D8.1

Pilot Case Requirements and Specification

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1. Introduction

The objective of this deliverable is to define the plans and activities to perform the pilot studies in USEMP. Pilot studies are aiming to test and evaluate the USEMP tools with close collaboration of end users implementing a living lab approach. Hence, in this document a plan for the Piloting work in USEMP will be presented. The objectives of the piloting are as described in the DOW to:

- To generate realistic data from citizens usage of the USEMP framework
- To carry out pilot tests in iterations; firstly a pre-pilot and thereafter two large-scale pilots
- To evaluate the USEMP framework contribution to citizen empowerment from a multidisciplinary perspective

Hence, this report will include plans for stakeholder studies as well as requirements and specifications to be able to run the pilots. As described in the DOW the overall aim is to:

determine the USEMP tools' contribution to user empowerment related to ethical issues such as social and information privacy on the Web as well as in relation to monetization of user data.

As mentioned a Living Lab approach will be used to engage users early and throughout the project so that all tests are done in collaboration with the users. This aims to strengthening the benefits of the framework for the citizens. Living Lab activities are based on needs and motivators which will be identified and the result from this will lead the pilot case deployment to have a pilot that really engage and motivate users. The Living Lab approach is for empowering users in the development of their Internet and it has been shown successful in previous studies.

The process for user involvement will be divided into micro tasks with clear objectives to keep the users engaged and committed to the process. Related to these micro tasks, the users will get incentives. This approach is implemented to make sure that the users are not overburden with too demanding efforts at once.

The challenges for users to actively manage the privacy of their online presence via new tools are part of the research questions in USEMP. Hence, in this report the pilot-case preparations are defined. This includes the plans for usage of USEMP tools as well as for the recruitment of USEMP stakeholders for the forthcoming tasks.

Together with the stakeholders recruited, stakeholder needs will be investigated to design both user involvement and features of the USEMP tool. This report also includes examples of USEMP usage scenarios and micro-tasks will then be specified and developed for pilot case deployment.

1.1. Structure and Logic of this Report

The structure and logic of the document is as follows; first we outline the main objectives of the piloting and directly after this we describe the outline of how and where the pilots will be implemented. In chapter three theoretical frameworks in relation to needs, motivators, values as well as on stakeholders, which will be important tools for both planning and for analysis of results in the pilots are introduced. Thereafter, moving in to chapter four the system in focus

is introduced. DataBait is the system which will be developed and tested in pilots throughout the whole project. Thereafter we outline the test strategy and its underlying theoretical frameworks in chapter five and in chapter six we detail how the living lab approach will be implemented in the pilots. Finally in chapter seven we give a short introduction to how ethical and juridical matters are handled in the piloting.

2. Main Objectives of Pilots

Realistic user data from usage of USEMP framework are to be generated in two iterations of a small scale pre-pilot followed by two large-scale pilots. Ethical Issues, the processing of personal data for privacy and data protection experiments will be based on informed consent; the purpose for which data are processed will be clarified in advance; anonymisation or pseudonymisation will be ensured automatically and still the data will be used for the specified research purposes only (D3.1).

The objectives of pilot studies are twofold:

1. Test and evaluate "Online Presence Control" and seek to investigate the usability of DataBait in terms of visualization and managing flow of personal information within the web/OSN
2. Test and evaluate "Monetization Insights" and seek to investigate effectiveness of DataBait tool in raising awareness related to economic value of their personal data and personal content licensing.

Both objectives focus on different procedures that allow us to investigate barriers, challenges and opportunities that users see when using the DataBait system. Those procedures are employed from well-established methods used in Living Lab projects, concentrating the cutting edge research in progress of researchers within LTU, iMinds and other institutes within the consortium. Pilot tests will give the consortium insights for further development and areas of concern.

The overall research questions defined for the USEMP pilot are the following:

- What **genres of disclosure**[1] are available in social media?
  - and what are the **implications** of genres of disclosure **in designing** of a privacy enhancement tool?
- How can we enhance **user empowerment** in a rising **culture of connectivity** by identifying, understanding and strengthening the social and technological aspects of **user tactics** coevolving with **platform strategies**?

For the living lab piloting we defined more concrete research topics and questions which are described by examples in chapter 6.

2.1. Pilot Contexts

Piloting will take place in two different contexts. They differ in several ways, e.g. culture, language and geographical context. Botnia Living lab at LTU is situated in the northern part of Sweden while iLab.o of iMinds is situated in Belgium. Having pilots in two different contexts offer potential for more general results since each test can be performed in larger scale, at the same time as the opportunity of making comparisons of results is given.

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[1] The concept of genres of disclosure, as the name implies, corresponds to a class of genres where disclosure is conceptualized as a type of communication, referring to types of disclosure that share the same content (motives, logic and themes) and form (linguistic and physical features) in a communication. For more detailed definition refer to chapter 3.

For the user involvement USEMP will make use of the existing user panels of both LTU and iMinds. iMinds, through its iLab.o Living Lab test facility, has an own panel of 20,000 people, which are all profiled with regard to their ICT possession and use. LTU, host of Botnia Living Lab, has a test panel with 7000 dedicated test pilots. In this test panel there is a diversity of private persons ranging from 18-70 years old.

2.1.1. iMinds

The iMinds panel management is responsible for recruiting, motivating and co-ordinating a panel of test users. We look for the right test users according to the goal of the project or certain demographic requirements provided by the researcher. Before the start of a project we're responsible for all promotional communication to potential test users. This involves tasks such as providing copy and design for invite e-mails, final check-ups of surveys and potentially targeting new test users by sharing information of the project and call-to-actions on social media.

Our main goal here is to recruit the right people for the project and to get them involved but we're also very committed to showing the world that scientific research is not necessarily dull and that everyone can make a difference in developing a new tool or service.

Secondly, we look after the daily communication with the panel and we're the single point of contact for test-users during the project in case of questions or problems. This also involves being the go-to person for event organizing and all practicalities involved.

In general we try to build a genuine community feeling among our test users by providing those results and feedback of the projects they have participated in by creating fun info graphics and keeping them informed on important tech and media news on our numerous social media channels.

The Panel

iLab.o was founded in 2009 and started building a test panel straight away, mostly with our yearly flagship project, Digimeter, which had now reached its 6th edition. Between 2010 and 2013, 3 large projects VPP, Leylab & Mediatuin supplied a high amount of member to our panel. In 2012 and 2013 popular projects on electrical vehicles such as iMove and EVA enlarged our panel. In 2013 we shifted our focus to approach SMEs, which gave us the chance to regularly involve our panel members in research of different contexts and scopes. From 2009 up to now 25.997 individual users took part in iLab.o activities. Our panel changes continuously with people signing in and out every day.

Today, we have 22. 533 individuals assigned to our test panel and they're all willing to participate in our research. The majority are men (58% vs. 41% with 1% unknown). Age-wise, the largest group is situated between 21 and 30. The oldest panel members are two 88-year old men. Geographically, East- Flanders (where iLab.o HQ is based) is the most represented region in our panel (32%) followed by Antwerp (19%). Only a small sample of 1% lives in Wallonia, which is obvious since a large majority of our research is conducted in Dutch.

2.1.2. Botnia Living Lab

Botnia Living Lab was founded in 2000 and is a world-leading environment for user-centric research, development and innovation (RDI), supported by innovative methods, tools and experts. The Living Lab is an effective member of the European Network of Living Labs

(www.openlivinglabs.eu) and was one of the founders of the network in 2006. Botnia Living Lab offers an integrated environment of people, infrastructure, tools, processes and services for research, development and test of new and emerging distance-spanning technologies and its applications.

Botnia Living Lab offers research expertise in user involvement and testing, Methods qualified by research for end-user involvement, a database of 6000 creative end-users (individuals) from 18 years of age and older in Sweden, a large partner network including SME´s, public bodies, large industry and other research organizations. Our Key capabilities are among others methods for Idea-generation with end-users for new solutions, User-interface testing, efficient methods and research expertise for planning and performing user-involvement activities, Innovation process management, Professional management and performance of large-scale pilots in real life setting including both technology and involvement of the entire value-chain of the actual solution being tested.
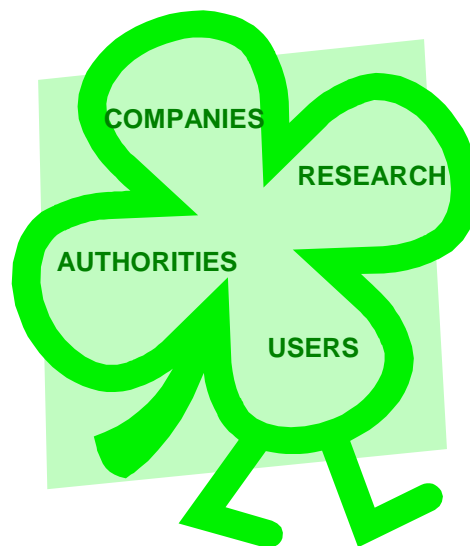
Figur 1 Botnia Living Lab Stakeholders

Botnia Living Lab is hosted by Centre for Distance-spanning Technology (CDT) at Luleå University of Technology (LTU). CDT is a research, design and innovation joint venture between Luleå University of Technology and the IT industry with the main objective to generate sustainable business innovation. Social Informatics is the main research partner of Botnia Living Lab. Social Informatics is a design and innovation oriented research subject that focuses on sustainable life in the digital society. The group have more than 20 years of experience from research and development within the field of user-centred and user driven service innovation. Within this area we have a particular interest in milieus for innovation and design of digital services such as Living Labs and platforms for crowdsourcing.

Botnia Living Lab's role in CDT's organisation is that it represents a real-life research factory for methods, tools, and processes for open user-driven innovation and research. The basic idea of Botnia is to engage end-users, individuals, and stakeholder organisations in an interactive and iterative process from need- and idea-generation through concept-development and prototype testing to market validation. Botnia also is open for all kinds of IT stakeholders in the value-chain, and its aim is to help these stakeholders manage their innovation process with a user-centred approach.

During the years the focus of activities has changed, in the beginning, the main objective for Botnia was to facilitate user tests of innovations for SMEs and researchers. This focus has matured and widened. Today, Botnia not only perform user tests; it aims to support processes in which users are involved as equal co-creators of innovations in close cooperation with companies, users, academia, and authorities.

Test Panel

Over the years, Botnia has built up a community of end-users that it easily can communicate with. In this community, approximately 6000 test pilots are accessible, and the test pilots are represented as individuals who have chosen voluntarily to be part of the Living Lab community. The users in this community are motivated to participate in technology innovation based on their curiosity to try new technical artefacts, and to get the opportunity to influence them. What separates them are demographical and psychosocial factors (Ståhlbröst, 2004). Botnia does not include only users from the database in its projects; if users with some specific character are needed, these are recruited specifically. For example, if the aim of an innovation project is to create mobile services for rural areas, people living in those areas are contacted. The user perspective is that they are involved as partners with the right to exit from the process whenever they choose; they are not bound by any contract.

When users are involved in Botnia activities, the aim is to involve them in the whole innovation process that should be grounded in reality. This means that each innovation process and its methods are customised in accordance with the unique requirements for its particular situation. The aim is to involve users in their natural environment by means of technology, with the objective to gain access to users' needs, ideas, and attitudes in their current situation. Due to Botnia's focus on products and services to support a mobile life, the circumstances in which the user involvement processes are conducted become multi-contextual in character. This means that the users can be involved, for example, in their homes, when they walk around the city, when they drive a car, or when they work. Hence, the methods applied in Botnia operations needs to handle this multi-contextuality.

3. Theoretical Foundation

In this chapter we outline relevant theoretical frameworks which will be used for analysis of results as well as influence in design of pilot activities.

3.1. Genres Theory

Yates & Orlikowski (1992, p. 301) defined genres within the boundaries of organizations as: "A genre of organizational communication (e.g., a recommendation letter or a proposal) is a typified communicative action invoked in response to a recurrent situation." Each genre is categorized by its substance and form (Yates & Orlikowski, 1992). Substance refers to motives, logic and themes presented in a communication which is conveyed through Form as a standard unit of communication shaped evidently and linguistic. Form can also have [at least] three elements in organizational communication: structural features (such standard units and formatting of a letter, agenda, etc.), communication medium (the thing that facilitates the communication such as pen, fax, etc.) and language or symbol system (defined as linguistic characteristics of the form with respect to the type of genre such as informal day to day language or formal written invitation letter.) An example of genre can be business letter invoked in a recurrent situation by means (substance) of communicating through paper-based written document (form) to the outside organization.

Built upon Yates & Orlikowski's (1992) and Erickson's (1997) "socially-constructed" notion of genre, Palen & Dourish (2003, p. 5) defined genres of disclosure as a unified principle of "socially-constructed patterns of privacy management … [which is] regularly reproduced arrangements of people, technology and practice that yield identifiable and socially meaningful styles of interaction, information, etc". For example disclosing credit card information to an online store during check out is a commonly understood type of communication that differs from traditional ways of paying (e.g. with cash in a physical store). Violations of privacy in this respect can be defined as the situations where one feels that disclosure has a direct relationship between the genre and its intended usage. This means that personal privacy is the degree to which a system fails to align its user's intended usage of genre of disclosure from its actual use. Lederer et al. (2004, p. 33) invited scholars and designers of privacy-affecting systems to identify genres of disclosure to give users the possibility to "(1) understand the extent of the system's alignment with those genres and (2) conduct socially meaningfully action that supports them".

Each genre of disclosure raises concerns about the usage of this information in which failure to those expectation will guide the user's privacy managing arrangement to cooperate or defy with that genre. From system designer's perspective, providing mechanisms aligned with expectation of use will ensure that disclosed content will not misappropriated and used unpredictably. In USEMP pilot studies we are aiming to use genre theory and its analytical lens as a means to scrutinize the communicative patters of disclosure and to evaluate the USEMP tools based on those genres to see how USEMP platform will be able to transfer user's regulatory patterns of disclosure and privacy management into online environment.

3.2. Needs

Understanding users' needs and requirements plays an important role in development of any IT system in order to improve the way people will adopt and enjoy using it. It is therefore commonly known that developers of IT systems must be able to have a holistic

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understanding of the users' current situation, the actions the users perform and the aim they have with their actions. The starting point in facilitating this users' adaptation of an IT-system is the cumulative task of collecting knowledge gained from the users' goals through enquires that forms a set of system requirements. This process which strives to identify user needs is known as "Need-finding" (2002), which continues during each and every phase of system development and design process (Bergvall-Kåreborn et al., 2008; Bergvall-Kåreborn & Ståhlbröst, 2007; Bergvall-Kåreborn & Ståhlbröst, 2008; Ståhlbröst & Bergvall-Kåreborn, 2007, 2008; Ståhlbröst & Holst, 2006, 2006). But what is a need really?

Starting with the confusion as to what the concept of need stands for and its relation to closely linked concepts, this has been discussed by a number of authors (Bergvall-Kåreborn et al., 2008; Ericson & Ståhlbröst, 2005; Hyysalo, 2003; Oulasvirta, 2005; Vidgen et al., 2004). The main conclusions drawn by these authors are that we need to define and separate more clearly the related concepts, and that we need to shift our focus from requirements to needs due to the previously mentioned benefits of focusing on needs.

Among the authors who do talk about what a need is, though often implicitly, needs are related closely to motivation and "underlying rationalities" (Bergvall-Kåreborn, 2002; Vidgen et al., 2004). Tiitta (2003) talks about "motivational needs" and Mumford (1981) talks about satisfaction. Salovaara (2004), claims that a need is the goal that a user wants to achieve by using a product. Oulasvirta (2004) categorises needs into two types of human needs: motivational needs and action level needs.

- Action level: Action-level needs define what kind of behaviour users are interested in and in what kind of context (Kankainen, 2003).
- Motivational level: Motivational needs rationalise and motivate action in a context and provide a starting point for discovering design opportunities on an individual level. There are two types of motivational needs: basic and quasi.
  - Basic needs: some related to regulating bodily homeostasis (physiological needs), some related to providing psychological nutriments for growth and healthy development (self determination, competence), and some preferring some aspects of the environment rather than other (social needs such as achievement, intimacy, power, and affiliation).
  - Quasi needs: these are more ephemeral, situationally induced wants that create tense energy to engage in behaviour capable of reducing built-up tension." They are not full-blown needs in the same sense as basic needs, but they have influence on how we act, think, and feel (Kankainen, 2003).

Both basic and quasi needs are instantiated in a given situation in which users eventually wants to perform a certain action that takes them closer to satisfying motivational needs.

The concept user needs often is mentioned among authors in systems development as something important to gain knowledge about. However, the identification of needs and the establishment of requirements is not an easy, straightforward process with a defined start and end. Most of the times needs are not obvious and their identification is hardly captured through observation and enquiry summarized into scenarios and examples. Some examples include difficulties for users to articulating and expressing their needs (Holst & Ståhlbröst, 2006; Robertson, 2001), immediate needs are obscured by lack of understanding of the current situations' needs (Hyysalo, 2003; Salovaara, 2004) and needs could be easily

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forgotten to be expressed (Kano 1984). Hence scholars like Robertson (2001) argue that some important aspects of user needs are to be neglected, should we expect the users to open up and express their needs.

Users are also sometimes accustomed to their own ways of doing things and are interested in finding their own solutions to the constraints based on what they think is technologically possible. Thus the real needs and requirements could be buried under illusion of what they have solution for. To stimulate the process of gaining insights into users' situations and their needs, it is useful to give the users something to relate to. When users gain more knowledge and insights into possible solutions, they also expand their needs (Dennis et al., 2002).

Hence in this study we stress on need finding as the heart of analysis and design process by focusing on tools and methodologies that help us look more deeply into ways that the final product could benefit from ways in which users could fulfil their needs and open up need needs and requirements.

3.3. Motivators

Users want products or services that improve their quality of life and work and that is what motivates the users to buy and use a specific product or service (Gerstheimer & Lupp, 2004). In other words, the user is mostly interested in his or her individual benefit, hence the possibilities for profitable applications and services and for success in the increasingly competitive market can only be sustained by knowledge of the users' needs and motives (Gerstheimer & Lupp, 2004).

Everyone experiences motivator by varying degrees. Humans have basic goals that are fulfilled through different intrinsic desires. As a matter of logic, we value that which we desire for its own sake; therefore, the list of sixteen basic desires can be reworded as a list of sixteen fundamental values. The experience of a basic goal produces an intrinsically valued feeling called "joys", and the specific joy is different for each basic goal. Much of what people do seems aimed at satisfying these sixteen basic desires (Reiss, 2004). When a basic desire is satisfied, we experience the joy. We feel secure, for example, when we are in an environment with the degree of stability and order we like. We experience love when we spend time with our children and satisfy the desire for family. The satisfaction of each basic desire gives rise to a different joy, so that we go through life trying to experience sixteen different types of intrinsically valued feeling. Soon after we satisfy a basic desire, the joy dissipates and the desire reasserts itself. Therefore, we seek activities that make possible repeated satisfactions of our basic desires (Reiss, 2004, 2005). Because human motivation is fundamentally multifaceted, the sixteen joys cannot be reduced further into super categories such as pleasure versus pain or intrinsic versus extrinsic motivation and the sixteen basic desires are largely unrelated to each other (Reiss, 2005).

Tabell 1 Motivators (after Reiss 2004)

Motivator	Motive	Intrinsic Feeling
Power	Desire to influence (including leadership; related to mastery)	Efficacy
Curiosity	Desire for knowledge	Wonder
Independence	Desire to be autonomous	Freedom

Status	Desire for social standing (including desire for attention)	Self-importance
Social contact	Desire for peer companionship (desire to play)	Fun
Vengeance	Desire to get even (including desire to compete, to win)	Vindication
Honor	Desire to obey a traditional moral code	Loyalty
Idealism	Desire to improve society (including altruism, justice)	Compassion
Physical exercise	Desire to exercise muscles	Vitality
Romance	Desire for sex (including courting)	Lust
Family	Desire to raise own children	Love
Order	Desire to organize (including desire for ritual)	Stability
Eating	Desire to eat	Satiation (avoidance of hunger)
Acceptance	Desire for approval	Self-confidence
Tranquility	Desire to avoid anxiety, fear	Safe, relaxed
Saving	Desire to collect, value of frugality	Ownership

Salovaara (2004), claims that a need is the goal that a user wants to achieve by using a product; hence needs can be related to motivators and basic desires. We claim that a need is an expression of the goals the user want to achieve. Reiss argues that people's actions are affected by their endeavour to satisfy their experience of the sixteen basic desires as illustrated in the second column of Table 1. When each basic desire is fulfilled an intrinsic feeling of happiness emerge, and that feeling is different for each desire, see third column of Table 1. In addition, people prioritise the desires differently and situated; what is important for one person in a specific situation, might be unimportant for another. Conversely, the desires of the same individual might be prioritized differently in a different situation.

In this study, we are focusing on motivators as a tool for the analysis of the data gathered in the interviews. In presenting the analysis, after introducing the selection of participants and the process for the interviews, each relevant motivator will be introduced including the respective intrinsic feeling. Each motivator appears differently in relation to the situation; hence, our interpretation of the motivation related to the specific situation will be presented. Each motivator has a name of the motive, a motive, and an intrinsic feeling.

3.4. Values

In social science, values have been a central concept for many years according to Schwartz (2012). Values are used to characterise cultural groups, societies, and individuals, to trace change over time, and to explain motivational bases of attitudes and behaviour. To increase the understanding of what motivates people; Schwartz has identified ten basic values. These values represent what is important to us in life and what distinguishes them is the type of

goal or motivation it expresses. All of us hold several values, but the degree of importance differs between individuals and that is what characterizes us as individuals (Schwartz 2012; Reiss 2004).

Below a description of the basic human values and the interpretation of it in the project is presented together with a defined design principle for user of Internet and OSNs.

Tabell 2 Values

Values	Defining goal	Interpretations of values	Design principle for USEMP Tools
Self-Direction	Independent thought and action. Need of control and mastery	When considering this value in design, it is important to let the user take control over their own data and over what they share through the system	Personal settings, ability to control of their historical data
Stimulation	Excitement, novelty and challenge in life	This value highlights the fact that people needs to be stimulated in the use and they need to be challenged and have the ability to learn new things	Visualization of data brokers and to encourage learning by means of tooltips
Hedonism	Pleasure or sensuous gratification for oneself	Related to this value it becomes clear that the system need to support having fun while using the system.	Gamification of privacy profile settings
Achievement	Personal success through demonstrating competence according to social standards	This value put emphasis on the importance of seeing individual success and to feel competent.	Make monetary achievements traceable and visible
Power	Social status and prestige, control or dominance over people and resources	In our interpretation of this value, control and social status came in focus. Here the feeling of being important is in focus.	Being able to view and control traces of personal information leakage
Security	Safety, harmony, and stability of society, or relationship and of self	This value set focus on avoiding anxiety and to make citizens feel safe while using the system.	Showing and informing possible ways users are encroached upon and indicating protective mechanism in place to ensure security
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm	Related to this value, the importance of encouraging a	The systems must not encourage users to see economic value of their data to share more

	others and violate social expectations and norms	particular behaviour and restraining another is highlighted to keep a good and sound community.	personal information
Tradition	Respect, commitment, and acceptance of customs and ideas that one's culture or religion provides	This value becomes a bit difficult to translate in this context since the focus of the system is to stimulate innovation and change. However, in relation to systems design, we interpret this as making the use of the system as familiar as possible.	Build the system on well-known and broadly adopted platforms
Benevolence	Preserving and enhancing welfare of those with whom one is in frequent personal contact	Our interpretation of this value encourages us to consider a way to socialise in the system both with new and old friends.	Users need to be able to see their friends and share their settings
Universalism	Understanding, appreciation, tolerance, and protection of welfare of all people and for nature	The system focus on contributing to make users more aware of their personal information value and enhancing Internet privacy, hence this value inspire us to think of how to simulate a focus on the common good and how to improve society through peoples compassion.	Give users the ability to share their experiences for sustainable innovations

Value can be sought in experience, based on the view that "value resides not in the product purchased, not in the brand chosen, not in the object possessed, but rather in the consumption experience(s) derived therefrom" (Holbrook, 1999, p.8). In USEMP pilot studies abovementioned human values will be under microscope when USEMP tools are implemented to scrutinize how different factors can become part of a user experience.

3.5. Stakeholders in Innovation Processes

Digital innovation processes are becoming increasingly dependent on the engagement of a variety of stakeholders to strengthening the likelihood of success for an innovation

(Chesbrough, 2011). Hence, the need to open up innovation processes has become important, if not inescapable, as knowledge has become a key resource in our society (Chesbrough & Appleyard, 2007). One important characteristic of open innovation is to have connection to external partners and to have open cycles of innovation (Gould, 2012). Hence, there is a desire to reap the benefits of open collaboration (Love et al., 2011).

One approach to open innovation is to work with an innovation intermediary that focus on supporting innovators to make use of external ideas (Sieg et al., 2010). Innovation intermediaries create value for clients by identifying, accessing, and transferring solutions to problems in various stages of the innovation process to their clients (Inkinen & Suorsa, 2010). Living Labs (LL) can be considered as one type of innovation intermediary (Bakici et al., 2013; Katzy et al., 2013). In these LLs one objective is to support the collaboration between different types of stakeholders in research and innovation processes and to balance the interest and intentions of these stakeholders (Leminen & Westerlund, 2012; Ståhlbröst, 2012). Innovation processes carried out in with an open approach require that the innovating organisation offer dialogue and relationship building (Gould, 2012). In these processes, information related to an innovation must be revealed to the other stakeholders involved in the activities that give a complex web of relations. These relations need to be understood and managed in LL to decrease the probability of unintended leakage within and beyond the LL.

In innovation processes supported by a LL, stakeholders such as end-user representatives, companies and researchers are typically involved. Hence, LLs have the potential to increase the research and innovation capacity by offering a meeting place for different competencies to collaborate at a somewhat neutral ground (Niitamo et al., 2012; Ståhlbröst, 2013).

3.5.1. Stakeholders Groups

Freeman defined stakeholders as "any group or individual who can affect or is affected by the achievement of the organisation's objective" (1984, p.46). In recent research, stakeholders have been categorised into primary and secondary stakeholders where primary stakeholders include groups such as communities, customers, employees, suppliers, and financers; and secondary stakeholders include groups such as government, competitors, consumer advocate groups, social-interest groups, and media (Gould, 2012). Based on this theory the fundamental question becomes, which groups or individuals are stakeholders deserving or requiring attention, and which are not? This is important since we need to understand the stakeholders in order to strengthen the business process (Laplume et al., 2008).

A stakeholder can, according to Mitchell, Agle and Wood (2011), take many forms; it can be a person, groups, neighbourhoods, organizations, institutions, societies, and also the natural environment. In addition, related to the notion of stakeholders, the term stake becomes important. Who has something at stake and what do they have at stake? To clarify the term, we need to differentiate between groups that have a legal, moral or presumed claim on the innovation, and groups that might have an ability to influence the direction, process, or outcomes in innovation (Mitchell et al., 1997), In addition, some stakeholders have no power, but they are still important.

In this work, we take a broad view of stakeholders to be able to recognise and respond effectively to the heterogeneous group of entities that may or may not have legitimate claims, but who may be able to affect, or are affected by the activities nonetheless, and therefore

have an impact on the interests of those who do have legitimate claims. This can for instance be end-users and affectees involved in the innovation processes.

4. DataBait

One of the main goals of USEMP is to empower users with respect to their personal data management tasks and raising the awareness concerning the advantages and risks related to sharing personal data. Our most tangible output of the project will be a privacy-enhancing tool that helps users with these issues: the DataBait tool.

In constructing the various USEMP tools, end-users are able to gain knowledge about who is tracking them, which data are part of their digital trail, what knowledge could be inferred from such data, to which actors this knowledge could be of interest and what economic value this knowledge could approximately represent. As such the information provided to the end-user of USEMP is one possible example of how legal protection by design could be implemented with regard to systems and practices which track and profile their end-users. The USEMP tools can thus be understood as supportive tools which try to embody *legal protection by design*: not only the requirement of profile transparency as formulated in EU data protection law, but also other legal requirements.

The development of this tool is partly driven by the observation that more and more Europeans engage with social platforms, but that according to a recent Eurobarometer study, 74% of the respondents think they do not have enough control over the data they share and 70% are concerned with the way such data are handled by OSNs. The most prominent features are the following:

- The tool will show which kind of information might be inferred by 3rd parties, based on the users' volunteered and observed data
- The tool will visualize the 3rd parties that track the user when browsing the internet, and provide the option to stop this activity
- The tool will show an estimation of how the personal data can be valuated
- The tool will inform the user through the use of pop-ups when their privacy is at risk and how they can act to reduce the threat.
- The user can see how their friends make use of the tool to increase their control and learn from this information

In order to make sure that all the provided solutions are in line with what the user wants, this tool needs to be tested and updated accordingly. This will happen in consecutive test phases, as explained in chapters 5-6.

Different versions of the DataBait tool will be developed over the duration of the project. Overall, the users will be encountered with two different prototypes:

1. DataBait Research tool: The goal of this prototype is to optimize the developed multimedia and text mining algorithms in USEMP. We do this by asking users to take a questionnaire and by asking them to let us record their Facebook information by giving access to their Facebook account.
2. DataBait tool: The DataBait tool is set-up as a webbrowser plug-in that incorporates different functions (privacy enhancement, privacy control, data monetization) that evolve over time. The plug-in generates webbrowser behavior of the user and if the user gives access to the Facebook account, it can also use the users's Facebook data. The plug-in of DataBait will automatically be updating till the full-fletched features are available. This implies that during the first trial other features will be used by the end-users as during the second trial. During the first trial focus lays on the

visualization features (profile, privacy, monetization trackers, audience visualization). In the second trial the user control features will also be integrated.

The user will always have to sign the USEMP contract (Data Licence Agreement (DLA)) before starting the use of the DataBait (research) tool. The contract is also a research domain an such because users are used to unconsciously sign consents when they use applications and not sign a contract with the application owner. (more on this in chapter 7 and D3.1)

4.1. The DataBait Research Tool

The major goal of the DataBait Research tool is to give the USEMP researchers data they can work upon to refine the developed mining algorithms. The short-time value for the users to install this tool is small. The users will most probably participate in this part of the research because of their willingness to bring research forward and they believe that by helping USEMP in this stage of the project a new interesting PET will be created.

The users will have to go through different steps when cooperating within this phase.

1. User visits http:///www.databait.eu/research
2. User gets information of the goal of the tool and research
3. User signs the DLA
4. User creates a DataBait account
5. User logins to his/her Facebook account
6. User gets some information on their Facebook profile (e.g. people s/he unfriended, first post s/he ever did, advertisments read (which information that will be shown will be decided upon the outcomes of the research currently done on Facebook information)
7. User fills in the questionnaire
8. User is thanked for involvement and asked if they will be kept updated on launch of DataBait tool

4.2. The DataBait Tool

When the DataBait tool is launched the user will be asked to install the DataBait plug-in. Once installed, the updates will be executed automatically and users will be notified about the new features that are available. By creating updates we hope to stay in contact with the users and make them use Databait more active. Of course other techniques will also be used to keep the contact with the users during the whole duration of the trials.

100% assurance on the definite interaction steps for the trial cannot be made in this phase of the project. But we can start from the GUI's that currently exist of DataBait.

The users will have to go through different steps:

- User visits http://www.databait.eu
- User registers new Databait account (figure 2) or logs in with existing account (figure 1) and signs DLA
- User logs in with Facebook account (figure 3)
- User gets overview of the different functions DataBait offers. A clear distinction will be made between the functions that are already available, and the once to come.

- User gets the possibility to install the DataBait plugin and/or to historical data from browser and Facebook profile. The more the user gives access to these sources, the more accurate and interesting the provided information of DataBait will be related to privacy leaks and user control.
- Different features will be visualized by different widgets. DataBait will contain following features: (1) User profile & privacy (leakage) information (vizualisation), (2) multimedia privacy-intrusion information & notification (vizualisation and control), (3) tracking information (vizualisation), (4) creation of black/white list of trackers (control), (5) re-use of defined black/white list of trackers of friends (control), (6) data monetization insight (vizualisation), (7) audience insites (vizualisation). Definition of other features is still under discussion within the project consortium.
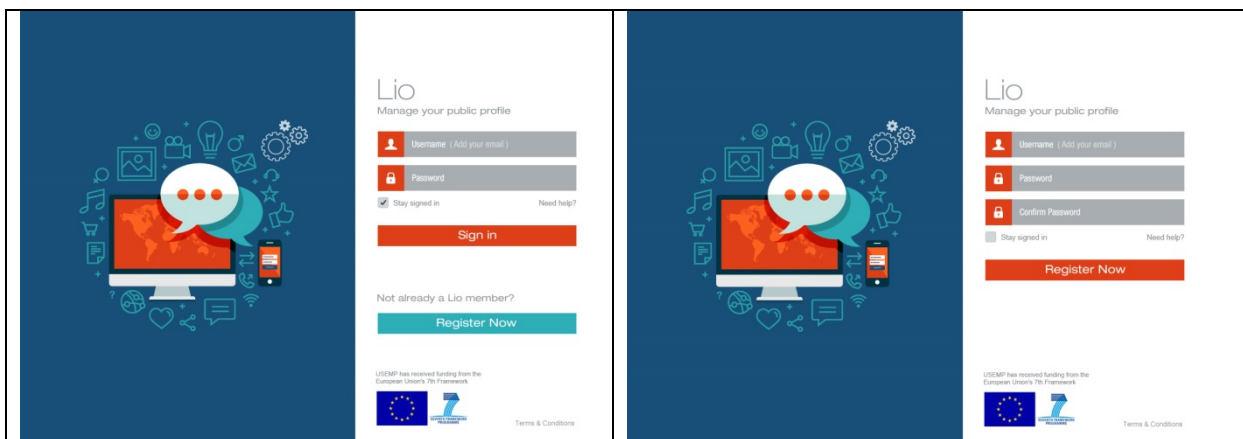
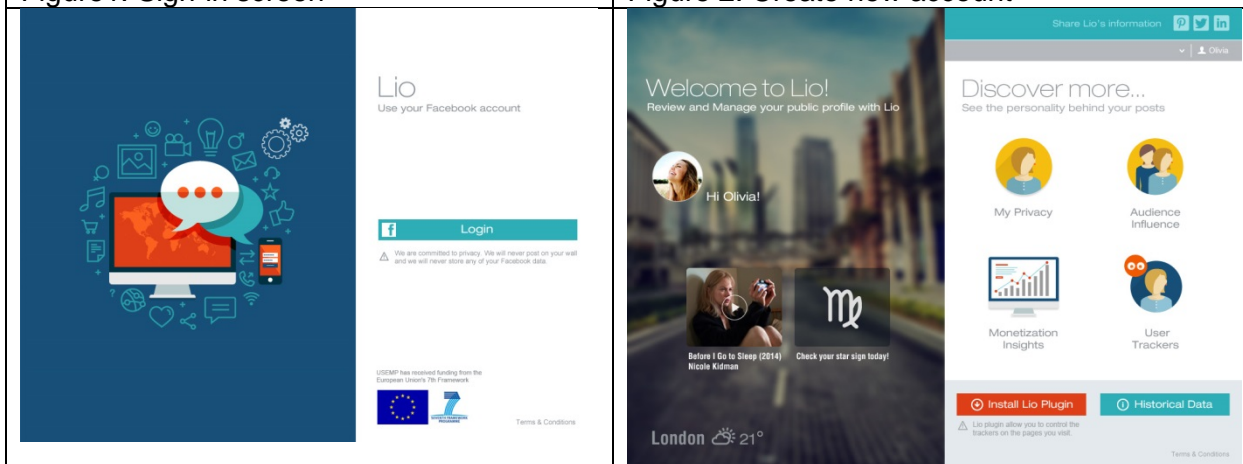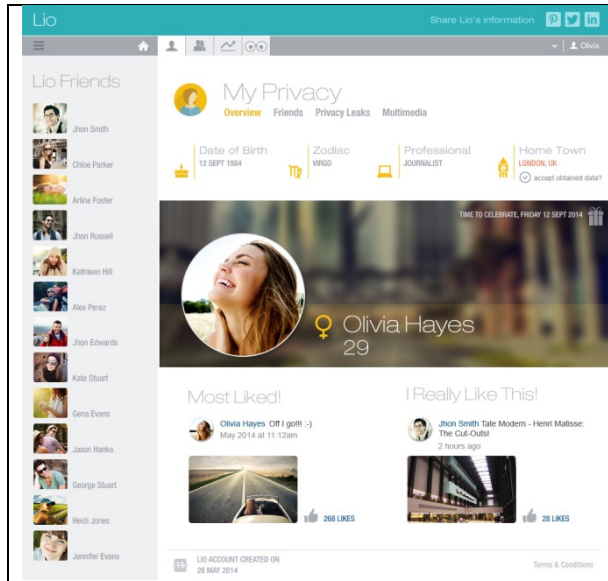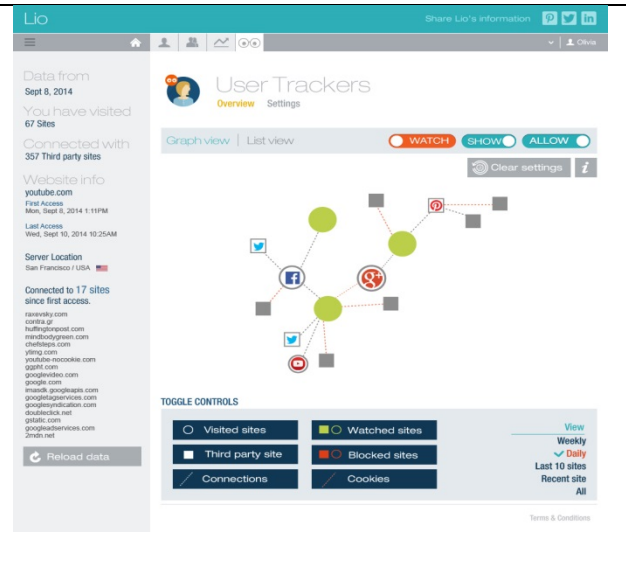|	
Figure1: Sign-in screen	Figure 2: Create new account
Figure 3: Users gives access to Facebook account	Figure 4: DataBait dashboard

| Figure 5: DataBait user profile & privacy | Figure 6: DataBait tracker vizualisatoin |

Figur 2 DataBait Features Visualised

The timeline for the development of DataBait was defined during the consortium meeting in Brussels (september 2014). Although it is always difficult to exactly define the readiness of a software product, two deadlines were defined where following features would be integrated.

Tabell 3 Time plan

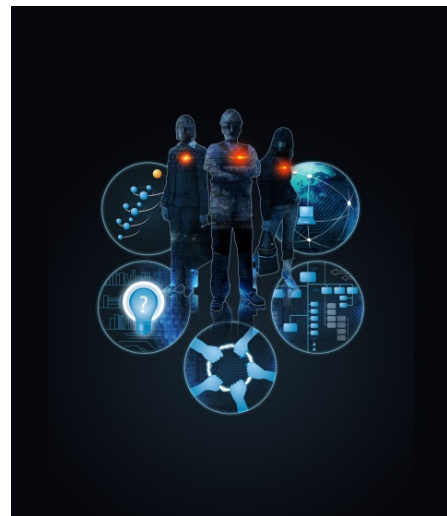| Phase 1 (end: dec. 2014)	Phase 2 (start: jan. 2015-start trial)
User profile & privacy (leakage) information	monetization insights (vizualisation)
Tracking information	audience influence (vizualisation)
Creation of black/white list of trackers (control),	user notifications for pictures/post privacy leaks (control)
Re-use of defined black/white list of trackers of friends (control)	
Trial January 2015	Trial April/May 2015

5. Piloting Strategy – a Living Labs Approach

The piloting strategy in this project is grounded in Living Labs and user centric approaches. We will in this section first introduce the concept of Living Labs, their key components as well as key principles for operations, before we outline the FormIT methodology, which is a typical Living Lab methodology. Thereafter chapter 6 will outline the methodology implemented in the pilots of USEMP.

5.1. Living Labs

A new concept supporting the processes of user-driven ICT systems development has started to spread and is often implemented in open innovation projects to get real world user influence and input. Hence, one precondition in Living Lab activities is that they are situated in real-world contexts, not constructed laboratory settings.

The development of Living Labs has two main underlying factors; one is the changed use patterns among ICT users; the other is the fact that many traditional ICT development projects carried out in closed environments have failed due to limited and late interaction with the potential market. When referring to change in use patterns, The transformation that can be discerned among users in the use of ICT for engaging in large user communities, for example in Facebook, Goggle Earth, Linux, Second Life, YouTube, and Wikipedia are in focus. These all are successful evidence of how users' joint efforts create valuable assets, such as content, products, services, etc. Hence, users have changed from being passive content consumers to becoming active co-creators of services and

Figur 3 Living Lab Users at the Centre

content. Based on the assumption that the power of large user communities situated in real-life contexts and built upon public-private partnership (PPP) can support the processes of innovation, the concept of Living Labs has started to get rooted around Europe. To facilitate the build-up phase of these Living Labs around Europe, a network was established in 2006, European Network of Living Labs (ENoLL).

At this moment (2014), 340 Living Labs are members of the European Network of Living Labs (ENoLL) and this network is continuously growing. The members of the network are operating all around the world, but their main residence is in Europe. The rationale behind these Living Labs is to support companies to open up their boundaries toward their environment and to elicit creative ideas and work capabilities existing among different stakeholder.

A Living Labs has the endeavour to support the innovation process for all involved stakeholders, from manufacturers to end-users with special attention to SMEs, and to do that with the potential users in the centre in their real world context. Among researchers, Living Lab is growing as a potentially important stream in innovation research and the researchers are concerned with issues such as defining Living Labs, how Living Lab supports the innovation process, the outcome of Living Lab projects and how to effectively involve users in

the Living Lab context. However, within the area of Living Lab there exists no agreed upon definition of the concept. It has been defined as a methodology, an organization, a system, an arena, an environment, and/or a systemic innovation approach. Based on our interpretation of the concept as well as our experiences of Living Lab practices, we define Living Labs as both as an environment (milieu, arena) and an approach (methodology, innovation approach).
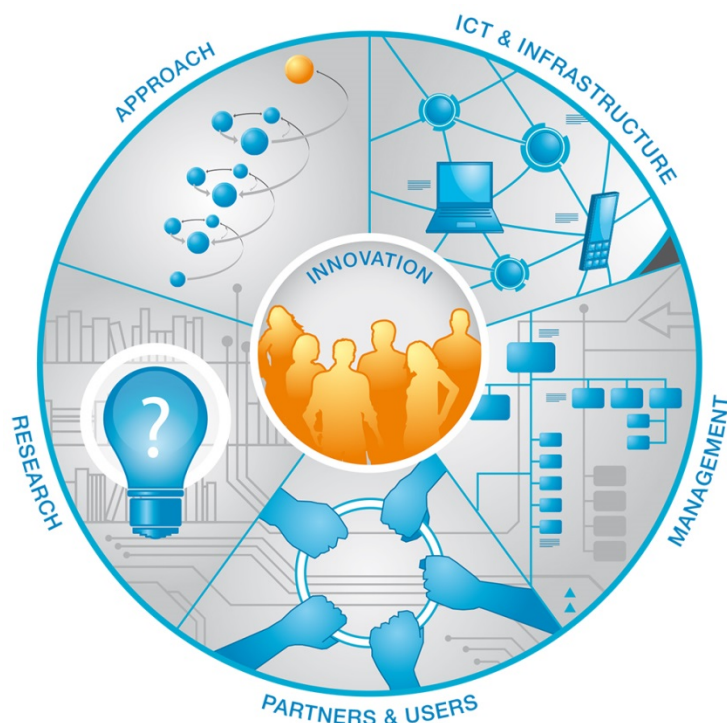
5.1.1. Living Lab Key Components

Many different types of Living Lab environments can exists such as, (1) *research Living Labs* focusing on performing research on different aspects of the innovation process, (2) *corporate Living Labs* that focus on having a physical place where they invite other stakeholder (e.g. citizens) to co-create innovations with them, (3) *organizational Living Lab* where the members of an organization co-creatively develop innovations, and (4) *intermediary Living Labs* in which different partners are invited to collaboratively innovate in a neutral arena. Due to the constant development of the concept other types of Living Labs certainly exists.

To be able to understand what a Living Lab is there are some components it should have. The components for a Living Lab are ICT and Infrastructure, Management, Partners and Users, Research and Approach, see figure above.

The *ICT & Infrastructure* component outlines the role that new and existing ICT technology can play to facilitate new ways of cooperating and co-creating new innovations among stakeholders. *Management* represent the ownership, organization, and policy aspects of a Living Lab, a Living Lab can be managed by

Figur 4 Living Lab Key Components

e.g. consultants, companies or researchers. The Living Lab *Partners & Users* bring their own specific wealth of knowledge and expertise to the collective, helping to achieve boundary spanning knowledge transfer. *Research* symbolizes the collective learning and reflection that take place in the Living Lab, and should result in contributions to both theory and practice. Technological research partners can also provide direct access to research that can benefit the outcome of a technological innovation.

A Living Lab environment should have a good relation with, and access to, users willing to be involved in systems development processes. Any Living Lab should also have access to multi-contextual environments, as well as high-end technology and infrastructure that can support both the processes of user involvement and technology development and tests. Each Living Lab environment also needs organisation and methodologies suitable for its specific circumstances. Finally, a Living Lab needs access to a diversity of expertise in terms

of different partners, since the scope of Living Lab activities often differ in character. Those involved are not obliged to be experts on Living Lab, but rather on their own specific area that can contribute to the Living Labs current activities. However, setting up a Living Lab with all the right components does not guarantee that it becomes a Living Lab; equally important are the key principles of the approaches applied in Living Lab activities.

5.1.2. Living Lab Key Principles

In Living Lab activities there are five key principles that should permeate all Living Lab operations. These key principles are Value, Influence, Sustainability, Openness, and Realism which will be described in more detail in the following chapter.

The five key principles for Living Labs will be described below[2]. As the Living Lab concept is multi-disciplinary, we will discuss these principles with reference to literature from related areas such as economy, innovation, organization, information systems, participatory design and human-computer interaction. These are the guiding principles on how to design the pilots in USEMP. How we do this is outlined in chapter 6.

Figur 5 Living Lab Key Principles

Value

In Living Labs, the goal is to create value for all stakeholders by having processes that emphasise this approach. This means that Living Lab processes support value creation in at least two different ways: for their partners (e.g. SMEs) in terms of business value and for the presumptive customer or user of the developed innovation in terms of user value. Business value is important for organisations to reach long-term prosperity and growth, which is of vital importance for their survival. Business value is a somewhat intangible term that includes all forms of value that determine the health and well-being of an organisation in the long-run.

Business value includes aspects such as employee value, customer value, supplier value, managerial value and societal value. One way to mitigate competition and open up entirely new markets is by focusing on creating advances in customer value (Kim & Mauborgne, 2005). In this project, we will focus on creating value by understanding users' context, activities and needs and then being able to design the DataBait system accordingly. Here, the value will mainly be focused on experienced and expected value of the system which will be one of our guiding principles when designing the Living Lab studies.

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[2] This description comes from the article: (Bergvall-Kåreborn et al., 2009)

Influence

One key aspect of the influence principle is to view users as active, competent partners and domain experts. As such, their involvement and influence in innovation and development processes shaping society is essential. Equally important is to base these innovations on the needs and desires of potential users (Sleeswijk Visser et al., 2007) and to realise that these users often represent a heterogeneous group. This means utilising the creative power of Living Lab partners while facilitating their right to influence these innovations. By stressing the decision making power of potential users and domain experts, this principle differs from related concepts such as participation, involvement, and engagement which instead focus on the activities carried out by users and on users' psychological state (Barki & Hartwick, 1989).

The term 'participation' means to take part in something, most typically to take part in and influence a change of some sort that again influences the different stakeholders of this change. The change is typically done in some organizational or societal context, where someone uses resources to perform the change, to achieve a result that produces some sort of value. In USEMP, influence will be reached by designing the process in iterations giving the users an opportunity to have an actual impact over the development and design of the system. We will also feed back to the users, which type of influence they had to further stimulate them to take part of our tests and evaluations.

Sustainability

Human life is dependent on a healthy and natural environment, which is rapidly degrading (Watson et al., 2010). It is therefore of utmost importance to work on a worldwide scale to create a sustainable environment for the future. Although the international determination to achieve environmental sustainability has been clearly articulated, considerable uncertainty remains at the individual, organizational, societal and governmental levels about problems and proposed solutions related to a sustainable environment (Elliot, 2011). Creating a sustainable environment includes economical, ecological and social aspects (SKR, 2004), which makes it a complex and multifaceted task. Sustainability can be defined as development that meets the need of the present without compromising the ability for future generations to meet their needs (Melville, 2010).

Many organisations have potential to contribute to sustainable growth while improving productivity, lowering costs and strengthening revenue. The environmental activities taken today in many organisations are not adequate and can lead to different types of waste such as unused resources, inefficient energy use, and emissions which decrease energy efficiency (Watson et al., 2010). DataBait as such will contribute to create a sustainable society through its focus on social sustainability. This means that by the implementation of DataBait, users will become less vulnerable and exposed to the possibility of their privacy being threatened. But the DataBait will also contribute to economic sustainability by empowering users to take control over their data and also possibly being able to make

money on the value of their data instead of, as it is today, mainly giving this resource away for free.

Openness

The current innovation landscape has changed. Many companies have thus identified a need to open up their innovation processes since innovation stakeholders have become more mobile, venture capital more abundant, and knowledge more widely dispersed across different types of organisations (van de Vrande et al., 2009). In the open innovation literature (e.g. Chesbrough, 2003, 2006; Chesbrough, 2011; Praest Knudsen & Bøtker Mortensen, 2011), openness is concerned with opening up the innovation process with a flow of knowledge in two directions: inflow and outflow. Outflow of knowledge implies innovation activities that focus on leveraging existing technological capabilities outside the boundaries of the organisation. Inflow of knowledge relates to innovation activities that focus on capturing and benefiting from external sources of knowledge (Huizingh, 2011; van de Vrande et al., 2009).

In Living Labs, the emphasis is on the inflow direction where several stakeholders are invited to participate in the innovation process. In a Living Lab, digital innovations are created and validated in collaborative multi-contextual empirical real-world environments. Openness is crucial for the innovation process in a Living Lab, where it is essential to gather a variety of perspectives that might lead to faster and more successful development, new ideas and unexpected business openings in markets. Being open and having an open process is something that will guide the design of the Living Lab approach in USEMP. This means that we will have a bidirectional flow of knowledge and information where the users gain insights into their privacy risks while at the same time giving us their input on the DataBait system which will further increase their understanding of privacy issues and losses.

Realism

One of the cornerstones of the Living Lab approach is that innovation activities should be carried out in a realistic, natural, real-life setting. This is important, since people cannot experience anything independent of the experience they get from being embodied in the world (Yoo, 2010). In the users' real world context, they interact with other digital artefacts and social actors; they perform different actions and carry them out on different occasions. To increase understanding of how a digital artefact influences and fits into the actors' activities and goals, it is important to study them in their intended context. Yoo (2010, p. 218) explains: "Technology is not being interpreted, nor is it being experienced as an end in itself. Instead, it directly shapes and occasionally transforms our lived experiences." Orchestrating realistic use situation and understanding users' behaviour is one way to generate results that are valid for real markets in Living Lab operations (Ståhlbröst et al., 2009).

However, the goal to create and facilitate realism needs to be addressed on different levels and in correlation to different elements such as contexts, users, use situations, technologies, and partners. This principle does not distinguish between physical and online contexts. Instead, it is argued that activities carried out in both contexts are real and realistic to actors. Inspired by online reality, we argue that IT based tools and methodologies can function as

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twin-world mediators (Attasiriluk et al., 2009) that facilitate the interconnection between real-world devices and their virtual counterparts.

Another view on realism is the more philosophical, critical realism, based on the work of Bhaskar (1989). From a philosophical view, critical realism asserts that the condition for knowledge does not arise in our minds, but in the structure of reality, and that this knowledge will not be universal and historically independent. Mingers (2004) argue, based on the work of Bhaskar, that there exist three domains of the real. These domains are the real (what exists), the actual (events) and the empirical (observable events). The real contains mechanisms and structured entities, events and experiences, i.e. the whole of reality; the actual consists of events that do (or do not) occur and includes the empirical, those events that are observed and experienced (Smith Longshore, 2006).(Mingers & Willcocks, 2004) Based on that, it is argued that we should not reduce all events to only refer to those that can be, and are, observed, and we should not reduce enduring causal mechanisms to events. (Mingers 2004).

The real is thus a complex interaction between dynamic and open systems, both material and non-material, where certain structures give rise to certain ways of acting. Adopting a critical realism approach means to maintain reality while still recognizing the inherent meaningfulness of social interaction. This means that ideas, concepts, meanings, and categories are equally real as physical objects. They are social products and are integral parts in the transformation of the social world. Critical realism aims to understand and explain why things are as they are (Mingers, 2004). With this approach, there exists a dualism where social objects are autonomous from individuals while dependent upon their activities (Smith Longshore, 2006). In the USEMP project, realism will be created by the implementation of the technology in their real world context. This means that we will use their actual Facebook profiles to be able to further develop DataBait. We will also strive to understand their real world context, to being able to design a system that is as appealing and useful as possible.

5.1.3. The 10 I´s for Involvement

In USEMP, we will design the user-engagement process according to the ten I´s Guidelines. These guidelines have been developed in previous projects focusing on user engagement in innovation processes and have been used since then to create successful user engagement[3].
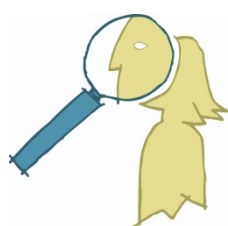
Identify: It is highly relevant to identify users' individual characteristics to understand them in depth. With the approach we have in this project, users are often involved as private persons, not as employees at a specific organisation. This approach makes it relevant to clarify in which role they are involved, is it as a customer, a citizen, a user or as a patient, since their role has influence on what they express as relevant. Hence, identifying users' characteristics and roles is relevant in user involvement processes carried out with a Living Lab approach. In USEMP a lot of efforts will be made to identify the users who wants to collaborate with the project both for the long term and for shorter periods. The identification of stakeholders is one step in the direction. We have identified users of Facebook as our main target user group in this project due to technical design.

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[3] For further details see, Ståhlbröst (2008).

Inform: users have been involved as partners, not just as containers of information from which their needs can be extracted. Instead, users are invited to involve themselves in all the phases of the development process, but with slightly different roles and responsibilities. With that approach, it is important to inform the involved users about their role, our expectations on their involvement, and their freedom to choose if they want to be involved in the development process. In USEMP the endeavour is to give the users the proper information about their role in the project, while also highlighting how we are handling privacy issues in the project to make sure that they are well aware of their rights.

Interact: in USEMP interaction is mainly related to the interaction between different competencies related to the project. This interaction has two dimensions: it is the interaction within the development team, and it is the interaction with partners outside the development team, such as potential users and affectees. When it comes to interaction among different competencies in the development team, this approach enabled gaining fresh insights and facilitates innovative thinking by providing different perspectives of what was expressed by the stakeholders being involved in the project. It is important to focus on generating user needs instead of focusing on identifying systems requirements since user needs stimulates creative thinking within the development team, which in turn makes it possible to innovate. In the process of interaction, both within the team and outside, is it vital the involved parties have an open mind to what the users express to enable them to feel empowered.

Iterate: It is important to iterate in the process of understanding users' needs when a Living Lab approach is applied. The iterative process has several purposes, one, to increase the development team's understanding of the users' situations, and two, to facilitate building users' knowledge about possible solutions and diverse perspectives, and three to value the design decisions throughout the process. By their increased knowledge, the stakeholders become better at communicating and the iterative process make it possible for the stakeholders to get a more nuanced way of expressing themselves as both their level of awareness of the relevant needs, and their level of knowledge about possible solutions increases as they become more informed. In USEMP, there will be an iterative process starting with a need finding study and continuing with a pre-pilot and then a large scale pilot when the DataBait system is more stable and the user can interact with the DataBait in a proper manner.

Involve: One basic approach in the USEMP project has been to involve external users and stakeholders in the development of the Databait system. These users and stakeholders are involved in our activities as voluntary contributors and, as such, we need to understand what motivates them to involve themselves in our development processes. What is their driving force for involvement? Involvement also concerns issues such as who should be involved, where should they be involved, when should they be involved, and how should they be involved. Hence, users should be involved early on in the process to make it possible for them to feel involved. Here, it is important to note the difference of being involved and attend in the process.

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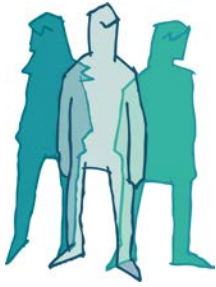
Influence: influence in user involvement process has two different meanings; firstly, the users' ability to influence the final innovation, and secondly, the influence the inspirational tools might have on users' expressions. Users' influence on the final innovation means that users can influence the development if they are involved early on in the process where they can actually have influence on the development of new technological solutions instead of merely giving feedback on determined systems. Here, to ensure that users feel that they have influence, their needs should be used as a foundation for the designed system. The other meaning of influence, is that when users are exposed to stimuli material their expressions and visions become influenced to some extent. Hence, the possible influence of every stimulus applied in user involvement processes needs to be considered strongly and discussed in the development team to ensure that the influence it might have on users' frames of reference is understood fully to prevent false design decisions. In the USEMP project, the users will have the opportunity to influence the design of the final version of DataBait through the interactive process in the project. This means that the insights from the pre-pilot will be fed into the continued design of the system. This will also be the situation with the final evaluation of the DataBait system.

Inspire: Inspiration is relevant in two processes in development activities: firstly, in the involvement process where the users should be inspired to let go of their status quo, and secondly, in the design process where the developers should be inspired expand their solution horizon. In the user involvement process, the users should be inspired to express themselves with their own terms to generate as rich data as possible from which their needs can be generated. The users also should be inspired to tell stories about their situations and the goals they aim to achieve in their everyday life. In addition, to make it possible for the users to expand their solutions span and become inspired. Stimuli can be used to trigger the users' motivations and reveal their needs. To make it possible to inspire developers, the users also should be inspired to dream about a desired future state and to describe this state. The users will be inspired to use the DataBait system in this project through the design of micro tasks for the to carry out during the test and evaluation of the DataBait. Here, the focus is to inspire the users to learn a new system and also new habits on using it which is not always an easy task. In addition, we will put efforts into inspiring the system developers to take in the input the users give on the system to make it as useful and appealing as possible.
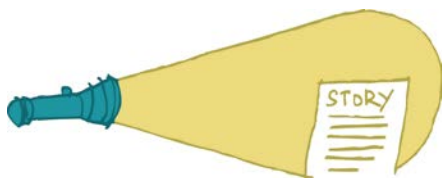
Illuminate: In this project we have acknowledged the importance of excavating into user stories to illuminate relevant aspects, such as information privacy from different perspectives in the situation under study. One central point in this process is to create an open climate in which the users feel comfortable to reveal their thoughts and illuminate opportunities they experience in their context. By this approach, insights about users' need of a system increases as well as the understanding of their perceived reality and the underlying rationale for their expressions. This sort of understanding is vital in order to design systems that users will feel motivated to use in a specific situation. Hence, by encouraging users to tell rich stories that illuminate vital aspects about their current life situation makes it becomes

possible to design the implementation of the system according to their situation and thus, an authentic use situation can be facilitated.
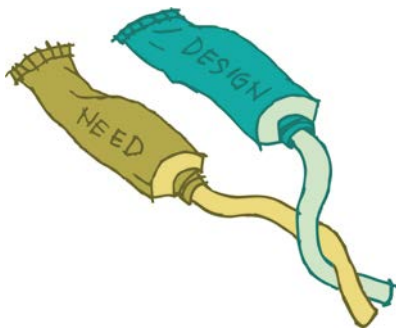
Integrate To integrate means two things in the USEMP project. Firstly, representations of users' needs should be integrated in the design to increase the chance that the final systems will provide an added value for the users. Secondly, when the design (in all its varied maturity levels) is introduced to the users, it should be integrated in their real-world context based on the knowledge gained in the interaction process. By this approach, understanding of how the IT system fits into the users' context and habits can be gained and based on that can informed design decisions be made. Hence, to integrate means to have proper insight into how users' perceive their everyday situation.

Implement One focal point our approach was to implement and test the results from the user involvement processes in the users' perceived real-world environment. The main aspect in this approach is to create as authentic use situation as possible for the users to make it possible to get their spontaneous input on how they perceive the implemented system. The design of this authentic situation should be supported by the deep knowledge about users' needs that has been gained during the process. I have also found that when a new system is implemented into users' context it is important to be open and attentive to what is happening during this process. People in general have inertia to change their behaviour; hence they must be encouraged and reminded to use the implemented system on a regular basis.

Implementing a system in real-world contexts inherits the difficulty to observe users' use and behaviour while using the system, hence the influence of contextual issues needs to be considered and discussed. In addition, when the system is implemented into the users' natural environment, they can also feel more comfortable and relaxed while they test the system in contrast to controlled laboratory setting where everything the user attempt to do is scrutinised and recorded. This does not mean that laboratory observations are inadequate in all situations rather it means that these tests and observations should be complemented with a real-world use perspective. Implementing a system in the users' real world context require also that the Living Lab environment feel that they can trust that the users' attitudes towards the system mirror their perceived experience.

In the tests and evaluation being carried out in the USEMP project, the DataBait system will be implemented in the users real world context. This means that they will test it in their every day context and that they will not go to a lab to test it. In this implementation, it is important for us to gain as much insights as possible about how they use Facebook, in which situations etc to get as good view as possible about the hindrens an opportunities the implementation in their natural context has.

5.1.4. Scenarios and Micro tasks

Pilot studies are aiming to test the USEMP tools though different scenarios and micro tasks. Scenarios are a series of stories compromised of different micro tasks that tests one feature or a number of features within USEMP platform. This section is focused on the front end of

USEMP tool, called DataBait. This is where users interact with the system and it provides visual interface to manage their privacy within social media and the Internet. Scenarios and micro tasks starts by describing the aims and objectives of the project and continues by demonstrating the DataBait system and its available features at a general level. We will then show the users what sorts of problems available in current OSN and how those could be addressed by DataBait.

The user is then invited to discuss the barriers that hinder them to use such a system. Those barriers are then fed into future scenarios to evaluate the acceptability of the system. More usage barriers that we capture in early phases, more we can improve our motivation of the future scenarios. D4.1 describes some common problems in adaptation of privacy enhancing tools. The pilot need-findings will focus on the needs and opportunities that DataBait will address and user's feedback will give new insights on pilot requirements. Scenarios and micro tasks must also give rise to new barriers, challenges and opportunities other than those enumerated in D4.1 and users will be encouraged to share their experience and ideas to improve DataBait.

User's behaviour towards usage of privacy tools will be given special attention here because the results from D4.1 ascertain user's disappointment in adopting into regulatory management of their privacy through technical tools. Pre-pilot and pilot requirements should be able to evaluate main feature of USEMP tool such as "OSN Presence control (empowerment) tool" and "Economic Value Awareness" along with barriers and problems that are available in current privacy enhancing tools.

The main features of the USEMP tool are extracted from D7.1 and those features are going to be used as the basis of conceptual testing. Those features that are connected to the frontend are categorized within three tools: LIO Browser Plugin, LIO GUI plugin and LIO Facebook Plugin (LIO refers to older name of DataBait in D7.1).

"Privacy Dimensions" discussed in work package 6 task no. 1 will be used to create thematic scenarios and micro tasks. Those dimensions are Demographics, Psychological Traits, Sexual Profile, Political Attitudes, Religious Beliefs & Cultural Heritage, Health Factors & Condition, Location and Consumer Profile. Privacy dimensions reflect user traits and information that are typically considered sensitive, hence each scenario will address one dimension and user feedback will be captured to evaluate the usability of DataBait. It is expected that after each iteration of pilot studies, the requirements for the next pilot evaluation scenarios are emerged. The choice of privacy dimensions used in the first iteration are based on less intimate but with high inferred data used within OSN.
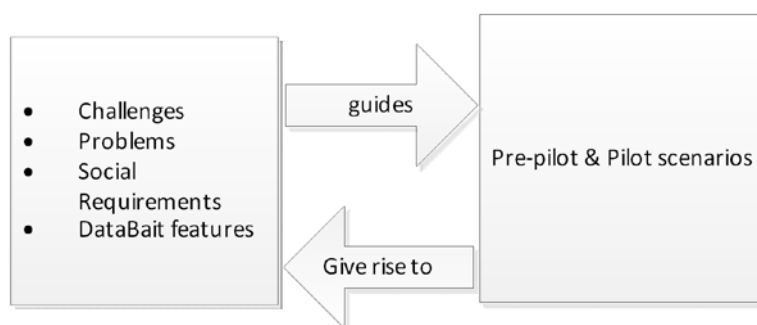
Figur 6 Scenarios Development

Scenarios and micro tasks concerning "OSN Presence control (empowerment) tool"

Scenario A)

After user logs in to the DataBait tool, she will go the main interface and selects "My Privacy" from the screen. User then defines her preferences for the level of invisibility that she considers sensitive (e.g. political preference) to low. Then users are asked to update their status in Facebook, like open groups or comment on something related to the defined preference. Users then will reflect upon their experience.

(Possible Privacy Dimensions: Demographics, Sexual profile, Political attitudes, Religious Beliefs & Cultural Heritage, Health Factors & Condition, Location)

(Barriers to overcome: Ease of use, Un-user-friendliness, Time consuming, Trust)

Scenario B)

After login to the DataBait tool and installing the browser plugin, users are asked to surf the web for 7 days just like their normal usage. After 7th day she will go to the DataBait tool and chooses "Audience Influence" and "User Trackers". Users must be able to reflect upon the functionality of each feature and describe in their own words what those features are.

(Possible Privacy Dimensions: Consumer profile, Possible Privacy Dimensions: Demographics, Sexual profile, Political attitudes, Religious Beliefs & Cultural Heritage, Health Factors & Condition, Location)

(Barriers to overcome: Ease of use, Un-user-friendliness, Time consuming)

Scenarios and micro tasks concerning "Economic Value Awareness"

Scenario C)

After creating profile in DataBait and linking their Facebook profile, users are invited to take pictures with a visible logo like t-shirt, cap, jacket, holding an item and etc. and then upload it to the Facebook or start advertising for an especial brand. After going to the DataBait main interface and selecting "Monetization Insights", users should be able to have an estimation of their shared data. The value must decline should the user share more data containing brands information.

(Possible Privacy Dimensions: Demographics, Consumer Profile, Location)

(Barriers to overcome: Ease of use, Un-user-friendliness, Trust)

Scenario D)

Upon installation of DataBait browser plugin, users are invited to frequently visit a list of containing random sites that are providing services based on different thematic privacy dimensions (e.g. hobbies, demographic), but they only need to visit sites within one theme. Based on their visit, users need to reflect on how relevant their USEMP user profile is to different third parties (i.e. sites visited before).

(Possible Privacy Dimensions: Demographics, Health Factors & Condition, Consumer Profile, Location)

(Barriers to overcome: Trust, Established habits)

5.2. FormIT – The Living Lab Methodology

In this chapter we outline the FormIT methodology which will guide the piloting in USEMP. How it is implemented is outlined in chapter 6. FormIT is a methodology that is developed to suit and support Living Lab activities. This methodology is inspired by three theoretical streams: Soft Systems Thinking, Appreciative Inquiry, and NeedFinding. From the first stream, Soft Systems Thinking (Checkland & Scholes, 1990; Checkland, 1981), the assumption that changes can occur only through changes in mental models is utilised. This implies that we need to understand both our own as well as other stakeholders' worldviews, and we need to be clear about our interpretations and the base on which they are made. The second stream, Appreciative Inquiry (Cooperrider & Avital, 2004; Cooperrider & Whitney, 2005; Cooperrider et al., 2005; Norum, 2001), has encouraged us to start the development cycle by identifying different stakeholders' dreams and visions of how IT can improve and support the lives of people. This includes a focus on opportunities, related to specific trends, contexts, or user groups, and on the positive and life-generating experiences of people (Holst & Ståhlbröst, 2006; Ståhlbröst & Holst, 2006).
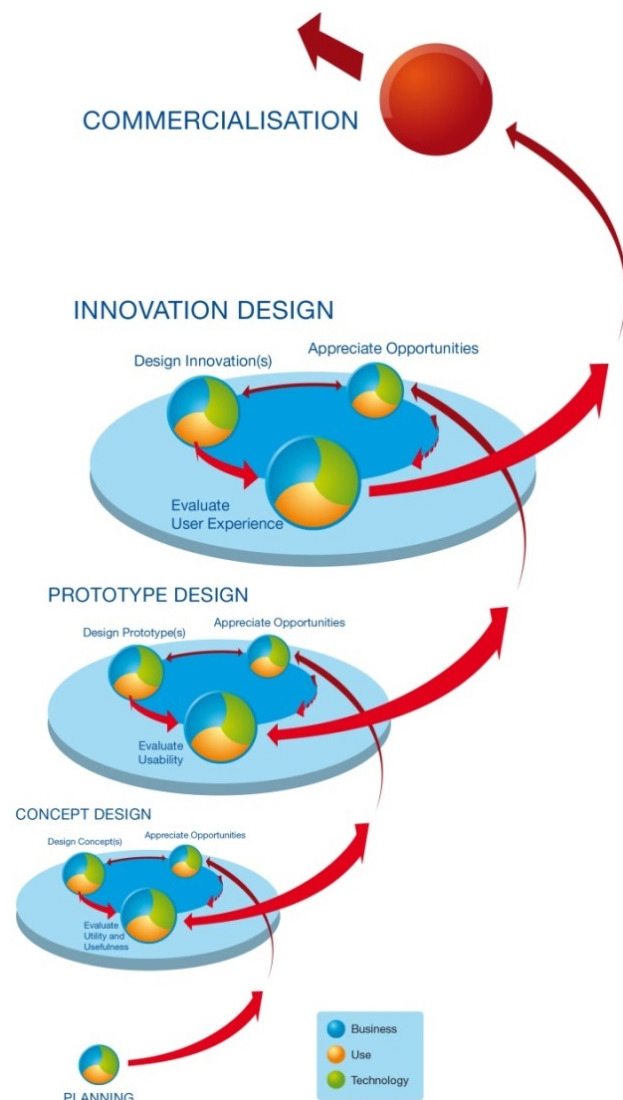
Figur 7 FormIT Methodology

This way of thinking is aligned closely with the philosophy behind soft systems thinking, since it also highlights the importance of people's thoughts about themselves and the world around in a design situation. Hence, instead of starting the process by searching for problems to solve in a situation, we identify what works well and use this as a basis for design.

The third stream, NeedFinding, has two different inspirational sources. The NeedFinding concept, as such, and its motivation finds its origin in a paper by Patnaik and Becker (1999). Patnaik and Becker argue that the main motivators for the NeedFinding approach are that needs are not influenced highly by trends; hence, they are more long lasting. The needs generation process, on the other hand, is inspired by Kankainen and Oulasvirta (2003) and Tiitta (2003). These authors inspire us to focus on user needs throughout the development process, and to use these as a foundation for the requirement specification.

5.2.1. Characteristics of FormIT

Grounded in these three theoretical streams, FormIT enables a focus on possibilities and strengths in the situation under study; which is fundamentally different from traditional problem-solving approaches. In our perspective, identifying opportunities is the basis for appreciating needs since needs are opportunities waiting to be exploited (Holst & Ståhlbröst, 2006; Ståhlbröst & Holst, 2006). Hence, FormIT strongly stresses the importance of the first phase in the concept design cycle, usually referred to as analyses or requirements engineering. Since this phase creates the foundation for the rest of the process, errors here becomes very hard and expensive to correct in later stages. This also is the phase in which users can make the strongest contributions by actually setting the direction for the design, rather than mainly responding to (half finished) prototypes. Since users' needs and requirements can change as users gain more knowledge and insights into possible solutions, it is important to re-examine their needs continually and make sure they correlate to given requirements.

In accordance, the FormIT method is iterative and interaction with users is an understood prerequisite. The idea is that knowledge increases through iterative interactions between phases and people with diverse competences and perspectives (Holst & Mirijamdotter, 2006; Mirijamdotter et al., 2006). In this way, knowledge increases through dialogue among participants. The idea is that the cross-functional interaction enables the processes of taking knowledge from one field to another to gain fresh insights, which then facilitates innovative ideas. The shared understanding of the situation that evolves in this process informs and enriches the learning processes and thus facilitates changes in perspective and lead towards innovative design processes. This, in turn, increases our qualifications to design IT systems that answer to user needs (Ståhlbröst & Holst, 2006).

5.2.2. The FormIT Process

The FormIT process can be seen as a spiral in which the focus and shape of the design becomes clearer, while the attention of the evaluation broadens from a focus on concepts and usability aspects to a holistic view on the use of the system.

In the FormIT process there are three iterative cycles:

- Concept design cycle in the lower part of the figure
- Prototype design cycle in the middle and
- Innovation design cycle in the upper parts of the figure.

and in each cycle there are three phases:

- Appreciate Opportunities
- Design and
- Evaluate

Besides these three cycles, two additional phases are included in the process. The first is planning, seen in the lower part of the figure, and the second is commercialisation, which is visible in the upper part of the figure.

Planning

Planning stands for planning the R&D project as a whole and in this phase is it important to gain as much information as possible about the underlying circumstances for the project, its aim and scope, different perspectives on the project, relevant competencies among the project-team, and the

Figur 8 FormIT Planning

context, constraints and boundaries that needs to be defined and agreed upon. It is important to mix different competencies to stimulate knowledge sharing and an increased understanding of the involved stakeholders' visions (Ståhlbröst & Bergvall-Kåreborn, 2008; Ståhlbröst et al., 2005).

This process can be difficult to accomplish since project participants usually want to make contributions to many diverse areas, hence making it hard to decide what to include and what to exclude in the intervention. Thus, it is important to support a continuous and communicative approach to build trust and confidence between the stakeholders (Ståhlbröst, 2006). Examples of explicit questions that need to be discussed among project partners before the appreciating opportunities phase starts can be:

- What is the goal with the R&D project?
- Who are the target user-groups, customers, intended users, as well as non-users of the innovation that is developed in the R&D project as a whole? (e.g. energy consumers)

When these questions have been handled and discussed the detailed planning of the project can start.

Cycle 1. Concept Design

The first cycle of FormIT, concept design focus on designing concepts that gives the foundation for future design of the Innovation. This phase is built on the appreciation of opportunities and on generating the basic needs that different stakeholders have of the system.

This cycle should end up in a concept,

which represents the generated needs from the first step in the cycle.
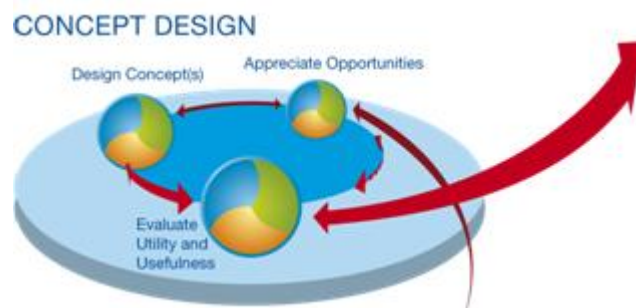
Figur 9 FormIT Concept Design Cycle

The process of the concept design phase starts by appreciating opportunities which included:

- define the scope for the process
- the target-user group and their important characteristics
- where these users can be found and their role in the user involvement process.

The needs in focus here are the needs that motivate the users to buy and use a particular IT system, i.e., what triggers their motivation.

This process is supported by obtaining a rich picture of different stakeholders and user groups, their behaviour, attitudes, and values by letting the users tell stories about their lives. In these stories, the users should be encouraged to tell stories about their history, their everyday practice, and their dreams of the future to facilitate an opportunity to find users' needs.

During this process it is important to keep the five key principles in mind and to consider how, for example, value can be created for the users, how openness should take form, how the users can influence the process, how the process should be designed to capture as realistic situation as possible and how sustainability take form in this phase.

When the data collection process is finalised, the users' expressions should be analysed and needs should be generated and translated into concepts, and by that, the focus for the work shifts from generating needs to designing concepts.

The design of the concepts needs to be detailed enough for the users to understand the basic objective of the system, without having a design of the system to keep more doors open and to avoid premature solutions.

After the design is finalised, the focus shifts again, but this time from the design phase to the evaluation phase. The aim of the evaluation of the first cycle is to:

- make sure that the involved stakeholders such as users agree with the basic objectives of the developed concept.

This means that the basic objectives and functions of the system should be related to the generated needs of the system to make sure that these are consistent. If not, this cycle needs to be reiterated until such coherence is achieved. The aim of this evaluation is also to give users the opportunity to co-create the concept according to their needs.

Phase 1 – Appreciating Opportunities

The aim of this phase is to gain insights into what needs users might have of the innovation in focus in the situation that the projects strives to contribute to. This process can be combined with the evaluation phase in later stages in the innovation process, but at the start of the project it is crucial that this process is a separate process to ensure that user needs is the driving force of the development of the design throughout the whole innovation process. We suggest using focus-group interviews as method for data-collection since they are easy and effective. In these groups, the process benefit from a mixture of roles; users, developers, business people and so forth.

In this phase the following issues and questions needs to be managed and decided to start with before designing the process as a whole.

- What is the purpose of the appreciating opportunities phase in the project? What do you want to achieve?
- Who are the target user-groups that need to be involved in this process? How should they be involved? What are the users expected to contribute with?
- Which needs, requirements and wants does the users have or express in the study?

Phase 2 – Designing Concepts

The aim of the concept design phase is to develop concepts or rough prototypes based on the constructed needs from the former phase. The concepts need to be detailed enough for the user to understand the basic objective with the functions of the innovation.

During this process it is important to keep the five key principles in mind and to consider how, for example, value can be created for the users, how openness should take form, how the users can influence the process, how the process should be designed to capture as realistic situation as possible and how sustainability take form in this phase.

Questions that need to be discussed among project partners in the concept design phase are for example:

- Which user expression(s) (such as needs, requirements, desires etc) are most relevant in relation to the purpose of the project?

Use methods and tools to support the creative process of creating new concept ideas. These methods can be for example: Future Workshops, Brainstorming, Method 365, Experience Prototyping, Innovation by Boundary Shifting, or other informal techniques to remove fixations.

- The main objective is to **look beyond** the immediate vision that comes to mind and to do that with the **users' expressions** in focus. Aim to develop different concept ideas

Document and design the concepts:

- Decide on what level the concept should be described to illustrate and transfer users needs
  - Use methods such as Scenarios, Mock-Ups, Storyboards, Films, Visual Narratives to document the concepts.

Iterate in the process to make the concepts more detailed.

Phase 3 – Evaluate Utility and Usefulness

In this phase, the focus is to encourage users to express their thoughts and attitudes towards the concepts being developed from the basis of their needs of the service. This is combined with the aim to identify new any unexplored needs users might have or needs that are modified in some way. Concept evaluations should be iterated until the concepts answer to relevant user needs in satisfying manner and no new insights about users needs can be identified. The aim of the concept evaluation is to identify how the concepts should be related and refined to answer to the needs that have been identified in previous inquiries. When dealing with innovations it is important to keep in mind that it can sometimes take years for an innovation to have an actual impact. What is most important is to learn from failures to ensure that the same mistake is only done once.

During this process it is important to keep the five key principles in mind and to consider how, for example, value can be created for the users, how openness should take form, how the users can influence the process, how the process should be designed to capture as realistic situation as possible and how sustainability take form in this phase.

Issues that need to be discussed among project partners in this phase are listed below:

- What is the approach and purpose for the evaluation? What results can be expected?

- What is the main question that needs to be answered?
- How are the identified needs and/or requirements reflected in the concept?

Cycle 2. Prototype Design

The second cycle, prototype design, starts with the process of identifying stakeholders' needs in the service. That is,

- when using a service, what needs are then important for the users??

As in the first iteration, this is done through a variety of data gathering methods, such as interviews and observations.
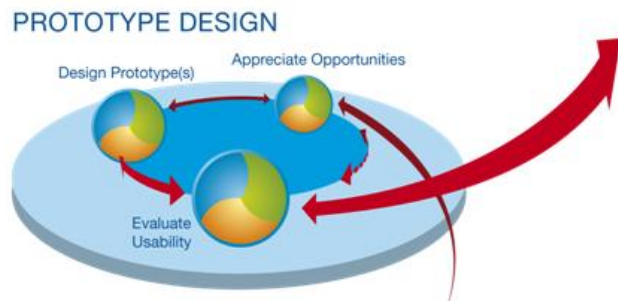
Figur 10 FormIT Prototype Design Cycle

One way of doing this is to keep the concept design, with key needs related to it, visible for the users during the data collection activities, so it is possible to relate to these during the discussions. When the data collection no longer generates new insights and findings, the focus again shifts to the design phase. However, in the second cycle the design of the system broadens to include basic functions, work flows, and interfaces.

During this process it is important to keep the five key principles in mind and to consider how, for example, value can be created for the users, how openness should take form, how the users can influence the process, how the process should be designed to capture as realistic situation as possible and how sustainability take form in this phase.

The prototype that has been designed in this cycle needs to be detailed enough for the users to understand and be able to experience how the final service will look and feel. This leads to the evaluation that is centred on usability aspects in the second iteration. This includes questions and analyses concerning:

- how easy the service is to learn
- how effective and enjoyable it is to use, from the user's perspective.

Hence, the evaluation is focused on INTERACTION between the user and the service. It is not limited to the user interface, even though this plays an important role in how the user experiences the interaction.

Phase 1 – Appreciating Opportunities

The focus in this phase here is to find what needs etc, users have in the systems we are aiming to design. This means that we want to find the basis for the design of the systems interface, and its functionality. The overall purpose is to collect sufficient, relevant, and proper data so that stable requirements can be produced. You already have a picture of the requirements, but not enough, they need to be expanded, clarified and confirmed. In this phase the following issues and questions needs to be managed and decided. When the project includes several cycles, this phase is often combined with the evaluation phase in the previous cycle.

- What is the purpose of the prototype? What situation does it aim to contribute to?

- In which **physical, social, technical and organisational** context is it planned to be implemented?
- Decide which data-collection methods to use.
- Which needs does the users have IN the system?

Phase 2 – Prototype design

The aim of the prototype design phase is to move from concepts (or low-fidelity prototypes) to high-fidelity prototypes with a focus on users identified needs throughout the whole process. Using prototypes has shown to be a useful aid in the discussions with stakeholders in the development process, as well as inside the development team as for you. The main objective is to look beyond the immediate vision that comes to mind and to do that with the users expressions in focus. Aim to come up with different design solutions.

Issues that need to be discussed among the development team in the design phase are:

- What is the overall purpose of the system to be designed? Discuss the user requirements (needs, requirements, usability goal, user experience goals, values etc) that have been identified and presented in the former process. Clearly express the underlying values important to consider in the design.
- Which hardware should the solution be designed for? (e.g. mobile phone, PC, surf pads, or other gadgets)

Document and design the prototypes:

- Decide on what level the prototypes must be described to express the feeling you want to mediate

Constantly go through the design to make sure that the user requirements, needs and values have been considered in the design. To evaluate the system before doing it with users, Heuristic Evaluation can be used (Sharp, Rogers & Preece 2007).

Iterate in the process to make the design more and more focused and detailed in their shaping.

Phase 3 – Usability Evaluation

In this phase, the focus is to encourage users to express their thoughts and attitudes towards the design being developed from the basis of the needs in the developed system. Users want systems that are easy to learn, effective, efficient, safe and satisfying, i.e. the systems usability and to achieve this, the system needs to be evaluated with users.

Issues that need to be clarified among project stakeholders in this phase are for instance:

- What is the purpose of the evaluation? (e.g. Navigation issues, user satisfaction, graphical design, efficiency, utility, learnability?)
- Which evaluation method should be used? (e.g. think aloud, usability evaluation, field study, logging, cognitive walkthrough, focus-groups)
- Who is the typical user?

Carry out the evaluation

The analysis of the data from the evaluation should emphasis what went wrong as well as what needs to (or must) be changed and modified in the next iteration.

- How does the design answer to the requirements, needs and values the prototype has been designed for? How can it be redesigned to better fulfil the needs?

Present the findings from the evaluation in an evaluation report including users' comments, design suggestions.

Cycle 3. Innovation Design

The third cycle, Innovation design, starts by analysing the results from the usability evaluation in order to generate changes in the needs of and in the service.

Small changes and adjustments in the needs are quite common, especially in relation to the needs in the service, as the system develops and users' understanding of structure, content, workflow, and interface deepens. Based on these changes, changes in

Figur 11 FormIT Innovation Design Cycle

the design of the innovation also take place, as well as general development work to finalise the service as a whole. User experiences goals can be both positive and negative, for example enjoyable or frustrating. They are primarily subjective qualities and concern how an innovation feels to a user and differ from more objective usability goals in that they are concerned with how users experience an innovation from their perspective, rather than assessing how useful or productive an innovation is from its own perspective (Sharp et al., 2007).

During this cycle it is important to keep the five key principles in mind and to consider how, for example, value can be created for the users, how openness should take form, how the users can influence the process, how the process should be designed to capture as realistic situation as possible and how sustainability take form in this phase.

Phase 1 – Appreciating Opportunities

The aim of this phase is to gain insights into what needs users might have both of and in the service. As in earlier phases, the questions that need to be answered are focused on identifying who the users are etc. This process need to be combined with the evaluation phase in previous cycles in the process, for guidance see cycle one and two to support the design of the appreciating opportunities in this phase. This means that questions regarding both utility and usability issues needs to be formulated and asked to the users. In this phase, users can use the prototype before conducting the evaluation in cycle two.

Phase 2 – Design of Final System

The aim of this design phase is to move from a high-fidelity prototype with a focus on users identified needs to an innovation. This means to include both business model aspects as well as designing a fully functioning innovation. The main objective is to re-design the innovation according to feedback gained in earlier phases.
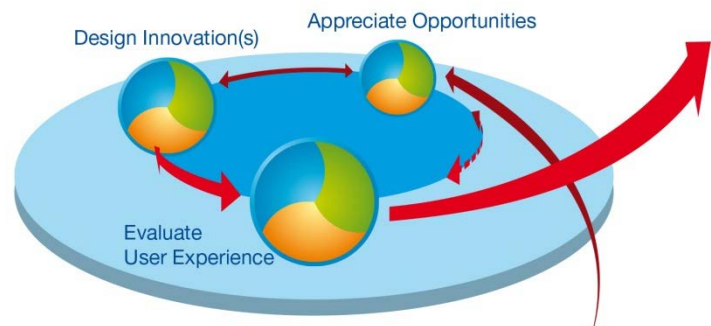
Phase 3 – User Experience Evaluation

In this phase, the focus is to encourage users to express their thoughts and attitudes towards the design from the basis of the needs of and in the developed innovation. User experiences goals can be both positive and negative, for example enjoyable or frustrating. They are primarily subjective qualities and are concerned with how an innovation feels, or are experienced, by a user. User experience goals differ from the more objective usability goals in that they are concerned with how users experience an innovation from their perspective. Issues that need to be clarified before a user experience evaluation starts are listed below:

- What is the purpose of the evaluation? What to you want to achieve?
- How can we encourage and stimulate users to use the innovation during the test period?

Develop a "test-storyline" to support the users in their test showing what is expected from them:

- Activities they must do, for example, number of surveys, typical tasks, use of certain functionality, etc.
- Activities they can expect from us
- Frequency of use
- Test-period, for how long will the test pro-long
- Time required from them
- Are there any ethical considerations that need to be handled?

Create questions or other material for the evaluation focusing on what should be. At this stage – develop questions on the basis of the users identified needs, requirements and values in the innovation and relate them to experiences.

Carry out the evaluation

- How does the innovation answer to the requirements, needs and values the system has been designed for? Which improvements are needed to better fulfil the needs?

The analysis of the data from the evaluation should emphasis what went wrong as well as what needs to (or must) be changed and modified in the next iteration.

Present the findings from the evaluation in an evaluation report including users' comments, design suggestions.

Commercialisation

The commercialisation phase can be viewed as a separate project in which the aim is to introduce the innovation to a potential buyer and assess its potential on the market. However, since the commercialisation phase is managed in WP9 it is not described in this deliverable.

Figur 12 FormIT Commercialisation

6. USEMP Adoption of the Living Lab Approach

The method especially designed for the USEMP project, is based on the established Living Lab methodology, FormIT (Bergvall-Kåreborn et al,; 2006; 2008; 2009a; Ståhlbröst, 2008). In every project when you work according to the FormIT methodology you will have to make a process plan based on what the aim of the project is. Sometimes you only work in the first cycle and sometimes you only work in the third cycle. In the USEMP project we will work in all three cycles. In this chapter we will outline the planned process a bit more in detail and relate it to the guidelines found in chapter 5.

The process is described as follows in the plan of the project. The first cycle focuses on Need Finding and idea-generation and concept development, the second cycle focuses on prototype development and beta-test and the final, third cycle focused on the final innovation design. In each cycle the idea of the DataBait tool will evolve and different partners and users are involved in an interactive boundary crossing process throughout the whole set-up.

DataBait development will take place in iterations and the solutions will be affected by the results in piloting. Hence, piloting will give valuable feedback on the prototypes and make sure problems and new ideas are addressed. In the pilots the different solutions that have been developed will be tested in real life situations with user-groups in the Living Labs. The user experiences will be evaluated and documented.

6.1. DataBait Stakeholders

In this section we will shortly discuss different stakeholders in relation to the usage of DataBait. At this point we see three clear stakeholder groups which we will involve in the innovation process as they are all affecting or affected by the Databait system. All types of stakeholders will be involved during the piloting process on different levels and during different time periods, the focus will however be on the end-users as data-providers which we aim to empower and turn into data-users as well as data-brokers and data-owners.

6.1.1. Providers of Online Social Networks (Data-owners)

Sharing data on Online Social Networks (OSNs) has become an important part of the everyday lives of a wide majority of European citizens. OSN users share a myriad of volunteered data, (such as photos, videos, texts, Web queries, likes) and are observed by a variety of Web services through various applications (such as browser cookies or location trackers) that record a mass of online behavioural data. From volunteered and observed (behavioural) data, different online services automatically infer new information and build user profiles that are sold to third parties and constitute the core of their current business models.

6.1.2. Third parties (Data-users and Data-brokers)

The USEMP platform aims at providing tools that enable OSN users to control their data and to understand how they are used by *third parties*. The user should be able to control the use of her content – volunteered, observed or inferred – by *third parties* whereas this is not currently the case. The recent change of terms of use introduced by Instagram (BITS, 2012), giving the OSN the right to monetise users' contribution without any notification, illustrates the need for innovative economic models that reward not only the platforms that store the

41

data but also their creators. Users are often not fully aware of the economic potential of their OSN contributions and tools that raise this awareness are needed in order for them to understand and control the way OSNs repurpose data through automatic inference and subsequently monetise them.

6.1.3. End-users (Data-providers)

Data processing capabilities available to OSNs and those available to end users are imbalanced in favour of the OSNs, a situation that determines a democratisation of content production and sharing but not of the means to manage and control content on the user side. This situation is echoed by a recent Eurobarometer study (Eurobarometer, 2011) which concludes that 74% of Europeans feel that they do not have enough control of their shared data and that 70% are concerned with the way such data are handled by the companies that gain access to it.

The idea in USEMP is to empower data subjects with regard to the sharing of their personal data, which is increasingly becoming part of a largely invisible economy where personal data is the currency.

6.2. Planning

To support knowledge sharing and to get a coherent view of the context in which the pilots are implemented, it is important that the pilots are described in some detail. In this phase the focus is to understand the basis for the user studies and the purpose of them.

PLANNING

As outlined in chapter 5 each phase needs to start with planning and with discussion and answers to these areas:

- Purpose, questions, methods,
- Type of users, number of users etcetera
- Time period and number of interactions
- Motivations and incentives
- Technical equipment needed
- Competences and other recourses needed
- Ethical considerations
- Context (social/technical/organisational/physical)

And as also discussed Key Principles of Living Labs operations as well as the 10 I's create the basis for design and are implemented in all activities.

Working in an iterative and interactive way always affects the planning. Therefore the first plan is not in too much detail in terms of methods and time slots for different activities. This is outlined in more detail for each phase depending on the results in previous phases.

6.3. USEMP Cycle one – Pre-Pilot – Concept Design

Moving into the first cycle we focus on utility and usefulness. In USEMP we will do this cycle in two iterations. First we worked internally with needfinding and design of concepts during the start-up of the project. Results from this have been outlined in D2.1, D3.1 and D4.1 as well as D7.1. The second iteration will be external with real users and is outlined in the following. The time-plan for the second iteration is to:

- Planning pre-pilot in detail (November/December 2014)
- Running Pre-pilot (January-February 2015)
- Analysing results. Summarizing and feeding back to developers. Pre-pilot evaluation report April. (March-April 2015)

The planning is guided by chapter 5.2.2 cycle 1 and this includes;

- detailed plans for the appreciating opportunities process.
- detailed plans for the design of concepts process.
- Detailed plans for the evaluation of concepts which since we are also working in cycle two include appreciation of opportunities for the next phase (cycle).

Hence, each step of the process needs to be designed. In the first cycle we will work in all three phases; appreciate opportunities, design concepts and evaluate concepts. As both users and stakeholders will be involved we will need to design processes for both these groups. A draft process could be as described in the following sections.

6.3.1. Appreciate Opportunities with users. (Both Living Labs does this)

In the first cycle and first phase needfinding will be conducted through user-pool brainstorming sessions where the users will tell their needs, problems and give ideas and suggestions on privacy enhancing tools, this phase also include different identified stakeholders, such as developers and providers of OSN. The sessions will be conducted in both Living labs, and with the best practice Living Lab methods. The user-pool suggestions (and solutions) will be documented, compared and packaged. In the next phase these concepts will be elaborated and tested further. Consequently we need to;

- Make plans for the process for this phase
- Prepare material
- Decide which users should be involved
- Recruit people for the groups to interact with
- Perform the workshops and document results
- Summarize the collected data and report to whole project group

This step is the process of generating and understanding users' needs in situations where people carry out, for them, meaningful activities with the objective to improve the situation as a whole in relation to privacy in OSN. It is important to separate between requirements, which are related to a solution or artifact, and user needs that are subjectively experienced, and context dependent.

6.3.2. Design Concepts (This is done by project partners)

The design phase is also the most innovative phase in the concept design cycle since this is where all collected data is clustered in different ways and viewed from different perspectives with the aim to construct concepts that represents users' needs.

First versions of the DataBait concept have been developed in the first iteration of this phase. In this second iteration we will use the designs as stimuli at the same time as they are evaluated and new ideas are generated. We need to:

- Plan the process for this phase
- Decide the number of concepts to develop
- Decide who should develop the concepts (all partners?)
- Decide how to design the concepts (films, narratives, mock-ups, etc)
- Designs concepts based on the results in phase 1
- Document designs
- present designs to all partners in the decided form

6.3.3. Evaluate Concepts (Both Living Labs does this)

Since we work in all three cycles this phase also is appreciating opportunities for the next cycle. Hence, we need to;

- Make plans for the evaluation and appreciating opportunities process
- Prepare material
- Decide which users and stakeholders should be involved.
- Decide which concepts that will be presented to the users and stakeholders in the workshops
- Recruit people for evaluation sessions
- Perform workshops with users and stakeholders and document results. The purpose of the workshops is to present the concepts and to evaluate them with the users, to create a boundary crossing meeting between different stakeholders, and to appreciate emerging opportunities. With users the focus is to evaluate how their needs have been met by the designed concepts and at the same time capture new needs.
- Summarise the results from the workshops
- Present results from the workshops to project partners

The pilot evaluation will focus on evaluating early versions of the platform in the pilots. In this trial the focus is to evaluate the whole system but with limited functionality. In this evaluation, the platform is implemented and functionality is tested together with the DataBait concept as a whole. Examples of research questions related to the identification of barriers for a widespread use which will be used in the pre-pilot are e.g. "what are the constraints of a privacy-enhancing tool in rising culture of disclosure with conflicting strategies of different stakeholders?" this Research question can be answered by us designing the pilot to help us answer:

- What different barriers that prevent use of the DataBait system?
  - Barriers inherent to the DataBait System (e.g. Slow down browsing experience)
  - Outside barriers (lack of motivation, non-interest, not privacy aware)
- What would/could motivate users to start using a system like DatabBait?
- Which situations could trigger their usage of DataBait or similar?

We also have an example of a micro-task related to the legal framework where we ask users sto download their profile in Facebook and to analyse it with a list of questions such as:

- Do you think that downloading the file with the data of your Facebook profile [with the "Max Schrems-button"] and looking at the sections where your ads, your likes and [….] are listed, will affect your future behavior on Facebook? If yes – how? If no – why?
- Does downloading the file with the data of your Facebook profile [with the "Max Schrems-button"] and looking at the sections where your ads, your likes and [….] are listed, give you more insight in how you are tracked and profiled? If yes – how? If no – why?
- You have heard a description of the future functionality of the DataBait tool. Do you feel these functions give you more insight in how you are tracked and profiled? If yes – how? If no – why?
- Which functionality gives you most insight? Which least?
- Do you think that the police, the secret services or the NSA have access to the Facebook file you just downloaded? Do you think they should have such access? If so, under what conditions? Would you change your behavior on Facebook if you know that such data are shared with the police, secret service or the NSA and if so, what would be the impact on your behavior and on your sense of dignity and personal autonomy?
- Do you think that the tax office has access to the data in the Facebook file you just downloaded? Do you think the tax office should have such access? If so, under what conditions? Would you change your behavior on Facebook if you know that such data are shared with the tax office and if so, what would be the impact on your behavior and on your sense of dignity and personal autonomy?
- Do you think that your (future) employer has access to the data in the Facebook file you just downloaded? Do you think your (future) employer should have such access? If so, under what conditions? Would you change your behavior on Facebook if you know that such data are shared with your (future) employer and if so, what would be the impact on your behavior and on your sense of dignity and personal autonomy?
- Do you think that your insurer has access to the data in the Facebook file you just downloaded? Do you think your insurer should have such access? If so, under what conditions? Would you change your behavior on Facebook if you know that such data are shared with your insurer and if so, what would be the impact on your behavior and on your sense of dignity and personal autonomy?
- Do you think you disclose any of the following data on your Facebook profile: racial or ethnic origin, political opinions, religious or philosophical beliefs, trade-union membership, criminal convictions and those concerning health or sex life?
- Do you consider these categories of data to be more sensitive than other data you might disclose on your profile? Think, e.g. of approximate income, spending pattern, log-in patterns (where and when do you log-in to Facebook), and educational level.
- Do you think it is ok to use the first category of data ("sensitive data") to decrease or increase your opportunities in terms of employment?
- Do you think it is ok to use the first category of data ("sensitive data") to serve you personalized advertisements?

- Do you think it is ok to use the first category of data ("sensitive data") to make you personalized offers ("price differentiation", that is, that the price of a product or service is based on these data)?
- Do you think it is ok to use the first category of data ("sensitive data") to decrease or increase your opportunities in terms of insurance premium?
- Do you think it is ok to use the second category of data ("non-sensitive data") to decrease or increase your opportunities in terms of employment?
- Do you think it is ok to use the second category of data ("non-sensitive data") to serve you personalized advertisements?
- Do you think it is ok to use the second category of data ("non-sensitive data") to make you personalized offers ("price differentiation", that is, that the price of a product or service is based on these data)?
- Do you think it is ok to use the second category of data ("non-sensitive data") to decrease or increase your opportunities in terms of insurance premium?

6.4. USEMP Cycle Two – Pilot 1 – Prototype Design

When we enter the second cycle we have results from the evaluation of concepts as well as results from appreciating opportunities since these two phases were merged. In this second cycle we focus more on usability. Again we need to do some planning to start up this cycle and the time-plan is outlined in this way:
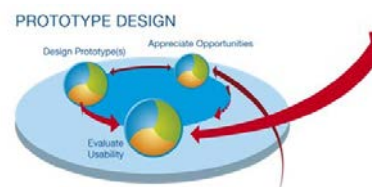
- Planning pilot 1 in detail. (May 2015)
- Running pilot 1. (June-August 2015)
- Evaluation of first Pilot. (August-September 2015)

6.4.1. Design Prototypes (this phase is carried out by the experts)

Based on our earlier research, we have found that, to ensure that the final solution answers to users' needs and not merely reflect what is technically possible, a close interaction between needfinders and developers is needed. This does not mean that the needfinder should be included in all the stages of development, but that the cooperation should build on mutual communication around the designed solution. The aim is to ensure that the gained knowledge from earlier stages is guaranteed to be included and considered in the final design.

6.4.2. Evaluate Prototypes (this is done by both Living Labs)

In this step, the interaction with the users is carried out again. The aim is to interact with users so that they stay engaged and committed to the process. Therefore, planning includes how to install the technology in the field. Hence, we need to:

- Make plans for the evaluation and appreciating opportunities process for the pre-pilot test (as these phases are merged again)
- Prepare material (e.g. guidance for users, test storylines, recruitment material)
- Decide which users to involve
- Decide how to document the evaluation
- Carry out the evaluation
- Present the results from the evaluation to the partners

Interact with the users according to the test storyline: Make sure that you interact with the users in order to keep them motivated and engaged, e.g. you can if it is necessary invite them to a start-up meeting where they can get to know the technology. Meetings like this create commitment.

Engage the users to carry out the assignments. Start with an assignment that gives the users a thorough understanding of their profile in OSNs. For instance, the scenarios outlined in chapter 3.1.4 can be used.

Collect answers: Let the users answer questions related to each assignment and micro task.

Give feedback: When the users answer the questionnaire and perhaps have suggestions or questions, make sure that their input is taken seriously and react on their input to increase their engagement and commitment.

Further pilot questions are e.g. related to platform strategies. Platform Strategies have to do with why OSNs work in a certain way and link it with their economic and structural logic. Hence, questions could be related to:

- **the usability** of the USEMP tool and **User Interface**
- the **affordances of USEMP tools** and how they can disclose how the underlying ownership structures and business models influence the operation strategies of social platforms (privacy script analysis and economics of privacy).

Another example on pilot questions is related to user tactics and these questions are related to the changes in user tactics in a real-life setting (through User Empowerment). Hence, questions could be related to:

- Changes in user perceptions (awareness and attitudes) towards platform strategies
- User behaviour in dealing with platform strategies
- User knowledge and capabilities towards institutional privacy issues.

You could in a first phase wait for natural behaviour to develop, later on, if the momentum 'dies': give some targeted tasks.

Finally, one example of pilot questions related to **stability and functioning** of the USEMP tool, here questions could be:

- Are you willing to store part or your entire web browsing data and/or OSN historical data to the USEMP data base, having always the capability to modify the history size or reset data?
- Do you prefer to check the privacy leaks and the identified behavior of a) the pictures that are uploaded to a web site (e.g. Facebook) or b) of the texts that are posted to a website?
    - o Online process that halts temporarily the upload process of a picture or the submission of a post until the reception of the processing outcome?
    - o Provide a web interface at the USEMP application that will be used for that purpose?

6.5. USEMP Cycle Three − Pilot 2 − Innovation Design

When we enter the third cycle we have results from the evaluation of the prototype in the previous cycles. In this phase the aim is to carry out a user test of the more advanced prototypes. Testing is focused on user experience and again we need to start up with a planning phase where the time plan is:
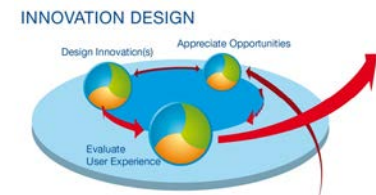
- Planning pilot 2 in detail (October 2015)
- Running pilot 2 (December 2015 – March 2016)
- Evaluation of second Pilot and overall results. (April – September 2016)

6.5.1. Design Final Innovation (this phase is carried out by the experts)

This process is quite similar to the one in cycle 1 and of course we need to consider feedback from previous phases.

6.5.2. Evaluate Final Innovation (this is done by both Living Labs)

In this process, the results from the whole process should be evaluated from many different perspectives. Due to the fact that privacy on-line and usage of OSNs is complex, it is important that the evaluation covers as many aspects as possible. Therefore, we need to:

- Make plans for the evaluation and appreciating opportunities process for the cross-border test
- Prepare material (e.g. guidance for users, test storyboards, recruiting material)
    - Decide which users to involve
    - Decide how to document the evaluation
- Carry out the evaluation
- Present the results from the evaluation to the experts and the project partners

6.5. USEMP Cycle Three − Pilot 2 − Innovation Design

7. Ethical Aspects

USEMP strives to offer better control over OSN users' personal data and, consequently, personal data need to be processed during the project. The central role of experienced legal experts and of living labs that already work with panels of users will ensure that personal data are processed with strict observance of legal and ethical regulations. USEMP will give specific attention to any ethical issues that will arise and will address them in a professional way following established and upcoming EU regulations and corresponding national laws about privacy, digital and property rights issues and protection of minors very closely.

Any data collected for privacy and data protection experiments will be strictly anonymous. To enforce anonymity, established practises of living lab partners will be implemented in USEMP and the other partners will not have direct contact with participants to the experiments. In all cases the personal identity of the data will be strictly protected from third parties and will only be used for testing purposes within the project. USEMP will comply with data protection acts, directives, and opinions, both at European and at National level. These include:

- Directive 95/46/EC of the European Parliament and the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data.
- The upcoming General Data Protection Regulation that will supersede the Directive 95/46/EC and National laws of EU member states and constitutes one of the main inspirations for USEMP works.
- The Charter of Fundamental Rights of the EU, specifically the article concerning the protection of personal data.
- The opinions of the European Group on Ethics in Science and New Technologies in their report "Citizens Rights and New Technologies: A European Challenge" on the Charter on Fundamental Rights related to technological innovation.

USEMP will perform user studies and tests and will operate with potentially sensitive data that are volunteered, obtained through behaviour analysis or inferred from the first two types. Following the best practice for ethics in Human-Computer Interaction (Ethics in HCI and Usability, 2010) and living labs partners existing practices, the personal data collected during the user evaluations will be automatically anonymised and used for research purposes only.

The data may include, but not limited to, personal information about the user such as: name, date of birth, interests, location, images, texts, opinions, or relations to other users, behavioural data such as clicks but also information derived from volunteered and behavioural data. It will not be transmitted to third parties, and will be handled with the experiment participants' explicit consents after clearly explaining what type of data will be collected and how they will be used, how it will be stored and destroyed after the experiments.

Consent will be obtained by formulating acceptance terms of usage, and depending on how far-reaching data collection is, informed consent will be requested at several levels of agreement (e.g. people may agree that USEMP analyses the data they upload, but not their user interactions, because this may intrude deeper into their privacy). Part of the terms of usage will be the information of users about the legal aspects of obtaining information for evidential purposes.

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USEMP will observe European legal regulations concerning privacy. This is at a policy level, and will be monitored and reinforced by USEMP Coordinators, Boards and the CEA legal department. ICIS will have a particularly important contribution here since they have extensive expertise in working with personal data. At the technical level strong technical measures concerning data security of personal data will be applied. For instance transmission of personal data over open communication channels will be done in encrypted form only. Several partners of the consortium have considerable experience with such privacy protection measures. Another aspect of privacy is the protection from spamming for which appropriate tools will be devised. As a further measure to ensure compliance with legal and ethical conduct with private data, USEMP will provide a mandatory training day on data privacy for all project researchers at the project kick-off and two further ones before the start of the pilot studies.

The IMINDS panel management for Living Lab research – as foreseen in USEMP – fully complies with Belgian and European privacy regulation. This includes that a notification for their data processing operations has been submitted to the Privacy Commission (www.privacycommission.be). A clear user agreement form is foreseen with every respondent that participates, which includes the rights and obligations of the researchers and the test users regarding privacy, data protection and related issues. In this agreement the anonymity of personal data is guaranteed. In the few cases were personal data are transferred not on an anonymous basis, a 'verwerkingsovereenkomst' (data processing agreement) is foreseen.

Taking all necessary actions described above, to our knowledge no burdens exist, since participation is voluntary, anonymous and informed consent is requested in all cases.

7.1. Privacy Agreements

In the context of USEMP the processing of personal data is a crucial and critical issue. It is the core purpose of USEMP to develop tools that empower users of OSNs to make more informed decision on which of their data to share.

Paradoxically this entails that USEMP

1. engages with a subset of USEMP users to develop and train the algorithms that aim to show users what can be inferred from their data and
2. to engage with the same subset to inquire how they experience the use of the DataBait tools.

This necessitates the processing of a very sensitive subset of personal data, for which a special legal regime is in force. The USEMP consortium partners are very well aware of the duty of care they need to exercise and the liability they face if they fail to act as a trustworthy stewart of this data. To make sure that the entire life cycle of collecting, processing, pseudonymisation, anonymisation and deletion of this data is done with the utmost prudence and care, we have developed a Data Licensing Agreement (which also contains explicit consent for the processing of sensitive data) between DataBait users and the Consortium partners, and a Personal Data Processing Agreement that clarifies the responsibilities of each USEMP partner in terms of the processing of personal data.

On top of this two buttons will be placed on the USEMP platform, one to provide users with the relevant information on which of their data are processed how and by which partner, the other one to provide users with the means to object to further processing of their data.

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Finally, the collection, storage and transfer of the data will be governed by appropriate security measures that will be tested against a risk assessment template, making sure that the data cannot be accessed by unauthorized persons. A more elaborate explanation is to be found in Deliverable 3.1.

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