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Grid of analysis supporting the participative design methodology

Brigitte Denis, Fabienne Pironet, Bernadette Charlier, Amaury Daele, Martin Erpicum, Liliane Esnault, France Henri, Nikos Karacapilidis, Manfred Künzel, Lysanne Lessard, et al.

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PALETTE

Pedagogically sustained Adaptive LEarning Through the exploitation of Tacit and Explicit
knowledge

Integrated Project

Technology-enhanced learning

D.PAR.01 – Grid of Analysis Supporting the Participative Design Methodology

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Deliverable manager

- Fabienne, Pironet, ULG

List of Contributors

- Bernadette, Charlier, UNIFR
- Amaury, Daele, UNIFR
- Brigitte, Denis, ULG
- Martin, Erpicum, ULG
- Liliane, Esnault, AESCRA-EM Lyon
- France, Henri, TELUQ
- Nikos, Karacapilidis, CTI
- Manfred, Künzel, UNIFR
- Lysanne, Lessard, TELUQ
- Robert, Peeters, ULG
- Fabienne, Pironet, ULG
- Étienne, Vandeput, ULG
- Nathalie, Van de Wiele, ePrep
- Romain, Zeiliger, GATE-CNRS

List of Evaluators

- Bernadette, Charlier, UNIFR
- Nikos, Karacapilidis, CTI

Summary

This deliverable presents the participatory design methodology of the PALETTE project and some first results of the implementation of this process. Some principles of the Actor Network Theory and of the Agile Methodology are embedded in the different stages of this methodology whose twelve stages (described in details in the last section) will be the basis of the participative development of services and scenarios of use. The first two stages of the process, establishing the collaboration with the CoPs and modelling their activities, have been implemented. Concrete results are available, i.e. procedures implemented to enrol the partners, methodological tools to gather and analyse the data from the CoPs. Some information has been communicated to partners of WPs 2, 3, 4 and 5 that needed it to progress in the development of their work. This process is not ended; it is iterative and will be refined all along the project.

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1. Introduction

A project like PALETTE is complex and involves many partners having different background and expertise, as well as interests in the development and use of diverse IT-supported services. The involvement of technological and pedagogical partners and multiple Communities of Practice (CoPs) in this project should be thoroughly exploited in order to guarantee the fact that the different services proposed in the project will be useful and usable. We have to manage a very important challenge with many issues: development of appropriate and interoperable services and tools contributing to the evolution of CoPs life. Towards this aim, we have to be aware of different possible difficulties and regularly evaluate and adapt our design process. That is why PALETTE recommends here an approach based on participatory design (PD).

This approach arises from the evolution of different methodologies related to software applications development and specifications of their scenarios of use. The traditional software design is based on a long process requiring the definition and the validation of different phases, step by step: needs analysis, design, prototyping, experimentation (field testing), revisions, implementation and maintenance. During the last decade, the focus has been put on the implication of final users at different phases of the process in order to better adapt the tools to their needs and contexts. It was an important step to a methodology based on participation. Now, the process becomes more flexible and more agile (Highsmith, 2004; Gasson, 2006). It is based on short steps including a maximum effort of the concerned actors, and not only human actors, but also other factors considered as acting in the process (e.g. the tool itself). This participative design process is iterative and aims at developing and adapting relevant useful tools and scenarios of uses linked to them.

The theoretical framework of the participatory design methodology, mainly based on some concepts derived from the Actors Network Theory (Mc Bride; Monteiro, 2000) and the Agile Methodology (Cooney and al., 2000; Gasson, 2006), is described in section 2 of this deliverable. Some theoretical principles are illustrated and discussed in section 3 within the context of the work done during the first six months of the PALETTE project. This section shows how we implemented this process through different participative activities, the tools we built and/or used to carry out this methodology and the results of some tasks and activities already dealt with till now. It also considers facilitating factors and removing obstacles, as well as lessons learned from the first actions carried out.

The work described in this deliverable mainly aims at providing information to support the work of the other WPs, especially the WP2 (information services), WP3 (Knowledge Management services), WP4 (mediation services) and WP5 (implementation of PALETTE services and scenarios), to adapt their services to the different kinds of CoPs' needs in order to guide and enhance the development of their respective tools. That is why the communication process and the involvement of the concerned actors were so important in our approach.

At this phase of the project, the first bases of the establishment of the participatory design methodology are defined (cf. Task 1 of the Description of Work - DoW). In the next phase of the project, we will focus on the implementation of this methodology through the following tasks: the design of services and customisable scenarios (developing pedagogically consistent scenarios, which will take place through a close collaboration with target actors) and the validation of the use of services of the project in diverse learning contexts. These tasks will

lead to the identification of other types of participative activities that will illustrate and better shape our participative design methodology.

The last section of the deliverable proposes an overview of the different steps to be operationalised to carry on the implementation of the participatory design process. At the moment, we do not explicitly propose “a (complete) grid of analysis supporting the participative design methodology” (see DoW, p. 64), but a report framework and different steps related to the elaboration of our participatory design methodology. The method elaborated in this document will be enriched and enhanced through its implementation and its evaluation. These processes should in the future result to the foreseen “grid” containing some guidelines-steps-recommendations for people involved in the same kind of projects. Nevertheless, even if the process is still ongoing, we conclude by providing some recommendations and perspectives for future work in the context of PALETTE as well as in the context of similar projects.

2. Participatory Design and Actor Network Theory

2.1 Introduction

We argue that the participatory design approach - that is inherent in the PALETTE proposal – may be considered as a process of **negotiation of usefulness** to be achieved through reconciling the contrasting perspectives of various stakeholders, and that this is what we can expect from a methodology based on Actor-Network Theory (ANT)¹.

Designing a “useful” - and not only “usable” - information system may be acknowledged as the implicit goal of R&D projects such as PALETTE. Usefulness is necessary if we want the CoPs to actively collaborate to the project. However, there are different interpretations of the usefulness of technology: “While traditional design methodologies attempt to establish the usefulness of a technology at design time”, as stated by Abreu de Paula, “perception of usefulness is not statically embedded in its design, but is dynamically and constantly created and shaped by different social groups. In this respect, one important goal is to attempt to reconcile these often contrasting perspectives” (Abreu de Paula, 2004).

In this view, the system (i.e. services and the associated tools) to be implemented in the PALETTE project is a socio-technical system that involves a socio-technical process of negotiation which remains open-ended. This is why the project life cycle defined in the PALETTE proposal focuses on an **iterative development process**.

Participatory Design approach fosters participation to the design process of all the concerned stakeholders: the users and the designers come first, but other influential actors need often to be considered independently like the organizations to which users and designers belong. While Participatory Design does not explicitly address the social construction of usefulness, it may be considered as framing the social interactions that eventually lead to a recognised useful system. The main difficulty of Participatory Design remains the organization and management of an efficient participation – i.e. a participation that can truly influence the design process. The key idea behind Participatory Design is that each actor is an expert of her domain and that her expertise should influence the design process. However, actors are heterogeneous in respect to their disciplines, preoccupations and interests: they do not speak the same language. For them to interact necessitates that they construct together a “common ground”. This is achieved through “**participative activities**”: in other terms, participation is not simply reached when people meet each other: it has to be embodied in specific activities. We claim that participative activities mediate participation. Examples of such activities include brainstorming meetings, prototype demonstration, scenario performing, role playing, and design games. Undertaking a needs analysis may be considered as a participative activity as long as it is not destined to make an “inventory of the needs”. Participative activities are often hampered by suspicion and even conflict. Some of these activities may focus on creating “**boundary-objects**” (Bowker, 1999; Gasson, 2006), i.e. objects “to-think-with” that facilitate mutual understanding and trust among participants with various backgrounds. A

¹ ANT was formerly the acronym for Actor-Network Theory. It is now used as itself, and even one of its first creators, Bruno Latour, recognizes that it has become something different, and if it was created now, he would probably not have used the same words, specially the word ‘network’ that he feels confusing now (Latour, 1999). We will then use ANT as a name and not as an acronym.

mock-up, an intermediate version of the final product, or a use-scenario are classical boundary-objects. People use boundary-objects as a means of coordination and alignment – or simply as something they can talk about! This concept is closely related to what Wenger (1998) says about reification in CoPs: “reification ... refers to the process of giving form to our experience by producing objects ... In so doing, we create points of focus around which the **negotiation of meaning** becomes organized”. It is the role of WP1 methodological task to propose a methodology allowing for designing, organizing and managing those participative activities.

We would argue that ANT can provide a conceptual framework helping formulating and building a methodology that takes participation of heterogeneous actors into account. We will now briefly review ANT concepts and explain how they relate to Participatory Design management. We will then present a methodology that builds on ANT analytic description of PALETTE actor-networks to propose a bootstrapping of the Participatory Design management process. Finally, we will propose a first round of participation management and a first set of participative activities. Because some important interactions that will affect the design process already took place between the PALETTE actors (through the tasks called “CoPs’ observation”, “Inventory and categorization of the tools” and the activity called “Clarification of the notion of scenario”), we need to incorporate their results to reshape the participation management.

2.2 Project life-cycles

There are obviously strong links between the project life-cycle (structure and stages) and the Participatory Design methodology. However, while the scientific literature about project life-cycles is important, it seems that specific studies on the relations between Participatory Design and the type of project life-cycle are few. PALETTE has considered an iterative mainstream process for the whole project, taking consideration of the novelty of the approach and the multiple cultures of the partners.

In the same way, there is not systematic relationship between ANT and the type of project life-cycle that would be better suited. ANT has been successfully used in traditional V-shaped (or waterfall) life-cycle projects and some recent examples are linked with agile approaches (Cooney and al., 2000; Gasson, 2006).

Participatory Design projects are risky. Fostering collaboration between actors of diverse origins, cultures, with diverse objectives and diverse concerns may imply that the first stages of the project take more time and are more efforts consuming. It is thus important to consider this initial investment against what is finally gained at the end of the project: acceptance, usability, quality, etc. Depending on the type of life-cycle chosen for the project, the efficiency of Participatory Design does not show in the same way. This is why we think important to briefly review the recent evolutions in project life-cycles, and explain the choice of an agile-like spiral process for PALETTE.

The main reflection around project life-cycle was done within the area of Information Technology / Information Systems (IT/IS). Before that, or in others areas where the output of the project is clearly material (such as in construction projects, construction of a new car or a new plane or a new building), the way the project is organized is strongly dependant on the

output itself: when building a house, you cannot put the roof before the at least some walls; when building a car, traditionally the idea comes from the marketing department, then a study is made by the designing team, then the different elements are developed and finally integrated, the prototype is tested before the industrialization process can take place.

In IT/IS projects, and especially in the software development industry, the life-cycle is not clear at the beginning, notably due to the immateriality of the output. It is the huge contribution of Software Engineering (see for example Sommerville, 2006) to develop a complete methodology, based on a specific project life-cycle (the V-shaped or waterfall life-cycle). The important changes in software engineering during the past 30 years, along with the emergence of rapidly evolving technology and standards, required to deeply modify the project life cycle, introducing for example rapid development, prototyping, iterations-based methods and the spiral life-cycle. One of the currently most used methods is the agile methodology. The main steps of the project life-cycle evolutions are presented below as a reminder.

The traditional V-shape life-cycle

The traditional V-shape life-cycle (Fig. 2.1) ruled over IT systems development for years. It enabled quality (in the sense of without failure) system development by ensuring that each step was carefully executed before passing to the next one. It was especially successful when designing and implementing customized software engineering projects, which were mainly technology driven. It was thus a first attempt to embed the participation of the users in the project.

The main pitfall of the V-shape life-cycle is that users are not able to “see” what happens until the last stages of the integration process. This was not a so big problem with the ’80s technology, when user interfaces and friendliness where quite not an issue (alphanumerical single colour screens and TTY printers). But it becomes a real hindrance with the development of user-oriented PC supported users’ interfaces and semi-packaged software.

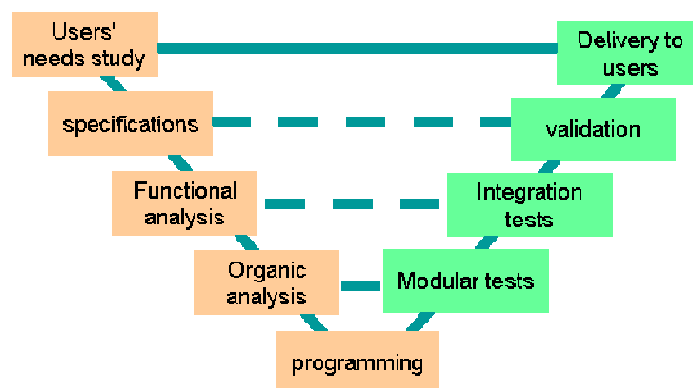


Fig. 2.1 – V-shape IT project life-cycle (classical representation)

The RAD- life cycle: prototyping and iterating

RAD (Rapid Application Development) methods (in a broad sense) enable to quickly develop large “semi-customized” software applications. The prototyping step allows testing the main

software features (especially user's interface) and helps users validating the principle orientations and choices. The final system is developed using industrialized development principles. The RAD method is based upon a quick reconciliation of users and developers interests and stakes through a first prototype which validates some choices and some feasibility decisions. The prototype is then enriched and improved until one version is agreed to be suitable and acceptable enough to be declared the final one.

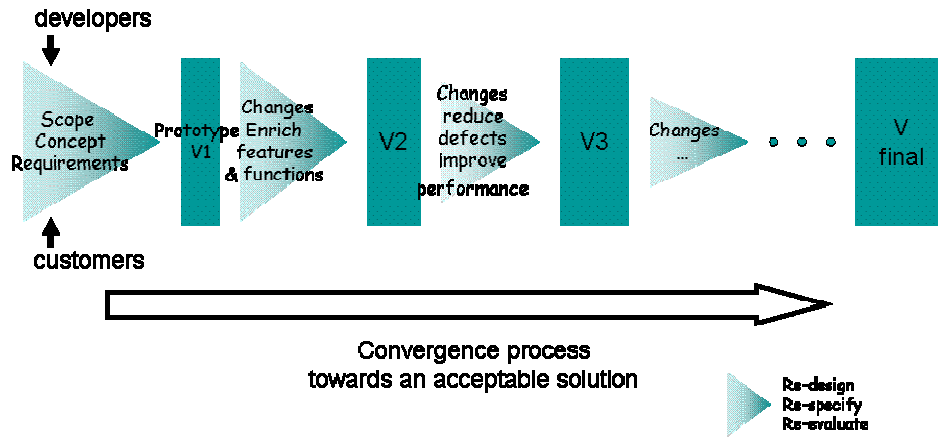


Fig. 2.2 – RAD life-cycle [after (Maner)]

The agile-spiralled life-cycle

With the development of new technology standards and development tools (object oriented programming, encapsulation, languages such as Java, XML, etc.), modern software are built of lots of “pieces”, more or less independent, linked together through standard interfaces and stuck into complex architectures (see, for example, Schwaber, 2004). They may be developed cooperatively by lots of teams working on their own and adding their own bricks to an always on-going construction (see <http://www.agilemanifesto.com>). The agile methodologies enable developing large contemporary systems by building parts step by step, even without knowing what the final system will exactly look like. The key requirements are things like permanent customer collaboration, stakeholder engagement, professional team developers, state-of-the-art architecture and components standards, as well as quick delivery of usable intermediate components (Highsmith, 2004).

This kind of development is especially suitable when dealing with incremental improvements of existing (or nearly existing) software tools, or customization of modular, flexible, complex sets of software according to users practical usage situations.

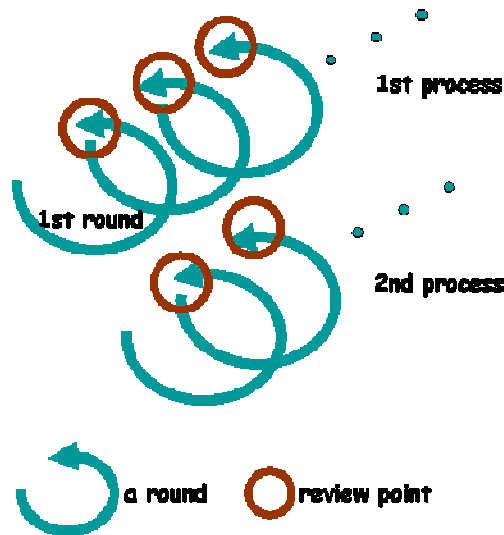


Fig. 2.3 – Agile-spiralled project life-cycle

Agile methodologies are characterized by short full cycles - development, validation, integration- what we called here rounds [called “sprints” in extreme programming (see <http://www.extremeprogramming.org/>)], to develop suitable “pieces”, using use-case situations. Each “round” is ended by a review point where the usability of what was developed can be tested. It enables both quick validation of the development processes and parallelization of streams of development. The final product is at the same time built from all the intermediary pieces and refined at each step. Also, it enables to take into account possible changes resulting from early testing of tools by CoPs’ members and thus to adjust more efficiently to their needs.

This spiral-like model seems especially suitable within the PALETTE project. In effect, in PALETTE, the software tools’ development concerns mainly incremental (though they sometimes might be fundamental ones) improvements of existing or nearly existing services, previously developed at least to some extent, according to state-of-the-art architecture and standards and according to use-cases coming from the CoPs’ observation.

2.3 Rationale for using ANT in a participatory design approach methodology

When compared with traditional system development management procedures that aim at “aligning” business strategies and system features, “ANT portrays an alignment that differs along crucial dimensions: it is **heterogeneous**, meaning that there is an open-ended array of “things” that need to be aligned including work-routines, incentive structures, system modules and organizational roles. It follows immediately that there can be no strict top-down control over such a collection of things” (Monteiro, 2000).

Heterogeneity is ANT main originality when considering actors: for ANT there are human actors and non-human as well. This makes sense when considering that – for ANT – an actor is characterized first hand by its capability, its **influence**. So it clearly acknowledges that a lot of “things” - not only humans - do have an influence (in fact the concept of heterogeneity in

ANT is more subtle; it encompasses the idea of *heterogenesis* of all elements of a network, meaning – in short – that actors and network are mutually constitutive and that actors are permanently redefined/re-constructed through a network genesis process. In the context of the PALETTE design process, for example, the influence of pre-existing tools may be acknowledged.

The ANT idea of “influence of heterogeneous actors” seems to supersede the Participatory Design concept of participation of users in providing an extension to other influential elements such as non-human actors: in other terms, the notion of participation is extended to take into account the participation/influence of artefacts and organizations. This is obviously an interesting feature when describing a socio-technical system.

In the PALETTE project, the concept of participation is central although it appears with various meanings. This requires a clarification. In CoPs, “participation refers to a process of taking part and also to the relations with others that reflect this process. It suggests both action and connection” (Wenger, 1998). Wenger says: “I will use the term *participation* to describe the social experience of living in the world in terms of membership in social communities and active involvement in social enterprises” (Wenger, 1998). Participatory design states that “People that use technology should actively *participate* in the design and development of the products and services they use” (Greenbaum, 2000). “Broadening participation” was the theme of the PDC’98 conference, with J. Lave as a keynote speaker on “Legitimate Peripheral participation” meaning that the Participatory Design conceptualization of participation is very close to the one pictured by Wenger for CoPs.

However, project teams are not CoPs; identity trajectories and learning effects are not central to participatory projects. Projects have a limited, pre-fixed duration and they aim at a “production activity” rather than at a “construction activity”. This links with the notion of influence (rather than participation) that is central to ANT²: non-human actors have an *influence* on the design process, but we cannot talk of their *participation* in the process because they do not develop “social relations” with the other actors. For what concerns human-actors in ANT, their influence is often referred as “interests”. Wenger description of CoPs does not use the term “interests” except when he explains the activity of brokering (Wenger, 1998): “the work of brokering (...) involves processes of translation, coordination, and alignment between perspectives”. Then Wenger refers to Latour when acknowledging that dealing with “conflicting interests” through the “translation of perspectives” is part of the work of “brokers” (brokers – in the context of Wenger’s book- are people that “transfer some element of one practice into another”).

To summarize, ANT concepts seem really appropriate for preparing management strategies in a Participatory Design context.

ANT descriptions are **network of actors**: “an actor-network consists of and links together technical and non-technical elements” (Monteiro, 2000). What that links actors together are their relations of influence. Actors and networks are mutually constitutive and thus should be

² It is precisely about how those materials (people, architecture, etc.) perform themselves to generate a series of effects (Law, 1992). In short, then, “the social” as actor-network is hybrid; it is a heterogeneity that consists of discursive, human, and material elements, which simultaneously coexist, and which cannot be separated from one another. And “society” is held together only through this heterogeneity (Latour, 1999).

co-constructed: a socio-technical situation can be described as an actor network given a particular purpose or perspective – in other terms, an element cannot be considered as an actor in itself but only as an “entity having an influence in relation with a certain perspective”. “Influential things” include both inhibitors and promoters (McBride).

ANT descriptions can be used to define management strategies that aim at “aligning the network” i.e. having all influences fit together. According to ANT, the alignment of the network is obtained through processes of “**translation**”: translation means both a move of some actor’s interests and a translation of those interests in order to align them with the interests of other actors. It is a process of negotiation. Alignment of a network starts with considering the interests of a particular actor – sometimes called the “focal actor”: in PALETTE the project team is a focal actor in the perspective of achieving the project goals. A translation process generates “ordering effects” that may not match the “top-down” order planned in a traditional project plan (Monteiro, 2000). An iterative design process is then mandatory.

According to Callon (1999), the translation process includes several steps, among which: **problematization, interestment and enrolment**. “During problematization, the [focal] actor tries to establish itself as an **obligatory passage point (OPP)** between the other actor and the network” (see also Tilson and Lyytinen, 2005). Then **interestment and enrolment focus on negotiating** acceptable roles for the human actors. We shall not forget that translation is a social process of negotiation, and that only human actors have the power of negotiating i.e. they negotiate on behalf of the non-human actors to which they attribute influences. This will help introduce the next ANT concept: **inscription**.

Inscriptions represent “aligned interests inscribed into durable material” (Law, 1992). A translation process supposes a medium or a material in which it is inscribed (boundary objects for example may support inscription). According to Akrich, “a large part of the work of innovators is that of inscribing their vision of the world in the technical content of a new object” (Akrich, 1992). What Akrich calls “the innovators’ vision of the world” seems to be “in line” with the definition given by Law: in a sense, a “vision” may be considered as resulting from “aligned interests”. On the contrary, Monteiro’s view that “the notion of inscription refers to the way technical artefacts embody patterns of use” (Monteiro, 2000) is confusing: as advocated by Rabardel (1995) or Vygotsky (1962) artefacts do incorporate patterns of use but ANT notion of inscription seems to be wider because it encompasses also “patterns of negotiation”.

Finally, ANT tackles the issues of granularity of the unit of analysis (micro-actors versus macro-actors) in making actor-networks scalable: this is the notion of “**black-boxing**”: an actor may be regarded as a network and vice-versa depending of the analysis needs. Black-boxes are “sealed actor-networks” (Stalder, 1997) whose alignment has been obtained, whose aligned interests have been inscribed in a stable association, and that is no longer questionable – except at a heavy cost. In this sense, a project plan is a black-box that has been sealed after a translation process has succeeded in aligning the interests of the project partners. The project implementation may be described as another actor-network – there are new actors that should be considered – and it still needs to be aligned!

To conclude this short presentation of ANT concepts in relation with a Participatory Design approach, we may parallel the importance of hybridisation in both frameworks: hybridisation of perspectives and actors in Participatory Design, hybridisation of micro and macro levels with socio and technical issues in ANT.

2.4 The design process in PALETTE: how to implement participation following ANT

ANT is basically a descriptive theory used to explain the links between society and technology: “it offers explanations of how technology becomes acceptable and is taken up by groups in society” (McBride). McBride suggests a 7 steps methodology (see Table 2.1) where ANT is used as an analytical tool “to identify actions which may speed the social embedding of the technology and the successful take-up of the system”.

- | |
|---|
| <ol style="list-style-type: none"> 1 - Identify stakeholders 2 - Investigate stakeholders 3 - Identify stakeholders' interactions 4 - Build actor-network models 5 - Identify irreversibility (provisional stabilities) 6 - Identify inhibitors and promoters 7 - Identify actions for aligning the network (participative activities) |
|---|

Table 2.1- Example of implementation of ANT in a project: McBride's 7 steps

We propose to apply an analogous methodology to the Participatory Design process in PALETTE:

- the first step consists in identifying the various stakeholders, their interests, the inhibitors and the promoters for the enrolment of these actors in the actor-network;
- then, by attempting to “align” these actors’ interests, we will build the actor-network and an ANT-based description of the issues related to bootstrapping the participatory approach in PALETTE;
- finally, we will propose a set of actions – mainly participative activities with boundary objects – and select a set of inscription medium with the aim to “enrol” the various actors and promote the social design and acceptance of the new technologies.

In PALETTE, there are a lot of actors gathered for the project purposes, but they already existed before the project and will continue their life after the project (researchers, institutions, currently existing tools, some CoPs, etc.). Some of these actors had already build relationship between themselves, some other not. Some actors will exist only due to the project (the newly developed tools, the WPs, the deliverables, for example). The PALETTE actor-network is a dynamic entity which is made of all the heterogeneous actors (meaning

human and non human, but also of different granularity³) and of all the links that tie dynamically these actors for the purposes of the project (and also for other possible reasons). These relationships and ties also define the roles of actors within the project; one person, for example, may appear as a certain kind of actor within the PALETTE actor-network and another kind of actor within another context (her institution). This is why, in ANT, it is said that actors and network are mutually constitutive.

2.4.1 Identifying and investigating the stakeholders and their interactions

Here is a sample list (certainly not exhaustive) of actors-network in PALETTE:

- CoPs, CoPs members, CoPs animators
- CoPs observers, community of CoPs observers
- Project, DoW, Project Officer, project coordination, project management
- Research teams
- WPs, tasks groups, sub-tasks groups
- Pedagogical tools: social and educational sciences methodologies, interviews, scenarios, data collection methods, data representation methods...
- Methodological tools: ANT, MOT...
- Management tools: reports, time-sheets, deliverables...
- Technical tools: from the project (existing and potential) and existing outside the project
- Technical tools developers (Ts)
- Pedagogical tools designers (Ps)
- Methodological tools providers (Ts+Ps)

2.4.2 Building the actor-network: enrolment of actors

The situation of an actor within an actor network is not fully defined by the existence of the actor. Some links have to be knitted with other actors to materialize the presence of the actor in the network. This is the step of **enrolment**. Enrolling an actor within an actor-network means that there are some **agreed common interests** between this specific actor and the actor-network at some moment. Callon explains that “enrolment is the mechanism by which a specific role is defined and given to an actor who accepts it; enrolment is a successful *interessment*” (Callon, 1999). Building the partnership between institutions (in fact, groups within institutions) to submit the PALETTE project’s proposal to EU was a first kind of enrolment. Choosing, in each partner site, who will participate and to which task is another kind of enrolment. Defining which tools will be integrated in the inventory/categorization process, which tool will be a possible candidate for further development within the project, are also other kinds of enrolment.

Enrolling actors in an actor-network requires going through some **participative activities** where actors can discover and share their common interests. The CoPs are not members of the project, but we are really wanting that they become actors of the project. Thus, we have to

³ A WP, or an institution, or a project involves a lot of persons and other elements; thus, a person and a group of person are actors of a different level of granularity.

enrol them so that there will be some common interest between CoPs, and/or CoPs' members and other actors of the PALETTE actor-network. The interview process should be considered as a first step toward enrolling the CoPs, the first steps suggested in the PALETTE R&D methodology (see section 4.2.2).

Currently existing collaborative tools (like Lotus Notes or e-Rooms, or Moodle, etc.) are not partners of the project as well. But they are used by a lot of people and by CoPs outside the project. We have to take them into account in the project: from the technical point of view – which is a matter of interoperability and standards- and from a user interface point of view as well. This is done through the tool inventory/categorization process, which is the main participative activity through which tools outside of the project are enrolled in the PALETTE actor-network. The enrolment of “inside” tools (those developed by partners) is slightly different because the inventory/categorization is not the only enrolment process for these tools; another enrolment process is that they are used within the project (for example, using Amaya to synthesize and present the data coming from the interviews is a participative activity that enrolls Amaya in the actor-network).

In this enrolment process, it is important that actors express at least some of the high level interests that foster their participation in PALETTE. The interests of actors are reshaping all along the evolution of the actor-network, are re-interpreted through *interressement* and enrolment steps, and are re-aligning along translation and inscription steps. The interests as well as the promoters and inhibitors for each actor have to be completed from the different enrolment processes, the results of which are still unknown at the moment.

2.4.3 Identifying actions (examples)

Here are some examples of actions which will be undertaken within PALETTE to practically implement ANT steps⁴:

- identifying actors
- identifying actors' interactions
- identifying actors' interests and promoters and inhibitors of their alignment
- translating interests into patterns (representations of data from interviews and categories of tools from categorization)
- inscribing patterns into scenarios (situation of use + usage of tools)
- translating scenarios into use cases (designing use-cases)
- black-boxing use-cases
- inscribing use cases into further developments

2.4.4 Translating and inscribing (examples)

Translation and inscription are a dual process.

In PALETTE, successive translations are undertaken from CoPs' life to developers' activities (scenarios) through CoPs observers'⁵ activities (interviews, transcriptions, data

⁴ The specific actions and their links are precisely described in sections 3 and 4 of this document.

condensation,...). The results are inscribed in data available as boundary objects for the actors that will support the development of PALETTE services.

Inscription is “a process of creating technical artifacts that would ensure the protection of an actor's interests” (Latour, 1992). For example, in PALETTE, the iterative and collaborative process of building a methodology leads to successive “inscriptions” into a specific medium: a schema (see Figure 2.4) elaborated with the MOT+ software (Paquette, 2002; Paquette et al., 2006). Figure 2.4 shows the different expected processes of the methodology, their inputs/outputs, as well as the principles and objectives underlying these processes. PALETTE is in relation with the CoPs and with the “Development of services” processes which existed before PALETTE and will probably continue after PALETTE⁶.

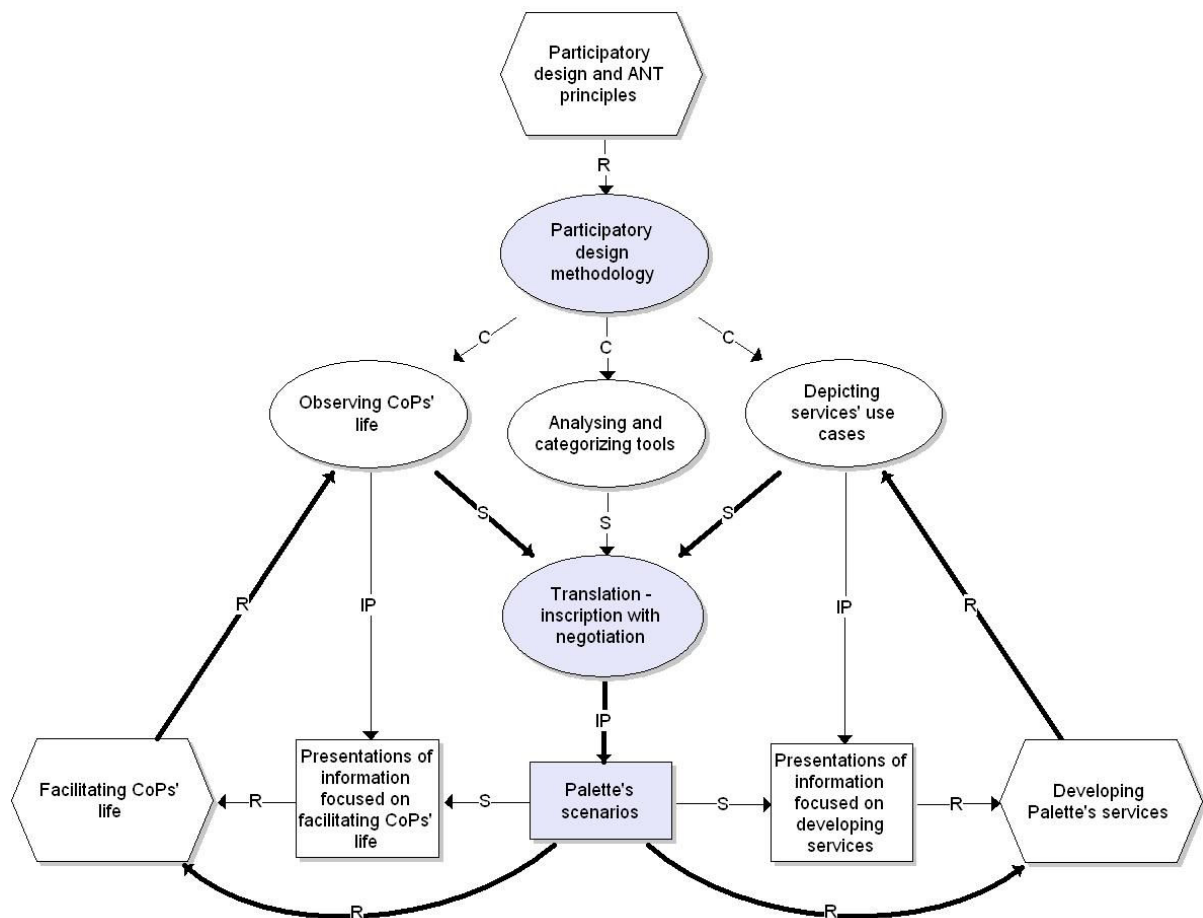


Fig. 2.4 - Inscription of the PALETTE project methodology represented with MOT+

Caption:

<p>“R” means “Regulates” (or “has an effect on”) “IP” means “Input/Product-Output” “S” means “is a Sort of” “C” means “is Composed of”</p>	<p>○ = Processes, actions ⬡ = Principles, objectives □ = Objects, products</p>
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⁵ CoPs observers are presented in section 3.2.2.2.

⁶ More information and details about MOT+ schemas are available in sections 3 and 4 of this document.

Figure 2.4 can be further analyzed (decomposed) in a set of sub-schemas depicting more precisely each process. The aim of these schemas is to inscribe (in a graphical representation) the results of a number of translations by defining ways of collaboration and dialogue. The successive versions of the schemas provide “provisional stability” (that will finally lead to black-boxes) for designing the whole methodology.

Another example of the translation-inscription process that could be found in PALETTE is supported by the activity aiming at “clarifying the notion of scenario”: what is a scenario, its content and its form, etc., according to the different PALETTE actors. Several participative activities (regular meetings with the “Ts” and “Ps” partners) have been organized for making explicit the representations/interests of the actors and progressively “inscribe” a definition and typical contents/forms of scenarios useful for all the actors. The inscription of these activities is formalized in different documents that will be available in the deliverables of WP1 and later of WP5.

2.5 From CoPs observation and tools inventory to scenario building: example of a first round

ANT was used in several different context of IT projects' development. It specifically enables to explicit how the interplay is woven between people and technology. This seems to be one of the (if not THE) key issues of PALETTE. As emphasised above, the organization (structure and stages) of the project life-cycle is a determinant factor in the success of Participative Design.

The building of the actor-network, its evolution throughout the project, as well as the nature of the translation-inscription process, and the nature and number of boundary objects, are totally different depending on the type of project life-cycle chosen.

We argue that observing all the CoPs, formalizing and representing all the data, taking all the tools and tools categories together, and hoping to derive fully users' needs driven specifications for tools that are then to be developed from scratch and finally offered for testing to users (the V-shape classical life-cycle) **would not be a suitable process, being too much risky and unrealistic.**

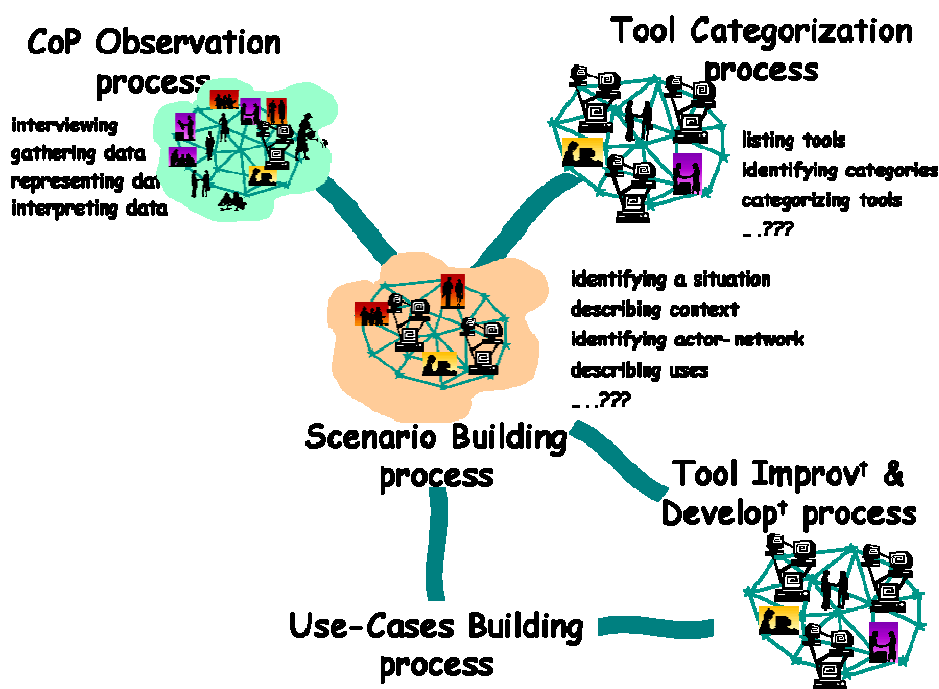


Fig. 2.5 – Up to scenario and use-cases building

Instead, as it is foreseen on the PALETTE project plan, we suggest that we should take a more agile perspective, doing a “first round” with a few CoPs, a few data from the interviews, a few tools, and try to build from this a few scenarios. This would allow us:

- to validate the feasibility of the whole process;
- to understand better what the different steps are (especially the data representing and the scenario building);

- to explicate the processes of enrolment, translation and inscription and see if it fits really well and if everybody agrees with (to enrol all the PALETTE actor-network in ANT);
- to go further into inscription of practices into the web services provided by the “Ts” partners.

(See Fig. 2.5)

From these scenarios, some adjustments (including possibly incremental developments) could be done in the partners’ tools to better suit CoPs users’ practical situations. Then we will be able to perform another loop with other CoPs and other tools.

This approach allows us to take into account that:

- CoPs exist independently from the project. They have their own life; they existed before and will exist after it. What we take into account is the interaction between the CoPs and other actors in the project;
- tools also exist outside of the project; even more, some tools already exist inside the project to some extent;
- there is a “state-of-the-art” of technology (standards, what is currently developed and used, standards of use, etc.) that has to be respected;
- the internal processes within the project have started to be carried out in a parallel way: all the WPs have started their work, nobody is waiting for others without doing anything, and nobody can wait until some tasks are fully completed to start other tasks (for instance, Ts are waiting for information about CoPs’ uses of tools). This would call for prioritization of the associated actions.

The proposed approach allows us go ahead rather quickly in the validation of the whole project, and enables actors working more collaboratively from the beginning (i.e. Ps and Ts are interacting and collaborating from the early stages of the project).

1st round

The first round is made of the following steps more precisely described in section 4:

- building (sub-)network of actors
 - one or two Cops
 - some CoPs members
 - some CoPs observers
 - some situations (from the interviews)
 - some tools (from the inventory/categorization process and methodological ones, such as MOT)
 - some tools developers
 - some interests (from interviews, categorization, DoW, ...)
 - describing concrete situations and their “interaction with” tools
 - translating into precise scenarios
 - inscribing scenarios in use-cases (“physical” representation and recommendations)
 - looping with actors’ interests (stabilization, black-boxing)

According to ANT vocabulary, the **interviewing process** (interviews, data collection, and data representation) fulfils the following purposes:

- enrolment of CoPs
- enrolment of CoPs observers
- enrolment of tools and developers
- enrolment of pedagogical tools and their providers
- enrolment of methodological tools and their providers
- displacement of CoPs from the outside to the inside of the project
- displacement of existing tools from the outside to the inside of the project
- inscription into representations (MOT+, ...)

The interview process can be seen as an *interesement* device; the creation of the community of CoPs observers and the inventory/categorization of tools are other *interesement* devices.

The **scenario building process** takes actor-networks some steps further:

- translation of actors interests into new actors called “patterns of interaction”
- inscription of patterns of interaction into scenarios (description of scenarios)
- translation/inscription of scenarios into use-cases⁷

We finally note at this point that the **web-services development** is basically an inscription and black-boxing process.

⁷ This last process will be detailed in the future tasks 3 of WP1 and WP5. A first clarification of the notion of scenario is provided in the D.PAR.02, section 3.

Carrying out loops

There may be several loops in the proposed approach, as illustrated in Figure 2.6.

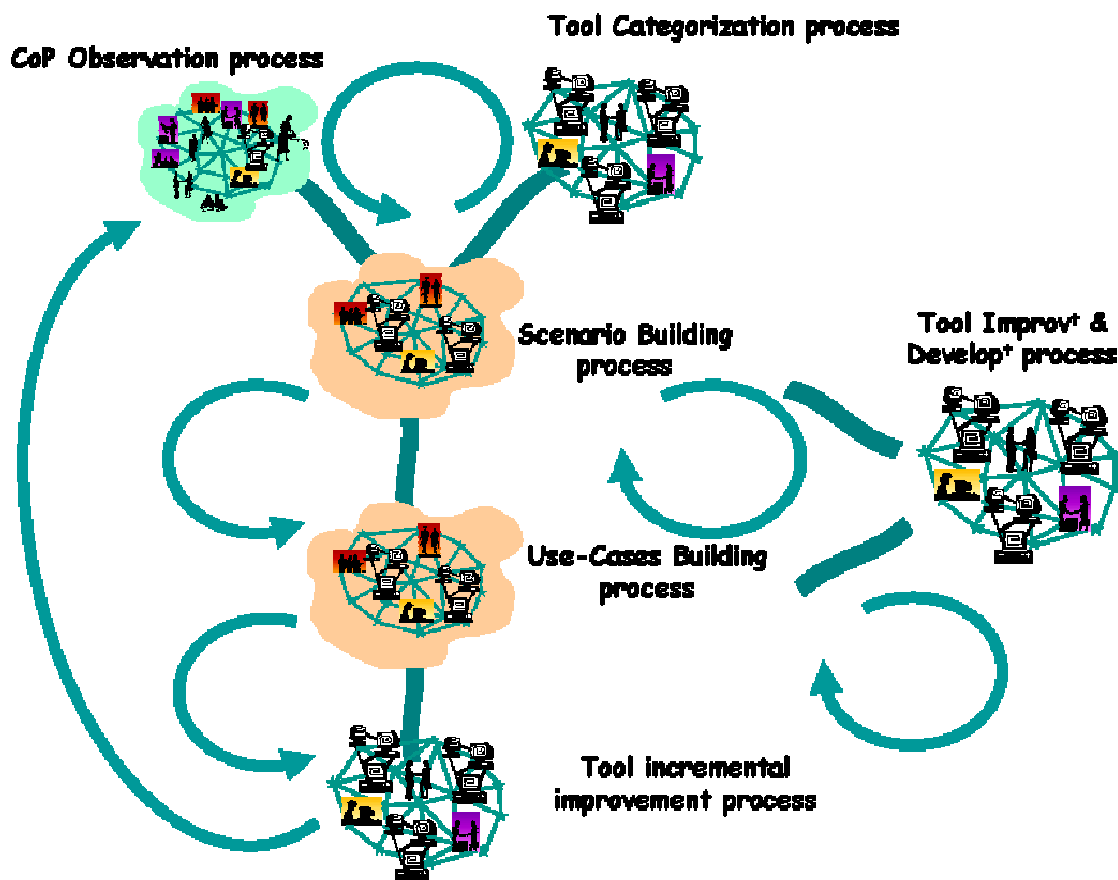


Fig. 2.6 – The first round and successive looping rounds

The successive rounds are made of different sets of actor-networks, tools and situations. The sets may have some overlapping: a specific CoP may be used in different situations, a specific tool may have different uses, a certain situation may involve different combinations of actor-network and tools, etc.

This approach enables teams in WPs starting early and continuing the processes all over the project phases, in order to refine the scenarios, exemplify or test new uses for further stages of tools development, possibly include new CoPs if necessary, or illustrate new situations coming from the early use of tools by CoPs.

3. Implementation of a Participatory Design Methodology to the PALETTE project: An approach based on the enrolment of the actors

In the previous section, we presented the theoretical framework of PALETTE's participatory design methodology based on Actor-Network Theory (ANT). In this section, we explain how we did implement it concretely through the description of the different participative activities we carried out, followed by the results obtained. We also include a critical point of view on the richness, feasibility, limitations and difficulties encountered.

As said above, "Participatory Design projects are risky; fostering collaboration between actors of diverse origins, cultures, with diverse objectives and diverse concerns may imply that the first stages of the project take more time and are more efforts consuming"⁸. This part presents the important steps to lead to an efficient collaborative process based on shared interests and expertises, and some of the useful results for now and later.

3.1 Identification of the actors and their roles in the project

If one considers the Description of Work (DoW) of the PALETTE project and other official documents already produced, it appears that several actors and roles have been identified since the very beginning of the project: the teams of researchers, some of which are technical partners (Ts), other are experts in pedagogy (Ps) but also often in educational technology (P&Ts), the Work Packages (WPs), the Communities of Practice (CoPs), the scientific and administrative co-ordination teams, the Steering Committee, etc.⁹. The roles of the WP1 actors have to be clarified, since it is not enough to put together a diversity of partners who are theoretically complementary to guarantee the efficiency of the project.

To accomplish its first two tasks described in DoW¹⁰, WP1 will i) identify all actors (human and non human) involved in its different tasks, ii) identify the participative activities through which these tasks would be accomplished and establish some internal rules for functioning and communicating, and iii) create and develop bonds with the CoPs so that they get more and more enrolled into the project.

i) Identification of all actors

- a) Human actors: as it strictly concerned the coordination of work inside WP1, this activity was not a real participative one. It has been realized by asking all the partners involved in WP1 (12 of the 14 involved in PALETTE) to identify which of their individual members would more specifically participate to the different WP1's tasks, mentioning also which role(s) they were ready to play and at which level of implication. Special attention has been given to the diversity of expertises, according to the specific objectives of the tasks. These groups or sub-groups can be considered as new actors inside the project. They are mainly methodological tools providers at this stage of the project.

⁸ See section 2.2.

⁹ See DoW, pp.44-51 and WP0's D.MAN.01.

¹⁰ See DoW, pp.64-66.

- b) Non human actors: this is more related to the participative activity that led to an inventory of tools (including the tools developed by PALETTE partners as well as those used by the CoPs). This activity corresponds to WP1's Task 2 and is described in details in the D.PAR.02 produced in parallel to this deliverable.

ii) Identification of participative activities and internal rules for functioning and communicating.

Once the actors for the different tasks have been identified, our first participative activity consisted in proceeding to an open debate about the participative activities needed to achieve these tasks and the way to coordinate them efficiently. The four main participative activities of WP1 developed during the first six months are the following:

- Designing participatory design methodology (described here in sections 2 and 4)
- Observing CoPs' life (described here in sections 3 and 4)
- Clarification of the notion of scenario (described in D.PAR.02, section 3)
- Inventory and categorization of tools (described in D.PAR.02, section 2)

This debate also led us to create sub-groups to implement activities and we determined internal rules for communicating (choice of tools for information sharing; mailing lists - identify receivers for given information; how to use the BSCW site - structure task documents directories; organize virtual or face to face meetings, etc.). Figure 3.1 illustrates the results of this process and shows the general action plan inside WP1 in a purely administrative perspective.

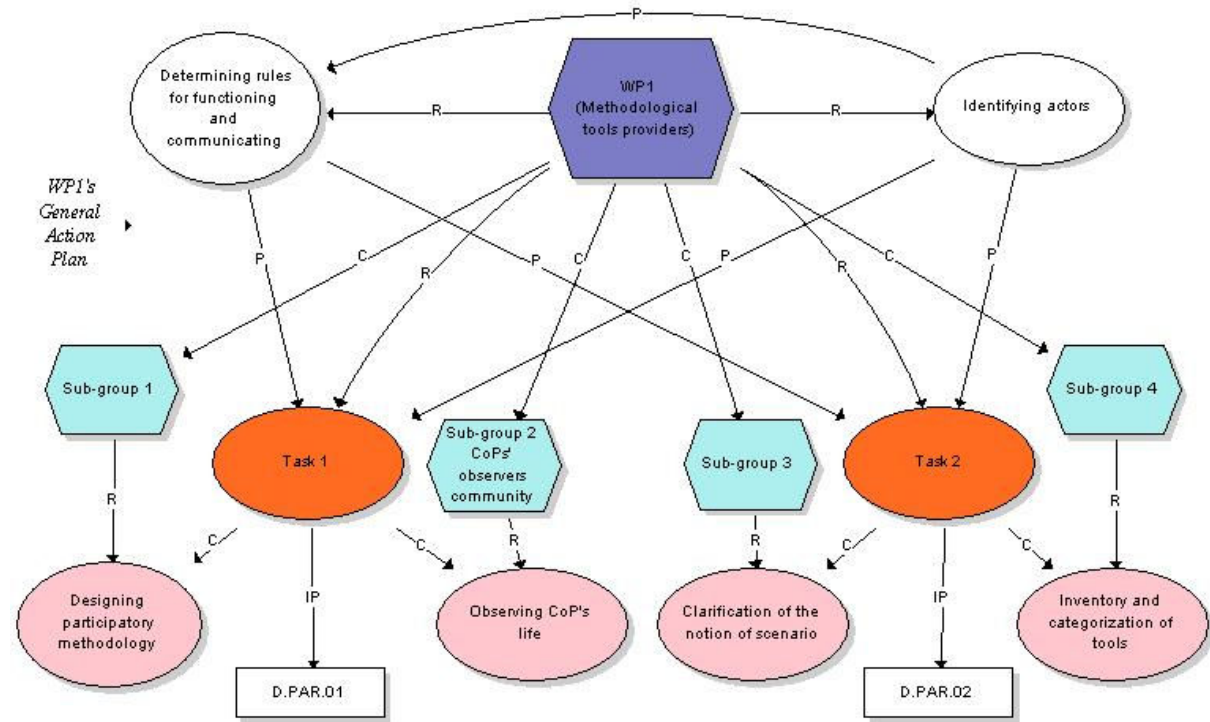


Fig. 3.1 – WPI's General Action Plan

Caption:

<p>“R” means “Regulates” (or “has an effect on”) “IP” means “Input/Product-Output” “C” means “is Composed of” “P” means “Precedes”</p>	<p>○ = Processes, actions ⬡ = Actors □ = Objects, products</p>
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iii) Create and develop bonds with the CoPs

WP1, in which almost all partners are involved, is the WP through which every contact with the CoPs gets established; in this very specific sense, it is the core of the project. To establish solid bases for efficiently assuming this essential mission, several new actors have been created and their roles defined: the community of observers of the CoPs, including delegates from the CoPs and an “animation cell” for this community (this is described in detail in section 3.2.2.2).

WP1 has drawn a map of all the actors involved in its activities, a map that is exhaustive for now but of course not definitely “closed”, as we are engaged in an iterative development process. Figure 3.2 below shows the association of WP1 with the other WPs, the actors with whom WP1 interacts the most (in blue), its main participative activities (in rose) and their outputs (in dark yellow).

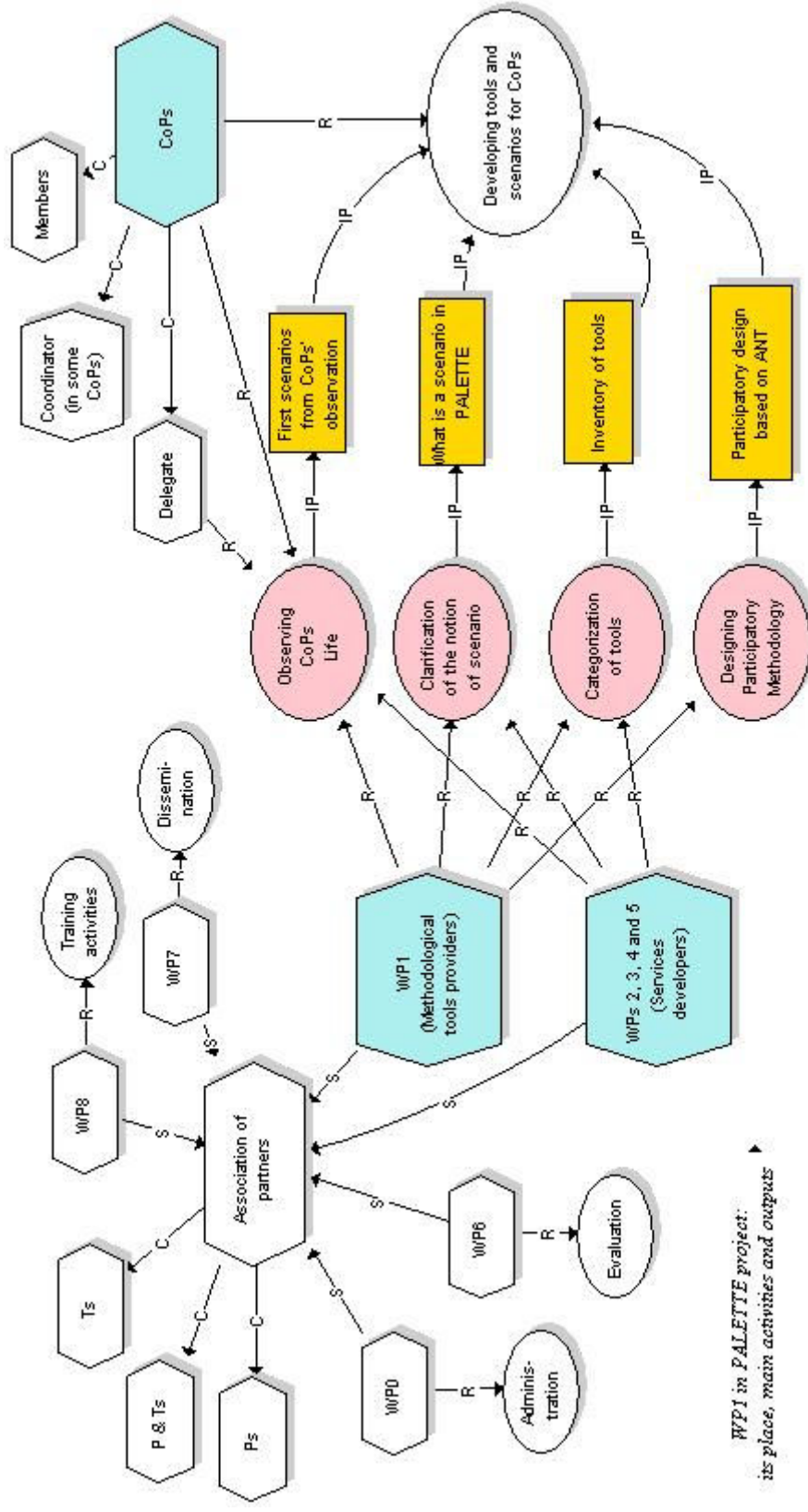


Fig. 3.2 – WP1 in PALETTE project: its place, main activities and outputs.

Caption:

“R” means “Regulates” (or “has an effect on”)
 “IP” means “Input/Product-Output”
 “S” means “is a Sort of”
 “C” means “is Composed of”

Being a WP where almost every partner is involved in, and being one of the most active WPs in the first stages of the project, WP1 has been a kind of training ground for testing the basic principles of PALETTE project, including rules for functioning and communicating.

3.2 Actors' enrolment procedures

To identify all the actors in a project is obviously not enough to develop efficient actions, to generate a real and effective collaborative process and to ensure the quality of the results. WP1 then had to make explicit and take into account several facts, such as the diversity of competences, the variety of vocabularies and the heterogeneity of interests among actors. The whole setting up of actors' enrolment procedures had the following objectives:

- Identify and try to align the interests of the actors (cf. ANT theory)
- Propose participative activities emphasizing the complementarities between actors
- Establish and develop bonds with other developers: WP2, WP3, WP4 and WP5, to which information about CoPs has to be provided for scenario building and tools development.

Generally speaking, we intended to contribute to the continuous intensification of cohesion of a community composed of heterogeneous communities (CoPs – PALETTE partners; T partners - P partners - P&T partners, etc.).

3.2.1 Identification of the actor's interests

This aim has been achieved through several activities.

Most of the activities inside WP1 have been conceived as participative, including the inventory and categorization of tools, which was mainly based on a form sent to technical tools developers¹¹, as well as the elaboration of a guide of interview¹², used to collect information from the CoPs. The building of both questionnaires has involved all the partners; each of them had to make explicit and share its views, interests, theoretical considerations and wishes concerning the way to analyse collected data. A similar process has been adopted in the activity aiming at clarifying the notion of scenario¹³. As shown in Fig. 3.3 above, all the below mentioned activities have been realized by sub-groups inside WP1.

We first tried to achieve this aim through a specific participative activity directly inspired by ANT theory that, after Callon, (1990), we called the “Obligatory Passing Points Exercise”. Let us recall that the main objective here was the enrolment of the actors and that, as said above, “enrolling an actor within an actor-network means that there are some agreed common interests between this specific actor [called focal actor] and the actor-network at some moment”¹⁴.

¹¹ This task is set out in details in D.PAR.02, section 2.

¹² This activity is set out in details later in this document, see section 3.3.2.

¹³ This task is set out in details in D.PAR.02, section 3.

¹⁴ The theoretical principles behind this exercise have been set out earlier, see section 2.3.

The main steps and principles of this exercise coordinated by a sub-group were:

- Identify a list of “obligatory passing points (OPP)” (general or more specific) WP1 will have to deal with (an activity, a task, a problem, an aim).
- Make explicit our own (WP1) interests as a focal actor.
- Identify the expected problems or obstacles from our (WP1) point of view.
- Try to determine which other actors (individual or collective) are concerned or should be concerned by some participative activities (CoPs, CoPs animators, other WPs, teaching specialists, computer scientists, observers, etc.), i.e. actors who can not be ignored or left aside because they could either have cross-interests to satisfy or raise specific problems that might create another obstacle for the success of the activity/task.
- Record and organize this information into simple tables easy to communicate (see an example below).
- Send the tables to all WP1 members (i.e. individuals belonging to most of the partners, who are also involved in other WPs) to get a feedback as large as possible.
- Collect the feedback given by WP1 members.
- Analyse the information to identify possible lacks of alignment or misunderstandings between actors.
- If lacks of alignment are identified, find a way to solve them.

As an example, Table 3.1 below shows the information WP1 (the focal actor) submitted to its members about the OPP: “Clarify the concept of scenario”. Tables 3.2 and 3.3 show the feedback we received from members of WP1 who answered as representative of the interests of other actors, in our example WP4 (tools developers) and WP8 (training providers).

Obligatory passing point : Clarify the concept of ‘scenario’ and describe scenarios		
Focal actor	Interests of the focal actor	(expected) Problems and obstacles identified by the focal actor
WP1	<p>Quickly clarify a notion that is absolutely central in the project.</p> <p>To get to an agreement on the essential components/aspects of a scenario so that partners are able to define several types of scenarios relevant inside the project.</p> <p>To produce a reference document including a synthesis of the main principles that is acceptable for every partner.</p>	<p>To be unable to get to a common view because of the diversity of opinions and the divergence of interests among partners</p> <p>To produce unusable data</p>

Other possible actor(s)	(supposed) Interests of the other possible actor	(supposed) Problems and obstacles for the other possible actor
Technical partners	To get to an agreement on the notion of scenario so that they are able to develop their tools in conformity with it	[to be completed]
WP5	To get to an agreement on the notion of scenario so that they are able to create scenarios of uses in conformity with it	[to be completed]
Some individual people especially interested in this subject	To confront different opinions on the subject and possibly develop a new model for developing scenarios	
Other people to inform	(supposed) Interests of the other people to inform	(supposed) Problems and obstacles for the other people to inform
WP8???		

Table 3.1 – Example of WPI’s OPP analysis. A table established by a WPI sub-group

Obligatory passing point : Clarify the concept of ‘scenario’ and describe scenarii		
Other actor	Interests of the other actor	(expected) Problems and obstacles identified by the other actor
WP4	<i>To define the notion and format (i.e. structure, content) of scenario in order to prepare the WP4 related scenarios asap</i>	<i>To be unable to get to a common view because of the diversity of opinions and the divergence of interests among partners</i> <i>Time constraints</i>

Table 3.2 – Example of WPI’s OPP analysis.
Additional information given by a WPI member representing WP4’s interests

Obligatory passing point : Clarify the concept of ‘scenario’ and describe scenarii		
Other actor	Interests of the other actor	(expected) Problems and obstacles identified by the other actor
WP8	<i>To delivery training modules that are congruent with scenario definitions and examples</i>	<i>Lack of awareness of the implicit “Learning Theory” that may be imbedded in the scenarios.</i> <i>Conflicting (or not coherent) Learning activities associated to a specified goal or training objective</i>

Table 3.3 – Example of WPI’s OPP analysis.
Additional information given by a WPI member representing WP8’s interests

As we believed that this kind of exercise could be useful to other WPs, we suggested them to use the model developed for WP1 and to send their information to WP1 members to get a feedback from them.

About the WP1's OPP exercise, we shall conclude that it has not been a great participative success, probably because it has been started too early without enough negotiation with the partners and providing too general or theoretical questions. Very few WP1 members gave their feedback, but as few as there are we shall keep their comments in mind for the project's further stages. We have also been able through this exercise to identify relevant expertises by some individual active in other WPs. Only two WPs, WP4 and WP7, adopted the suggestion, saying that it had been a useful exercise for them to make, but, as has been the case for WP1, they received few feedback comments.

Aligning the possibly divergent interests (to increase their knowledge about the CoPs life and activities, to improve the tools they still developed, to improve the quality of life of the CoP they animate, etc.) of heterogeneous actors depending on their specific profile (teaching specialist, CoP's animator, computer scientist, sociologist, "theory" oriented, "tools" and/or "information standards" oriented, etc.) is essential in the project. This specific issue is also dealt with by WP0 and WP6 that are in charge of the coordination and evaluation of the project.

However, other participative activities developed around a negotiated boundary object¹⁵ (a questionnaire to elaborate, a way to represent collected data, etc.) proved to be more much efficient to reveal, identify and align developers' concrete and detailed interests.

3.2.2 Enrolment of actors

With respect to the PALETTE project, the most important WP1's mission is to get information from the CoPs, to analyse it and provide it through suitable formats to the technical developers (WPs 2, 3 and 4) and to return to the CoPs an interpretation to be validated. This mission corresponds to some elements of the first two stages of the whole PALETTE R&D methodology described in the last part of this deliverable (section 4): Establishing the collaboration, and modelling the activities of the CoPs.

3.2.2.1 Enrolment of CoPs

The CoPs are not partners of the project, but we are really wanting that they become actors of the project. Thus, we have to enrol them, i.e. give them a role that is acceptable for them and that takes into account their interests and needs. The first step toward enrolling them is the interview process through which we:

- Answer to their questions about the project and what is expected from them,
- Know which increase in value they hope,
- Present them the ethical principles we commit ourselves to respect¹⁶, such as confidentiality and liberty for them to retreat at any time,

¹⁵ On this notion, see section 2.3.

¹⁶ We followed recommendations by Pudelko, Daele and Henri (2006).

And, of course, through this process we now:

- Know who they are, how they function and in which context,
- Know which tools they use, for what purpose and how.

This interview is not the only way by which we can get information about CoPs' life, but, after negotiation with the developers, it has been the method chosen¹⁷ for establishing the collaboration with CoPs, i.e. have with them a first contact that will be followed by many others (see details in the last part of this deliverable) that should consolidate their initial enrolment.

At this stage, we know better which kind of complementary information we can get (tracks from discussion forum, documents produced, etc.) so that developers can from now on refine their demands (what they did after the June Fribourg meeting where first results have been presented to them). We also observed different levels of interest in the project, some of the CoPs members indicated their fear of too time consuming collaboration.

3.2.2.2 Enrolment of new actors inside WP1

To create good relations with the CoPs, to convince them about the opportunity to be helped through the development of the PALETTE project, to collect some relevant information on which tools they use and how they use them, to analyse collected data and organize information transfer from the CoPs to the different partners who need it at different moments, WP1 has created three new actors in the project:

a) A community of CoPs observers (10 researchers): work in pairs for interviewing a CoP by using built-in tools (grids, questions lists, analysis tools, etc.). To ensure a maximum balance between a good knowledge of the CoP and a necessary independence from it, each pair of observers includes a person in close and direct link with the CoP (the 'internal' observer) and another one that is 'external' to the CoP. They both decide how to work together.

Figure 3.4 below gives the composition of the community of CoPs' observers of the PALETTE project (the delegate is the person who introduced the CoP to the PALETTE project, its role consists simply in connecting his (her) CoP(s) and the CoPs' observers).

¹⁷ In fact, even if based on the same Interview Guide, different practices occurred. Generally the Co-observer 'Internal' and the Co-observer 'External' met one or two CoPs representatives during about two hours most of the time in a free conversation. Some of us nevertheless decided to proceed a bit differently: one used a writing technique, for others the language was a problem so they asked interviewees to record their answers to the questions of the Interview Guide and they translated the recordings in English.

CoP \ Role ¹⁸	Delegate	Co-Observer 'Internal'	Co-Observer 'External'
<i>Teaching domain</i>			
Learn-Nett	Nathalie Deschryver	Amaury Daele	Nathalie Van de Wiele
Form@Hetic	Brigitte Denis	Amaury Daele	Martin Erpicum
Did@ctic	Ana Moura	Hervé Platteaux	Paul Ashwin
Odysseia/eOmogeneia	Dora Nousia	Dora Nousia	Fabienne Pironet
Apretic	Étienne Vandeput	Étienne Vandeput	Robert Peeters
<i>Management domain</i>			
ADIRA	Liliane Esnault	Liliane Esnault	Martin Erpicum
Pôle productique Rhône-Alpes	Liliane Esnault	Liliane Esnault	Hervé Platteaux
Centre des Entrepreneurs	Liliane Esnault	Liliane Esnault	Robert Peeters
<i>Engineering domain</i>			
Telecom-INT	Nathalie Van de Wiele	Nathalie Van de Wiele	Martin Erpicum
BADGE-CGE	Nathalie Van de Wiele	Nathalie Van de Wiele	Étienne Vandeput

Fig. 3.4 – The community of CoPs' observers and the delegates

b) A CoP's observers animation cell (a sub-group of three researchers, one observer for each category of CoPs: management, engineering, teaching - this choice is making easier a regulation process avoiding us to focus only on one kind of CoPs): this cell has three main roles: i) to relay information or request for information and lead negotiation between the observers and the developers, ii) to validate the built-in tools for the community of CoPs observers, and iii) to be aware of all the opportunities to facilitate exchange between observers as often as possible so that they can share their experience. For example, they organized a face to face meeting of the observers' community to which other partners were invited during the first summer school of the PALETTE project (June 2006, in Fribourg).

c) A data condensation team (sub-group of four researchers): they are responsible for the analysis of data collected from CoPs, as well as for the presentation of the results (synthesis, vignettes, graphical schemas) in accordance with what has been negotiated between the community of CoPs observers and the technical developers¹⁹. All of them are volunteers and they are mainly Ps or P&Ts.

3.2.2.3 Enrolment of developers

As said above, the community of CoP's observers and its two sub-groups have been created to ensure the communication of relevant information from CoPs to developers²⁰. Developers have thus been systematically associated to the discussions about the kind of information to collect, the way to analyse collected data, the way to organize and present the results of analysis. Of course, the information to be searched will be refined all along the project and the observers will (recursively) ask questions to the CoPs on demand from the developers.

¹⁸ N.B. The list of CoPs evolved since the time the DoW has been written. One of those mentioned in the DoW has disappeared (DES-TEF); it has been replaced by two new ones (Did@actic and Apretic).

¹⁹ The data condensation team mainly followed the method described by Bardin (1983) and L'Ecuyer (1990).

²⁰ At this stage, only technical developers or developers of tools (WPs 2, 3 and 4) have been consulted, the WP5 activities (development of scenarios) will begin from stage 3 of the whole PALETTE R&D methodology (see section 4.2.4).

This process of enrolling the developers through the community of observers' activities has been at the moment the most successful, and this is a guarantee for the following stages of the project. Indeed, as a good illustration of ANT principles, through a constant negotiation with the developers, we succeeded here in aligning their different interests and points of view through the following boundary objects:

- The elaboration of an Interview Guide as relevant and complete as possible;
- An agreement on the data in priority to be analysed (each technical developer sent its specific requests to the CoPs' observers animation cell);
- An agreement on the way to present the results:
- Audio records accompanied with a minutes by minutes timing succinctly describing the content;
- Retranscription of some audio records ;
- A synthesis including:
 - vignettes (text format);
 - graphical representations.

3.3 The results for now and later

3.3.1 Three built-in tools

WP1 developed three specific methodological tools that will be useful all along the project's life (and could also be used by other researchers interested in the same kind of subject).

- An Interview Guide
- Some general guidelines to conduct an interview
- A data analysis template

3.3.1.1 The Interview Guide

The interview guide²¹ can be considered like a grid, a check list for the interviewers. Issues have been classified in different classes, such as origin of the community, knowledge about the CoPs members, and organization, with a special attention towards software tools that CoPs are using or may need in their everyday life activities. Figure 3.5 below shows the table of content of this guide. The complete version of it is given in **Annex 2**.

²¹ Created following recommendations by Daele (2004) and Miles & Huberman (2003).

1 Description of the first interview's aim

2 Description of the PALETTE project

3 Tips for interviewers

4 Questions

4.1 Origin of the community

4.1.1 Could you describe the decision process by which the CoP has started?

4.2 CoP's members

4.2.1 Tell us about the members

4.2.2 Could you describe with specific examples the process by which new members enter in the CoP?

4.2.3 How do you describe the involvement of members? Tell us examples where members are very involved and other examples where not.

4.2.4 How would you describe the relations between the members?

4.2.5 Could you give us examples of 'central' members and of 'peripheral' members? Which clues do you use for classify members as 'central' or 'peripheral'?

4.3 Self organization and organigram

4.3.1 How does the community organize itself? Could you describe and give examples of:

4.3.2 Who is the coordinator? Could you describe his/her roles by giving some specific examples?

4.3.3 Can you describe with examples how the CoP manages the crucial stages of its evolution (questions or problems)?

4.4 Organizational and outside context

4.4.1 How could you describe the relationships between the CoP and its organizational context?

4.4.2 How can you characterize the relations between the CoP and the outside?

4.5 Future

4.5.1 In your view, what is the future of the community?

4.6 About the activities of the CoP

4.6.1 Can you describe the activity of CoP compared to what it produces?
4.6.2 What are the current results (in a large sense) of the CoP's production?
4.6.3 In your view, does the CoP create knowledge? If so, can you describe this process of creation?
4.6.4 Can you describe how and where the community finds/retrieves information? Can you describe the process?
4.6.5 Can you describe the mediation process (collaboration, negotiation, decision making on specific tasks)?
4.6.6 How would you describe the learning activities (or the development of competencies) of the members in the community?
4.6.7 Can you illustrate (with examples) some situations of uses of tools (technological and organizational)?
4.6.7.1 Which tools (technological and organizational) are used by CoPs?
4.6.7.2 How could you characterize the appropriation of the tools by members? Are they well accepted / used?
4.6.7.3 Which tools (technological and organizational) could be useful for CoPs?

Fig. 3.5 – Interview Guide: Table of content

3.3.1.2 General guidelines to conduct an interview

Like any other people, interviewers have their own opinion on what data collection concerns. That is why it is not easy for them to adopt a common method. To help them in their task, some general guidelines have also been provided: Figure 3.6 below shows the table of content of this methodology²².

1 Principles for conducting an interview
1.1 Some basic references
1.2 What is the role of CoPs in the project?
1.3 What is (are) the question(s) we want them to answer?
1.4 Ethical issues
1.5 Which method for collecting data?
2 Conducting interviews in practice
2.1 Before : preparation of the interview
2.1.1 How to proceed?
2.1.2 Who will observe CoPs?
2.1.3 How many interviewees? What sort of person do we intend to interview?
2.2 During the Interview : Tips
2.2.1 Guidelines for Conducting Interviews
2.2.2 The situation of Interview
2.2.2.1 Semi-directing Interview or guided Interview
2.3 After : Recording and Analysis
2.3.1 Retranscription
2.3.2 Analysis

Fig. 3.6 – Table of content of the Guidelines to conduct an interview

²² Inspired by Mucchielli (1996, pp.29 and 33) as well as Kaufmann (1996).

3.3.1.3 A data analysis template

The synthesis of interviews²³ is divided into three parts:

1. Identification and brief description of the CoP

This is a summary of the general information about the CoP, established by answering to the following questions:

- **Context:** in which context is the Cop situated (institution, region, professional network, etc.)?
- **History:** when did the community start? Would you say that it is a community in emergence? Or matured?
- **Focus:** what is the domain of the Cop? On which content or project is the Cop focused?
- **Actors:** who are the actors involved? How many are there? Are there people playing a particular role?
- **Practice:** How would you describe the content of the exchange and production of the CoP? Could you give a typical example illustrating the content of the exchanges?
- **Communication tools:** which virtual environment or communication software does the Cop use? For which purpose?
- **Archive:** do you have archives for your CoP? How do you reify (formalize) the contents of your exchanges? Do you use specific tools or methodology to explicit and share your knowledge?
- **Cultures:** how could you describe the value shared by the community?
- **Links:** can you give some references to tools (Websites, forums...) that you use inside your Cop?
- The PALETTE project has identified four categories of issues to be encountered, for each category choose a number between 1 and 5 indicating if you find this issue (5) very important or (1) not important.

2. Tools

1. Name and type of the tool (brief description in case of CoPs own tools): <i>Type here</i>
2. The tool is used by the CoP for: <input type="checkbox"/> Information sharing <input type="checkbox"/> Knowledge Management <input type="checkbox"/> Mediation/Collaboration <input type="checkbox"/> <i>Other category (please explain)</i>
3. Why is it used by the CoP? For what need? [list of activities] <i>Type here</i>
4. How is the tool usually used? [examples very shortly described] <i>Type here</i>
5. Screenshots or possible additional information <i>Images here</i>

²³ Created following the method described by Bardin (1983) and L'Ecuyer (1990).

3. Activities

Activity of ...
1. Description of the activity. Why? How? When? <i>Type here</i>
2. Possible problems encountered <i>Type here</i>
3. Needs/Urges of the CoP <i>Type here</i>
4. MOT graphical representation <i>Image here</i>

3.3.2 Work in progress

The process is well engaged, we have useful methodological tools that are regularly improved according to the developers' needs, at least one member of almost all the CoPs (8 of 11) has been met, the audio (8) or written (3) audio records are all accessible to researchers on the BSCW site (access restricted to PALETTE's researchers), 3 audio recording have been fully transcribed and a first round (from interview to synthesis) is completed for 3 interviews.

3.3.2.1 A sample of representative Cops

We nevertheless have to be aware of some possible dimensions related to the status and involvement of the interviewees. Indeed, two problems still remain.

The first one is related to the chosen CoPs. Some are community of learners, some are community of professional practice, some are about to start. Some have a short life (1 to 4 years). Some are animated, some not. Some have (just) come up, some have been voluntary created. We have to match up gathered data with these different types of CoPs so that tools and scenarios that will be developed later in the project could be as adaptable and acceptable as possible. It also appears that we should perhaps involve new CoPs in order to allow working on particular aspects not encountered with the present CoPs (for example, find a CoP that necessarily needs mediation tools). This kind of suggestion has been transmitted to the Steering Committee that will make a decision about this.

The second one is related to the status of the interviewed people and their role in relation to the CoP. A CoP's coordinator does not share the same interests as a CoP member, for instance. So, information might be differently "coloured". We will then try to get information from different kinds of members (central, peripheral, critical, enthusiastic, with various technical skills, etc.) so that we arrive to an understanding of the CoP functioning as realistic as possible.

This is why one (or two) interview(s) is probably not enough to know a CoP well enough. The work of gathering and analysing data has to be continued. It will be followed by activities (see the steps described in section 4) set up by developers teams (in which WP1 members will be part) coordinated by the WP5 and working in strong collaboration with a limited number of CoPs.

3.3.2.2 A first sample of useful data

Some of the first results, as those shown in the following synthesis (a vignette followed by a graphical representation - Figure 3.7), are anyway already enough to give an idea of some specific services that could be further developed by WPs 2, 3, 4 and 5.

This example concerns a CoP of the learning domain whose tutors and coordinators are involved in the design and animation of distance collaborative activities. One of their activities (information sharing) is described hereafter.

Activity of Information sharing in a learning domain CoP
<p>1. Description of the activity. Why? How? When?</p> <p>The figure below depicts the documents produced or used into the community. Three kind of actors are represented, two among them are members of the CoP (composed of tutors and coordinators); the students participate in the distance training organized by it. Eight sorts (link "S") of documents are produced by the larger community (including the students) while only two sorts of documents only (scientific papers and bookmarks) are reused. The tutors and the coordinators participate in the production of research results (i.e. based on students' productions), of a pedagogical guide for the students and of pedagogical tools for tutors. This last production is especially a product of the tutors' CoP.</p>
<p>2. Possible problems encountered</p> <p>The half bottom of the figure shows that only one of the products is reused in the next years for designing new distance training scenarios. What the students produce is not reused nor researches or practical tools. This could depict a CoP without memory... while one condition of learning is precisely the organization of knowledge management and the formalization of the exchanges.</p>
<p>3. Needs/Urges of the CoP</p> <p>This CoP maybe needs tools and scenarios to better archive and reuse all the documents it produced and will produce. This could be discussed with it.</p>
<p>4. MOT graphical representation</p> <p>See Figure 3.7.</p>

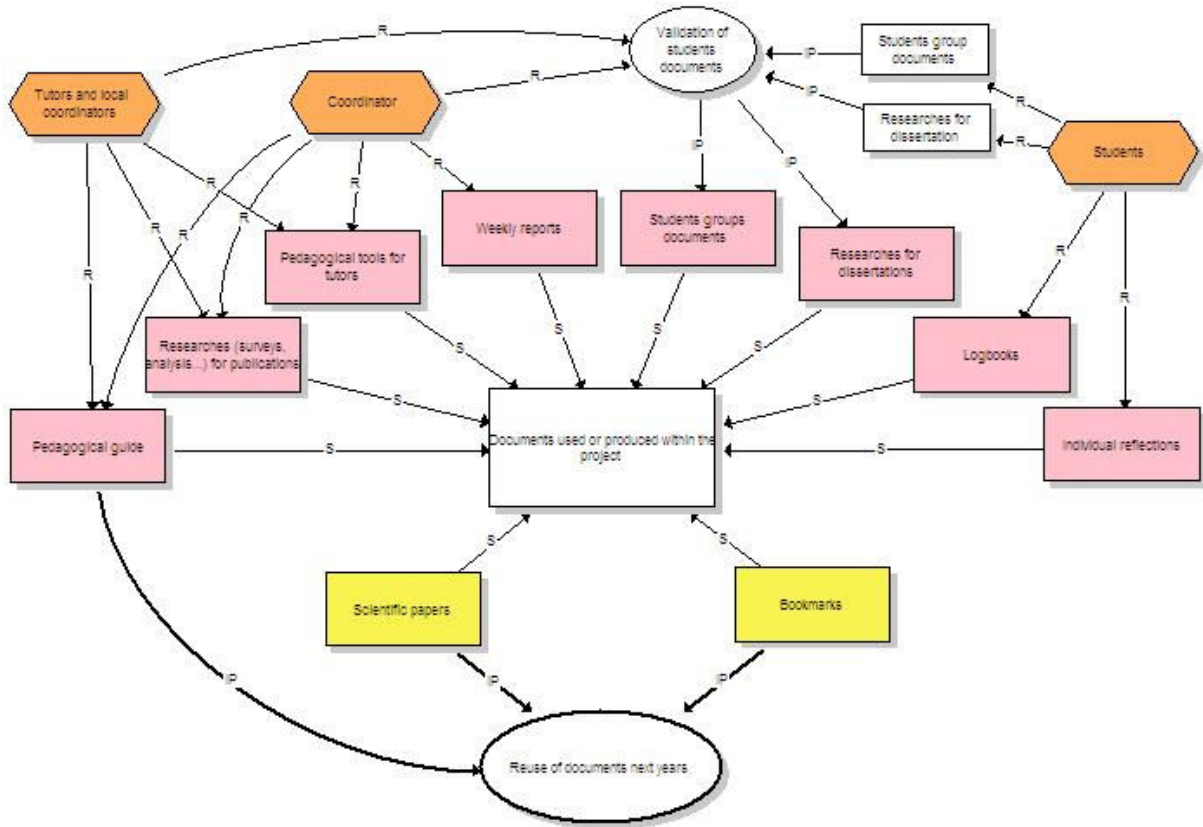


Fig. 3.7 – Documents used and produced and actors involved in a CoP.

Caption:

<p>“R” means “Regulates” (or “has an effect on” or “acts on”)</p> <p>“S” means “is a Sort of”</p> <p>“IP” means “Input/Product-Output”</p>	<p>○ = Processes, actions</p> <p>⬡ = Actors</p> <p>▭ = Objects, products</p>
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With this kind of information (textual and graphical), nearly ending the stage “Modelling the activities of the CoPs”²⁴, developers (WPs 2, 3, 4 and 5) will be able to go further through the stages of the whole PALETTE’s R&D methodology²⁵, so to design models of ideal situations (stage 3), to design mock-ups and prototypes (stage 4), and so on with the permanent possibility to go back to previous stages to collect more precise information from CoPs (this operation could lead to some additions into the interview guide).

²⁴ The process is only ended when the information has been validated with CoPs, see section 4.2.3.

²⁵ See sections 4.2.4.

4. PALETTE’s R&D methodology

4.1 Framework of the methodology

This section aims at describing the PALETTE’s methodology, i.e. the different methodological stages of the whole research. For depicting the methodology and its processes and sub-processes, we used MOT, a graphical knowledge-modelling methodology. The caption of each figure describes the meaning of the boxes and links. In addition, the reader will find in Annex 1 a summary of the MOT grammar. Additional information about this modelling methodology could be found in Paquette (2002) and in Paquette *et al.* (2006).

Figure 4.1 below summarizes the principles of the PALETTE’s R&D methodology regarding its two main objectives: facilitating CoP’s life and developing services. Strictly speaking, this figure is not the methodology itself. Its goal is to summarize the PALETTE’s objectives (“Facilitating CoPs’ life” and “Developing PALETTE’s services”) that have guided the choice of the methodological principles: ANT and the participatory design approach which have been described in the Section 2 above. These principles regulate (link “R”) the methodology.

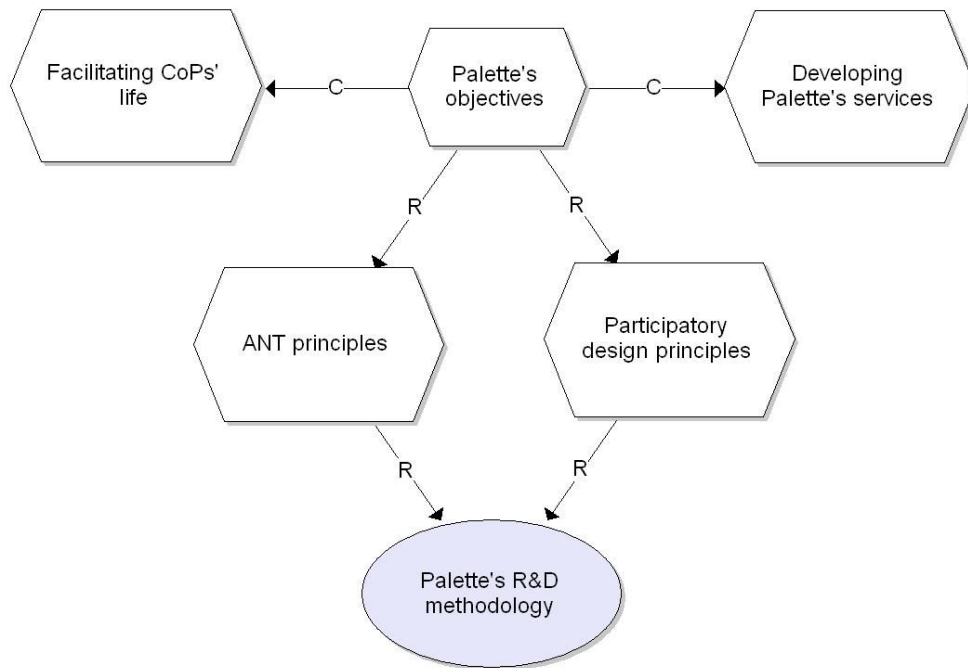


Figure 4.1 – The PALETTE’s methodology regarding its objectives and principles

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”

○ = Process, actions

⬡ = Principles, objectives

In other words, PALETTE has two basic objectives: facilitating CoPs’ life, their functioning and the learning of their members and developing online services for CoPs. For achieving these two objectives, a methodology is carried out, based on participatory design and ANT principles.

4.2 The PALETTE's R&D methodology sub-processes

The methodology itself is composed of twelve sub-processes (links “C”), as suggested in the figure below (Figure 4.2 – The participatory design methodology). In the following paragraphs, we will describe and specify each stage of this model.

The figure more precisely depicts the process “PALETTE's R&D methodology”, i.e. the whole process of collaboration with the CoPs involved in PALETTE. Three kinds of objects are depicted:

- The **actors** (yellow oblate hexagons): the developers (the PALETTE's partners) bringing together the different WPs and two sub-teams within the WP 1 as well as the CoPs with their delegates and members. These actors have different roles in each of the sub-processes.
- **Twelve processes** contained in the methodology (the circles around the “PALETTE's R&D methodology”). From left to right, the first one “Analysing and categorizing tools” and the last one “Following-up and evaluation of the CoPs' reflection about their activities” happen regularly all along the project and influence the other processes with their products. The ten other processes numbered from 1 to 10 happen one after the other.
- The **objects as inputs/outputs** in/from each process.

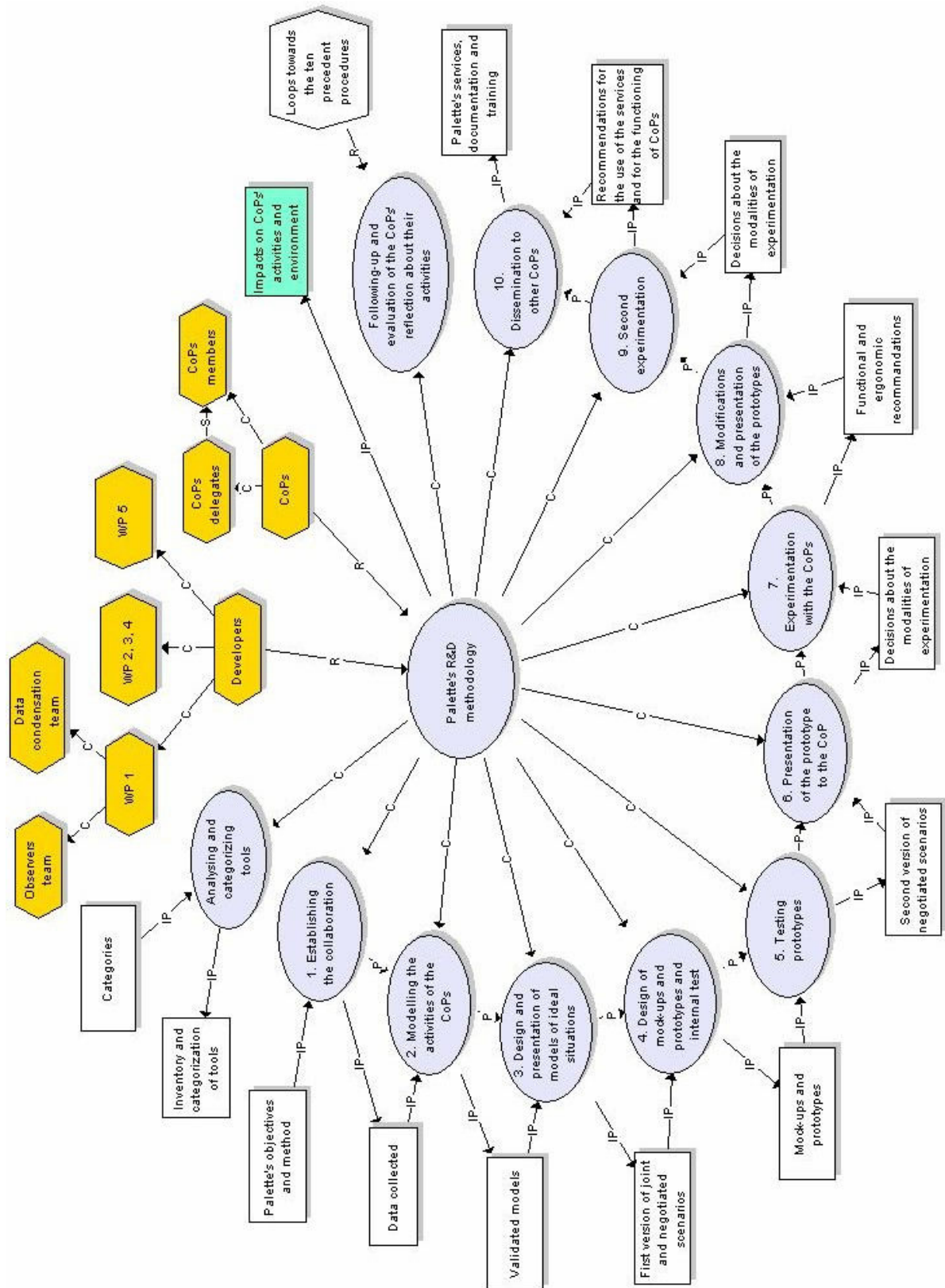


Figure 4.2 – The participatory design methodology

Caption:

“R” means “Regulates” (or “acts on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”
 “P” means “Precedes”
 “S” means “is a Sort of”

○ = Processes, actions
 ⬡ = Actors, principles
 □ = Objects, products

Before describing the different sub-processes, it is useful to specify the expected results of the methodology. It consists of “Impacts on CoPs activities and environment”. Different tracks (or indicators of the achievement of the project’s objectives) of this result for the individuals, the CoPs themselves, the organizations and the society are described in the figure below.

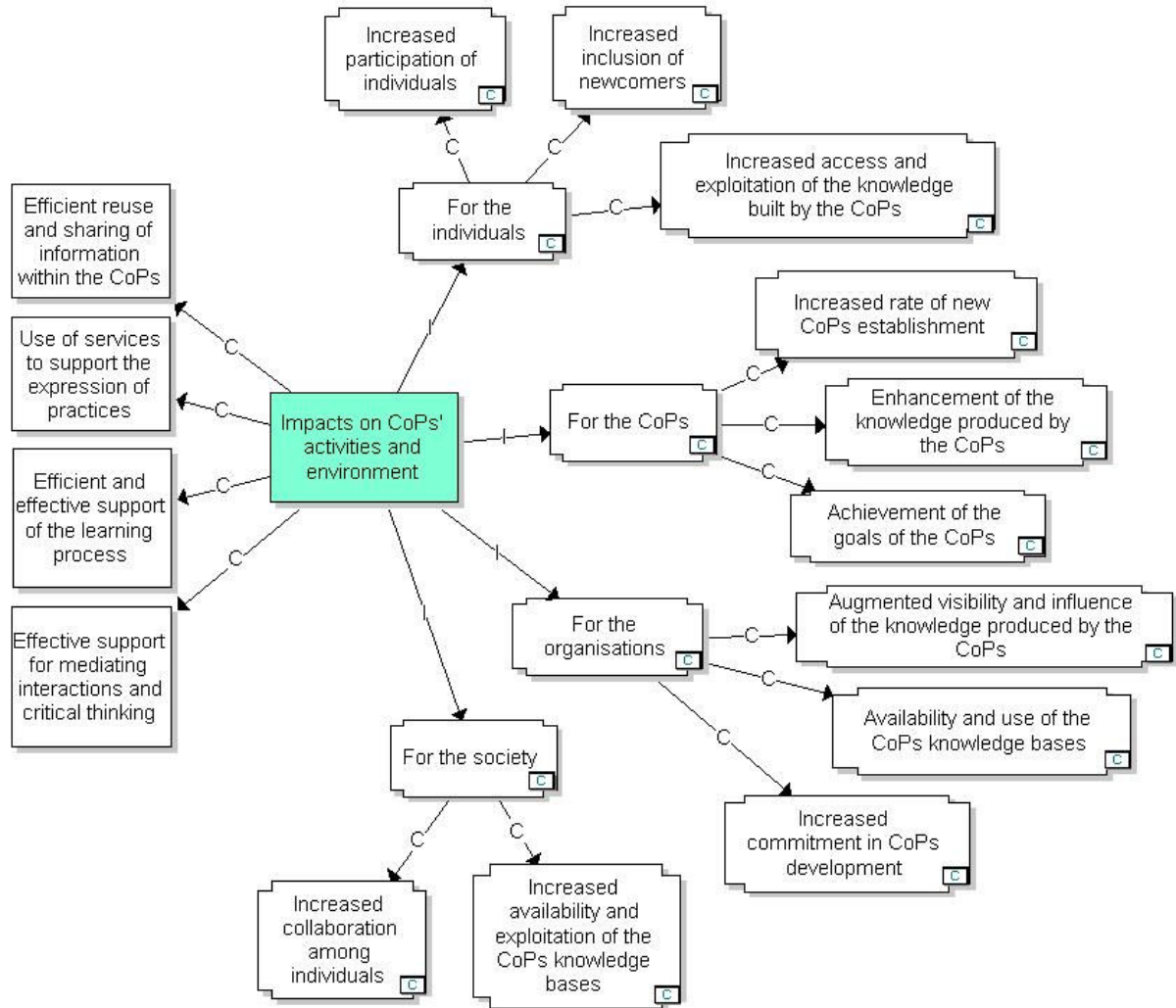


Figure 4.3 – The expected results of the methodology

Caption:

“C” means “is Composed of”
 “I” means “Instantiates”

□ = Objects, products
 □ = Instances, tracks

The different expected impacts on the CoPs’ activities and their environment are described on the left of the figure above and the indicators (or tracks) of their achievement are described on the right: these indicators concern the individuals, members of the CoPs, the CoPs themselves, the organizations in which the CoPs are placed and the society in general.

We now describe each process in more detail. At the present stage of PALETTE (July 2006), the first two steps “1. Establishing the collaboration” and “2. Modelling the activities of the CoPs” as well as the process of “Analysing and categorizing tools” are under way.

4.2.1 Analysing and categorizing tools

This process intervenes at different times into the methodology and aims at providing an inventory and a categorization of the tools developed by the PALETTE’s partners, used by the CoPs or existing on the market. WP1 is responsible of this task. It works out categories of tools based on different sources (the principles regulating the box “Categories”). Four steps punctuate the process: (a) designing an online questionnaire, (b) fulfilling the questionnaire by the PALETTE’s partners, (c) a definition of the tools from a user perspective and (d) an analysis of the data collected towards the questionnaire.

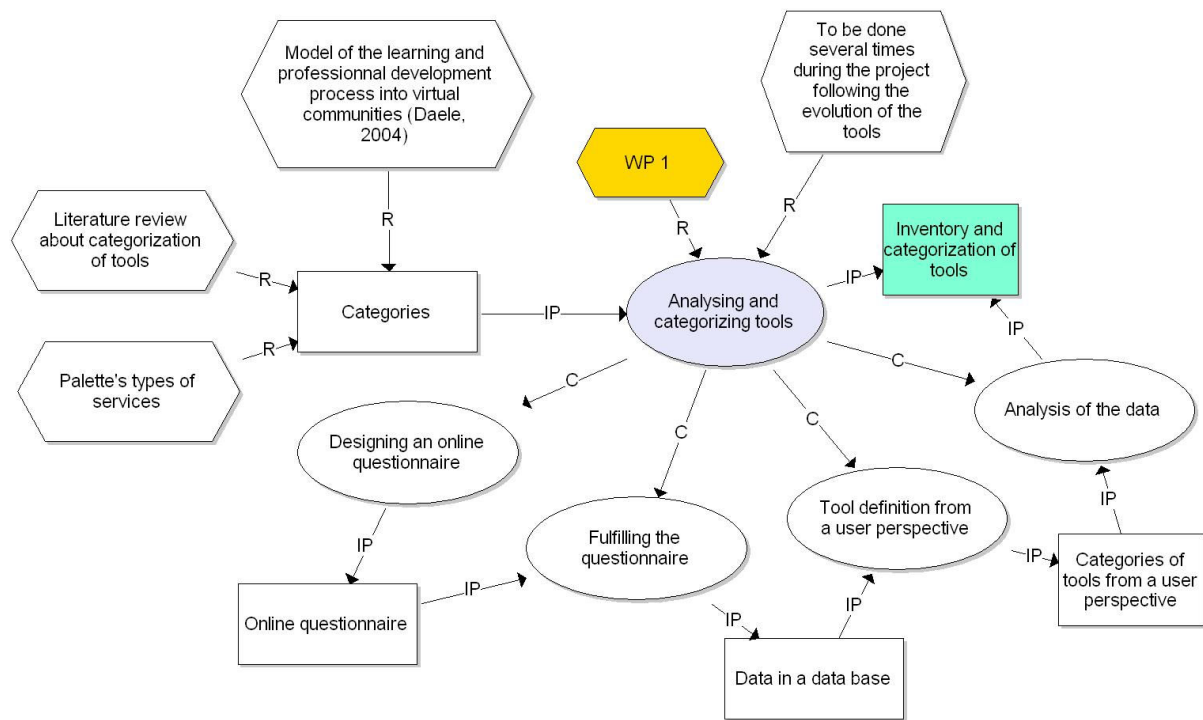


Figure 4.4 – Analysing and categorizing tools

Caption:

“R” means “Regulates” (or “acts on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”

○ = Processes, actions
 ⬡ = Actors, principles
 □ = Objects, products

The inventory produced is reused in different processes of the methodology, as suggested in the figure below (

Figure 4.5): the design of models of the CoPs' activities (process 3), the design of prototypes (process 4) and the dissemination (process 10). We will specify this reuse in the associated processes.

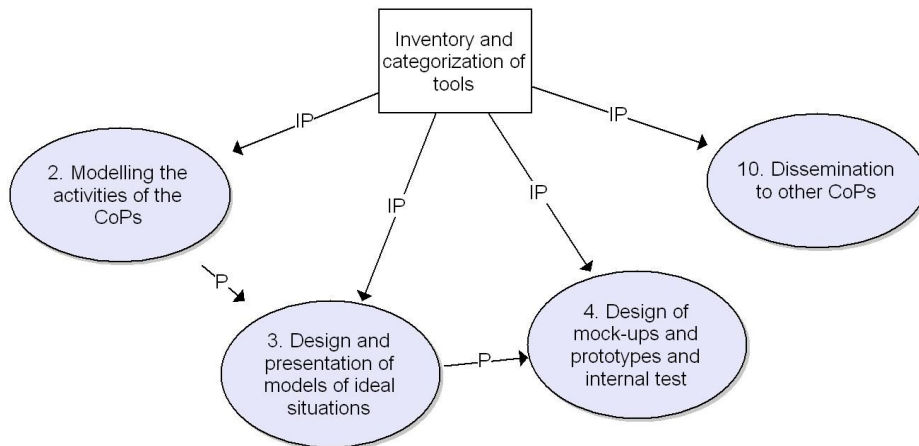


Figure 4.5 – The use of the inventory of tools within following processes

Caption:

<p>“P” means “Precedes” “IP” means “Input/Product-Output”</p>	<p>○ = Processes, actions □ = Objects, products</p>
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4.2.2 Establishing the collaboration²⁶

At the end of the first step, an agreement is reached or the project ends. The CoP – in its entirety if it is small, or delegates – needs to understand:

- the intended steps and the requirements,
- that ethical principles such as confidentiality are respected,
- that there is an interest for the community to become involved in the process and that they are free to retreat at any moment.

At this stage, the negotiation allows us to adapt the collaboration modalities with each CoP without modifying the purpose of the project.

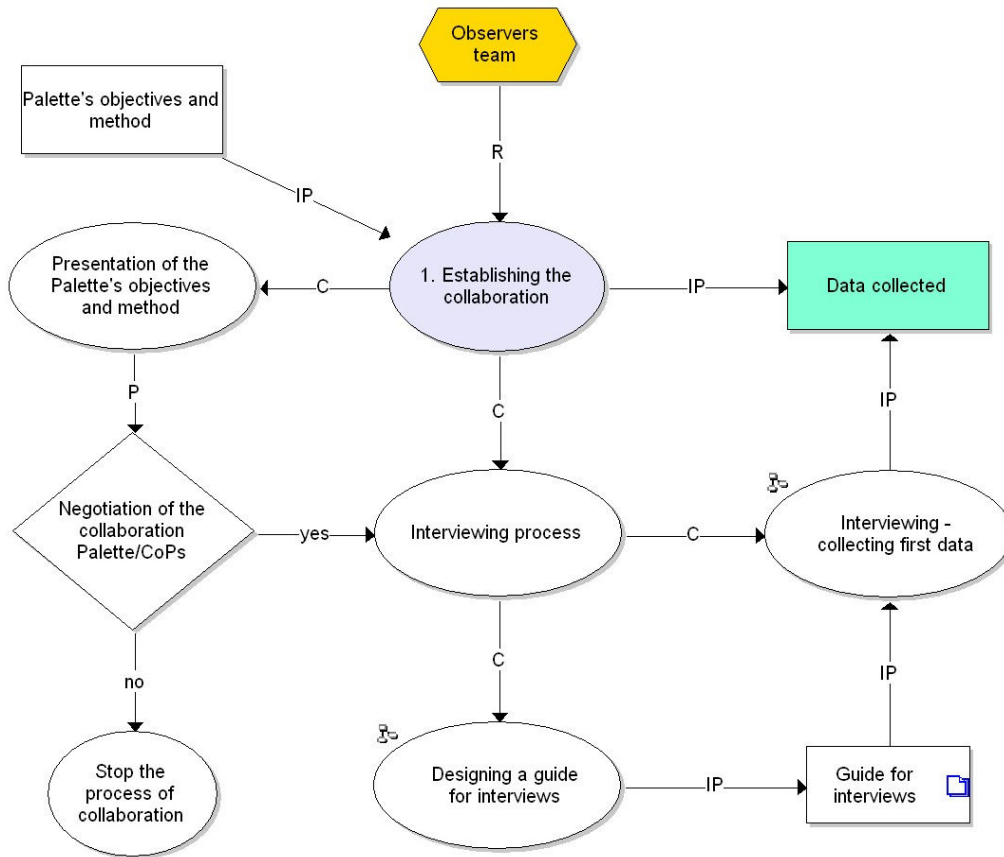


Figure 4.6 – Establishing the collaboration

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”
 ◊ = Decision

○ = Processes, actions
 ⬡ = Actors
 □ = Objects, products

²⁶ Further details of the implementation of this process are described in section 3.2.2.

After a presentation of the PALETTE’s objectives and method as well as a negotiation of the collaboration, the first participatory activity with the CoPs is an interview conducted by the “Observers team”. This team has designed a guide for the interviews²⁷ and collected the first data.

The process of designing a guide for the interviews (

Figure 4.7) aims at providing the team of observers with a document for conducting their interviews following the methodological principles and containing a description of the objectives and the ethical issues of the interview process, as well as the list of questions to ask and some tips. A model of learning and professional development within CoPs (Daele, 2004) and ethical issues (Miles & Huberman, 2003; Pudelko, Daele & Henri, 2006) underlie this activity.

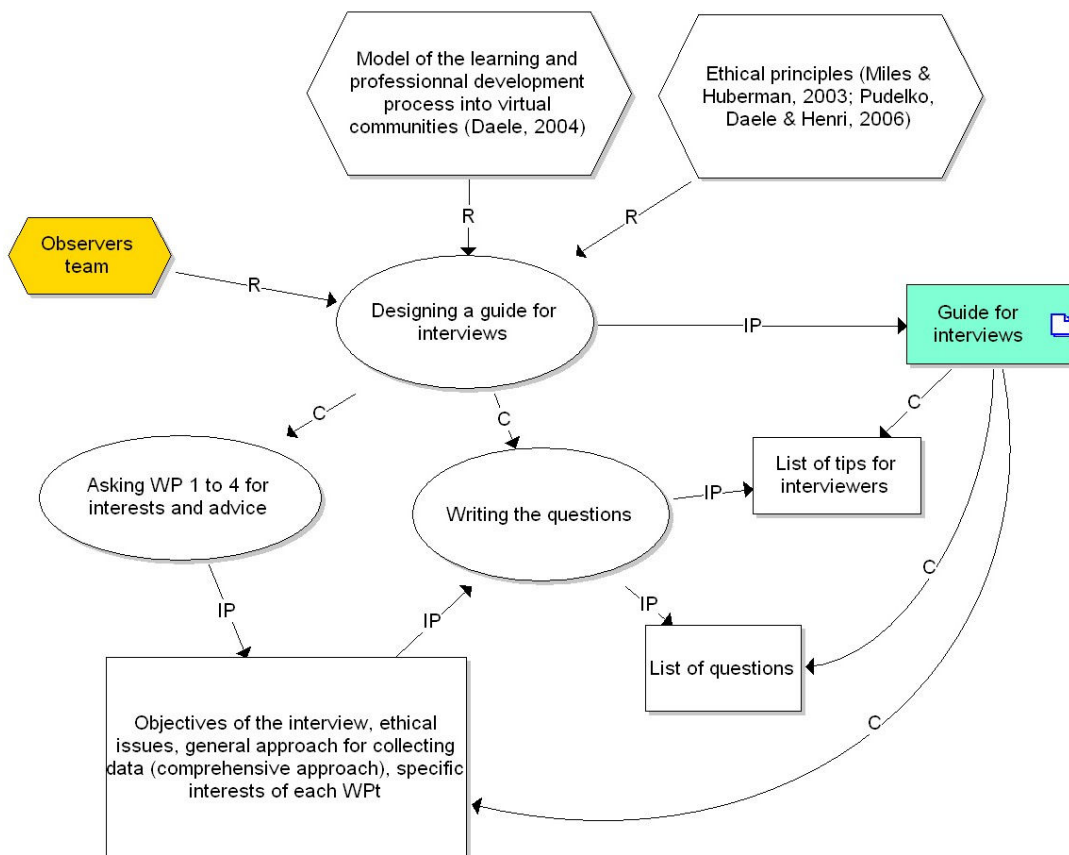


Figure 4.7 – Designing a guide for interviews

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”

○ = Processes, actions
 ⬡ = Actors, principles
 □ = Objects, products

²⁷ The complete Interview Guide is given in Annex 2.

After this process for preparing the interviews, the interviews are conducted by the observers and aim at collecting data. Figure 4.8 describes the interviewing process. It is based on qualitative research principles (Kaufmann, 1996; Mucchielli, 1996) and it implied the creation and the management of a team of “CoPs observers” within WP1. The observers contacted the interviewees and conducted the interviews aiming at comprehending the CoPs’ life and activities.

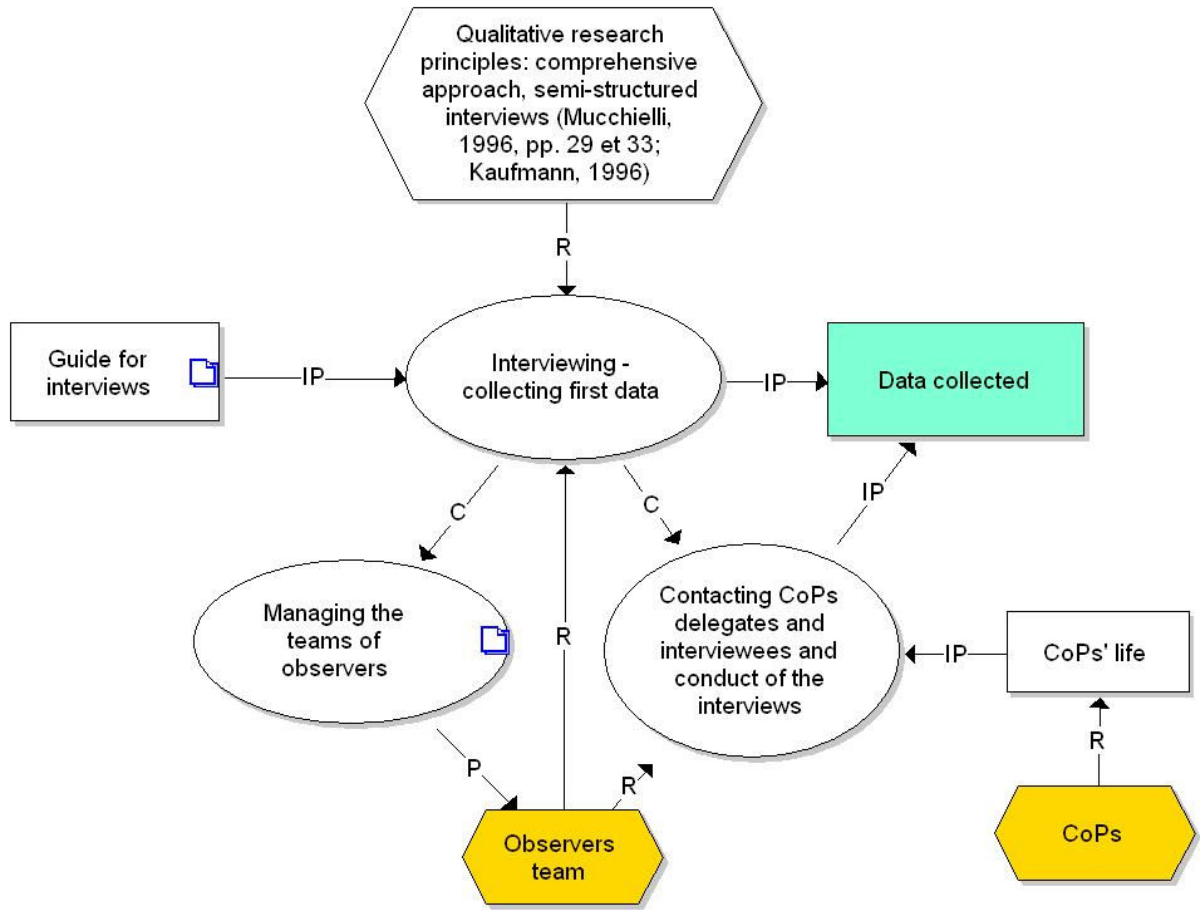


Figure 4.8 – Interviewing and collecting first data

Caption:

<p>“R” means “Regulates” (or “has an effect on”) “C” means “is Composed of” “IP” means “Input/Product-Output” “P” means “Precedes”</p>	<p>○ = Processes, actions ⬡ = Actors, principles □ = Objects, products</p>
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Figure 4.9 describes the different data collected. Some data are collected thanks to technical devices (software and audio/video devices) and they consist of the interviews themselves and other documents produced by the CoPs. During the interviews, the interviewees as delegates or members of their CoP express the interest of their community to participate in PALETTE.

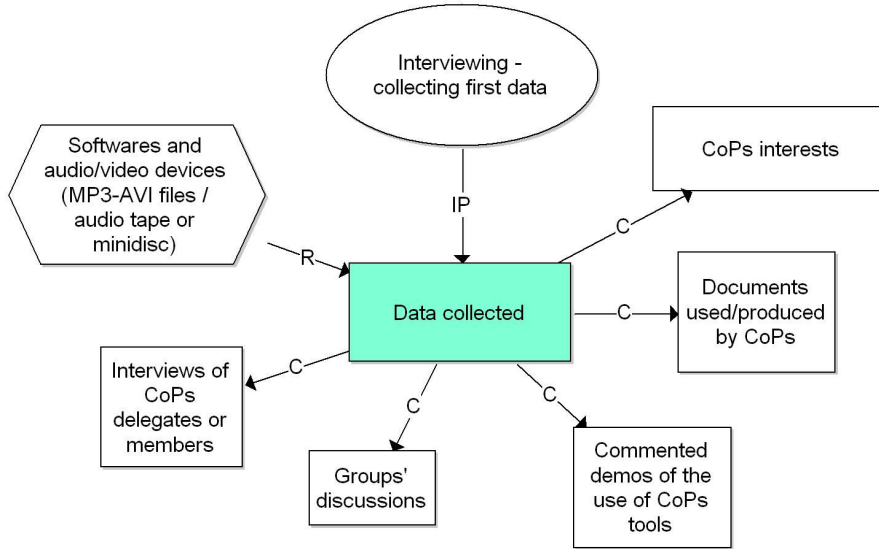


Figure 4.9 – The data collected

Caption:

<p>“R” means “Regulates” (or “has an effect on”) “S” means “is a Sort of” “IP” means “Input/Product-Output”</p>	<p>○ = Processes, actions ⬡ = Principles □ = Objects, products</p>
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4.2.3 Modelling the activities of the CoPs²⁸

This process concerns a first analysis and modelling of the data collected (Figure 4.10). The main actor is the data condensation team of WP1. Two inputs are used within the process: the inventory and categorization of tools for representing the uses and the appropriation of the tools and the data collected. Then, five main steps lead to the elaboration of “validated models”:

- Proposing grids for the data condensation process. This step mainly aims at choosing a representation mode useful both for the WPs 2, 3, 4 and 5 and for the CoPs. The advices provided by Miles & Huberman (2003) for designing matrices have been useful. The presentation of data with short texts and MOT models has been chosen;
- Processing the raw data for obtaining the transcripts and the minutes of the interviews;
- Analysing the content of the data following the method of category-specific analysis described by Bardin (1983) and L’Ecuyer (1990);
- Presenting the analysed data with different software for the text-based descriptions of the activities of the CoPs and their graphical representations;
- Validating and enhancing the representations from the developers through discussions with the CoPs (see
- Figure 4.11).

²⁸ Further details of the implementation of this process are described in sections 3.2.2 and 3.3.

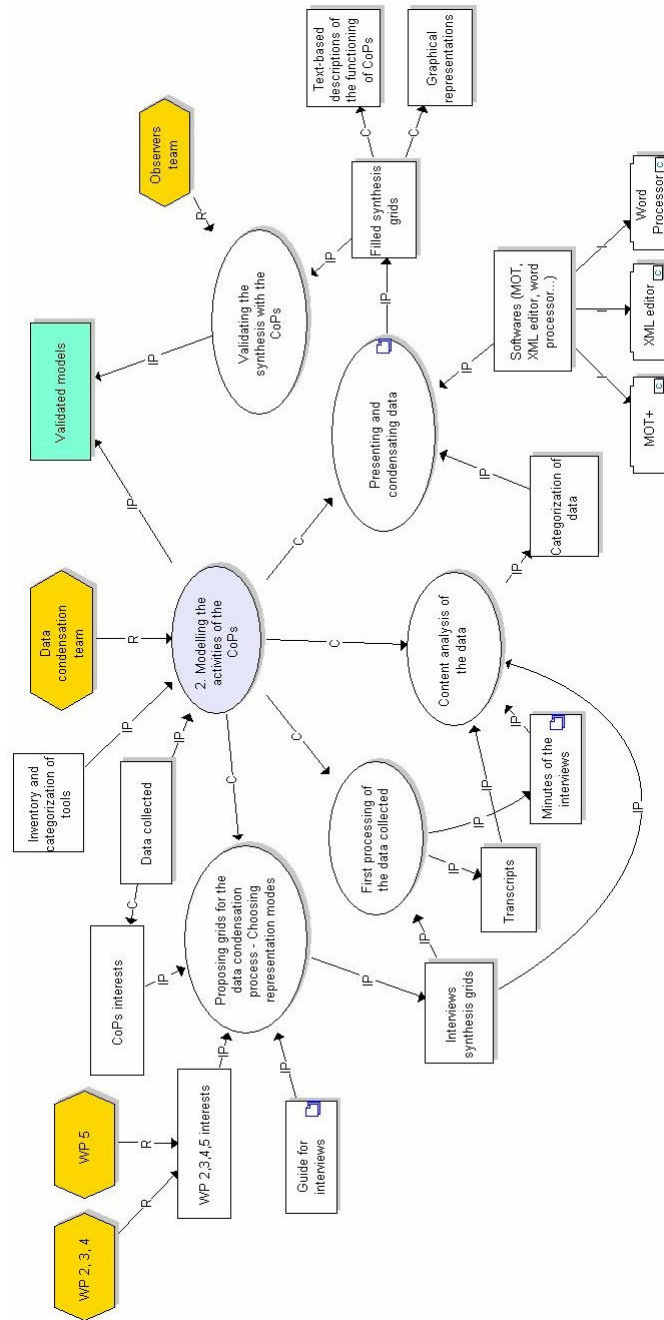


Figure 4.10 – Modelling the activities of the CoPs

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”
 “P” means “Precedes”

○ = Processes, actions
 ⬡ = Actors
 □ = Objects, products
 ▭ = Instances, tracks

The last step is important for the collaboration with the CoPs because it could allow the CoPs to better understand their actual functioning. It also could arouse their interest for conceiving new situations and solutions. Precisely, the validation process below uses the synthesis grid of the data analysis and is composed of two sub-activities: a contact with the CoPs and discussions within focus groups for producing validated models of the CoPs’ activities.

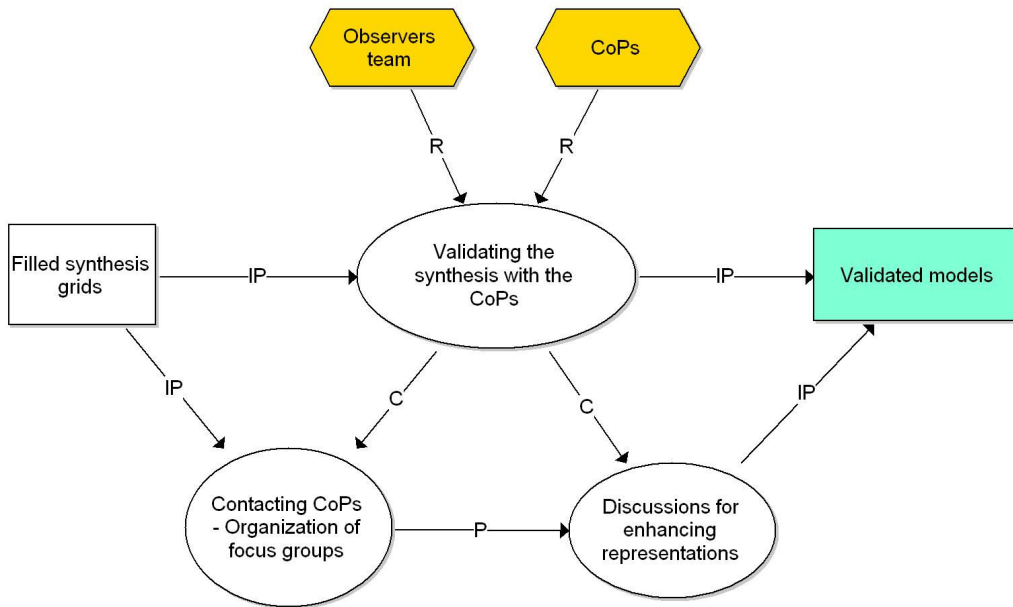


Figure 4.11 – Validating representations with the CoPs

Caption:

<p>“R” means “Regulates” (or “has an effect on”)</p> <p>“C” means “is Composed of”</p> <p>“IP” means “Input/Product-Output”</p> <p>“P” means “Precedes”</p>	<p>○ = Processes, actions</p> <p>⬡ = Actors</p> <p>▭ = Objects, products</p>
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4.2.4 Design and presentation of models of ideal situations

This process (see Figure 4.12) is adapted from Checkland’s Soft System Methodology (Checkland, 1981). At this point, the developers elaborate one or more possible technological and pedagogical solutions in order to model a new activity scenario representing an ‘ideal’ situation. This new scenario can then be compared to the actual situation by way of discussions with the members of the community, structuring the negotiation process between the developers and the CoPs. This aims at stimulating a reflexive process about the community’s practices and at engaging its members in the design of the tools, their use and the support of the appropriation process. Several meetings may be required in order to achieve joint and negotiated scenarios acceptable by the partners (developers and CoPs) and feasible in their particular context. At this stage of the project, an acceptable solution is defined as one which does not bear too heavy a charge on the members of the community. Together, developers and members of the community thus try to optimize the workload induced by the use of new tools and new processes.

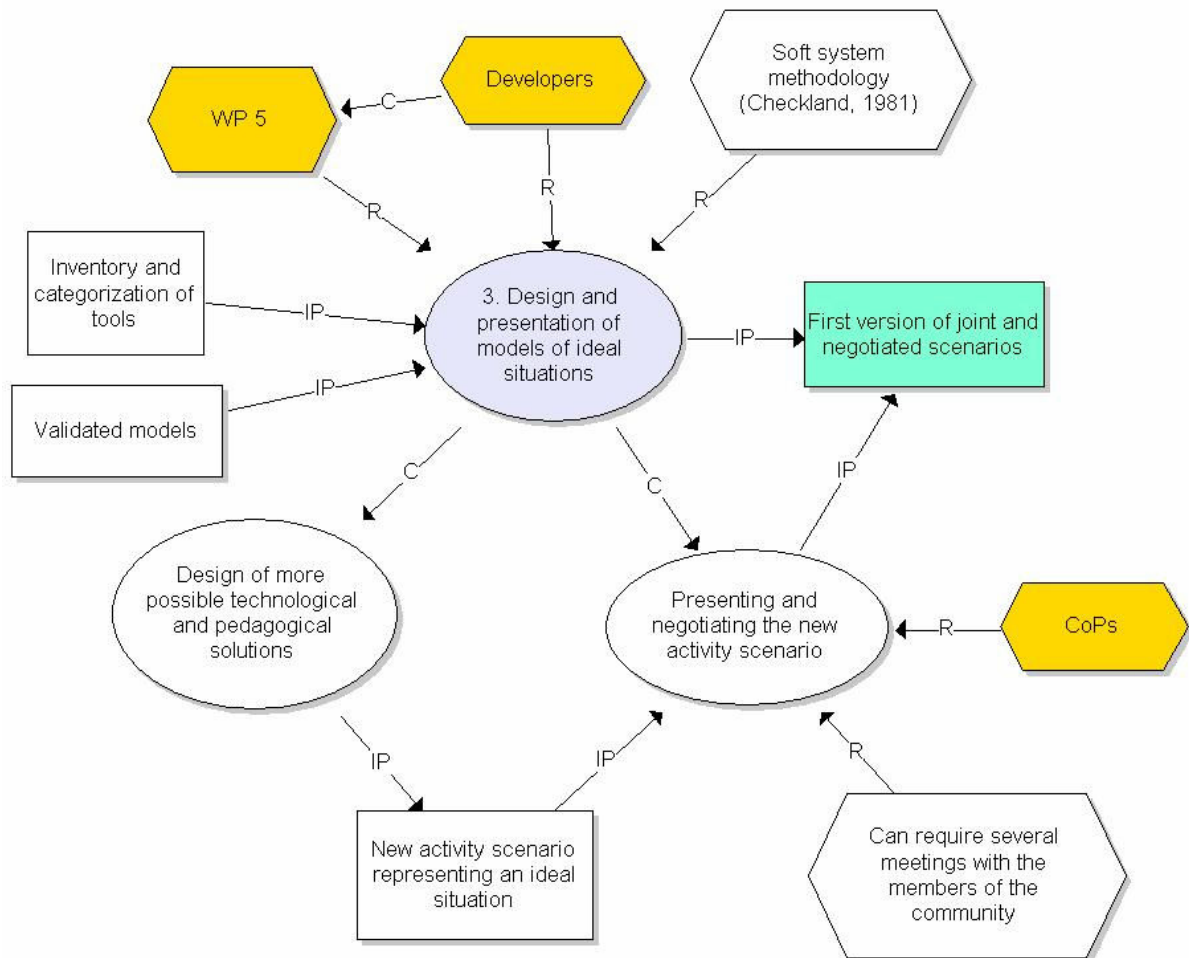


Figure 4.12 – Design and presentation of models of ideal situations

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”
 “S” means “is a Sort of”

○ = Processes, actions
 ⬡ = Actors, principles
 □ = Objects, products

4.2.5 Design of mock-ups and prototypes and internal test

The aim here is to develop and test a first version of prototypes produced by the developers. It is a first “internal diagnosis” of the tools. These internal tests aim at checking that the solutions being developed correspond really to the solution previously negotiated. In addition, developers try to establish a first measurement of the degree of acceptability by evaluating the instrumental distance and competences necessary to implement the solution. Thus the developers among themselves develop a common vision of the solution (Figure 4.13).

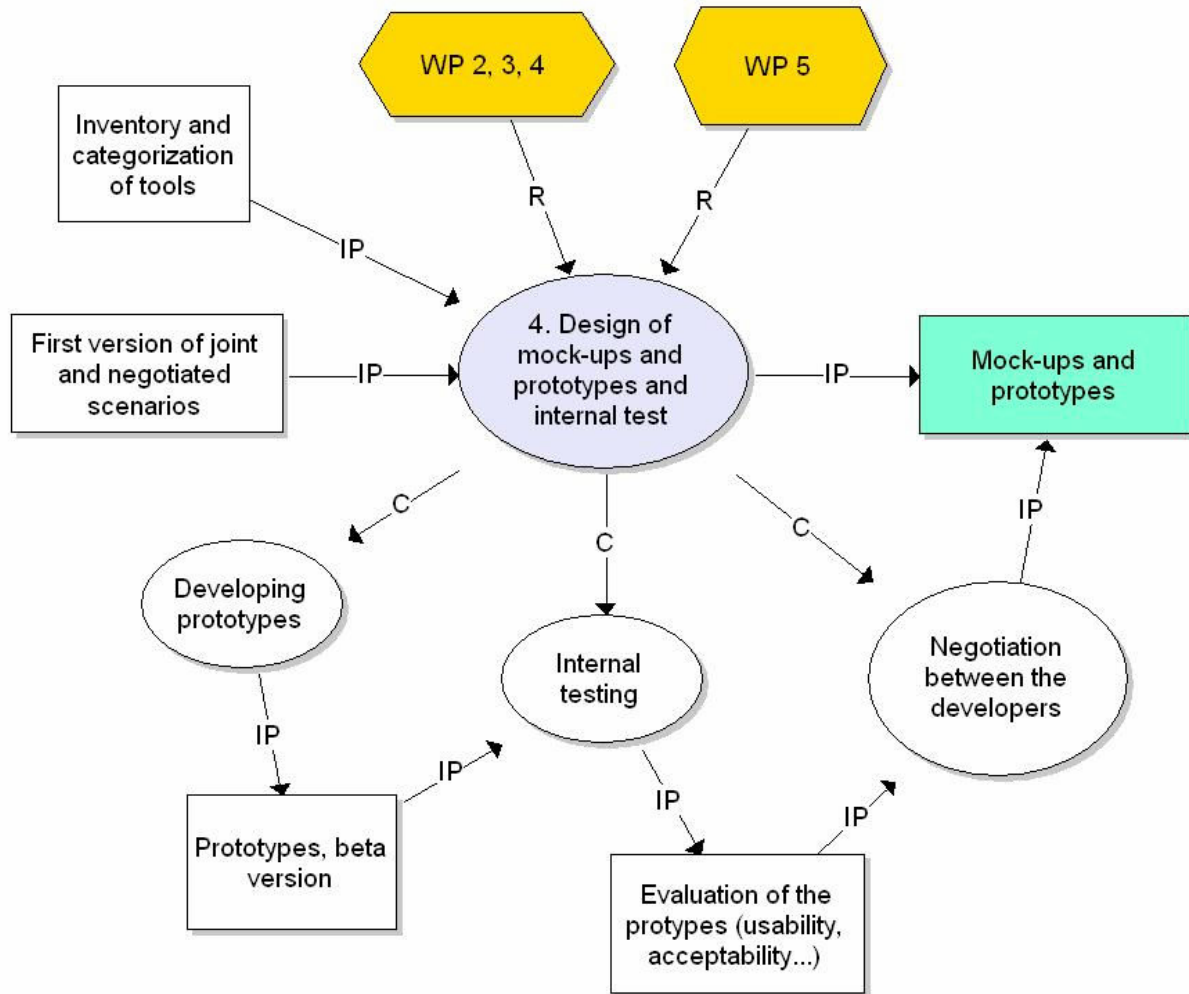


Figure 4.13 – Design of mock-ups and prototypes and internal test

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”

○ = Processes, actions
 ⬡ = Actors
 □ = Objects, products

Figure 4.14 depicts the internal testing of the prototypes by checking that the solutions proposed correspond to the solution negotiated with the CoPs and by measuring the degree of acceptability and competences necessary for using the solution within a CoP.

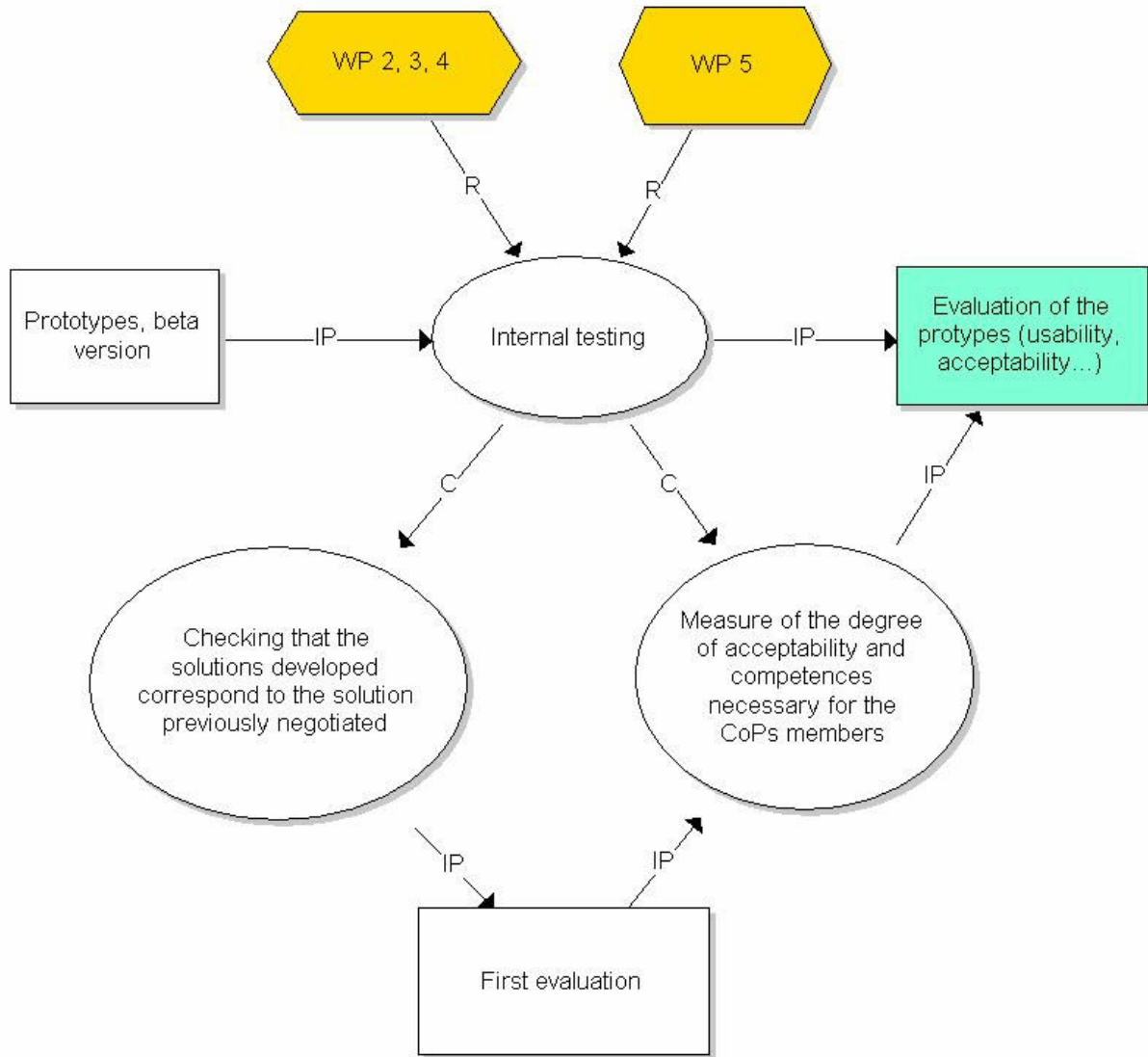


Figure 4.14 – Internal testing of the prototypes

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”

○ = Processes, actions
 ⬡ = Actors
 □ = Objects, products

4.2.6 Testing prototypes

The aim of this process (

Figure 4.15) is to test the prototypes with delegates of the community. The test is designed to simulate authentic actions performed by the community. The delegates of the community with the developers strive to perform a second measurement of the degree of acceptability of the solution, and, if needed, negotiate a more acceptable solution. In this case, process 4 is repeated. Thus, the developers and the delegates develop a common vision of the new solution.

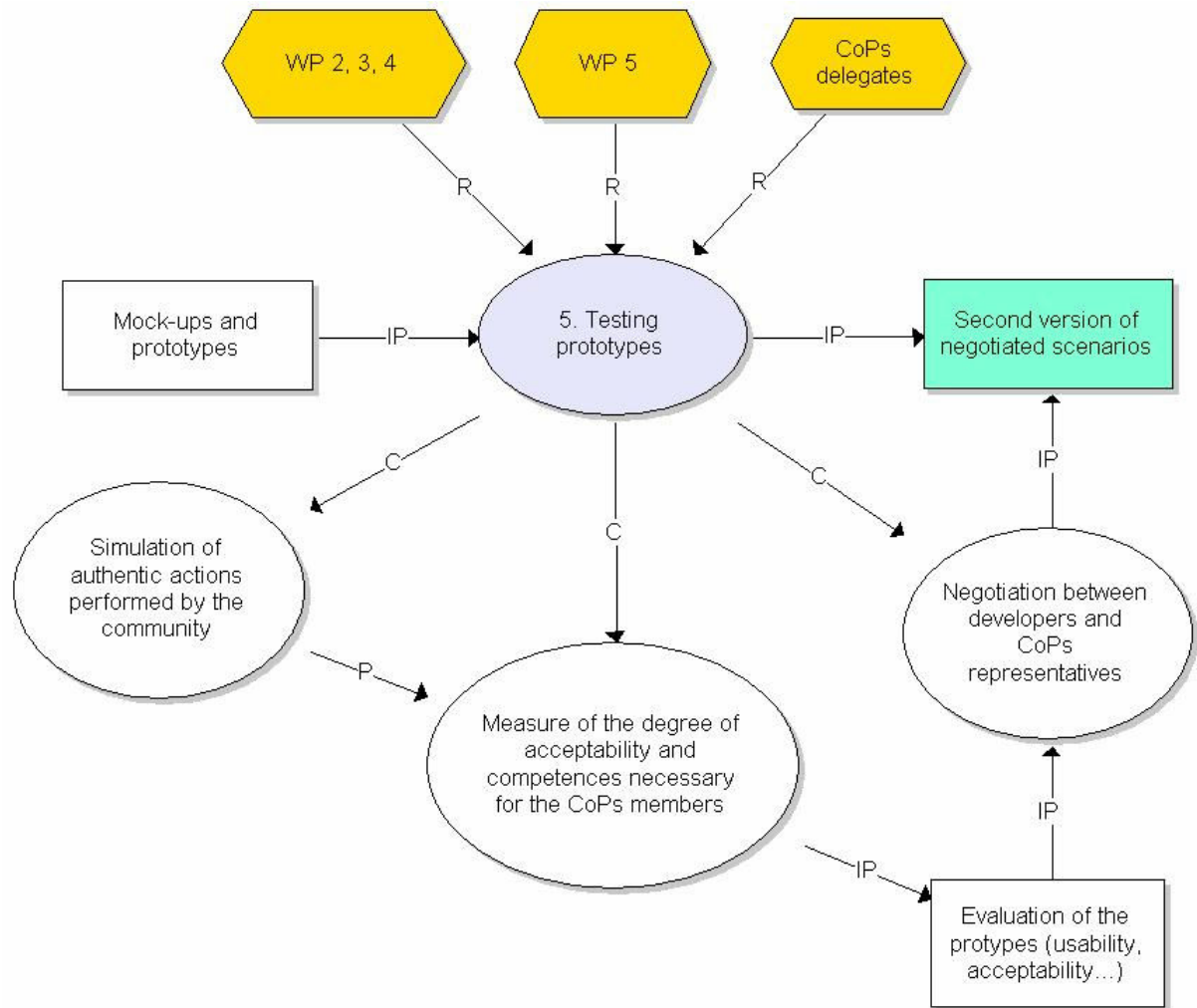


Figure 4.15 – Testing prototypes

Caption:

<p>“R” means “Regulates” (or “has an effect on”)</p> <p>“C” means “is Composed of”</p> <p>“IP” means “Input/Product-Output”</p> <p>“P” means “Precedes”</p>	<p>○ = Processes, actions</p> <p>⬡ = Actors</p> <p>▭ = Objects, products</p>
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4.2.7 Presentation of the prototypes to the CoPs

This stage aims at designing modalities for the experimentation of the prototypes with the CoPs.

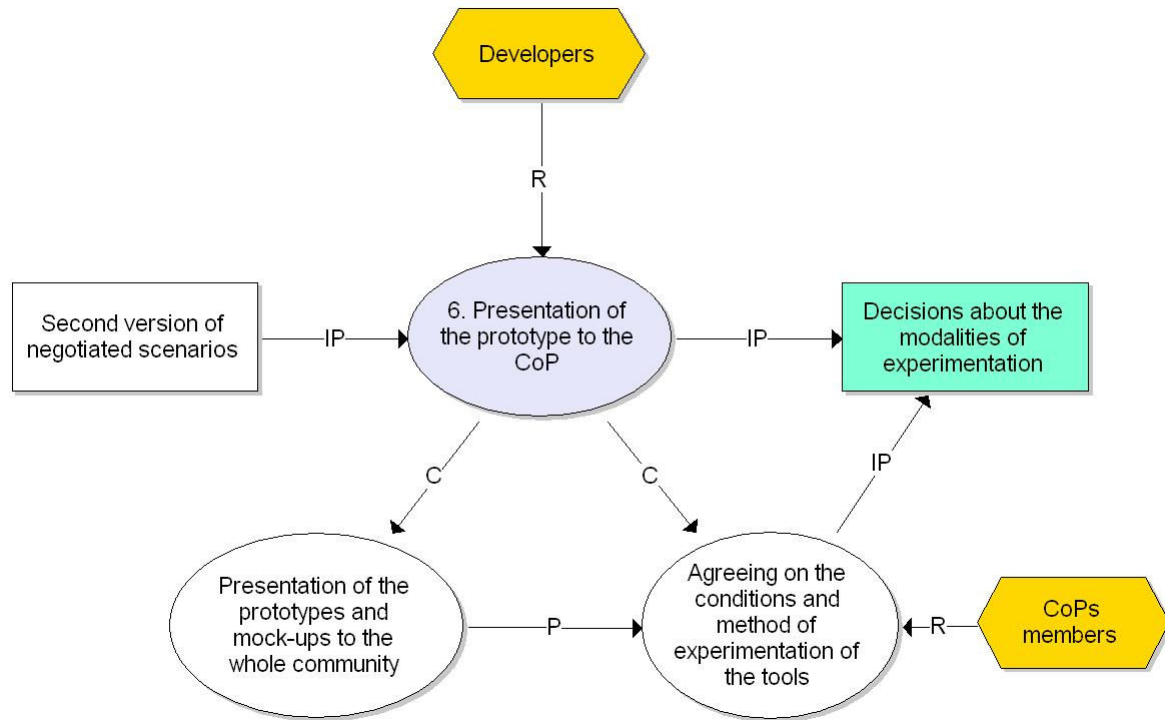


Figure 4.16 – Presentation of the prototypes to the CoP

Caption:

<p>“R” means “Regulates” (or “has an effect on”) “C” means “is Composed of” “IP” means “Input/Product-Output” “P” means “Precedes”</p>	<p>○ = Processes, actions ⬡ = Actors □ = Objects, products</p>
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These modalities could be different for each CoP. However, two steps are required: the presentation of the prototypes or mock-ups to the CoPs and a discussion about the experimentation.

4.2.8 Experimentation with the CoPs

The seventh process aims at experimenting with the prototypes by observing the instrumentation and instrumentalization processes (Rabardel, 1995), and individual and collective learning carried out. To be reliable and valid, the experimentation has to be led over a significant period of time.

- For the instrumentation process, observation focuses on the appropriation of the constituent functions of the tools (functions envisaged by the developers).
- For the instrumentalization process, observation focuses on made up functions (not envisaged by the developers).
- For individual and collective learning carried out, observation focuses on the various types of mediation processes which lead to it: praxeologic, sociocognitive and reflexive mediation processes.

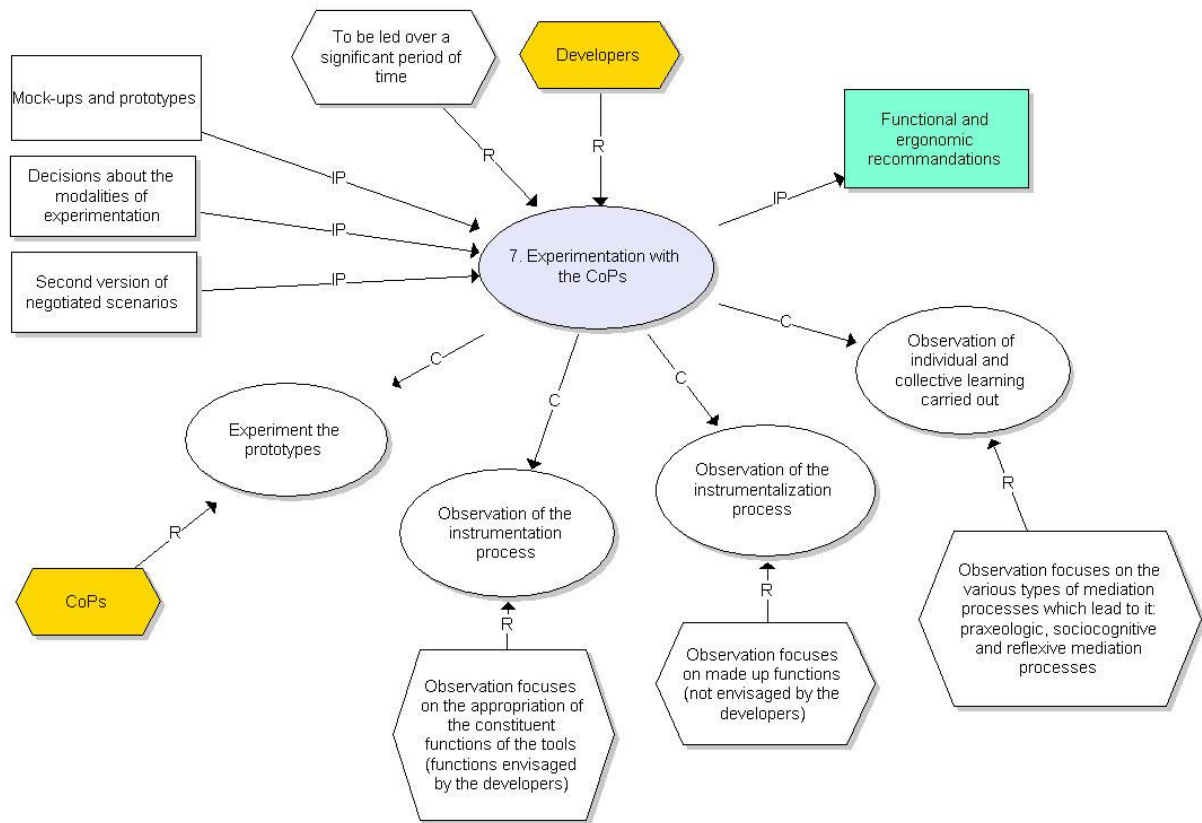


Figure 4.17 – First experimentation with the CoPs

Caption:

“R” means “Regulates” (or “has an effect on”)

“C” means “is Composed of”

“IP” means “Input/Product-Output”

○ = Processes, actions

⬡ = Actors, principles

□ = Objects, products

4.2.9 Modifications and presentation of the prototypes

According to the results of the experimentation of tools in use, the developers modify the prototypes. Again, an internal testing precedes the presentation of the prototypes to the CoPs and the negotiation about the modalities of a second experimentation. The CoPs participate in the presentation of the prototypes and in the agreeing of the modalities of the second experimentation.

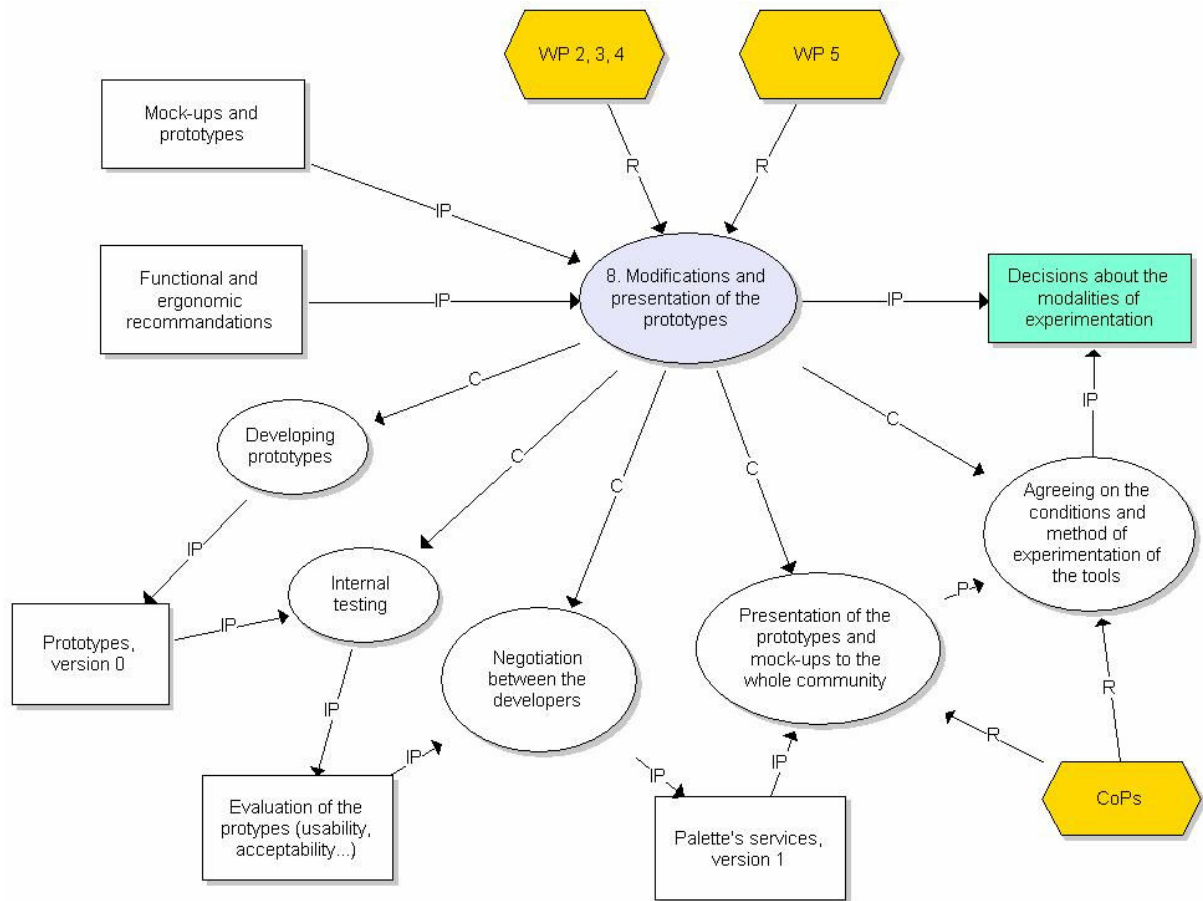


Figure 4.18 – Modifications and presentation of the prototypes

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”

○ = Processes, actions
 ⬡ = Actors
 □ = Objects, products

4.2.10 Second experimentation

Following the decisions about the modalities of the second experimentation, observations are conducted in the same way as in process 7. The product of this process (Figure 4.19) comprises recommendations for the use of the services and for the functioning of the CoPs.

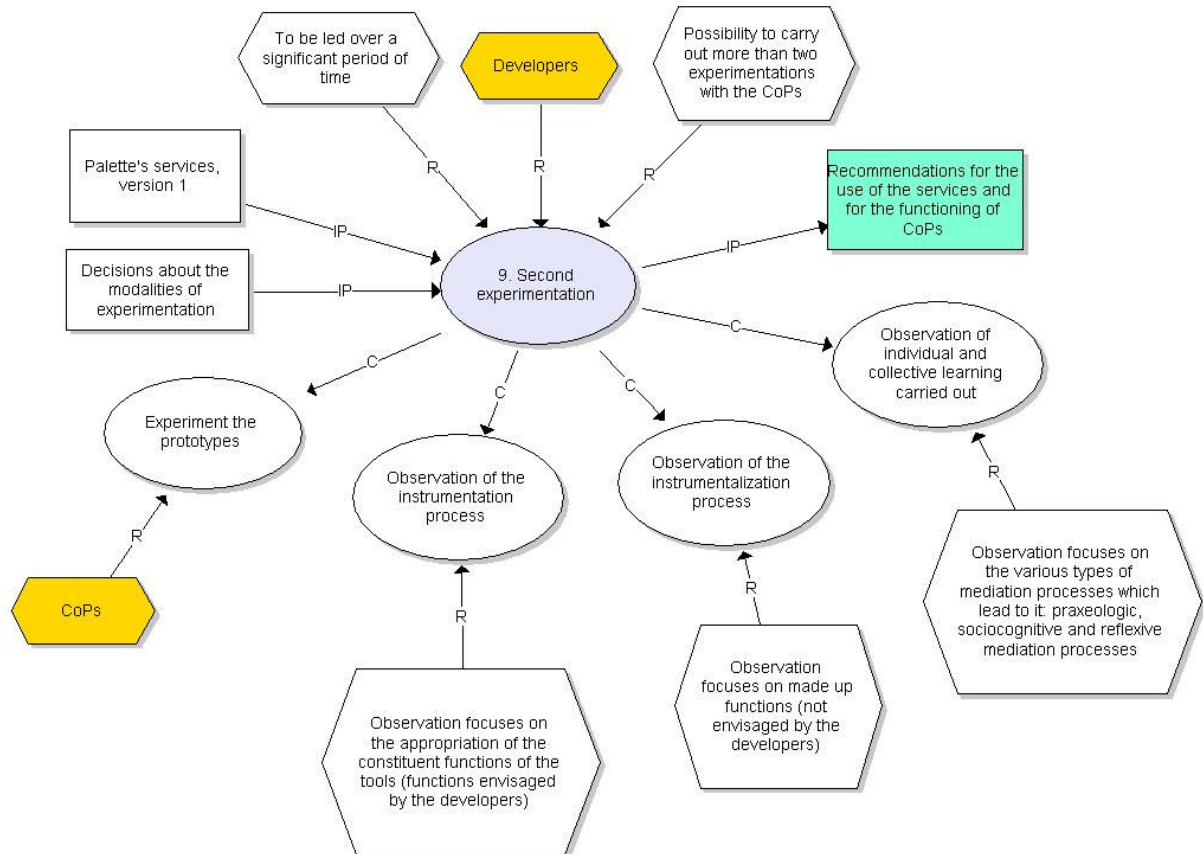


Figure 4.19 – Second experimentation

Caption:

“R” means “Regulates” (or “has an effect on”)
 “C” means “is Composed of”
 “IP” means “Input/Product-Output”

○ = Processes, actions
 ⬡ = Actors, principles
 □ = Objects, products

4.2.11 Dissemination to other CoPs

This last process aims at providing other CoPs and scientific community with the products of the project: the PALETTE’s services, the documentation about these services and training. It is based both on the inventory of the tools and the recommendations for the use of the PALETTE’s services and about the functioning of CoPs. This is depicted in the figure below.

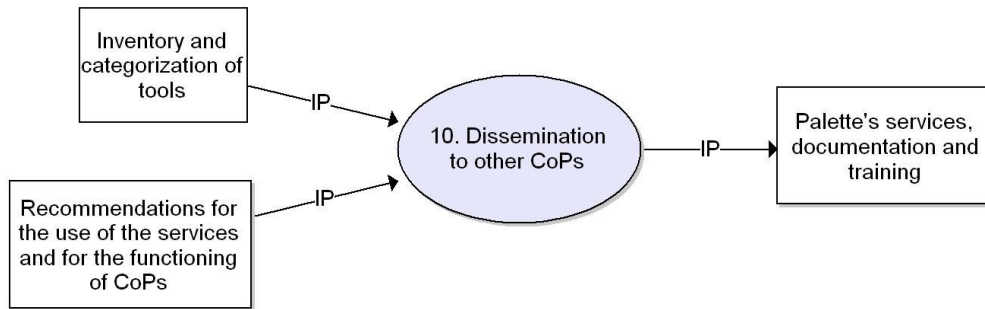


Figure 4.20 – Dissemination to other CoPs

Caption:

<p>“IP” means “Input/Product-Output”</p>	<p>○ = Processes, actions □ = Objects, products</p>
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4.2.12 Following-up and evaluation of the CoPs’ reflection about their activities

This last process of the methodology acts on the ten precedent processes by accompanying the CoPs through the reification of their activities and their produced knowledge. This reification is continually used and reused within the other processes through the different participative activities: interviews, validation of the models produced and of the scenarios, negotiation of the modalities of experimentation, etc. These activities, like in the CoPs themselves, provide a framework for negotiation of meaning, reification of knowledge, and reflection about the CoPs’ functioning and learning.

5. Conclusions and perspectives

The PALETTE project, based on a participatory design approach and gathering fourteen partners and eleven CoPs is ongoing now. Its methodological approach has been discussed and clarified through the collaborative work done in WP1.

Referring to the Actor Network Theory, some principles have been described and implemented, such as the concept of translation including the definition and sharing of some common problematic, the identification and the enrolment of different actors in participative activities coming out of the development of tools and of first data analysis that can be considered as inscriptions (i.e. interview guide, pieces of methodological advice, data analysis template, etc.) and blackboxes. WP1 has been and is the ground allowing to test the implementation of our methodological principles with the PALETTE partners.

The participatory design methodology to be followed in PALETTE, composed of twelve sub-processes, has been described in the previous section. The first process mentioned, namely “analysing and categorizing tools”, has been achieved. Its results are presented in another deliverable of WP1²⁹. At the moment, the first two phases directly referring to the implication of the CoPs in the development of the PALETTE services and scenarios of uses are implemented: the collaboration with most of the CoPs (8 out of 11) has been established and a first part of their activities has been modelled. This process will continue. More information will be collected to provide more inputs to the developers and more CoPs are going to be interviewed. Based on the first data analysis, scenarios of use of developers’ services related to ‘ideal’ situations that could match with CoPs interests and activities will be designed and proposed to the CoPs, following the ten processes described in the methodology. This process is agile, tries to combine actors’ interests and does not let them bear a too heavy charge. A continuous evaluation of the process will support the reification of their activities and knowledge. At each phase, the enrolment of the actors and the negotiation on the way to conduct the activities are very important.

Several participative activities gathering different actors can be considered as successful and provide now relevant tools and process to work on such kind of project. They can be considered as Obligatory Passing Points that enrolled the actors about a specific and concrete problematic.

The enrolment of the partners in the creation of the interview guide allowed us taking into account many dimensions of CoPs’ life and different partners’ interests. The creation of a CoPs observers community permitted to manage the complexity of the task and the need to share the related experience. The CoP’s observers animation cell allowed a regulation process avoiding us to focus only on one kind of CoPs and also helped the organisation of the data communication to the partners and the management of their feedbacks. Information based on the interviews is available in different formats (audio, minutes by minutes timing succinctly describing the content, transcriptions of some audio records, synthesis including vignettes and graphical representations). Complementary kind of information requested by the developers will also be provided (e.g. tracks from forums discussion).

²⁹ D.PAR.02 - Categorization of tools and pedagogical approaches related to collaborative learning and CoPs

Nevertheless, even if the process started well, for the future, we have to be aware of several points concerning:

- the CoPs representativeness and their motivation to fully participate to the project: bonds with some CoPs have been established, but we are not yet sure that they will continue to collaborate all along the PALETTE project. They are from different domains (6 of the teaching domain, 3 of the management and 2 of engineering domain) and they have different stories and characteristics. This is richness but sometimes their way of functioning and context does not permit them to be very involved in a project like PALETTE. Some might not be interested in the proposed services, for instance, having not enough time to dedicate to new perspectives or considering that the foreseen services do not fit with their actual needs. We also have to consider the representativeness of the people interviewed and the implication of different kinds of CoPs members when continuing the participatory design process. This implies to meet more people. That is why the community of observers has proposed to consider first only three CoPs (one per domain) to go further and to collect a maximum of data with CoPs that really will (on a volunteer basis) to participate. Moreover, the possibility of adding new CoPs if necessary has been envisaged, for instance to answer specific need of the developers (e.g. work with a CoP that really needs to use a specific foreseen service and to take time to experiment its use through scenarios designed collaboratively). But if we start with CoPs members who are fans of innovations and technology, we have not to forget that we will have to be able to transfer our results to 'average' CoPs. This is planned through WP7 (dissemination) and 8 activities (training).
- The necessary alignment of actors' interests. Even if we all collaborate to the same project and share a general common goal, we have different profiles and interests. We are working with teaching specialists, computer scientists, sociologists, CoP's animators, etc. After six months, we can nevertheless attest that the difficulties linked to this heterogeneity of interests are less and less sensitive. This is mainly due to the PD methodology we conceived and are implementing, that led us for example to identify boundary objects about which an actual negotiation between all the partners is realized. This alignment of actors' interests should guarantee that the project will be a success at several levels: for individuals (e.g. for the CoPs members or researchers), for organizations confronted to the same kinds of concerns, and finally for the society (cf. DoW pp. 24-26).
- The future participative activities have to be concrete and relevant to the various next phases of the project. These phases described in the methodology are like tasks to be done and will necessitate the enrolment of different actors in specific participative activities that will be negotiated. Some activities, such as interviews and data condensation will continue. It would be interesting to suggest to some technical partners to take part to these tasks and do not assign this kind of work only to pedagogical partners. As already described in DoW, the complementary expertises of the partners will contribute to each phase of the R&D process.
- The proposed participatory design process is really time consuming. Alignment of the actors' interests, agreement on participative activities to work on, sharing different points of views, adopting a given strategy or tool, etc. take a lot of time (more than if one works alone or with just one or two people), but it should lead to richer and stronger results, as well as to the durability of the results since the participation of the different actors should lead to useful solutions and to the quality of the tools and

scenarios developed. PALETTE partners may have a large amount of time to work on the project, but at the moment the CoPs have not. This process has to be negotiated and evaluated all along the time to optimize the results of the project.

Taking into account the success and lessons learned during the first six months of the project, the PALETTE partners are now ready to go further in the implementation of the methodology and to design collaboratively useful services and scenarios for CoPs.

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Annex 1: Summary of the MOT grammar

Excerpts from Paquette et al. (2006)

The benefits of graphical knowledge or cognitive modelling (Ausubel, 1968; Dansereau, 1978; Paquette, 2002) can be summarized as follows: it

- illustrates relationships among components of a complex phenomena
- makes evident the complexity of actors interactions
- facilitates the communication of the reality studied
- ensures the completeness of the studied phenomena
- helps scanning for a general idea because it minimizes use of text.

Concepts (or classes of objects), procedures (or classes of actions) and principles (or classes of statements, properties or rules) are the primitive objects of the MOT graphical language. Other primitive objects are instantiations of these three kinds of classes that correspond to single individuals. These individuals are respectively called examples, traces and statements.

Classes			
Individuals			

Figure 5.1 – Types of knowledge units in MOT

MOT models are thus composed of up to six types of objects or knowledge units. The object type is represented by a geometrical figure as shown in figure 5.1, where each class or individual is represented by a name within the figure. Classes can be related to corresponding types of individuals by an instantiation (I) link.

Table 5.1 presents various possible semantic interpretations of these graphic symbols.

Table 5.1 – Interpretation of various types of knowledge

<i>Type</i>	<i>Interpretation and examples</i>
Concept	<ul style="list-style-type: none"> • Object classes: country, clothing, vehicles... • Types of documents: forms, booklets, images... • Tool categories: text editors, televisions... • Groups of people: doctors, Europeans... • Event classes: floods, conferences...
Procedure	<ul style="list-style-type: none"> • Generic operations: add up numbers, assemble an engine... • General tasks: complete a report, supervise production... • General activities: take an exam, teach a course... • Instructions: follow a recipe, assemble a device... • Scenarios: the unfolding of a film, of a meeting...

Principle	<ul style="list-style-type: none"> • Properties: the taxpayer has children, cars have four wheels ... • Constraints: the task must be completed within 20 days ... • Cause and effect relationships: if it rains more than 5 days, the harvest will be in jeopardy ... • Laws: any metal sufficiently heated will stretch out ... • Theories: all of the laws of the market economy... • Rules of decision: rules to select an investment ... • Prescriptions: principles of instructional design principles ... • Regulating agent or actor: the writer who composes a text ...
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The relations we use between objects are represented by links bearing a letter that specifies the type of relation. There are six basic types of relations or links that connect the various types of objects to form more complex models.

- The **instantiation link (I)**, connects abstract knowledge (classes) to corresponding types of individuals.
- The **composition link (C)** connects a class to other classes, either component attributes or constitutive parts of concepts, sub-procedures of procedures or component principles of more complex principles or set of principles; the C-link can also connect an individual to component individuals.
- The **specialization link (S)** connects two abstract knowledge objects of the same type, in which one is a subclass of the other one; in other words, the second class is more generic or more abstract than the first one.
- The **precedence link (P)** connects two procedures or principles of which the first one must be completed or evaluated before the second starts; in a trace, it also connects individual actions of statements to other subsequent individual actions or statements.
- The **input-product link (I/P)** connects a concept and a procedure, from an input concept to the procedure (examples of the concept are possible inputs) or from a procedure towards an output or produced concept (examples of the concept are possible outputs of the procedure).
- The **regulation link (R)** connects a principle to another class; in the case of a concept, the principle defines the concept by properties to be satisfied (sometimes called “integrity constraints”), or it establishes a law or a relationship between two or several concepts (for example rules); the regulation link from a principle towards a procedure or another principle means that the principle controls the execution of the procedure or the selection of other principles, for example a rule-based system controlling the execution of a process from the outside.

Annex 2: The Interview Guide

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 - 4.6.5 Can you describe the mediation process (collaboration, negotiation, decision making on specific tasks)?
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 - 4.6.7.2 How could you characterize the appropriation of the tools by members? Are they well accepted / used?
 - 4.6.7.3 Which tools (technological and organizational) could be useful for CoPs?

1. Description of the first interview's aim

1. To make a first contact with the community: To learn how the CoPs works, its activities (learning, collaboration, knowledge management, etc.)
 2. To collect the CoPs objectives regarding the PALETTE's ones (to establish a framework of collaboration).
 3. To collect a first list of persons to contact in the CoPs.
- The questions are designed for getting narratives or little stories, anecdotes and lived examples. It's not a questionnaire that the interviewees could answer in writing. They rather have to tell and describe their representations and personal experiences. The questions also try to get more 'objective' data (if written materials exist, the interviewee could give us a copy) but it's important that these data be placed in a situated context.
 - *For instance, if the interviewee describes the tools used by his/her CoP, it's important to know how the tools are used, for what purposes, how the CoP's members appropriate them and negotiate their use, and to get different lived examples.*
 - In our view, the more the interviewees' narratives will be detailed, the more the scenarios we will design afterwards will be valid and consistent and provide interesting guidelines for the conception of services. It will be our work to "translate" the processes and activities described in natural language by the interviewees in more formal forms as tables, schemas, mock-ups or vignettes (Rolland et al., 2001).
 - **Ethical issues:** the following points clarify matters concerning the interviews' ethical framework. These points should be explained to the interviewees from the first contact with the observers. A synthesis of the main ethical issues concerning research about virtual communities can be found in Pudelko, Daele and Henri (2006, pp. 149-150) or in Rourke, Anderson, Garrison and Archer (2001).
1. At first, the interviews are **anonymous**. The observers guarantee that the interviewed persons will remain anonymous. However, on the one hand, within the Palette project, the name of the CoPs will be used. On the other hand, outside Palette, the name of the CoPs could be revealed on condition that the name of interviewed persons or of members of the CoPs stays unrevealed.
 2. The collected **raw data will be treated by the group of observers** through a method of content analysis. The treated data will be anonymous and used by the different partners of Palette. These partners could access the treated data but not the raw data.

3. The treated data **will be also used** for communicating and collaborating with each CoP **for validation purpose**.
 4. Interviewed people **must be approving to be interviewed**. The observer should ask people if they agree with the process of interview (including tape-recording).
 5. The observers **guarantee respect for persons** (especially private lives), non-maleficence and fairness.
 6. The observers work for **providing benefit to the interviewed persons**. The Palette project aims at providing tools, know-how, knowledge... to the interviewees and their CoPs notably by helping them to analyse their needs and by establishing an ongoing collaboration with them.
- **Some references about ethical issues :**
 - Pudelko, B., Daele, A., & Henri, F. (2006). Méthodes d'étude des communautés. In A. Daele & B. Charlier (Eds.). *Comprendre les communautés virtuelles d'enseignants : pratiques et recherches*. Paris: L'Harmattan, pp. 127-155.
 - Rourke, L., Anderson, T., Garrison, R. & Archer, W. (2001). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education*, 11.

2. Description of the PALETTE project

The observers should be able to answer to some simple questions:

- Who are you (PALETTE partners)?
- Who are they, their roles in the project (Cops partners)?
- What is PALETTE - Description of the relation (cooperation, collaborative...): Encounter the personal goal of the CoPs should be the framework of PALETTE.
- Why was my CoP chosen?
- Which interest does my CoP have to take part in the project?
- What can I (or the CoPs) gain (i.e. the concrete benefits obtained by improving my operation in technical, human and "political" terms)?
- How much investment will my participation imply? (in time, human resources to release, etc.)
- How will the cooperation works?
- Which is the schedule?
- Which are my duties and my "rights" if I accept?
- How can I make my members adhere to this project?
- What do the partners gain in the project?
- What could others (CoPs or not) gain in the future by the results of the PALETTE project?

3. Tips for interviewers

- See the document "Methodology" on the PALETTE intranet.

4. Questions

4.1 Origin of the community

4.1.1 Could you describe the decision process by which the CoP has started?

This question tries to highlight the process by which the CoP has defined its domain and objectives, if this process has been done through a particular method or using a specific tool.

- Describe the decision process (who (*one person or group of persons*), when, where, why, with whom, what was the history of the decision...) that led to the creation of the CoP?
- At the beginning of the CoPs, what was its objective? and for which expected results?
- Is the objective still the same now? Did it change? If so, why?
- Which is the level of satisfaction towards the actual results?

4.2 CoP's members

4.2.1 Tell us about the members

This question attempts to better know the members, who they are, how they know each other, how the individual objectives are taken into account and how the process of awareness is sustained.

- Who are they? How many are they? Where do they come from?
- How could we describe the heterogeneity or the homogeneity of the members of the group?
 - Motivation level, age, competences, education, training, personal interests, volunteers or obliged, status, ...
 - Give us some examples of 'typical' members.
- Can you describe their technical skills?
 - Can you give some information about level of Internet awareness?
 - Can you give some information about level of elearning awareness - what do they know about elearning?
 - Are there some people with special needs in the CoPs (blind people for example)? Does the production of the CoPs need to be consult by people with special needs? Is the CoPs open to people with special needs?
- What are their personal expectations of the community activity (their interest and personal goals)? Are these interests explicitly clarified at a given time? How are they taken into account? Could you give us specific examples on how the personal interests are explained by the members and can influence the CoP's activities?
- How much time does people spend times in/for the CoPs? How much are they able/ready to spend for the CoPs? How much are they intended to spend time?

4.2.2 Could you describe with specific examples the process by which new members enter in the CoP?

This question specifically concerns the process of engagement of newcomers into the CoP and how they pass from a peripheral position towards a more central one.

- Who are they?
- What lead a new member towards the CoP?
- Which kind of person is it?
- Are they recruited? If so, how? By whom? (institution, delegate, coordinator... etc.)
- How do they accommodate? By whom?
- How could you describe the turn-over and the stability of membership?
- What are the procedures / entrance doors for new members?
- What are their personal expectations of the community activity (their interest and personal goals)? Are these interests explicitly clarified at a given time? How are they taken into account?

4.2.3 How do you describe the involvement of members? Tell us examples where members are very involved and other examples where not.

This concerns the 'enthusiasm' of the individual members, how it is expressed in the formal discussions or by socio-affective cues. The question also aims at understanding how this enthusiasm is sustained by specific tools or by actions of the coordinator or other members.

- What is the degree of involvement? How could you describe it (and what kind of clues do you use to describe it)?
- Are there particular events organized to stimulate members' involvement? (i.e.: *Get Together* on IRC-channel)? Tell us how they are organized and how they happen.
- How could you describe the relational link between a member and his/her community? Is there a shared common goal which is more important than the individual aspiration?
- What is the difference of investment between members who are considered as active one and others?
 - How important is this time (collaboration within the CoPs) compare to the time spend for other professional activities (Is there some members who the main activity is the CoPs participation?)

4.2.4 How would you describe the relations between the members?

This question focuses on the socio-affective dimension of the relations between the members, how they are sustained and managed.

- Could you give us examples of critical incidents (arguments)? Could you explain and describe them (context, involved members...) and how the CoP finally dealt with them?
- On the other hand, could you give us examples of harmonious time, where the members get along really well?
- Have CoP members developed identification and trust between them? When did this happen and how?
- Are there some formalized rules for behavior (a charter, a guide of good control, a netiquette)? How have they been formalized (who, which form...)? If that is not formalized explicitly, are there implicit or tacit rules?

4.2.5 Could you give us examples of ‘central’ members and of ‘peripheral’ members? Which clues do you use for classify members as ‘central’ or ‘peripheral’?

This question is linked to the precedent one. It attempts to identify the way the members feel themselves as members of the CoP and how this feeling is possibly supported.

- What the characteristics of ‘central’ or ‘peripheral’ members?
- What does belonging to this CoP bring to you?
- How can you define who belongs the CoP?
- What makes the difference between a ‘central’ member and of ‘peripheral’ member of the CoP?
- Are there tools used for increasing the feeling of membership or for helping members to pass from a peripheral position to a central one?
- In your own view, do you think there is a particular sense of community? Can you define it?
 - Does the sense of belonging in a CoP rise from the personal contact between members; the mutual benefits of participation, the common domain of interest or profession? Other?

4.3 Self organization and organigram

4.3.1 How does the community organize itself? Could you describe and give examples of:

This concerns all the internal organization's processes of the CoPs. It is really a question about processes: to make a decision, to regulate, to negotiate aims or views... and about the services used for sustaining these processes.

- Procedures of decision-making (for example about the organization of communication or about the choice of discussion topics...)?
 - Organization of vote?
 - Their leader/coordinator/facilitator/moderator decides.
 - They negotiate and reach a consensus
 - Silently!
- Distribution of tasks between the members?
- Deal with marginal behaviors?
- Agreement on the “common understanding” between members?
 - On the use of the common vocabulary?
 - On the use of the common language?
- Introduction of new topics?
 - *How open are the community to testing new ideas?*
- Introduction of new tools?

- Have they been aware of the forming of some kind of (explicit or implicit) hierarchy or authority between them? Could they describe it?
 - Do the members of CoP have a sense that there are distinct roles between them?
 - Can we draw a sort of organigram of the Cop?
 - Is somebody a leader (Is the leader the same as the technical moderator)? A peacemaker? A genius (has smart ideas)? A problem (imposes obstacles)? A lurker (is someone who read regularly the production of the community, but does not participate)? Other?
 - Could they characterize the other group members? Could they define categories of members or roles?
 - Are roles related to the issue/task/problem/practice under consideration or are always the same?
 - How does one member shift from one role to the other?
 - Do they feel that their community would diminish if one (or more) certain members extinct? Are these people or roles?
 - Would they agree in case that the “CoP leader” opinion would matter more in decision making situation?
 - Should everybody's opinion matter the same?

4.3.2 Who is the coordinator? Could you describe his/her roles by giving some specific examples?

The coordinator's role is often central in a CoP and this question aims at understanding its roles, which questions s/he has to deal with (participation, authority, facilitation...) and which tools can support his/her tasks (grids of questions, of analysis or of evaluation, planning...).

- Does s/he intervene on:
 - The contents of discussions?
 - The organization of discussions?
 - The facilitation of communication?
 - The use of tools?
 - The introduction of new members?
 - The relation with the outside of the CoP?
- Is there a coordination team or is he (she) alone?

4.3.3 Can you describe with examples how the CoP manages the crucial stages of its evolution (questions or problems)?

The aim of this question is to collect examples of discussion themes and problematic treated within the CoP. The interviewee should be asked to detail these themes by explaining the processes of exchanges, experience sharing, analysis, debates, creation of new knowledge and the 'objects' shared within a discussion or project. So it aims at identifying different 'periods' of wide or little activity of the CoP and their reasons. It attempts to understand the process of stimulation and participation of the members.

- Tell us, what kind of problem does the CoP need to go through? (administrative issues, sensitive topics)
 - Tell us some examples of very sensitive topics that the CoP has had to deal with and how it reached a consensus or not.
 - Do you remember some internal discussions about the future of the CoP (for example the creation of a 'break-away' CoP, the decision making about a possible extension or narrowing of the CoP, the welcome of newcomers, the change of coordinator...) i.e. discussions about the existence or development of the CoP?
- Could you identify and describe more or less intense phases of activities since the birth of the community?
 - In your view, what are the factors influencing the stimulation of the community (particular period of the year, particularly stimulant topics...)?
- Could you identify and describe more or less intense phases of activities since the birth of the community?
 - In your view, what are the factors influencing the stimulation of the community (particular period of the year, particularly stimulant topics...)?

4.4 Organizational and outside context

4.4.1 How could you describe the relationships between the CoP and its organizational context?

This question aims at describing the relations between the CoP and its organization: support, evaluation, institutional expectations... and how the CoP deals with it.

- Could you give examples where your CoP has to deal with the organization it is a part of (at its beginning or at different moment of its life)?
- Does the organizational context facilitate the participation in CoPs? (management of time, logistic supports, recognition, etc.)

4.4.2 How can you characterize the relations between the CoP and the outside?

This is about the external visibility of the CoP, for future members, for the organisation in which the CoP takes place or for people interested in the outputs of the CoP. It also tries to evaluate the effects of the CoP on the larger professional community.

- What kind of information is given outside the CoPs? (In connection with its activities, its members, its products, its objectives, etc.)
- Does CoPs receive information about itself coming from outside? How is the CoP perceived outside, and how does the CoP evaluate this information coming from outside?
- What are the repercussions of the activity of CoPs outside?
- Are the CoP members implied in other CoPs? Which is the importance of this CoP compared to other CoPs?

4.5 Future

4.5.1 In your view, what is the future of the community?

This question concerns the future of the CoP at short- or long-term.

- Is the community in progression (in term of activity or size) or in recrudescence?
 - If it's in recrudescence, what can stimulate the activity of the CoP (new members, new tools, new topics, new danger)?
- About topics of discussion?
- About technical tools?
- About contact with the outside world?
- About new recruits?

4.6 About the activities of the CoP

4.6.1 Can you describe the activity of CoP compared to what it produces?

This question is about the outputs of the CoP : what they are and by which process they have been created.

- D
- describe tasks/practices of production within the CoPs.
- What are the outputs of the CoPs? What are its products?
- What kind of product is it? Documents (what kind of documents)?
 - What do they do with these documents? Are they archived, published? How? On a Web site? Printed? How are they distributed? To whom?
- From what?
- From what kind of collaboration do they result?
 - Who produces it? A group? A sub-group? A person alone?
- What internal organization supports the production?
- Who/What is the customer of the product? (the members themselves, outside, the community as a whole, the organization, etc.)

4.6.2 What are the current results (in a large sense) of the CoP's production?

This question attempts to understand the process of (self)-evaluation of the activities of the CoP.

- Comparin
- g objectives and results of the CoPs, what can we say?
- Are these results measurable or not? Are they measured? How are results measured?
- Are the results related to the objects that the community produce and disseminate? How could you evaluate that the result is positive or negative? Does that relate to the satisfaction of the members or the regulator? (example: "Our community goes very well because members (or hierarchy) is happy!")

4.6.3 In your view, does the CoP create *knowledge*? If so, can you describe this process of creation?

This question aims at describing the process of *knowledge management* from the informal expression of members knowledge or skills to their reification, storage and possible dissemination. This question is tied up with the WP3 services.

- What is your own representation of knowledge?
- Does the community create knowledge?
- How does the community create knowledge? Describe it with some examples.
- How does the community share its knowledge?
- How is it formalized and finally reified (so only, if it is)?
 - Who does it? Only one person or a team?
 - Which are the tools (if so) which are used for that goal?
- How is the created knowledge re-appropriated /re-used by the members in their daily activities?

- In your own representation, does the knowledge belong to the CoPs' members or to the CoPs itself?
 - Could the departure of a CoP member be problematic for the circulation of knowledge within the CoP?
 - If is not, could you explain the reason/the process why?
 - How would you define tacit or implicit knowledge?
 - Do you think implicit knowledge can and should be made explicit?
 - How is implicit knowledge made explicit?
 - How is explicit knowledge validated?

4.6.4 Can you describe how and where the community finds/retrieves information? Can you describe the process?

This question aims at describing the process of *knowledge retrieval* from the informal expression of members knowledge, explicit knowledge out of the CoP or skills to their reuse, reification, storage and possible dissemination.

- Do they plan brainstorming?
- Do they have shared archives (electronic/paper)?
- Do the search on the CoP's Intranet, CoP's Forum, CoP's Website, CoP's Mailing-list, and Internet?
 - Where/How do they store information?
 - Do they record their sessions? Is the access restricted to certain members or not?
 - Do they have common archives? (what type?)
 - How do they feel about sharing knowledge?

4.6.5 Can you describe the mediation process (collaboration, negotiation, decision making on specific tasks)?

With this question, we would like understand the process of mediation (in large sense)

- How do they value the issue of communication or "common understanding" between members?
 - Do they share the same 'language' (this does not mean if they all speak French)
 - Do they confront conflicts of interests? Goals? Priorities?
 - Do they share the same vision? (for the CoP/for something else)
 - Any ideas about how "common understanding" could be achieved?
- How do they find/retrieve information when wanted for CoP needs?
 - Brainstorming?
- Besides using technological means for communication/collaboration, in what other ways do they collaborate as a team?
 - They have face-to-face meetings?
 - They meet all in person or some people at a time?
 - Does anybody organize their meetings or facilitate collaboration? Who?
 - Are there intermediaries?
- Do they use already or need some tools for argumentation? Can you describe what?

4.6.6 How would you describe the learning activities (or the development of competencies) of the members in the community?

This question is linked with the precedent one and is focused on the members' learning and professional development. It also focuses on the process by which the members appropriate the knowledge created into the CoP for their own practice.

- What kind of learning is it? (professional, technical, relational) ?
- What are the factors set up by community which are favorable to the development of competence? (i.e. available time for members) What are the obstacles?
- How could we evaluate these learning? (if it is possible)
- What do you know about e-learning? What is the CoP experience about it?
 - What are the beliefs about efficiency of e-learning?
 - What are the beliefs about collaborative learning vs. individual learning (specific learning path for each learner)?
 - What is the learning needs and expectations within the CoP (what do you think CoP's members need to learn; what they want or expect to learn)?
 - If you are the coordinator: What do you want members to learn within the CoP ? What do you think about collaborative learning (including e-learning)? Do you believe in its efficiencies?

4.6.7 Can you illustrate (with examples) some situations of uses of tools (technological and organizational)?

4.6.7.1 Which tools (technological and organizational) are used by CoPs?

With this question, we would like to list the functionalities and tools **used** by the CoP, generally and for all kind of purposes, not necessary technical tools but also methods (existing or ad-hoc) for coordination, negotiation, etc.

- **On the technological level** - Tools are used to :
 - Documents storage
 - Communication
 - Organization / Coordination / Collaboration
 - Collaborative management of contents
 - Negotiation tools
 - Awareness
 - Authoring Tools / Author system
- **On the organizational level** - Tools are used to :
 - Coordination
 - Animation
 - Facilitation
 - Organization of knowledge
 - Sustain of sociability
 - ...

Some examples: Forums, e-Mailing lists, Common calendar, Common workspaces, other?

- Which kinds of difficulties (if so) have people in using these tools? Describe it.
- **More concretely:** How does the community create documents? How are documents shared? Exchanged? What do they contain? Only text? Pictures? Drawings? Is video and audio used? Would these media be used with easy-to-use tools?

4.6.7.2 How could you characterize the appropriation of the tools by members? Are they well accepted / used?

This question concerns the process of instrumentation of tools by the individual members, by little groups of members or by the whole CoP. The description of this process should highlight the usual uses of tools within the CoP and how these uses have been negotiated and structured.

- Tell us short stories showing how the tools are accepted/refused?
- Did the appropriation need a formation, a shared handbook?
 - *Could you describe scenarii of documents production and processing?*
- How the members are trained with the use of the tools?
 - Is this an individual or collective training?
 - Is it a contextualized training (in connection with the practice of the community) or not?
 - Who organizes the training? What kind of training is it? Would you need help from the outside for that? What kind of help?
- Clarify: Tell us a scenario of use? An example of negotiation of the use of a tool
- What is the acceptability of these tools among the members of the community?
- Are these tools differently used by the members of CoPs, or the groups of members?
 - How does the management of communication tools works? (moderation, manager, etc.)

4.6.7.3 Which tools (technological and organizational) could be useful for CoPs?

With this question, we would like to list the functionalities and tools that **could be useful** for the CoP (the tools they would dream of), generally and for all kind of purposes, not necessary technical tools but also methods (existing or ad-hoc) for coordination, negotiation, etc.

- **On the technological level** - Some tools could be useful to :
 - Documents storage
 - Communication
 - Organization / Coordination / Collaboration
 - Collaborative management of contents
 - Negotiation tools
 - Awareness
 - Authoring Tools / Author system
 - Argumentation and decision making tools

- **On the organizational level** - Some tools could be useful to :
 - Coordination
 - Animation
 - Facilitation
 - Organization of knowledge
 - Sustain of sociability
 - ...

- Could you describe the ideal tools for the collaboration, production of information, share of information etc? What (in term of technical tools) is needed in the CoPs? Do you think your CoP could need personalized tools (which does not exist)?
- What sort of tools could be useful for people with special needs (for example: blind people)?