Figure 32: T2 - Scenario C: Mapping expertise requests	39

Figure 33: T2 - Scenario D: Crowd sourcing support to new ITS / C-ITS projects/ ideas / products/ services	39
Figure 34: T2 - Scenario E: Members interact with the training material on the new business models for C-ITS	40
Figure 35: T3 - Processes flow.....	41
Figure 36: T3 - Scenario A: Publish a post (article).....	41
Figure 37: T3 - Scenario B: Discussions / Forum.....	42
Figure 38: T3 - Scenario C: Crowd sourcing support to new ITS / C-ITS projects/ ideas / products/ services	42
Figure 39: Non-registered user (External visitor) visits NNP	43
Figure 40: NNP home page.....	44
Figure 41: NNP tier 1, NEWBITS consortium.....	45
Figure 42: NNP Tier 2, ITS experts	46
Figure 43: View collaboration opportunity	46
Figure 44: Add new collaboration opportunity	47
Figure 45: View project, idea, product, service	47
Figure 46: Add new project, idea, product, service	48
Figure 47: NNP Tier 3, all users	48

List of Tables

Table 1: Tier 1 User Roles	31
Table 2: Tier 2 User Roles	32
Table 3: Tier 3 User Roles	32
Table 4: Privileges per role.....	32

Abbreviations

C-ITS	Cooperative Intelligent Transport Systems
CMS	Content Management System
Col(s)	Community of Interest(s)
CS	Case Study
CSL	Case Study Leader
CSS3	Cascading Style Sheets level 3
DoW	Description of Work
EC	European Commission
EU	European Union
GA	Grant Agreement
HTML	HyperText Mark-up Language
H2020	Horizon 2020 Program of the European Commission
ITS	Intelligent Transport Systems
JS	Java Script
NGOs	Non-Governmental Organisations
NNP	NEWBITS Network Platform
SAB	Stakeholders Advisory Board
WP	Work Package
WPL	Work Package Leader

Abstract

In the first introductory section of the specifications of the NNP the concepts of Cols and Tiers, developed in D6.1, are presented briefly. This section is considered important to assist the NNP developers (ORT) in the definition of the scope of the NNP and how the platform relates to the NEWBITS project.

Deliverable 6.1 (D6.1) has deepened in the identification of the features considered important for the operation of the NNP. In order to consider other potential features of the NNP, Intelspace SA has examined a number of on-line platforms i.e.: Kickstarter.com; Indiegogo.com; CIPTEC Crowdsourcing Platform; ICOS: Intelligent City Software and Solutions; CloudFunding platform; Stackoverflow.com. The identified features are presented in the second section of this deliverable.

In the third section, the NNP structure is described along with the following key components: a set of tools to support WPs; the Content Management System; the networking space; the showcase of ITS and C-ITS applications and crowdsourcing. In this section issues related to data protection are also pointed out to the developers.

NNP proposed functions are described in the fourth section. Some key functions considered are: Information publishing; Social / Community; Internal tools; Research assisting; Crowdsourcing module. For each of the mentioned functions, several tools are presented so that the developer knows what can be used and what is expected.

An important element of the specifications is the definition of NNP users and their foreseen roles. This definition is presented in detail in the fifth section of this report. NNP groups of users and the foreseen hierarchy is also presented. Key characteristics and privileges per role are also included.

To further support the development of the NNP and to implement it in a way to satisfy Col members' needs, specific use cases and scenarios are presented in the sixth section. The scenarios for all tiers include: a) Col Member creates a new account; b) a member wishes to opt out from the Col. Scenarios related to Tier 1 are: a) Publish a post (article); b) Discussions / Forum; c) Wiki Creation; d) WPL, CSL wants to perform an online survey; e) myOwnCloud integration. For Tier 2: a) Posting of new collaboration opportunities to members; b) Express of interest to participate in a published initiative; c) Mapping expertise requests; d) Crowd sourcing support to new ITS / C-ITS projects/ ideas / products/ services; e) Members interact with the training material on the new business models for C-ITS. And for Tier 3: a) Publish a post (article); b) Discussions / Forum; c) Crowd sourcing support to new ITS projects/ ideas / products/ services; d) Non-registered user visits NNP

The seventh section of the specifications includes the mock-ups and block diagrams developed by ORTELIO after considering an intermediate version of these specifications.

1. Introduction – NNP and Cols definition (D6.1)

The proposed NEWBITS Network Platform (NNP) is designed to accommodate the foreseen structure of the Cols, which are central elements for stakeholder engagement in the NEWBITS project. To justify how NNP will support Cols, general information on the NEWBITS Cols is provided in this introductory section.

A Community of Interest (Col) is considered as an agglomeration of people -or actors in general, such as organizations- that are concerned with the exchange of information in some subject area or that share a common goal or environment.

In NEWBITS project, Col is a broad concept that can be used for any group of actors, organizations or stakeholders operating within a given field and/or environment that exchange information and strive towards a common goal.

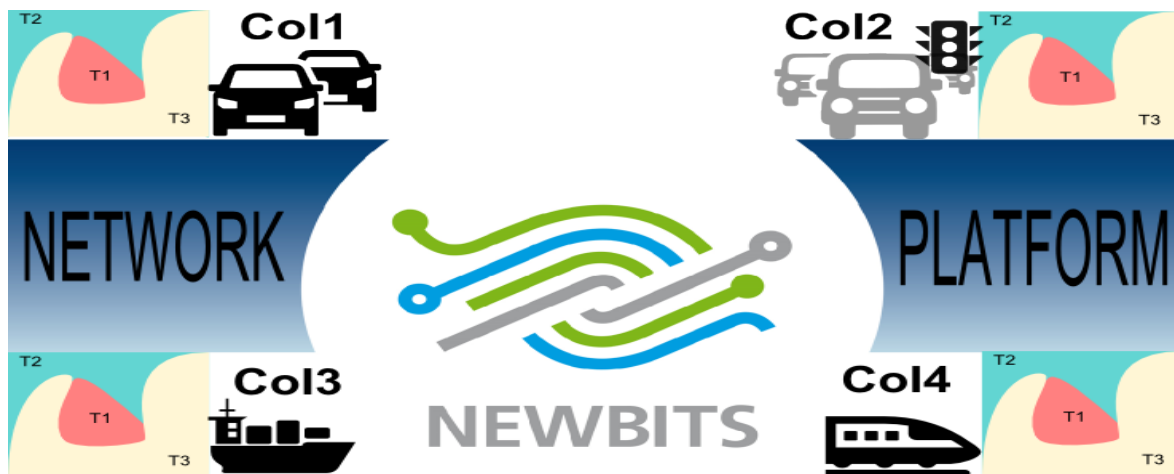


Figure 1: Structure of the NEWBITS Cols

The Conceptual Elements of the Cols include the following:

1. Cols are part of the deliverables described in DoW
2. INTELSPACE cannot guarantee the success /sustainability but guarantees the quality of their design and implementation
3. NEWBITS consortium partners do not share 100% similar interests but they believe that participating in the Cols can help them expand their businesses and believe in the benefits of building the four (4) proposed Cols
4. Members of Cols will be persons either representing their affiliated organisations / enterprises or themselves
5. The four (4) proposed Cols are intended to attract more members through the provision of high quality information, services and solutions to satisfy members needs

2. NNP Important Features and Tools

This section contains important features and tools of highly successful platforms that have been considered as examples of good practices in the design of the NNP.

2.1 Kickstarter.com

Kickstarter ¹ helps artists, musicians, filmmakers, designers, and other creators find the resources and support they need to make their ideas a reality. To date, tens of thousands of creative projects — big and small — have come to life with the support of the Kickstarter community.

Steps in the process

- 1) Have a great idea
- 2) Make something tangible to demonstrate your idea
- 3) Tell an emotionally compelling story (video is recommended)
- 4) Think about rewards for backers pre-order of products
- 5) Choose a realistic amount & time
- 6) Share, share, share
- 7) Watch your project funded
- 8) Involve backers in the process

¹ Kickstarter.com: [Online] <https://www.kickstarter.com>, 12/02/2018

[Publishing](#) [Food & Craft](#) [Music](#) [Film](#) [Comics & Illustration](#) [Arts](#) [Games](#) [Design & Tech](#)

FEATURED PROJECT



- [VIEW ALL](#)

[illegible]

² The Kickstarter story [Online] <http://cargocollective.com/workisplayislife/The-Kickstarter-Story>

2.2 Indiegogo.com

Indiegogo³ is a launchpad for entrepreneurial ideas. Some of its functions include the following:

- CROWDFUNDING: Raise funds with a crowdfunding campaign
- INDEMAND: Extend your campaign with InDemand
- MARKETPLACE: Keep up momentum with early sales in the Indiegogo Marketplace

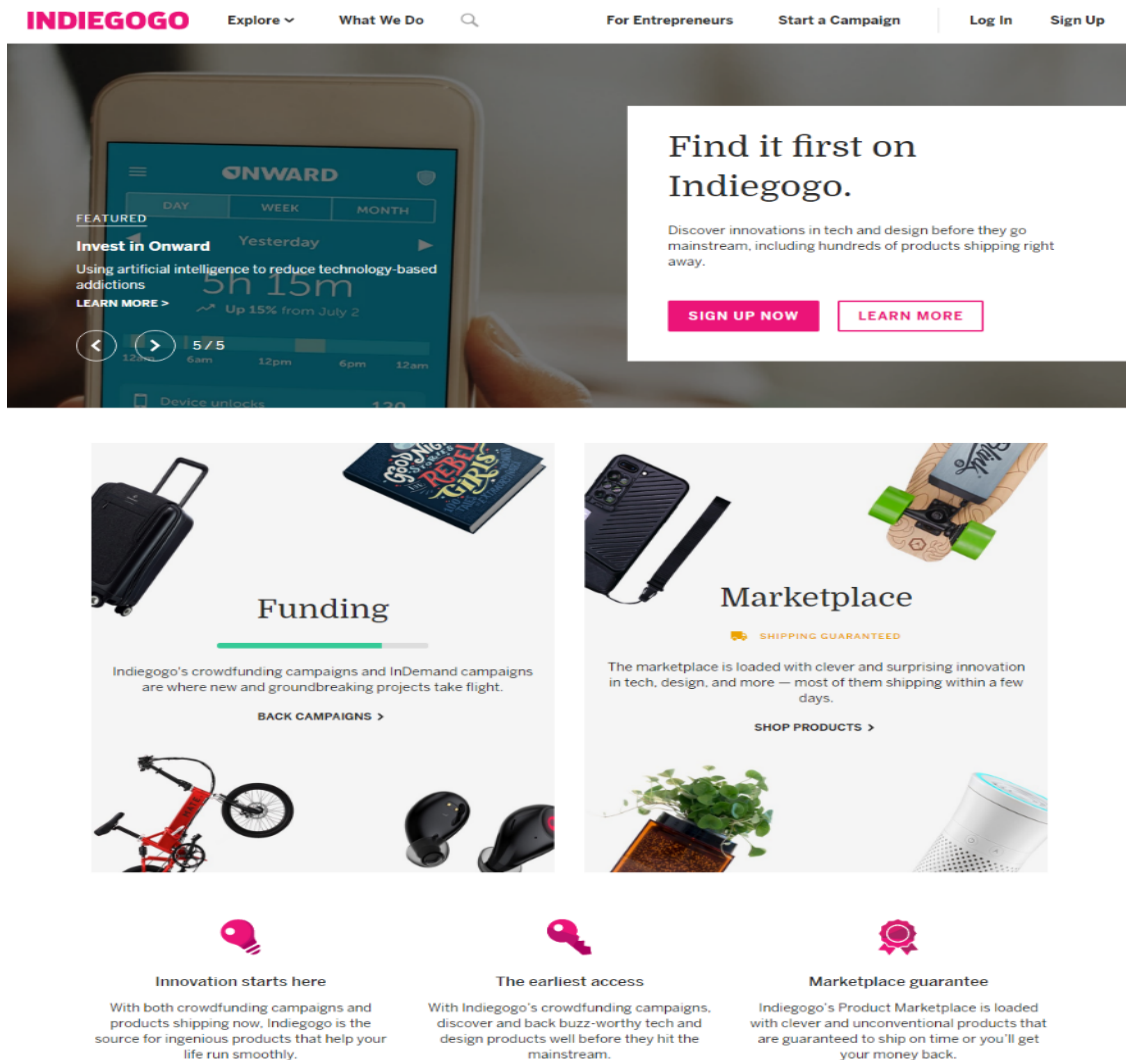


Figure 4: Indiegogo.com part of screenshot [3]

One of the most significant differentiator of the two platforms can be considered the 2–3 day Kickstarter Review for projects involving “manufacturing and distributing” of something “complex” where they require to “show backers a prototype” without using “photorealistic renderings”. Indiegogo is simpler, since only a name, banking details and an address are

³ indiegogo.com [Online] <https://www.indiegogo.com/en> ,10/11/2017

required. Both platforms have recently addressed the refund policy and have taken different approaches. In Kickstarter, the credit card is not charged until the end of the campaign and only if the project reaches its funding goal, allowing backers to cancel a pledge at anytime and refunds can be issued within 14 days of the funding deadline.

Kickstarter is a benefit corporation. According to its charter, “Kickstarter’s mission is to help bring creative projects to life. We measure our success as a company by how well we achieve that mission, not by the size of our profits. That’s why we reincorporated Kickstarter as a Benefit Corporation in 2015.”⁴. While Indiegogo is considered more focused as an innovation market place with its Shipping Now button introduced in 2015 and their InDemand feature to continue raising money indefinitely after deadline funding expires.

Kickstarter positions itself mostly as a community for creative projects. •Funding scheme: fixed •Registration: after staff review •Own video hosting •Re-marketing: not available •Max Reward: 10K USD	Indiegogo prides itself as a neutral platform giving anybody’s ideas a market test, fully embracing the efforts of entrepreneurs. •Funding scheme: variable •Registration: Automatic •YouTube •Re-marketing: available •Max Reward: No limits
--	--

Figure 5: Features differentiating Indiegogo and Kickstarter⁵

2.3 CIPTEC Crowdsourcing Platform

CIPTEC (*Collective Innovation for Public Transport in European cities*) is a research and Innovation project of the EU Programme Horizon 2020. The CIPTEC crowdsourcing platform is an online tool (currently available at <http://demo.ciptec.eu>) specifically developed for the purposes of the CIPTEC project and allows users submit innovative ideas for public transport.

The Crowdsourcing Platform offers a crowdsourcing platform to support the generation of innovative ideas from different groups of individuals, and in parallel to stimulate dialogue and discussion among all parties involved in the process. CIPTEC ⁶ is for organisations seeking to innovate, and according the developers is an easy to install, crowdsourcing platform that supports innovation.

CIPTEC Features considered for NNP:

- Three versions available
 - Basic (Free)

⁴ Kickstarter.com Charter [Online] https://www.kickstarter.com/charter?ref=about_subnav, 12/02/2018

⁵ Kickstarter vs Indiegogo [Online] <https://thecrowdfundingformula.com/2015/11/13/kickstarter-vs-indiegogo-2/>, Accessed 12/02/2018

⁶ CIPTEC Platform: [Online] <http://crowdsourcing.ciptec.eu/> 10/11/2017

- Pro (89€/mon)
- Gold (No price defined)
- White labelling
- One click social login
- Core + customised functionality
- Customised admin panel
- Server setup
- Hosting
- SEO + campaign promotion
- Email + telephone tech support
- Onsite training

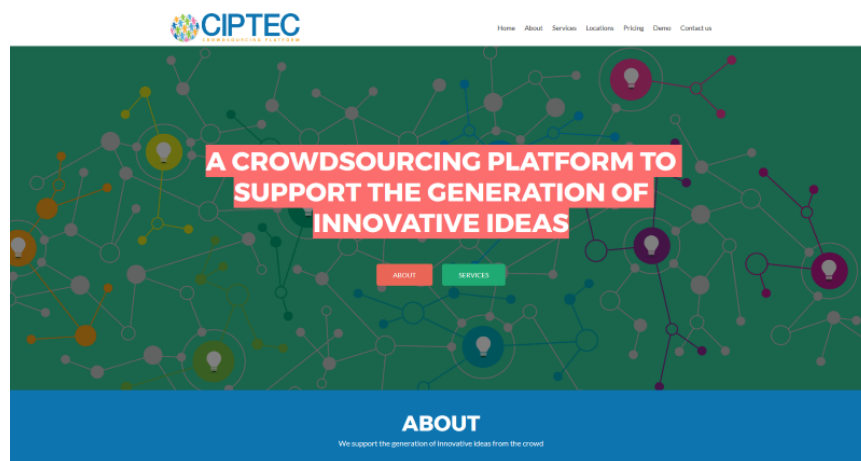


Figure 6: CIPTEC Platform Screenshot [5]

2.4 ICOS: Intelligent City Software and Solutions

ICOS⁷ website supports a community offering software and solutions in the field of intelligent cities / smart cities. ICOS is an Open Repository of Solutions for Intelligent Cities. The community will serve to showcase existing projects, provide a forum for discussing projects and processes, and guide developers' groups in applications' creation, contribution, and release.

Features:

⁷ ICOS: [Online] <http://icos.urenio.org/> 10/11/2017

- Open source software for intelligent cities is a valuable source of applications and solutions offered within a culture of sharing and reusing software.
- Addressing increasingly complex landscape of technologies, applications, data and e-services about smart cities.
- Support local authorities to retain the value of investments within short cycles of innovation as each wave of web technologies eventually makes the previous digital solutions quickly obsolete.

Benefits:

- “Share more – Develop less” is about the exchange of applications among city authorities, the creation of communities of non-trading solutions, sharing and exchanging application software. This goes together with the use of free open source software and participation in FOSS communities. Open source is ideal for city authorities as they don't compete on software development and don't create advantages on proprietary software.
- Use existing software, re-use software, spend less and proceed by small steps, minimize investments, is a safer way to deal with software. Develop applications from scratch should be the last resort, in case that no other solution is available.



Figure 7: ICOS Platform Screenshot [7]

2.5 CloudFunding platform

CloudFunding⁸ supports local communities to collect money for social and charitable purposes.

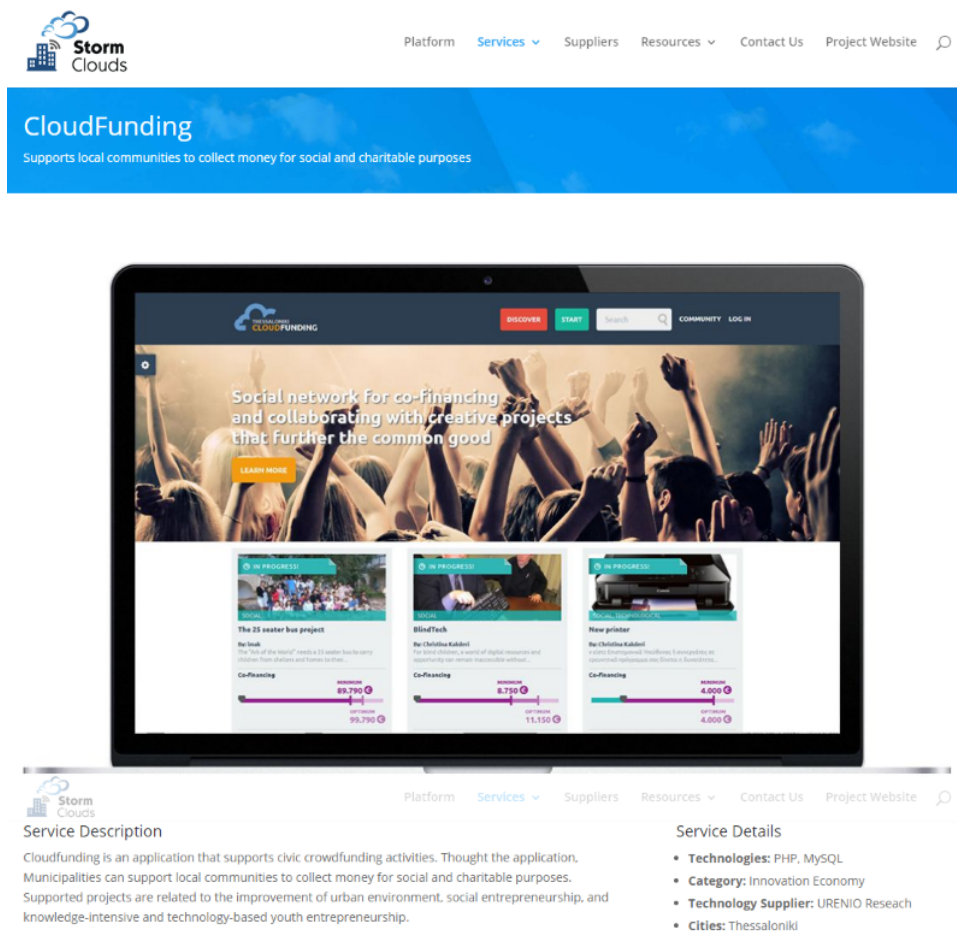


Figure 8: CloudFunding platform part of screenshot [8]

Features:

- **Focus on citizens Initiatives:** The application is tailored to the financing of citizen initiatives and social, cultural, technological and educational projects.
- **Multiple types of support:** The application supports donations not only of money but also of labour, tools, materials, etc.
- **100% Open Source Application:** The application is based on Goteo platform, a well-known open source crowdfunding platform.

Benefits:

- **Social impact projects with collective returns:** The city's local communities, civil society groups, NGOs and young entrepreneurs are supported through collaborative financing.

⁸ CloudFunding: [Online] <http://www.storm-clouds.eu/services/service/cloudfunding/> , 10/11/2017

- **Harnessing the Power of Crowdsourcing:** Crowdsourcing has become one of the most effective ways to solve civic and social problems.
- **Perpetual Improvement:** The involvement of a vibrant open source community ensures the update of the application with new features.

2.6 Stackoverflow.com

Each month, over 50 million developers come to Stack Overflow⁹ to learn, share their knowledge, and build their careers. Stackoverflow.com is one of the world's largest developer community.

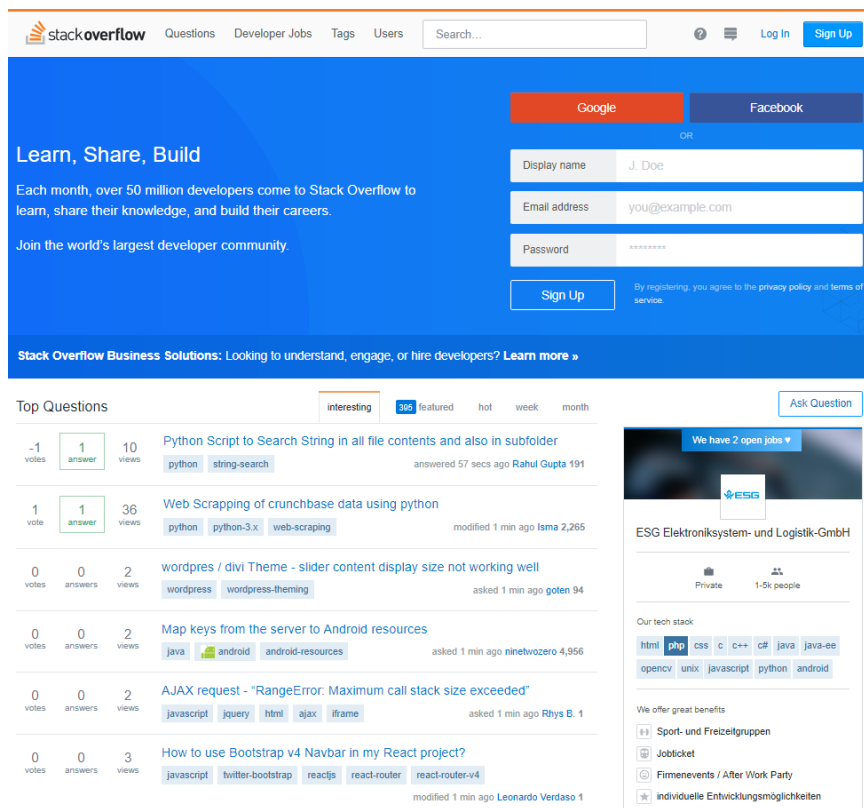


Figure 9: Stackoverflow.com screenshot [9]

There are eleven (11) key features responsible for the success of Stack Overflow that might be considered in the NNP.

The 11 key features responsible for the success of Stack Overflow are:

1. Transparent Ideology,
2. Gamification,

⁹ Stackoverflow.com: [Online] <http://www.stackoverflow.com> 10/11/2017

3. Simplicity,
4. Objective Q&A Style,
5. Strict Moderation,
6. Built on Nine Building Blocks of Social Engineering: (A) Voting, B) Tags, C) Editing, D) Badges, E) Karma, F) Pre-search, G) Google Is UI, H) Performance, & I) Critical Mass
7. Daily Community Involvement,
8. Strong Leadership,
9. Bright Career Prospects for Reputed Users,
10. Mobile-friendly Design,
11. App Store Presence.

3. NNP Platform Structure

As they defined in D6.1 there are four (4) Cols proposed, aligned with the project's 4 case studies, and essentially based on the C-ITS/ITS field that each case study focused on. As a result, the platform is essentially structured in such a way as to accommodate the activities of the stakeholders that are active in the three Tiers of the four Cols, which, at the highest tier, include additional stakeholders from the C-ITS/ITS field and the general public. The four Cols and the types of stakeholders that can gather around them are outlined below.

- **Col 1:** Intercity Mobility. Involving stakeholders providing and participating in Intelligent services based on advanced ITS platforms for city communities. Examples include carpooling and car-sharing services.
- **Col 2:** Efficient Traffic Management Systems and Strategies. Involving stakeholders active in the installation and application of intelligent traffic management control systems.
- **Col 3:** Efficiency-maximising solutions for goods transport on water. Involving stakeholders that are active in increasing transport efficiency for water transport (although not exclusively) through the use of intelligent solutions such as real-time data collection and analysis.
- **Col 4:** Railway customer satisfaction and safety. Involving stakeholders that are active in ITS solutions that increase railway efficiency and safety, through the use of solutions such as predictive maintenance.

According to the C-ITS/ITS stakeholder mapping conducted in the context of D6.1, most stakeholders, including those expected to participate in the Cols are companies, academia, policy makers and ITS associations. Stakeholders are usually active in all the different ITS market area segments or at least several ones, with only a low percentage specializing in one or two segments only.

Each of the above COIs will include three tiers. Each tier is defined by its scope, members and visibility to public.

- Tier 1: Support internally NEWBITS WPs
- Tier 2: As an advanced group of ITS experts
- Tier 3: Open to all to promote ITS

Col 1: Sustainable Intercity Mobility.

A Col built around sustainable and intelligent intercity mobility services made possible by advanced C-ITS platforms that provide state of the art capabilities such as coordinating different route planners and providing real-time routing advice. The scope is to improve traffic flows, reduce emissions and increase urban road transport efficiency. End users also benefit from lower cost.

Based on the initial CS level¹⁰, reflected in the organizations that are active in Tier 2 of the Col, the participating stakeholders should include host cities, transport authorities, academia, ITS service providers, funding bodies, ITS associations, and social media marketing companies, in the beginning identified during the implementation of NEWBITS project.

This Col eventually aims to involve all relevant stakeholder groups identified in the related case study for its broader, open form in Tier 3: cities, transport authorities, Academia, ITS service providers, funding bodies, ITS associations, social media and marketing companies, end users (consumers of the ITS service).

The core incentive for this Col is to achieve a better quality of life in urban centers by the reduction of traffic and emissions and the increase of efficient transportation for users/citizens.

Col 2: Efficient Traffic Management Systems and Strategies.

A Col built around the installation and use of intelligent traffic management systems that provide adaptive traffic control strategies, such as the installation of bi-directional communication system between traffic lights and vehicles, which instruct drivers on how to move efficiently in order to expend less time and energy in intersections. The scope is to improve the flow of traffic and reduce delays and carbon emissions.

Based on the initial CS level¹⁰, reflected in the organizations that are active in Tier 2 of the Col, the participating stakeholders should include host cities, automotive suppliers, original equipment manufacturers, transport operators, ICT service providers.

The main stakeholders expected to be involved in the broader, open final form of Tier 3 for this Col are the following stakeholder' groups: cities, automotive suppliers, original equipment manufacturers, transport operators, end users, ICT service providers.

The Col main incentive is the identification of new business opportunities on collaborative intelligent transport systems.

Col 3: Efficiency-maximising solutions for goods transport on water.

This Col is built around efficiency-maximising solutions for goods transport on water. The example of case study CS3, is the use of synchromodality, which refers to the possibility of choosing the most optimal transport modality at transshipment points. This is achieved by collecting and transmitting real-time data on container transport, from ship tracking, container handling at port, inland ship and truck transport and handling of the containers at the inland terminal and eventually at the warehouse. The scope is to achieve better planning and shorter transport times by better insight into the logistics chain and the resulting decrease of idle time.

Based on the initial CS level¹⁰, reflected in the organizations that are active in Tier 2 of the Col, the participating stakeholders should include the host port(s) authorities, shipping companies, terminal operators, warehouse operators, research organizations, ITS/C-ITS service providers, government promoters and funding bodies, and relevant SME associations.

¹⁰ NEWBITS project (2017), Deliver 3.1 Market Research Analysis, NEWBITS project

The main stakeholders expected to be involved in the broader, open final form of Tier 3 for this Col are parties in the supply chain of container transport: shippers, terminal operators, warehouse operators, research organisations, ITS and ICT service providers, Governmental and funding agencies, Port Authority.

The Col core incentive is the improvement of the collaborative decision-making process across the various stakeholders.

Col 4: Railway customer satisfaction and safety.

This Col is built around solutions that increase railway customer satisfaction and safety. The example taken from Col4 is the use of predictive maintenance for railway networks, identifying and reporting potential issues requiring repair before damages and delays appear. The scope is to improve service efficiency and increase passenger safety.

Based on the initial CS level¹⁰, reflected in the organizations that are active in Tier 2 of the Col, the participating stakeholders should include the rail infrastructure owner and manager, public boards concerned with railway safety, railway regulatory bodies, research institutions and train manufacturers and operators.

The main stakeholders expected to be involved in the broader, open final form of Tier 3 for this Col are organisations within the Railway Industry: train manufacturers, Railway infrastructure owners, train operators, Service delivery organisations, Railway Regulatory bodies, Railway industry organisations, Research organisations.

The main incentive for the Col is to foster a fully integrated business network modelling approach to railway industry.

The following Figure 10 presents the envisaged general NNP structure to support the above four Cols and their three Tiers.

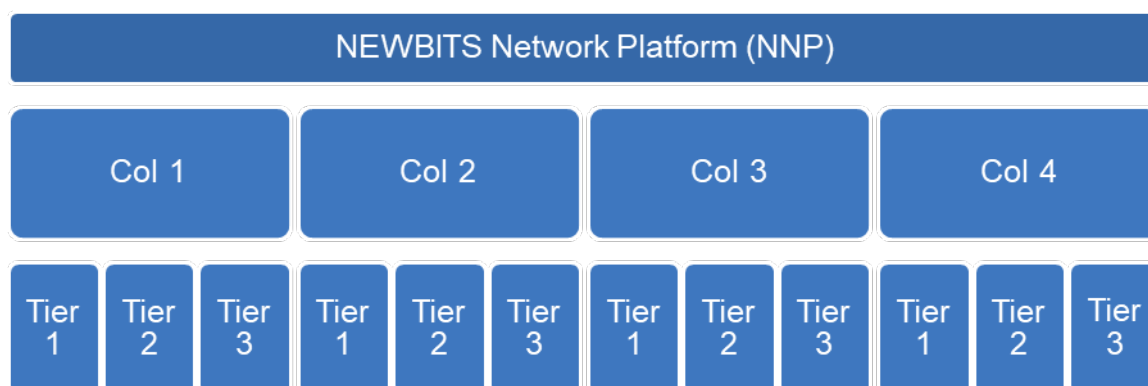


Figure 10: NNP to support four COIs and three tiers per COI

The proposed Cols are key not only to the implementation of the NNP but conceptually to NEWBITS project and how the new business models will emerge. The Cols have been formed since the commencement of the project with initial members the consortium partners and the four case studies stakeholders. During the project meetings and through numerous SKYPE discussions amongst partners, taking into consideration feedback from the interaction with the stakeholders of each case have been taken into consideration to define the functions of NNP.

The core functions have emerged following an iterative structured approach, that is summarised in the following figure.

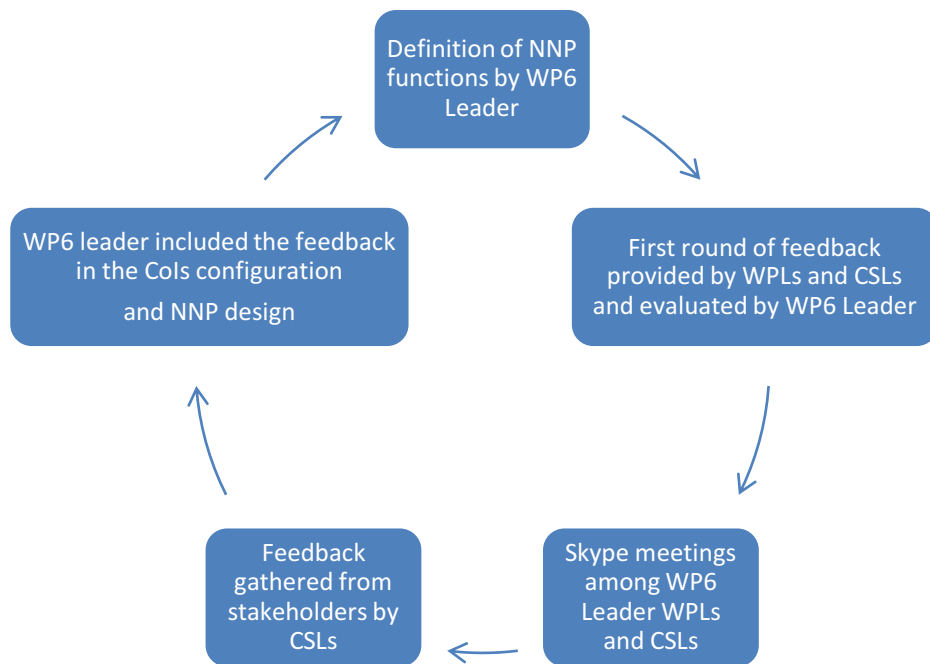


Figure 11: Iterative structured process to define NNP functions

The core functions and tools to support Cols targets to be performed by the NNP (Figure 12) are the following:

- Set of tools to support WPs tasks
- Content Management System (CMS)
- Networking space
- Showcase of ITS and C-ITS applications
- Crowdsourcing / Crowdfunding

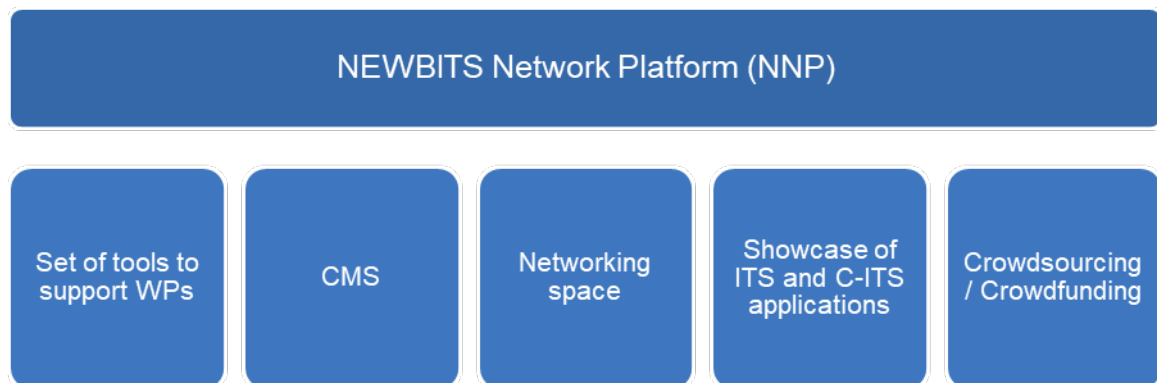


Figure 12 NNP Core Functions

3.1 NNP Set of Tools to Support WPs

The main functionality to foster and integrate into the NNP in order to support WP operation is envisaged to be on-line surveying. The NNP will support the development and management of new surveys by the WP leaders. Users can also easily create visualisations of the surveys. Most probably, the open source Lime Survey¹¹ tool will be used for this purpose.

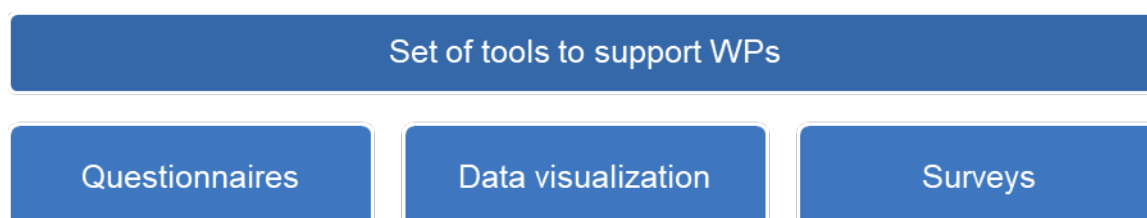


Figure 13: NNP tools to support WPs implementation

During the implementation of the NEWBITS project different questionnaires will be circulated among the stakeholders and consortium partners. WP leaders considered that an online tool to support qualitative questionnaires would be very supportive to their tasks. The online surveys differentiate from the questionnaires as in the NNP framework are considered mainly quantitative.

The use of online tools under the umbrella of NNP can create common list of potential responders, common visuals of questionnaires. Since it has been proposed the NNP to host data collection tools, the data visualization is considered by WPLs as another important set of NNP.

3.2 NNP Content Management System

The proposed CMS is Wordpress¹². Wordpress with the numerous plugins, themes and one of the largest community of supporters / developers around it is considered that can cover fully the requirements of the proposed NNP.

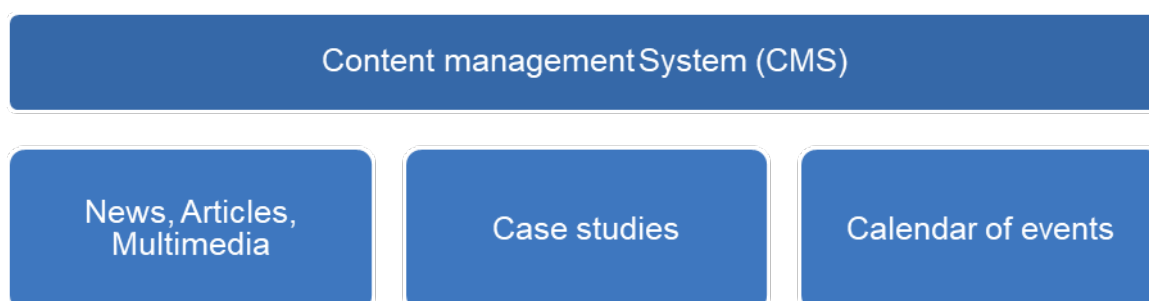


Figure 14: NNP Content Management System

News, articles and multimedia content are differentiated with the case studies mainly on the reference material that they are going to have attached and on how often it will be offered to

¹¹ <https://www.limesurvey.org>

¹² Wordpress: [Online] <http://wordpress.org>, 10/11/2017

the Col members. It is proposed for the NNP to accommodate the above distinct categorizations so that members can easily find relative material to their needs. Different categorization techniques are proposed to be also available (i.e. keywords tagging), though should be optional to the author of the post.

The calendar of events is considered as another way to enhance networking and information sharing. There are numerous ITS / C-ITS events that are taking place and it is proposed to include them in order the Col members to be informed about them. The members could interact with the calendar of events and add comments or express their intention to attend them.

3.3 NNP Networking Space

The networking space is the core element to foster interaction amongst Col members and amongst Cols in the framework of the NNP. A proposed tool to be incorporated in the Wordpress is BuddyPress. BuddyPress¹³ is a powerful community plugin for WordPress. It includes all the features you've come to expect from any online community, like user profiles, groups, activity streams, notifications, and more.

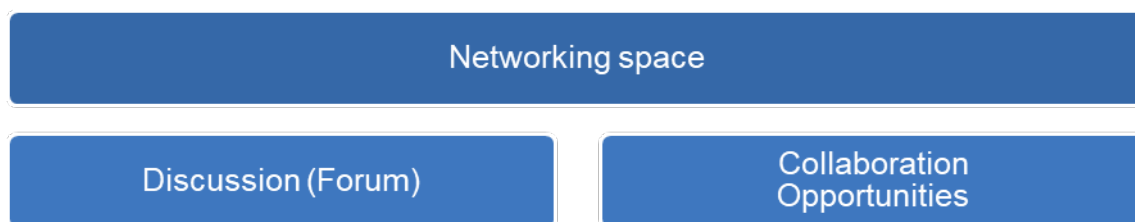


Figure 15: NNP Networking space

3.4 NNP Showcase of ITS and C-ITS applications

Each ITS and C-ITS application should be collated and presented in the NNP using a template. The design of the showcase should be attractive, functional and towards a market-oriented scope. The scope of the showcase is to promote ITS and C-ITS applications and attract potential clients.

Amongst other specifications, the Showcase functionality should include core elements such as: List of suppliers, Promotion of the network of suppliers, Presentation of Applications, Use case applications.

¹³ BuddyPress: [Online] <http://BuddyPress.org>, 10/11/2017

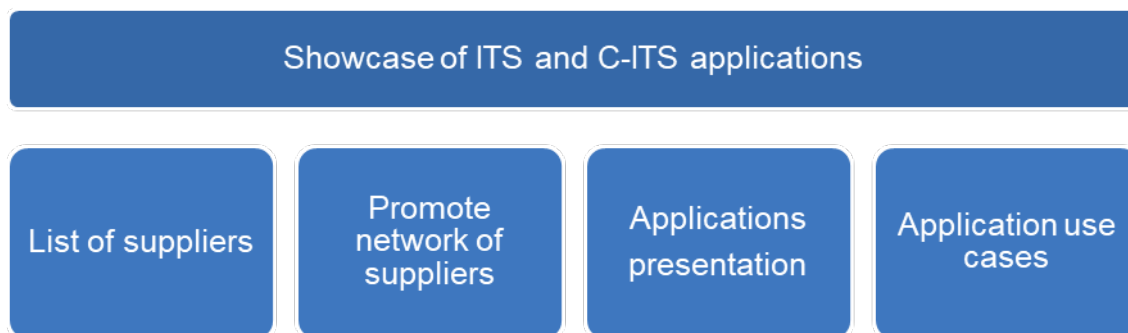


Figure 16: NNP Showcase of ITS and C-ITS applications

3.5 NNP Crowdsourcing

There are different types of Crowdsourcing: Crowdfunding; Crowdsourced design and Crowd wisdom. Crowdsourcing in general is best suited for simple tasks. For the case of NNP the crowd wisdom is proposed to be implemented with a customised version of virtual crowdfunding, since financial transactions are not foreseen. It is proposed that NNP will be implemented in such a way that in future to support real crowd funding transactions.



Figure 17: NNP Crowdsourcing functions

3.6 Data Protection

Personal data protection¹⁴ should be considered by the developer of NNP. The case of possible data transfers outside the EU in case that hosting server will be outside EU should be considered as well.

¹⁴ EU Personal data protection: [Online] http://ec.europa.eu/justice/data-protection/index_en.htm, 10/11/2017

3.7 Software Development Applications and Tools to be used

A number of software development applications will be used in the NNP design and implementation. The following section depicts and summarizes the “front-end” and “back-end” applications.



Figure 18: NNP Software development application and tools

Frontend:

- HTML 5 (fifth and current version of the HTML standard, markup language for structuring and presenting content on the World Wide Web)
- JS (JavaScript, as multi-paradigm language to support webpage interactivity and provision of online programs)
- CSS3 (Cascading Style Sheets, level 3)
- Compatibility with most browsers as: Opera; Safari; Chrome; Mozilla Firefox; IE, Edge

Backend:

- Java / JS (general computer-programming language)
- PHP (Hypertext Pre-processor, server-side scripting language)
- Other if required

4. NNP Proposed Functions

4.1 Info Publishing

The presented information and solutions should be presented based upon a common template. The fields that will be included will be provided by INTELS to ORT to be included in the NNP.

The content/ material uploaded by the members of Cols is proposed to be categorised. INTELS will check different categories from WP2 and WP3 that could be used and proposed to ORT.

News and updates should be distributed to Cols members by news pushing methods.

Some of the modules to be included in NNP are the following:

- Blog
- Forum / Discussion
- Wiki
- Web publishing
- Calendaring module

4.2 Social / Community:

- Bookmarking
- Tagging
- Rating and Comments
- Communities
- Sharing to Social Media (SM)

4.3 Internal Tools:

- Workflow system
- Document Management
- List Management
- Forms Management and workflow
- Project Management
- Tracking / Monitoring

4.4 Research Assisting:

- Surveys
- Business Intelligence
- Charting
- Enterprise search
- Office suite

4.5 Crowdsourcing module

In the proposed crowdsourcing NNP module the potential interested entity towards a project / idea might either express interest in supporting financially the project / proposal or in in-kind contribution i.e. allocation of time, expertise, know-how etc.

The presented project / idea is proposed to be rated by Cols members in four dimensions related to: i) Potential market; ii) Technology involved; iii) The team iv) the satisfaction of user needs

The proposed rating should be user friendly and its scope is to create a radar chart per ITS / C-ITS project idea that will present graphically what the users think about it. The rating could be a Likert scale¹⁵ ranging from 1 to 5. The user interface is proposed to be chosen by ORT as the responsible partner for the development of NNP.

¹⁵ S., Brown, (2010) Likert Scale Examples for Surveys, ANR Program Evaluation Iowa State University Extension <https://www.extension.iastate.edu/Documents/ANR/LikertScaleExamplesforSurveys.pdf>

5. NNP Users and their Roles

5.1 NNP: Groups of Users



Figure 19: Groups of Users

5.2 NNP: Foreseen Roles Hierarchy

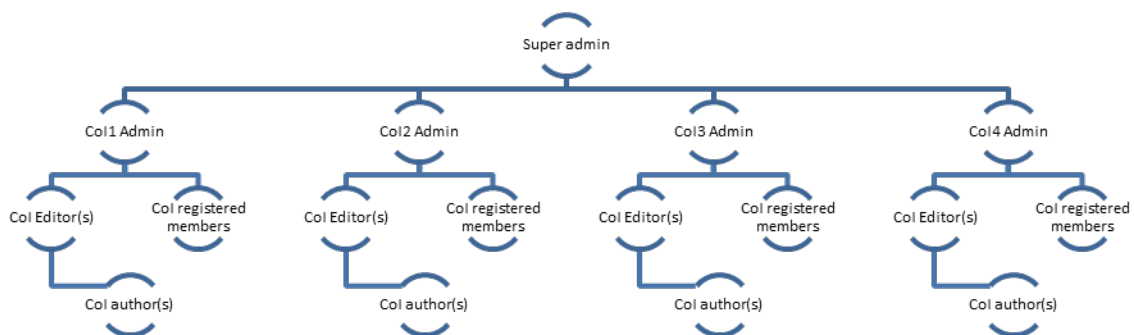


Figure 20: NNP Foreseen Roles Hierarchy

- Each role should be designed to be dedicated to unlimited number of user accounts
- For each Col one administrator is foreseen that is proposed to be the CS leader.
- Editors can be numerous depending on the impact of each Col, defined by Col administrators.
- Roles will be transversal to the three tiers per Col

5.3 Key Characteristics per Role

5.3.1 NNP Super Admin: ORT / INTELS

- View / edit / delete any content
- Monitor all processes
- Create / Modify / Delete any sub role user
- Create / Modify / Delete content that is presented in all Cols
- Perform structural and functional modifications on NNP
- Monitor web analytics of NNP and each one of Cols

5.3.2 Cols Admin: Case Study Leaders

- View / edit / delete content per Col
- Monitor all processes per Col
- Create / Modify / Delete any sub role user per Col
- Create / Modify / Delete content that is presented in the specific Col
- Monitor web analytics of the specific Col

5.3.3 NNP Editors:

- Tier1:
 - WPL(s) are foreseen as Editors
 - Editors can view / modify content by all authors
- Tier2:
 - Editors can view / modify content by all authors
 - Initially editors will be CSL
 - Col Admin can assign editor role to other NEWBITS partners or CS stakeholders*
- Tier3:
 - Editors can view / modify content by all authors
 - Initially editors will be CSL
 - Col Admin can assign editor role to other NEWBITS partners or CS stakeholders*

5.3.4 NNP Authors:

- Tier1:
 - Authors: Can create / publish content
 - CS stakeholders are considered as authors
- Tier2:
 - Authors: Can create / publish content after the approval of editors
 - CS stakeholders / SAB members are considered as authors
- Tier3:
 - Authors can create / publish content after the approval of editors
 - All registered members should be able to contribute content as authors

5.3.5 NNP Members:

- Tier1: Consortium members and CS stakeholders as defined previously
- Tier2: Consortium Members, CS stakeholders and SAB as defined previously
- Tier3: Members open to public (ITS / C-ITS related only)

5.4 Summary of Roles per Col Tier

5.4.1 Tier 1 User Roles

Table 1: Tier 1 User Roles

	Admin	Editor	Author	
NEWBITS Partners		✓	✓	
CS Leaders	✓	✓	✓	
CS Stakeholders		✓	✓	
WP Leaders		✓	✓	

5.4.2 Tier 2 User Roles

Table 2: Tier 2 User Roles

	Admin	Editor	Author	Member
NEWBITS Partners *[1]	✓	✓	✓	✓
CS Leaders	✓	✓	✓	✓
CS Stakeholders*[1]	✓	✓	✓	✓
SAB members*[1]	✓	✓	✓	✓
ITS C-ITS Experts *[2]			✓	✓

5.4.3 Tier 3 User Roles

Table 3: Tier 3 User Roles

	Admin	Editor	Author	Member
NEWBITS Partners		✓	✓	✓
CS Leaders	✓	✓	✓	✓
CS Stakeholders *[1]	✓	✓	✓	✓
SAB members *[1]	✓	✓	✓	✓
ITS C-ITS Experts *[2]		✓	✓	✓
Regional / local authorities *[3]			✓	✓
Researchers *[3]			✓	✓
Funders / Sponsors *[3]			✓	✓
ITS C-ITS application providers *[3]			✓	✓
Other				✓

5.5 Privileges per Role

Table 4: Privileges per role

	Manage Members	Manage processes	View / Edit / Publish Info (Others posts)	View / Edit / Publish info (Own Posts)	View / Comment (All posts)
Super Admin	✓	✓	✓	✓	✓
Col Admin	✓	✓	✓	✓	✓
Col Editor(s)			✓	✓	✓
Col Author(s)				✓	✓
Col Member(s)					✓

6. NNP Use Cases - Scenarios

This section presents in flow diagrams possible use case scenarios for the three tiers of the four foreseen Cols. The scenarios are same for all the four Cols since the content will be mainly modified per Col. The proposed use cases scenarios are not exclusive but are considering the most important use cases that NNP should satisfy.

To support the development of the NNP for each tier a figure is included presenting the key processes that will be undertaken inside.

6.1 All tiers

6.1.1 Scenario A: Col Member creates a new account

This scenario explores the process of a Col member creating a new account. This is done by entering an e-mail address, password and other information, and accepting the terms of use. The admin is informed about the new account and sets the Tier(s) of the Cols that the user can access. The user will receive an e-mail with an introduction to each tier he/she can access, and is able to access them using his/her account details.

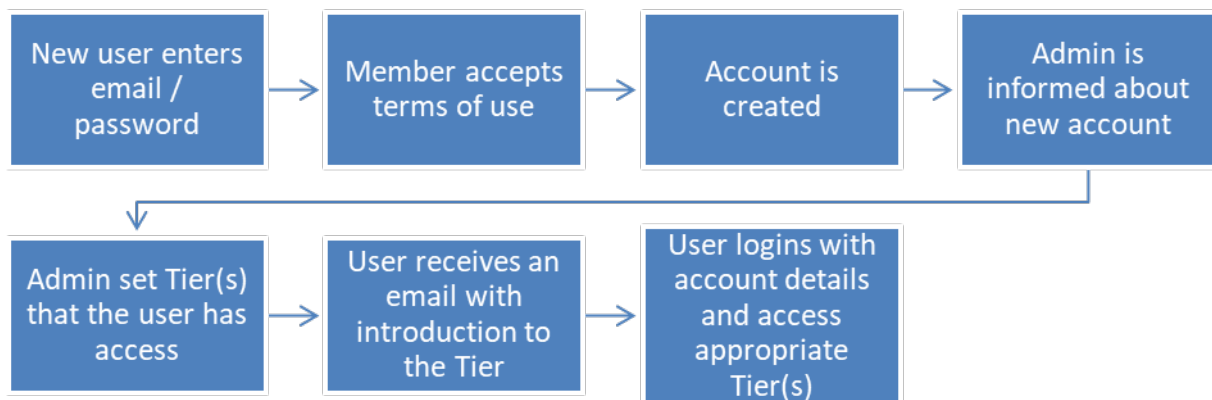


Figure 21: All tiers - Scenario A: Col member creates a new account

6.1.2 Scenario B: Member wishes to opt out from the Col

This scenario examines the possibility of a member opting out from the Col. The member deletes its account and chooses whether its content should be deleted as well, and the admin is informed about account deletion.

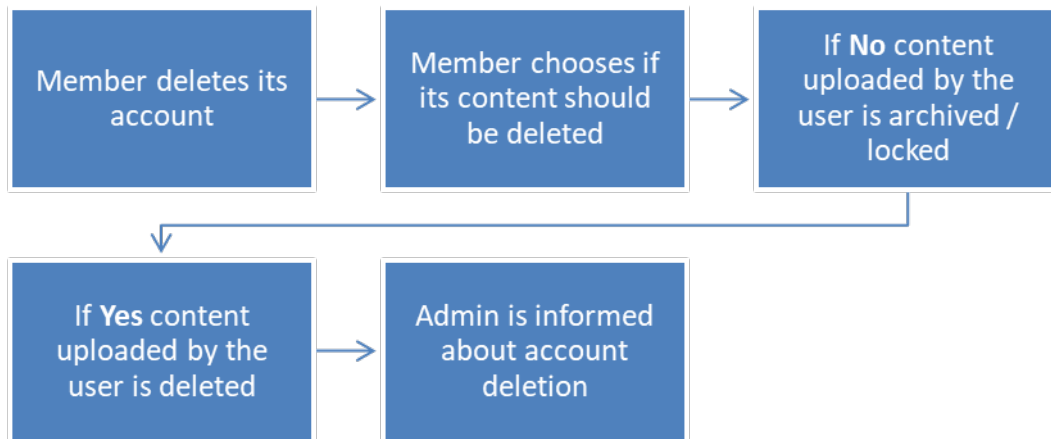


Figure 22: All tiers - Scenario B: Member wishes to opt out from the Col

6.2 Tier 1: Supporting internally NEWBITS WPs

The following Figure 23 presents the initial proposed processes that will be undertaken in **Tier 1** of each of the proposed Col. NNP will incorporate modules / tools to support the implementation of the following processes.

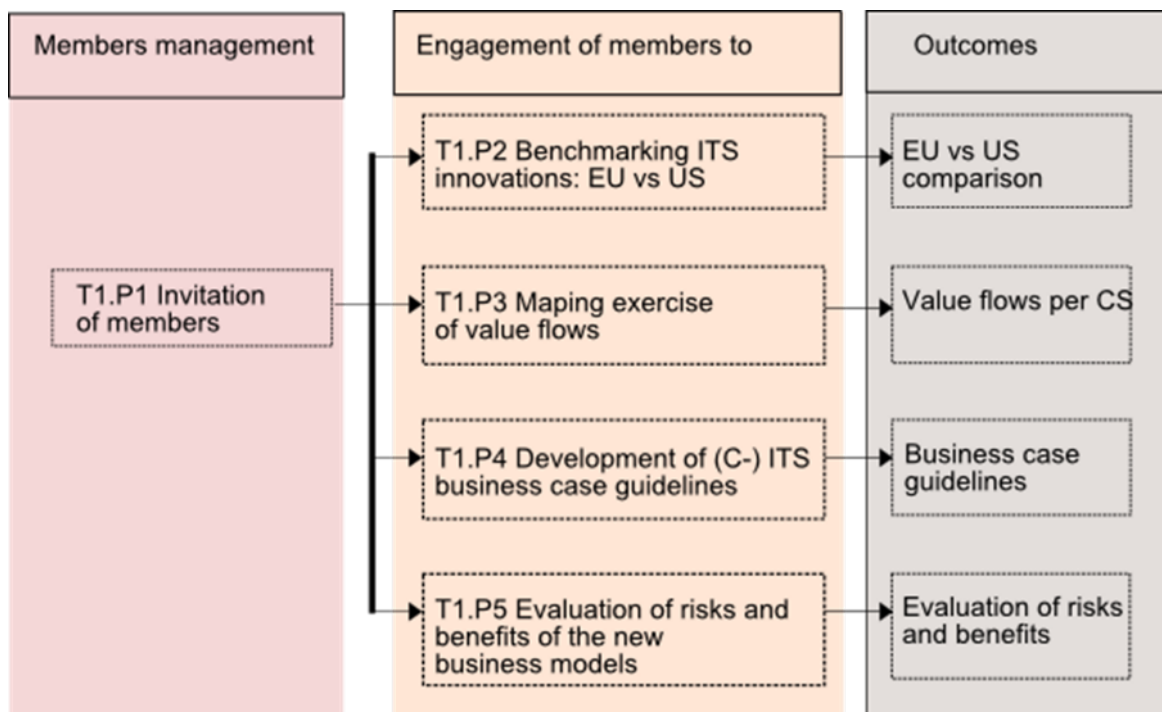


Figure 23: Tier1 - Processes flow

6.2.1 T1 - Scenario A: Publish a post (article)

The scenario assumes that the WPL, CSL wants to publish an article related to ITS / C-ITS. The author categorises the article on predefined categories and NNP pushes the new article to all members of the Col. The list of categories should be non-exhaustive and WPL, CSL will be able to add /modify new categories if required. The initial categories will be selected considering WP2 and WP3 deliverables.

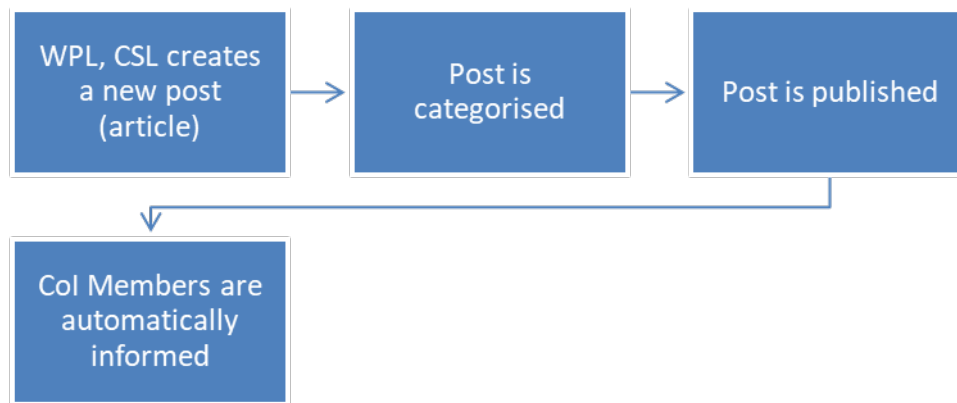


Figure 24: T1 - Scenario A: Publish a post (article)

6.2.2 T1 - Scenario B: Discussions / Forum

NNP is proposed to accommodate private discussion forums as well. In the private discussion forums Col members can initiate discussions and invite specific members to participate only.

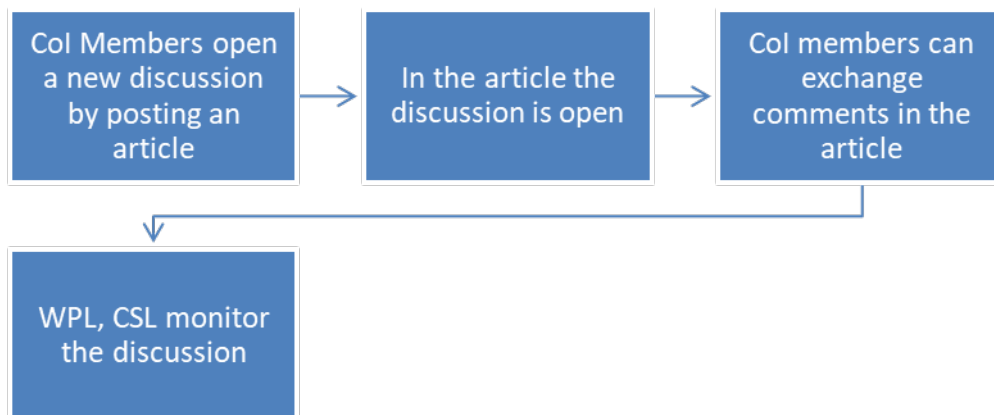


Figure 25: T1 - Scenario B: Discussions / Forum

6.2.3 T1 - Scenario C: Wiki Creation

A wiki is a website on which users collaboratively modify content and structure directly from the web browser. In a typical wiki, text is written using a simplified markup language and often edited with the help of a rich-text editor.¹⁶

A wiki is run using wiki software, otherwise known as a wiki engine. A wiki engine is a type of content management system, but it differs from most other such systems, including blog software, in that the content is created without any defined owner or leader, and wikis have little implicit structure, allowing structure to emerge according to the needs of the users.¹⁷

¹⁶ "wiki", Encyclopædia Britannica, 1, London: Encyclopædia Britannica, Inc., 2007, archived from the original on April 24, 2008, retrieved April 10, 2008

¹⁷ Mitchell, Scott (July 2008), Easy Wiki Hosting, Scott Hanselman's blog, and Snagging Screens, MSDN Magazine, archived from the original on March 16, 2010, retrieved March 9, 2010

There are different wiki engines in use, both standalone and part of other software, such as bug tracking systems. Some permit control over different functions (levels of access); for example, editing rights may permit changing, adding or removing material. Others may permit access without enforcing access control. Other rules may be imposed to organize content.

The wiki engine that will be selected should be able to work with the user management system of the NNP.

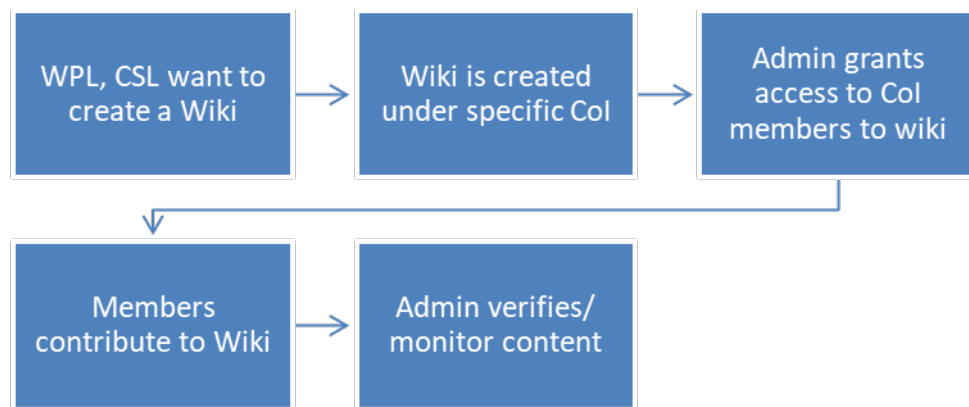


Figure 26: T1 - Scenario C: Wiki Creation

6.2.4 T1 - Scenario D: WPL, CSL wants to perform an online survey

This scenario outlines the steps for the case in which a WPL or CSL wants to perform an online survey. The survey is created under a specific Col, the Col members are notified, they answer the survey, the WPL/CSL monitors the answers, and can create charts and share them with the Col members after collecting the answers.

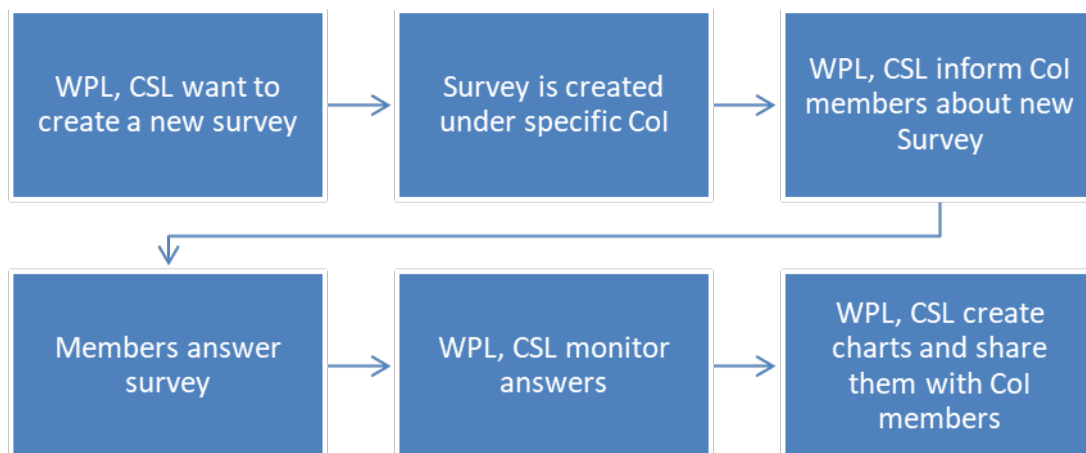


Figure 27: T1 - Scenario D: WPL, CSL wants to perform an online survey

6.2.5 T1 – Scenario E: ownCloud integration

This scenario describes the steps of integration into ownCloud, as a WPL or CSL uploads a document on NNP, which is afterwards uploaded on ownCloud, with specific restrictions set by the uploader on who can access it.

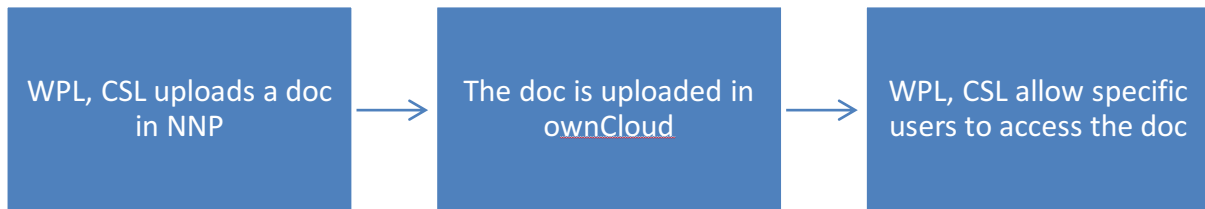


Figure 28: T1 - Scenario E: ownCloud integration

6.3 Tier 2: As an advanced group of C-ITS experts

The following Figure 29 presents the initial proposed processes that will be undertaken in **Tier 2** of each of the proposed Cols. NNP will incorporate modules / tools to support the implementation of the following processes.

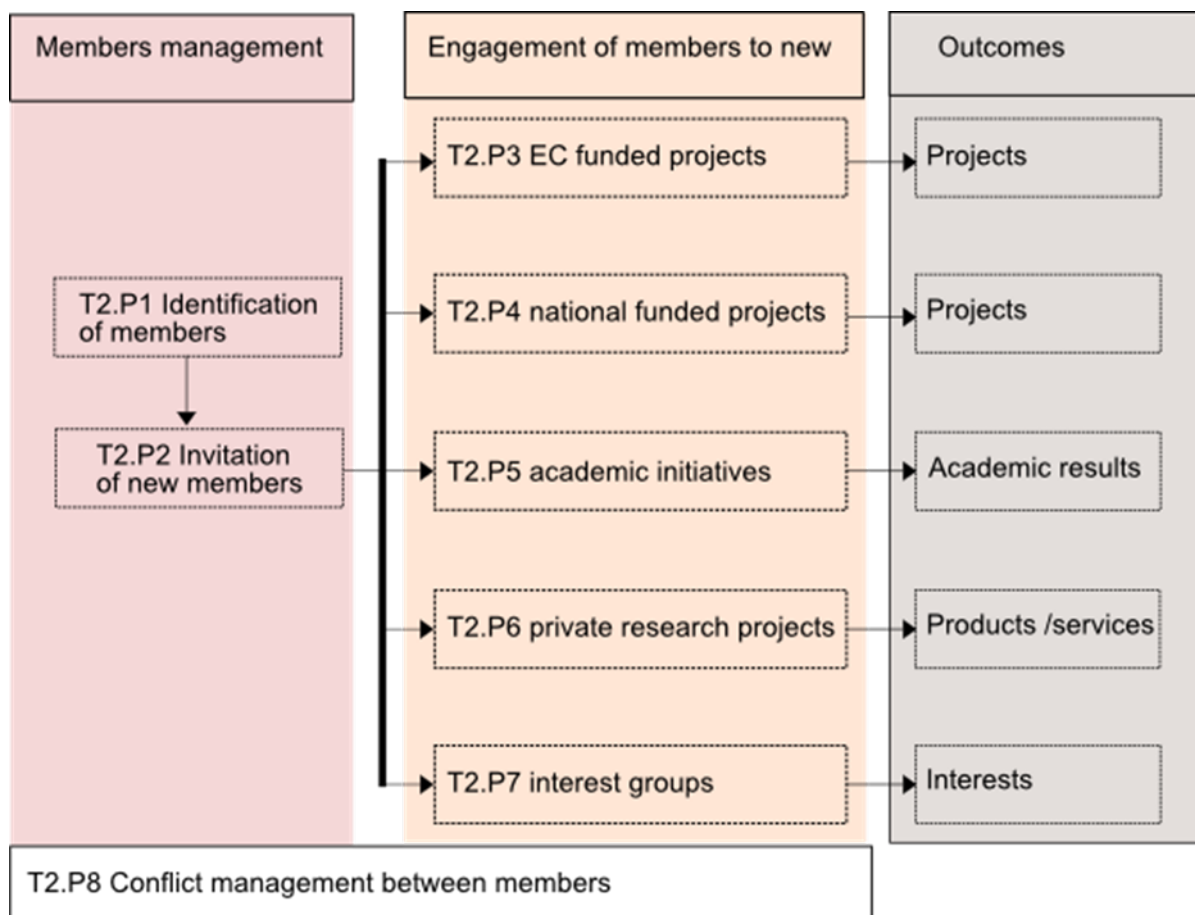


Figure 29: T2 - Processes flow

6.3.1 T2 – Scenario A: Posting of new collaboration opportunities to members

The following Tier 2 - Scenario A is also applied in the following cases to engage members to new: EC funded projects; national funded projects; academic initiatives and private research projects.

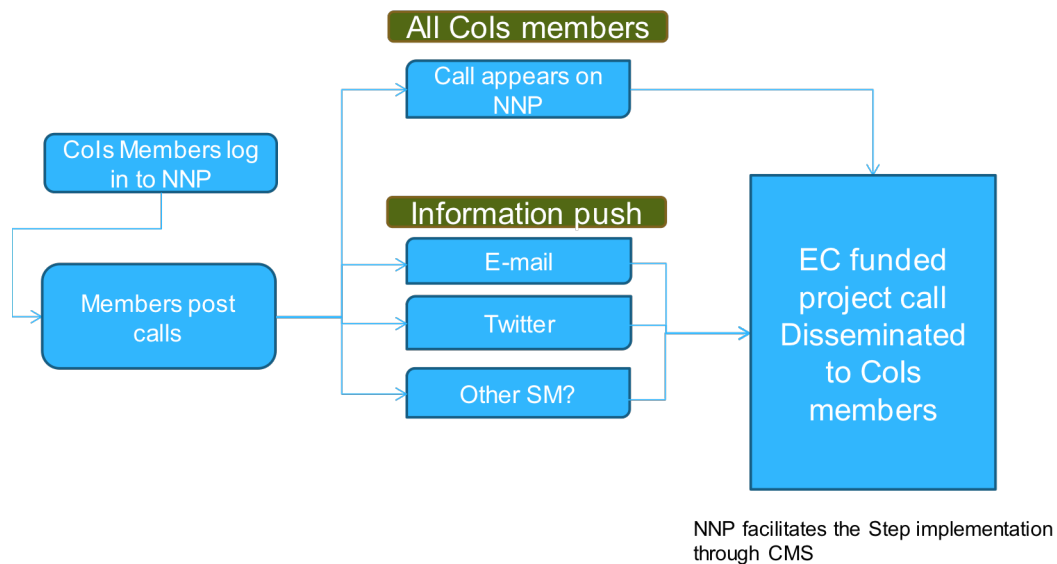


Figure 30: T2 - Scenario A: Posting of new collaboration opportunities to members

6.3.2 T2 - Scenario B: Expression of interest to participate in a published initiative

The following scenario is applied after Scenario A. NNP facilitates the Step implementation though holds only the transactions not the content.

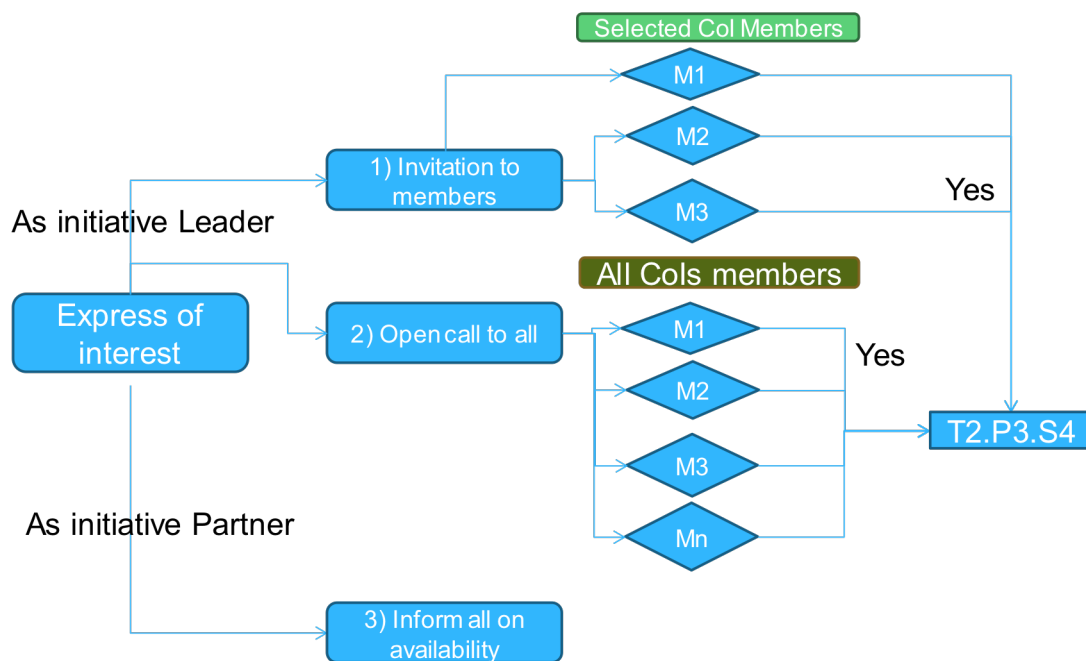


Figure 31: T2 - Scenario B: Express of interest to participate in a published initiative

6.3.3 T2 - Scenario C: Mapping expertise requests

Project / Initiative leaders define the expertise fields that they consider required for the implementation of the project / initiative. Members of the Cols map their expertise with the requested and the availability of members. The outcome of the scenario is that the project / Initiative leaders have a group of partners to continue towards the implementation of the project / initiative.

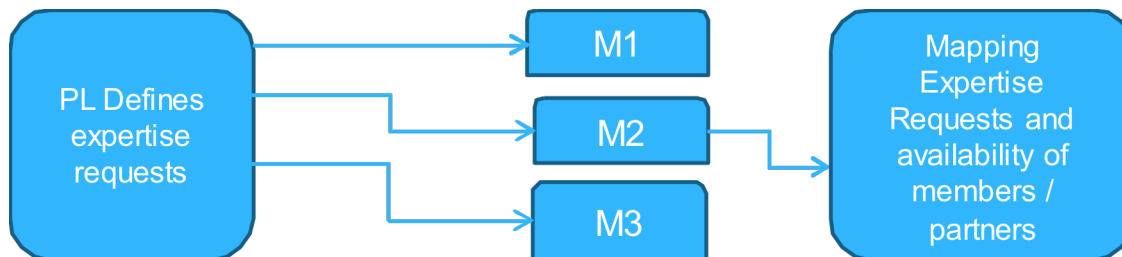


Figure 32: T2 - Scenario C: Mapping expertise requests

6.3.4 T2 - Scenario D: Crowd sourcing support to new ITS / C-ITS projects/ ideas / products/ services

The following scenario applies to Tier 3 as well.

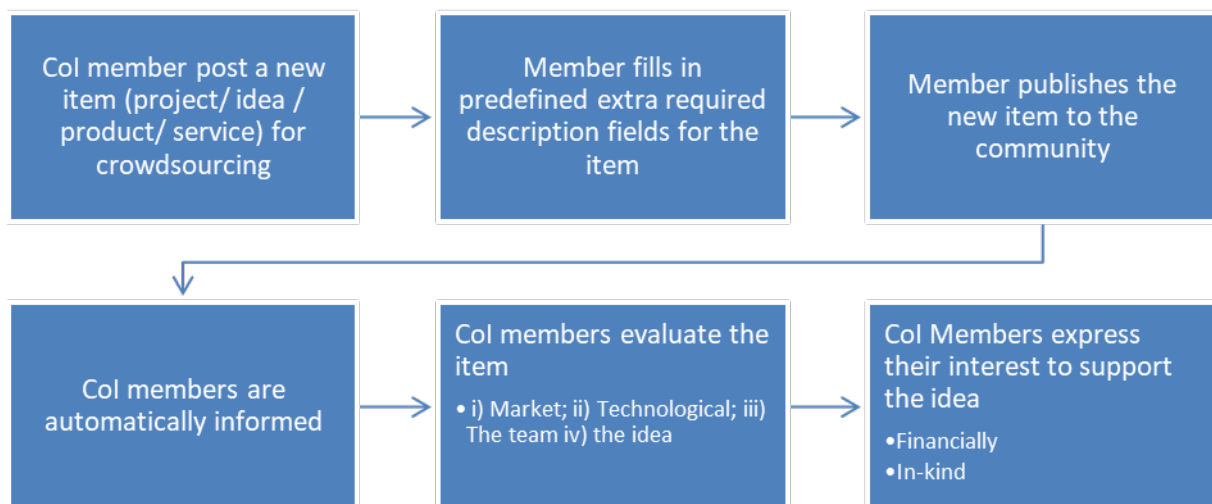


Figure 33: T2 - Scenario D: Crowd sourcing support to new ITS / C-ITS projects/ ideas / products/ services

6.3.5 T2 - Scenario E: Members interact with the training material on the new business models for C-ITS

Task 5.2 is dedicated to the dissemination of the new business models for C-ITS developed by the project, as well as the barriers and drivers to their implementation. WP5 Leader (CUE) will upload the developed set of training materials as a virtual training concept to NNP. The technology-based knowledge repository of the NNP allows for the new ideas to be introduced to the members of Cols in an effective manner, encouraging self-reflection and facilitating positive action in their individual environments.

Based on the nature of the training materials as well as the limited availability of participants and the diversity of their roles within the different C-ITS Cols, an optimal training delivery method will be one supported by a web-based platform such as a course management system. This will enable not only stakeholder's self-study, but also instructors from selected project partner institutions to continuously post learning resources and set up and facilitate knowledge exchange sessions between participants through discussion boards. An additional benefit of this approach is determined by the possibility to share the lessons learned by the project with an unlimited number of potential stakeholders, by identifying and providing them with access to the web based training platform. This channel is proposed to be incorporated in the NNP.

Thus, participants would experience an active learning process based on access to both a structured C-ITS knowledge base in the form of a categorised set of training materials, and a facilitated, asynchronous mechanism for effective sharing of their expertise. Furthermore, the combination of both learning techniques will result in a valuable, growing source of practitioners' knowledge. The consistency of the training materials, stored in a common knowledge base means that a face-to-face training can be delivered with similar levels of effectiveness by both partners.

The following scenario might be applied to Tier 3 as well, after the agreement of consortium partners.

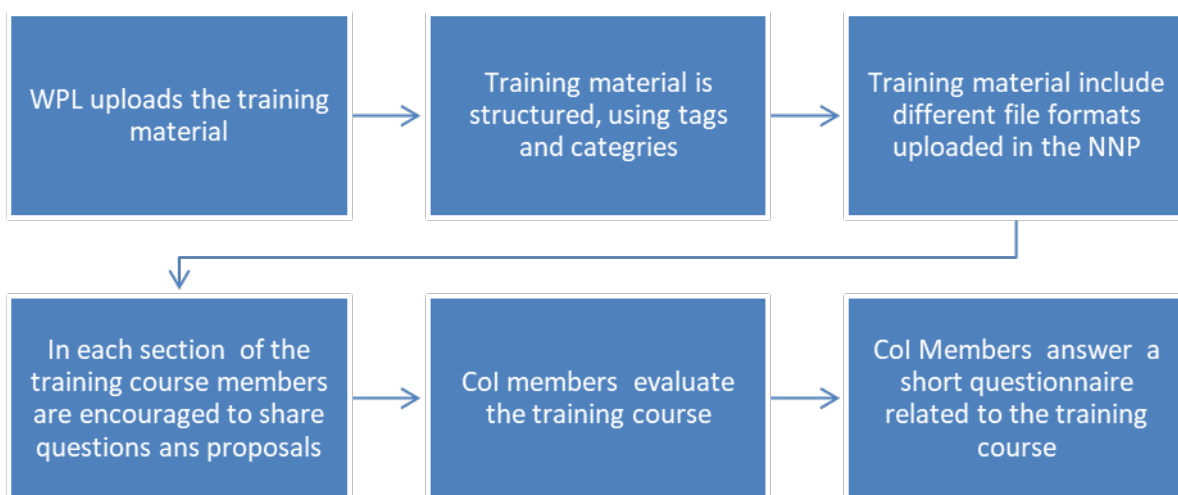


Figure 34: T2 - Scenario E: Members interact with the training material on the new business models for C-ITS

6.4 Tier 3: Open to all to promote C-ITS

The following Figure 35 presents the initial proposed processes that will be undertaken in **Tier 3** of each of the proposed Col. NNP will incorporate modules / tools to support the implementation of the following processes.

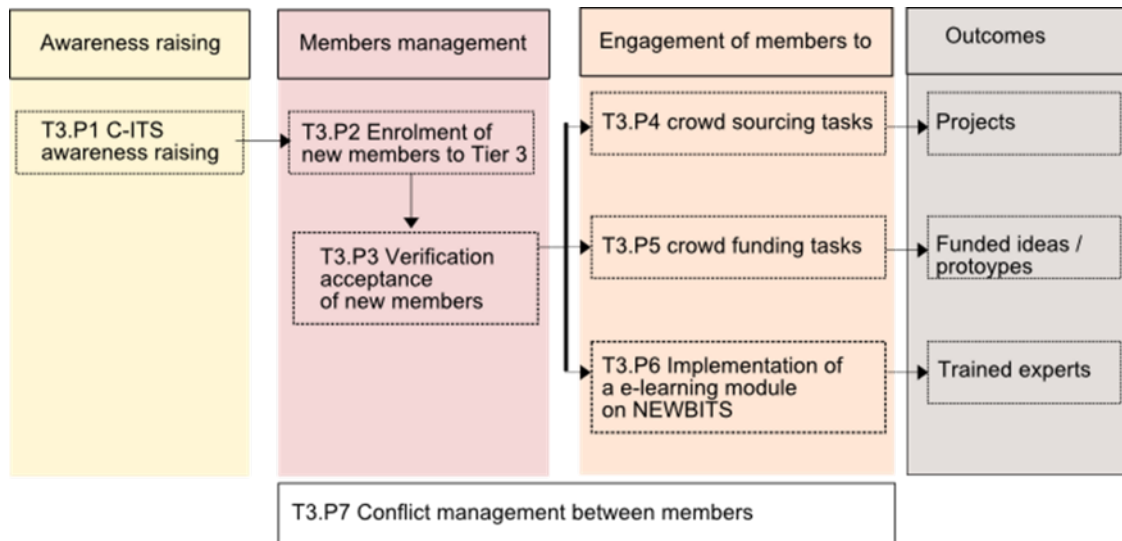


Figure 35: T3 - Processes flow

6.4.1 T3 - Scenario A: Publish a post (article)

The scenario assumes that a member of the Col (author) wants to publish an article related to ITS / C-ITS. The author categorises the article on predefined categories and NNP pushes the new article to all members of the Col. The list of categories should be non-exhaustive, and authors will be able to add /modify new categories if required. The initial categories will be selected considering WP2 and WP3 deliverables.

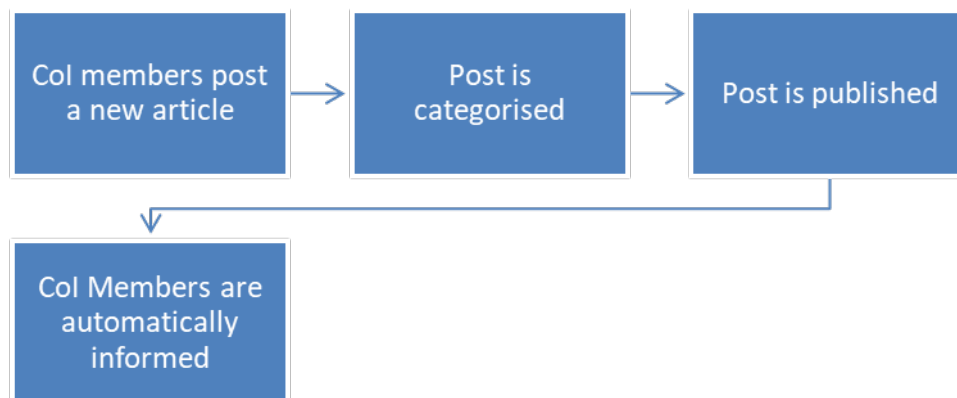


Figure 36: T3 - Scenario A: Publish a post (article)

6.4.2 T3 - Scenario B: Discussions / Forum

Differently from the similar scenario on Tier 1 NNP is proposed not to accommodate private discussion forums. All discussions in Tier 3 are proposed to be open and all members are able to pose answers and questions.

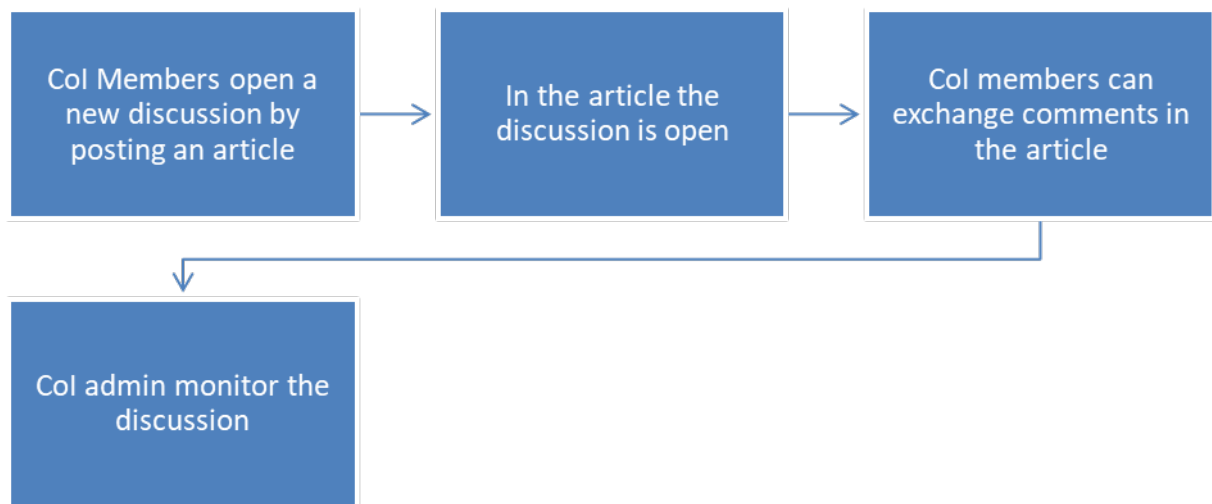


Figure 37: T3 - Scenario B: Discussions / Forum

6.4.3 T3 - Scenario C: Crowd sourcing support to new ITS / C-ITS projects/ ideas / products/ services

In this scenario, a Col member presents a new item (project/ idea / product/ service) for crowdsourcing. The member fills in a presentation template of the item and publishes the new item to the community. Other Col members are automatically informed, and they can express their interest in supporting financially the project / proposal or in in-kind contribution (allocation of time, expertise, know-how etc.). Members are able to rate in a user-friendly way the published idea.

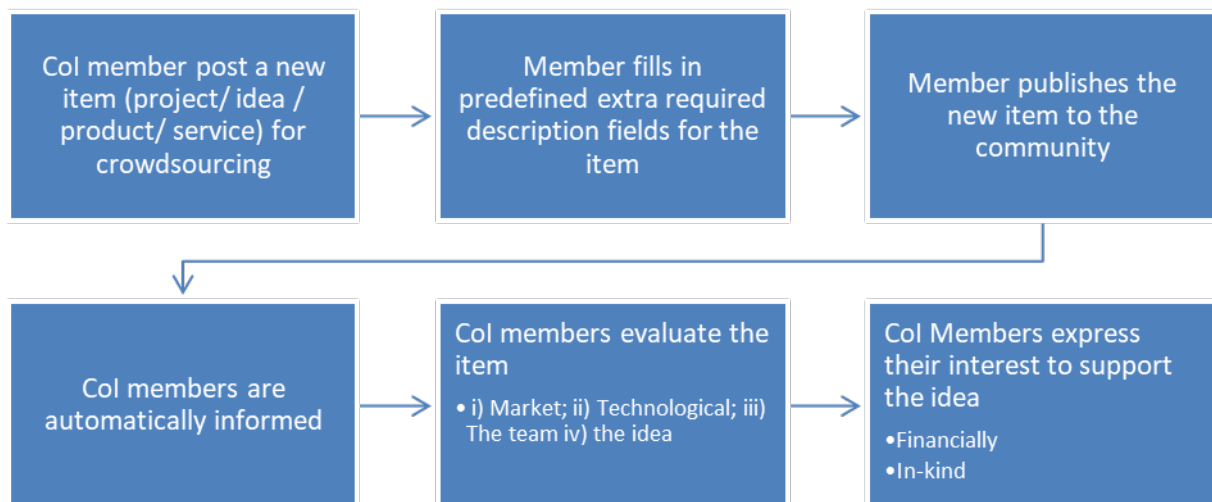


Figure 38: T3 - Scenario C: Crowd sourcing support to new ITS / C-ITS projects/ ideas / products/ services

6.4.4 T3 - Scenario D: Non-registered user visits NNP

In this scenario, a non-registered user (visitor) enters NNP. This user can navigate the platform with limitations to simply seeing published posts, open discussions, and seeing and participating in the crowdsourcing of published ITS / C-ITS projects or ideas.

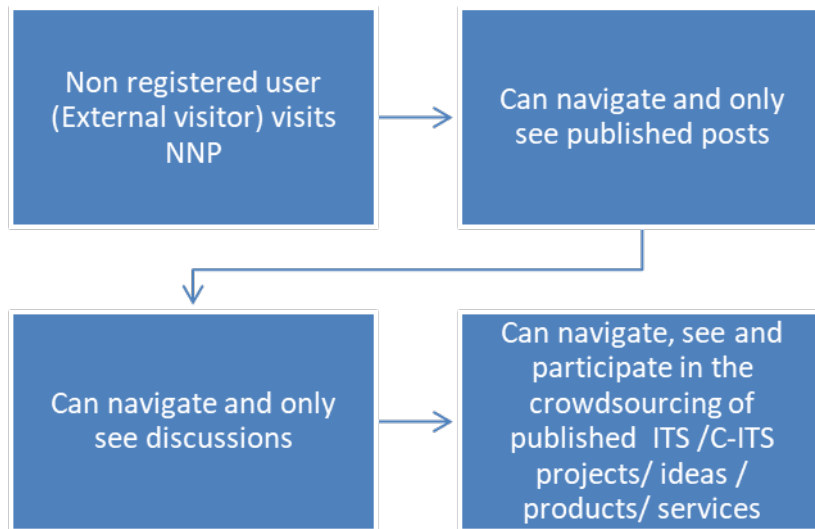


Figure 39: Non-registered user (External visitor) visits NNP

7. NNP Mockups

In this section, we present preliminary mockup screens of the NEWBITS network platform based on the requirements set in the previous sections.

7.1 Home page

The home page of the NNP (Figure 40) displays information about the four Cols. Users can login and click on a Col to view more information based on their access level (tier 1, tier 2, tier 3). Non-registered users can register by clicking on the register button. All users can view all the latest articles (from all Cols), the discussions in the public forum, the wiki and the calendar of events by selecting the appropriate link from the top menu.

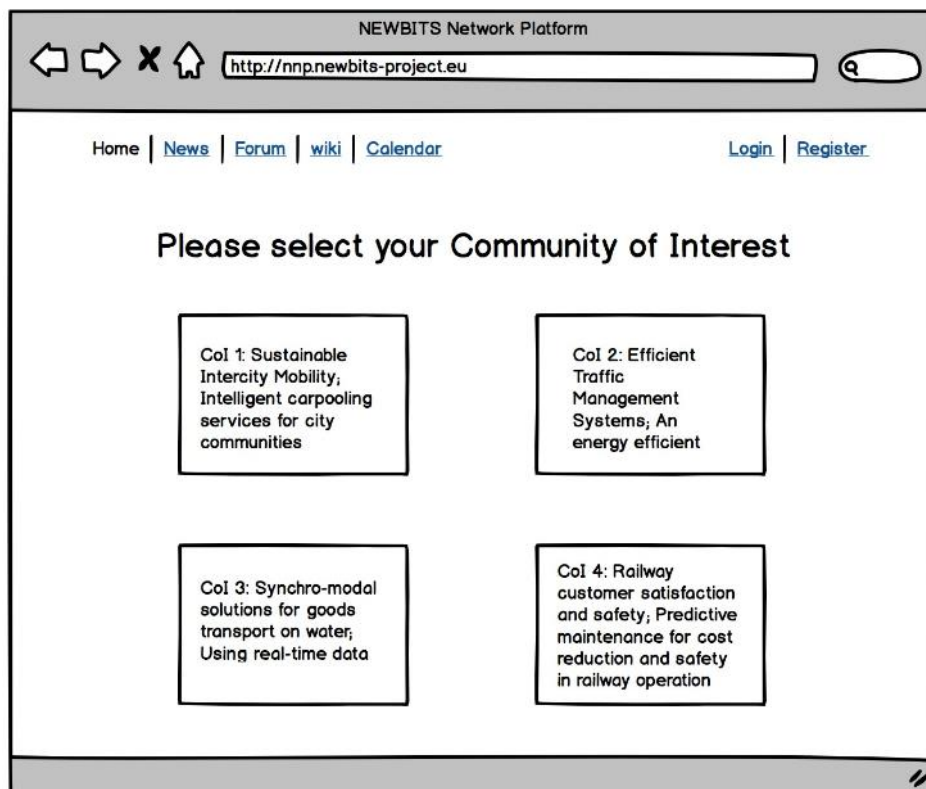


Figure 40: NNP home page

7.2 Tier 1: Internal NEWBITS area

In Tier 1, NEWBITS partners have the following options (Figure 41):

- Publish a new article under a specific Col,
- Initiate a discussion in the NEWBITS forum under a specific Col,
- Add, edit the wiki page of the NNP,
- Create and manage a survey,
- Browse the internal NEWBITS file repository (owncloud server).

Automatic notifications will be sent to members of Cols (based on their requirements) when something is happening (new article, new post in Forum, new wiki page, new survey etc.).

NEWBITS partners (that belong to Tier 1) can also have access to Tier 2 functionalities (ITS members area) that are described in Section 7.3.

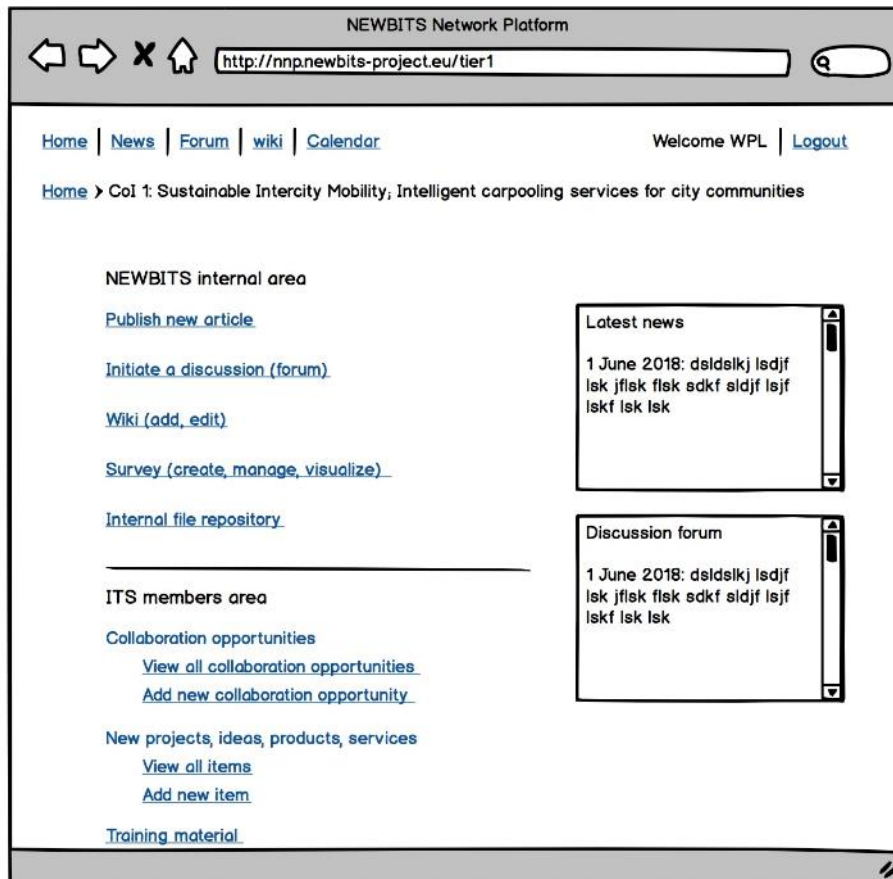


Figure 41: NNP tier 1, NEWBITS consortium

7.3 Tier 2: ITS experts

ITS experts that belong to Tier 2 can have the following options (Figure 42):

- View all the existing collaboration opportunities (they can browse the collaboration opportunities and select a collaboration opportunity of their interest / Figure 43),
- Add a new collaboration opportunity based on an existing template (Figure 44),
- View all existing projects, ideas, products, services (they can browse all the existing products, ideas, projects, services and select an item of their interest – they can then express their interest and can also rate the item / **crowdsourcing features**) (Figure 45),
- Add a new project, idea, product or service based on an existing template and ask for financial or in-kind support (Figure 46).
- View training material provided by the NEWBITS consortium.

Notifications will be sent to all members of the Col based on their selected preferences.

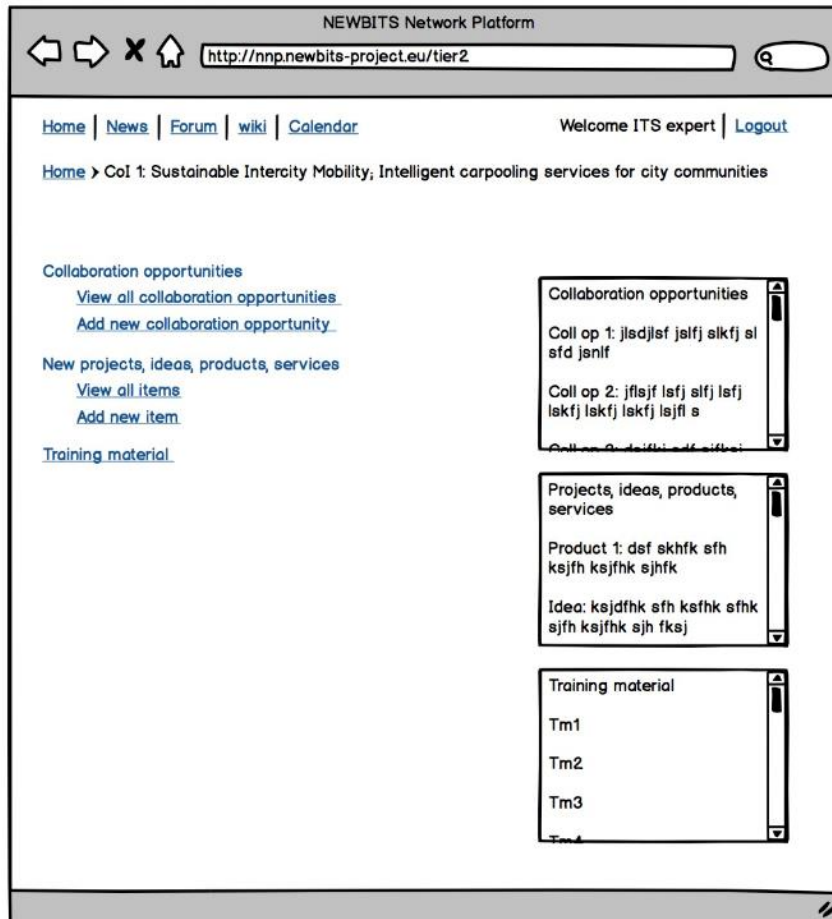


Figure 42: NNP Tier 2, ITS experts

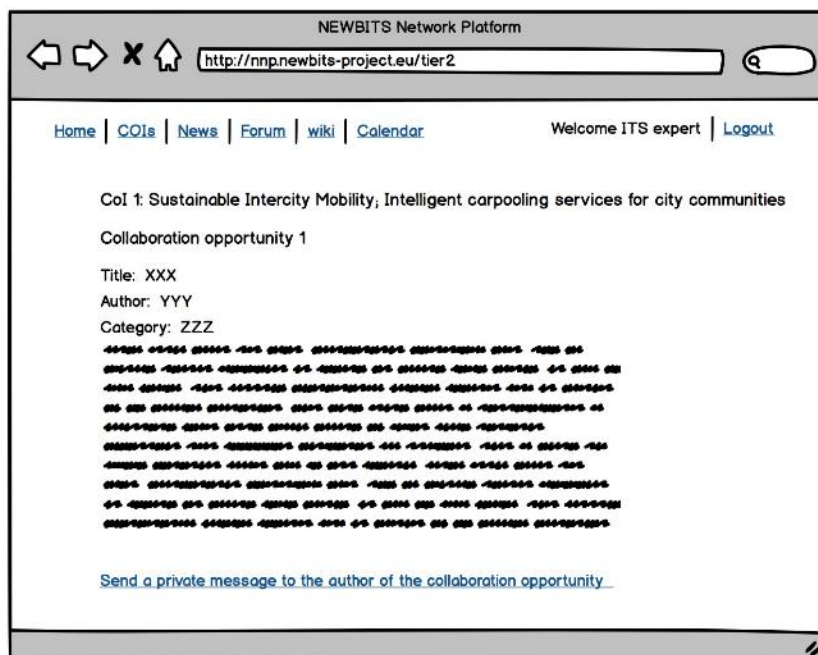


Figure 43: View collaboration opportunity

The screenshot shows the NEWBITS Network Platform interface. At the top, there is a navigation bar with links: Home, COIs, News, Forum, wiki, and Calendar. To the right, it says "Welcome ITS expert" and "Logout". The main content area has a heading "CoI 1: Sustainable Inter-city Mobility; Intelligent carpooling services for city communities" and a sub-heading "Add new collaboration opportunity". Below this, there is a "Title:" label and a text input field. The input field has a dropdown menu for "Select category" and a rich text editor toolbar with options for Bold (B), Italic (I), Underline (U), Strikethrough (ABC), Text color (style), Bulleted list, Numbered list, Indent, Outdent, Undo, Redo, Link, and Image. The text area below the toolbar contains placeholder text in a non-Latin script.

Figure 44: Add new collaboration opportunity

[Home](#) | [COIs](#) | [News](#) | [Forum](#) | [wiki](#) | [Calendar](#)

Welcome ITS expert | [Logout](#)

CoI 1: Sustainable Intercity Mobility; Intelligent carpooling services for city communities

Project idea 1	Rate	
Title: this is the title of the idea	Market	★ ★ ★ ★ ★
Category: this is the category of the idea	Technology	★ ★ ★ ★ ★
	Team	★ ★ ★ ★ ★
	Idea	★ ★ ★ ★ ★

[Express your interest on the idea.](#)

Figure 45: View project, idea, product, service

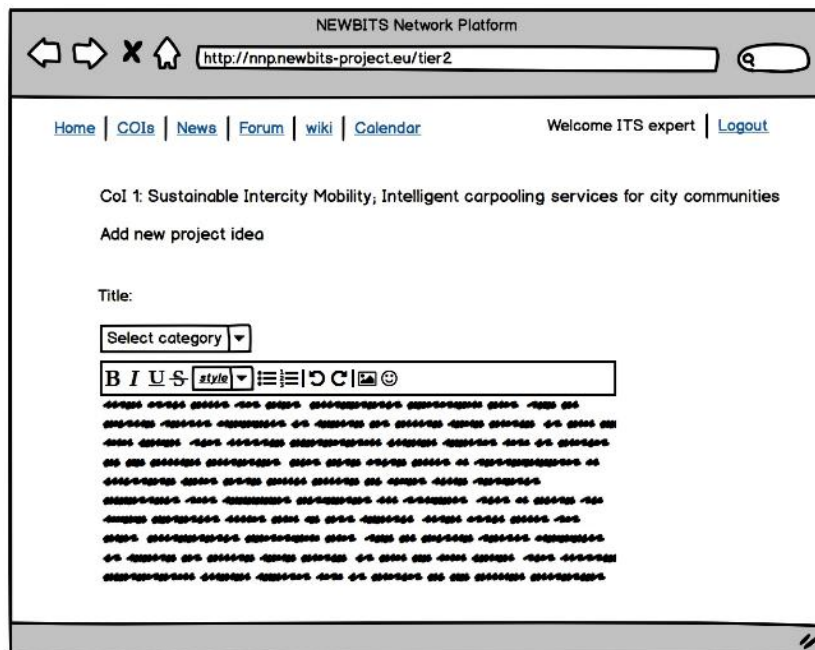


Figure 46: Add new project, idea, product, service

7.4 Tier 3: All users

In Tier 3, all users can publish new articles, can initiate discussions in the Forum and can add or view/rate existing projects, ideas, products or services (Figure 47).

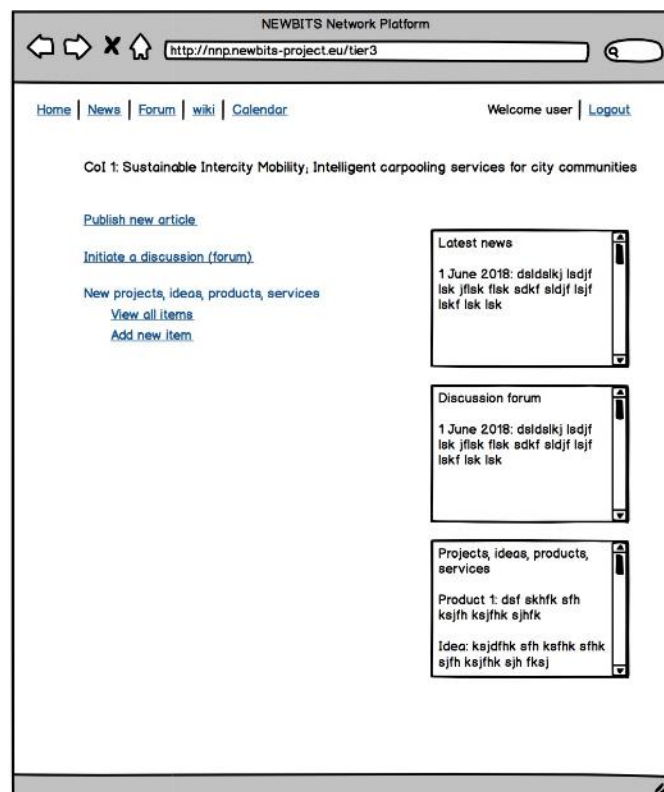


Figure 47: NNP Tier 3, all users

References

- [1] Kickstarter.com: [Online] <https://www.kickstarter.com>, 10/11/2017
- [2] The Kickstarter story [Online] <http://cargocollective.com/workisplayislife/The-Kickstarter-Story>
- [3] indiegogo.com [Online] <https://www.indiegogo.com/en> ,10/11/2017
- [4] Kickstarter.com Charter [Online] https://www.kickstarter.com/charter?ref=about_subnav, 12/02/2018
- [5] Kickstarter vs Indiegogo [Online] <https://thecrowdfundingformula.com/2015/11/13/kickstarter-vs-indiegogo-2/> , Accessed 12/02/2018
- [6] CIPTEC Platform: [Online] <http://crowdsourcing.ciptec.eu/> 10/11/2017
- [7] ICOS: [Online] <http://icos.urenio.org/> 10/11/2017
- [8] CloudFunding: [Online] <http://www.storm-clouds.eu/services/service/cloudfunding/> , 10/11/2017
- [9] Stackoverflow.com: [Online] <http://www.stackoverflow.com> 10/11/2017
- [10] NEWBITS project (2017), Deliver 3.1 Market Research Analysis, NEWBITS project
- [11] Wordpress: [Online] <http://wordpress.org>, 10/11/2017
- [12] BuddyPress: [Online] <http://BuddyPress.org>, 10/11/2017
- [13] EU Personal data protection: [Online] http://ec.europa.eu/justice/data-protection/index_en.htm, 10/11/2017
- [14] wiki", Encyclopaedia Britannica, 1, London: Encyclopaedia Britannica, Inc., 2007, archived from the original on April 24, 2008, retrieved April 10, 2008
- [15] S., Brown, (2010) Likert Scale Examples for Surveys, ANR Program Evaluation Iowa State University Extension
<https://www.extension.iastate.edu/Documents/ANR/LikertScaleExamplesforSurveys.pdf>
- [16] Mitchell, Scott (July 2008), Easy Wiki Hosting, Scott Hanselman's blog, and Snagging Screens, MSDN Magazine, archived from the original on March 16, 2010, retrieved March 9, 2010