

# SEVENTH FRAMEWORK PROGRAMME

## ICT and Ageing



### **D6.1 Draft Roadmap (Plan of actions)**

July 2009

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**D6.1 – Draft Roadmap****Edited by:** UNINOVA**Contributors:** UNINOVA: Luis M. Camarinha-Matos, Filipa Ferrada, A. Inês Oliveira  
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Antonio Dominguez (SECOT), Patricia del Cura (SKILL)**Date:** July 2009**Distribution level:** Public**Abstract:**

This report includes a first set of proposed strategic research and technical development actions that, if successfully implemented, are likely to deliver to society a desirable future in terms of active ageing and the silver economy. In other words, this action plan will help us to achieve the ePAL vision, taking into account the current baseline and trends we have previously identified. The proposed actions are organized according to the three perspectives of analysis - social, organizational and technological - being followed throughout the ePAL project.

According to our adopted roadmapping methodology, this action plan, together with the baseline and vision statements, will now be the subject of an extensive consultation and consensus building process involving a large and diverse group of stakeholders. For this purpose, the report also includes, in annex, an executive summary to be used during the interactions with these stakeholders.

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# 1. INTRODUCTION

Previous phases of the ongoing ePAL roadmapping process include:

- Consolidation and characterization of the baseline, i.e. analysis of the current situation (D1.1).
- Analysis of drivers and trends, design of desirable scenarios, and elaboration of a vision statement and its instantiation according to the social, organizational and technological perspectives (D2.1).
- Gap analysis, assessing the “distance” between the current situation and the desirable future represented by the vision statement, as well as identifying strengths and limitations at European level regarding the achievement of the vision (D3.1).
- Analysis of existing and emerging organizational forms involving the various types of stakeholders, in complement to the baseline analysis, and focusing those forms with more potential to support the vision (D4.1).

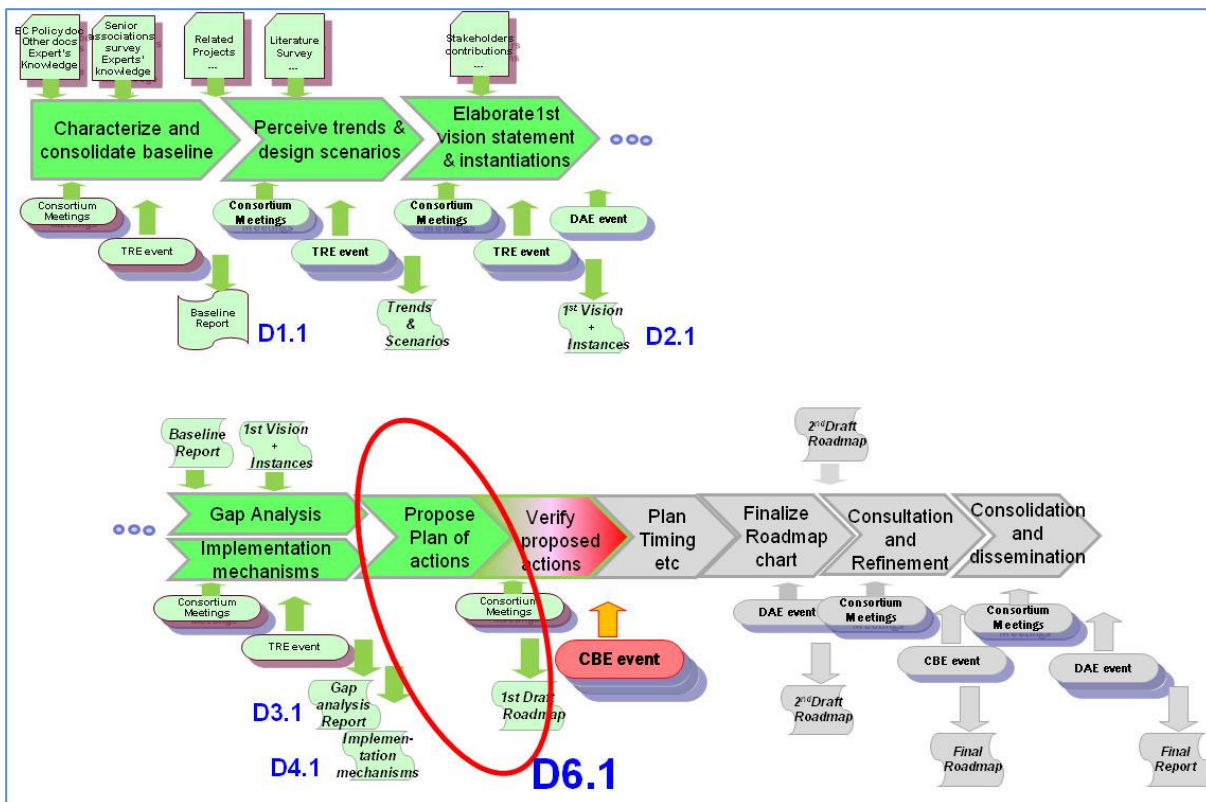


Figure 1 – Steps in the roadmapping method and focus of this deliverable

This report (**D6.1**) introduces now a first draft of a proposal for a strategic plan of actions aimed at leading to a new vision of active ageing for senior professionals. It also includes some preparatory elements for the next phase which will be devoted to consensus building among a wide variety of stakeholders (to appear in D5.1).

Figure 1 illustrates the various steps of the roadmapping process and highlights the positioning of this report in the process.

## 2. PROPOSED ACTIONS

### 2.1 Introduction

The elaboration of a plan of strategic actions is a fundamental step in roadmapping. Such actions, when successfully implemented, shall take the society from the current situation, as reflected in the baseline, to a desirable future, as stated in the elaborated vision. The process of formulating such actions starts with an intense brainstorming activity within a small group of experts.

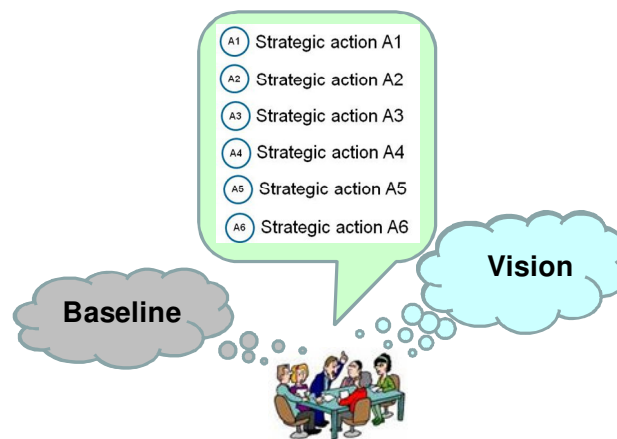


Figure 2 – Brainstorming towards a plan of actions.

In this formulation for ePAL some base principles were followed:

- Consider the needs according to each perspective of analysis – social, organizational, and technological – and thus identify suitable actions for each of these focus areas.
- Keep the number of actions in each focus area relatively small (no more than 6) in order to facilitate focused discussion.
- Ensure that the proposed actions cover all stated facets of the vision.
- Propose actions that although ambitious, are feasible considering the current baseline and trends, namely taking into account the results of the gap analysis.

The following sections introduce the set of actions that resulted from this exercise conducted inside the ePAL consortium. This proposal will then be extensively discussed with stakeholders through a number of Consensus Building Events in order to collect feedback and suggestions for improvement, which will subsequently lead to a refined (final) version of the roadmap.

Considering that ePAL is a project under the ICT program, it is natural that more emphasis should be put on the technological perspective. Nevertheless, given the sensitivity of the area and the importance of developing technologies that can effectively be taken up, the socio-organizational perspective needs to be considered as well. This approach was strongly supported by all stakeholders we interacted with. Therefore, in the proposed roadmap, strategic actions are defined for each focus area but the technological perspective also includes further details by decomposing each strategic action into a number of more concrete actions.

## 2.2 Social perspective

Proposed actions under the social perspective:

- |    |   |
|----|---|
| S1 | Promote <b>socio-economic studies</b> that identify the unique value senior workers bring to the workplace, investigate <b>new ways of senior workers interacting</b> with the socio-economic system and communicate findings to employers and to society and as whole. |
| S2 | Design/develop <b>mechanisms for skills/talent identification and improvement</b> that assess acquired experience, provide <b>career transition advice</b> and deliver skills-enhancement to maximize the potential of seniors.   |
| S3 | Establish the “ <b>European Senior Space</b> ” to promote dialogue and consensus around issues of technology, culture and socio-economic participation and to develop a single, powerful voice for senior professionals across Europe.                                  |
| S4 | Investigate the <b>barriers and potentials for cross generational interaction and collaboration</b> between senior professionals and younger people, and fund/promote technology development programmes that support and facilitate this interaction/collaboration.     |
| S5 | Investigate and promote <b>new models of working practices and related reward and taxation models</b> for senior professionals, taking account of issues of work-life balance and aging well.   |

Discussion:

**S1 – Promote **socio-economic studies** that identify the unique value senior workers bring to the workplace, investigate **new ways of senior workers interacting** with the socio-economic system and communicate findings to employers and to society and as whole.**

Many older people want to work, learn and earn but are encountering difficulties in doing so. Main barriers include: actual or perceived age discrimination, especially by employers. Groups such as Age Concern in the UK have identified that many employers still hold negative preconceptions regarding the abilities of older workers and are thus reluctant to work with them. Many of these preconceptions are based on outdated notions of the abilities of senior workers. This is a waste of third age experience, skills and potential – in terms of the implications for individuals, local communities and the wider economy.

Research is needed into ways of overcoming negative preconceptions about the value of senior professionals and, moreover, identifying the specific and unique value they bring to the workforce. Investigation into schemes and employment models that provide opportunities for work trials, work sampling and work experience so that seniors can try out their skills, learn about unfamiliar occupations and prove themselves to employers would be highly beneficial.

European governments have a role to play in ensuring that employers do not arbitrarily dismiss the worth of senior professionals to the European economy. Knowledge of what information campaigns and voluntary codes of practice for employers could help support the implementation of further anti age discrimination legislation is needed.

These concerns must be considered in the context of Industry complaints highlighted in the Effective Education for Employment report<sup>1</sup> carried out by Edexcel concerning weaknesses in younger workforces. Complaints regarding poor customer service, project management skills and business skills are often skills which are built up over a long career, those held by senior professionals.

<sup>1</sup> Playfoot Jim, Hall Ross, *Effective Education for Employment: A global perspective*, Copyright 2009 Edexcel

**S2 – Design/develop mechanisms for skills/talent identification and improvement, that assess acquired experience, provide career transition advice and deliver skills-enhancement to maximize the potential of seniors.**

Many seniors are now finding themselves working into retirement age without necessarily having planned to do so. It is therefore important that there is strong support to help them adjust to this new reality. At present there are many programmes concentrated on the reinsertion of unemployed seniors into the labour market but not enough to help those who are looking to make a smooth transition from full to part time work, in other words, an *extension* rather than a *renewal* of professional active life. Better mechanisms need to be developed to measure the skills senior professionals bring from their previous employment: this would help to counteract negative assumptions concerning their abilities. These mechanisms should be formally accredited to give them more legitimacy. Skill assessments for senior professionals – including help in identifying existing and transferable skills, aptitudes and experience, and relating these to the current labour market - are vital.

More holistic help with such areas as personal branding, self advocacy and presentation – with a focus on techniques to overcome age stereotyping and hidden or overt discrimination - would be highly beneficial. The role of high-quality advice and guidance in helping many mid-life and older adults to work, learn and earn needs to be thoroughly investigated. The potential benefits for individuals, employers, government revenues and personal savings of such schemes are high.

ICT tools are needed that help automate classification/quantification of the experience that senior professionals bring into easily recognizable universal skillsets that makes it easier for employers to judge the value this experience brings across industry sectors. This quantification of the transferable skills that senior professionals bring to the marketplace should be combined with new approaches to ICT training designed specifically for leveraging these skills. This would help ensure that regular retraining, according to labour market demands, covers all stages of a person's career. Such efforts could serve to counteract negative preconceptions regarding the ability of seniors to learn new technologies and adapt to new working environments.

**S3 – Establish the “European Senior Space” to promote dialogue and consensus around issues of technology, culture and socio-economic participation and to develop a single, powerful voice for senior professionals across Europe.**

Currently, European organisations that represent seniors (including associations of senior professionals) mostly recruit on a national basis. In order to fully leverage the weight of senior's voice across Europe – and in order to develop a coherent approach at European level – a network of Europe-wide seniors, supported by technology, could be launched to address issues at a pan-European level. This would help insure that seniors are able to provide Peer group support – to extend networks, provide motivation and encouragement, and support each other in achieving personal and collective objectives. For proper consensus on the debate around senior professionals, all regions must be able to take an equal part in the debate. Unfortunately, unless the current lack of access to proper broadband facilities in Eastern Europe changes, this situation may restrict many seniors from contributing to this debate, while language and socio-economic cultural differences make reaching across national borders a difficult task.

However, if a European Senior Space is to grow it must do so in a fair and all encompassing fashion. Social capital can be a negative force creating groups which restrict opportunities and support to those outside. Studies show that middle class males have very high levels of professional social capital that may well be excluding & restricting opportunities for female senior professionals. This is certainly true in the field of ICT with the e-accessibility conference in Bled (Slovenia) criticizing the industry for the lack of female representation at management level. Issues of inclusion must be addressed in the design and implementation of any Europe-wide senior network.<sup>ii</sup>

<sup>ii</sup> Conference Report - Inclusion Ministerial Conference (Vienna, 30th November -2<sup>nd</sup> December 2008) available at <http://ec.europa.eu/einclusion>

**S4 – Investigate the **barriers and potentials for cross generational** interaction and **collaboration between senior professionals and younger people, and fund/promote technology development programmes that support and facilitate this interaction/collaboration.****

Research is needed into how seniors can connect with SMEs and, specifically, younger individuals to help develop novel mechanisms for knowledge transfer and foment a greater understanding of what senior professionals can offer. Issues around technology access and accessibility need to be addressed as part of this research. In addition, models for advanced senior professional networks are needed to catalyse the development of better communication between senior professionals, their associations with SMEs and the younger generation.

Studies such as the Effective Education for Employment report<sup>iii</sup> produced by Edexcel have highlighted a lack of soft skills in recent graduates entering the labour force. Creating better interaction between senior workers and those entering the workforce has the potential to address these shortages in a practical and cost effective way.

Given the relatively low membership of many senior associations in Europe, there is clearly a need to improve the effectiveness of collaborative networks. Building on and learning lessons from the success of online social networks could provide one mechanism for developing meaningful inter-generational interactions across national boundaries and could ensure a fuller participation of all societal groups, taking into account such issues as gender.

**S5 – Investigate and promote **new models of working practices and related reward and taxation models** for senior professionals, taking account of issues of work-life balance and aging well.**

Employers often worry about a lack of adaptability in older workers, and are reluctant to accept responsibility for training older workers who they see as a poor return on this investment compared to younger workers. They are also worried that they may miss a large number of working days through illness. In short, many of the traditional employment models that predominate across Europe are not ideally suited to the promotion of increased professional activity in senior workers.

Research is needed to develop new employment models that better fit with the life dynamics of seniors whilst continuing to provide value for employers. Furthermore, greater emphasis is needed on helping employers recognize the benefits of adopting flexible working patterns that enable individuals to balance better aspects of work and life. These include promoting, among other things, flexi-time, staggered hours, shift swapping, job-sharing, and working from home with the intention of enhancing motivation and productivity, and extending working life through reducing work-related ill-health.

Studies are also needed into the changing financial needs of & work related benefits/incentives required by senior professionals. What are the financial benefits that would attract a senior professional to work for a business e.g. comprehensive health insurance schemes. By staying in work, some older workers continue to be covered by employer's health insurance which may also explain why some older workers in the US continue longer in employment. Schemes allowing pensioners to delay claiming a pension and then benefiting from a preferential tax rate when they do claim it as a lump sum would also be beneficial. Studies are also needed into understanding the important social benefits of work. A sense of purpose, stress reduction and social engagement are also important motivations when convincing senior professionals to extend their working life.

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<sup>iii</sup> Playfoot Jim, Hall Ross, *Effective Education for Employment: A global perspective*, Copyright 2009 Edexcel

## 2.3 Organizational perspective

Proposed actions under the organizational perspective:

- |    |  |
|----|--|
| 01 | Identify and <b>assess current</b> national and European <b>policy and legislation</b> relevant to active participation of seniors in the socio-economic system and recommend new approaches that eliminate barriers and promote and support active aging.   |
| 02 | Investigate new mechanisms that <b>forge</b> mutually beneficial <b>relationships between seniors and the socio-economic system</b> including novel interaction models that facilitate collaboration between organizations and their retiring employees.   |
| 03 | Investigate and establish <b>new roles, governance rules and organizational forms</b> for communities of active senior professionals to promote inter- and intra-community collaboration and to create new opportunities for member engagement.  |
| 04 | Characterize and design <b>new roles and modes of operation for intermediate organizations</b> , both public and private, that provide brokerage and assistance to better facilitate integration and collaboration between senior professionals and the socio-economic system.   |
| 05 | Define new <b>programmes and organizational practices</b> that prepare for and <b>guide the successful transition</b> of senior professionals from full employment to active retirement, taking account of issues of gender, profession and local context.   |
| 06 | Characterise and quantify the <b>uniqueness of what senior professionals can offer</b> the socio-economic system (mature experience, compensation flexibility, etc.) and identify <b>new channels</b> to harness these resources in order to generate wealth and stimulate innovation amongst European businesses, thus supporting the 'silver economy'. |

Discussion:

**O1 - Identify and **assess current** national and European **policy and legislation** relevant to active participation of seniors in the socio-economic system and recommend new approaches that eliminate barriers and promote and support active aging.**

To identify legislation best practices that allow senior professionals to combine their pension allowance with the maintenance and extension of their professional life and thus complementing their incomes in order to maintain a similar lifestyle to pre-retirement. Evaluate future sustainable pension systems and forms of legal extension of "silver economy" (including adequate taxation models for eventual additional income perceived by seniors).

An important issue is the adoption of more flexible policies, namely regarding taxation, allowing senior professionals to keep some professional activity, namely consultancy, after retirement. Flexibility in terms of the work modality is also necessary in order to smooth the transition from the pre-retirement to the retirement phases.

Considering that SMEs and start-ups are among the main potential beneficiaries of consulting and coaching services rendered by senior professionals, it is necessary to analyze which schemas of incentives can better promote the involvement of seniors in such activities. Complementarily it is also necessary to finding reasonable ways of guaranteeing that such involvement does not collide with principles of fair competition regarding other economic actors.

**O2 - Investigate new mechanisms that **forge mutually beneficial relationships between seniors and the socio-economic system** including novel interaction models that facilitate collaboration between organisations and their retiring employees.**

To identify new systems and new types of intermediaries that help in reducing the current barriers to the involvement of seniors in the socio-economic system, identify mechanisms to help keeping relationships between seniors and their former employers, find smooth ways of transition between a pre- and post-retirement situation and investigate new structures and organizational models that favor the creation of relationships between senior professionals and industry (companies, associations, financial entities, etc).

The existence of global policies to encourage the involvement of senior professionals in economic activities will be an important factor to facilitate the transfer and interchange of knowledge and experience of these professionals into the global market.

New forms of intermediate organizations providing highly efficient brokerage will help seniors engage with businesses in Europe. New models of interaction between senior professionals and younger workers, that must favor the collaboration between them in some areas such as training and in economic sectors such as industry, associations, financial entities, etc, reducing the time and training costs and increasing their efficiencies, is one of the main areas in which it is necessary further research.

Global regulations and policies will need to be changed in order to encourage the involvement of businesses in collaboration with senior professionals. Furthermore, consultancy, intermediate organizations, and senior professional organizations, should receive financial support and subsidies for their participation in public and private projects supporting active ageing. There should be significant long-term funding – from both public and private sectors - and the political drive to support new forms of senior associations and other intermediate brokers.

**O3 - Investigate and establish **new roles, governance rules and organizational forms** for communities of active senior professionals to promote inter- and intra-community collaboration and to create new opportunities for member engagement.**

Analyze and propose new operating rules for the existing organizations of senior professionals, identify and establish new roles for seniors associations and senior professionals, leading to an increment of their activity level as well as the engagement of new members. Identify new organizational forms that favour the creation of new relationships between their members and the different types of stakeholders in the socio-economic system.

The use of senior professionals' experience and knowledge can be an important contribution to generate value in the beneficiary entities and support innovation in the global market via coaching activities oriented to entrepreneurs. It is however necessary to support the retraining of this professional group in order to facilitate a better linkage between their knowledge and background and the use of technology in order to implement their ideas. The special characteristics of senior professionals must be well understood and properly used, through the definition and implementation of adequate mechanisms to facilitate mature consulting and coaching activities towards young actors of innovation in all Europe.

Moreover it must be taken into account that new organizational cultures, supported by new organizational forms and proper regulatory frameworks, will positively embrace relationships between senior professionals and pre-retired (active) professionals.

**O4 - Characterise and design **new roles and modes of operation** for intermediate organizations, both public and private, that provide brokerage and assistance to better facilitate integration and collaboration between senior professionals and the socio-economic system.**

Since existing organizations (e.g. regional development agencies, business innovation centers, etc.) do not properly consider the needs and specificities of senior professionals and do not effectively put in contact potential clients with the senior professional that can provide services, it is necessary to analyze and define new roles for the existing organizations and develop new forms of intermediaries.

A particular focus needs to be put on the development of new forms of intermediate organizations that can provide highly efficient brokerage to help seniors engage with businesses.

Complementarily, better use of some existing intermediate professional channels such as innovation business centres, local development agencies, etc., will favor the relationships between beneficiary entities and senior professionals, leading to emergence of new roles on the existing organizations as well as new forms of intermediation. In this area it is critical to design new forms of intermediation that allow a better connection between necessities of the business world and the capabilities of seniors professionals. Putting into practice such new forms and new roles will require significant funding – from both public and private sectors - and as well as a clear political drive in this direction.

**O5 - Define new programmes and organisational practices that prepare for and guide the successful transition of senior professionals from full employment to active retirement, taking account of issues of gender, profession and local context.**

At this moment retirement is not a smooth process but rather an abrupt step which makes this transition in people's life a difficult one. It is thus necessary to properly address issues such as the necessary training for the transition, and the associated psychological, cultural and social aspects, in order to guarantee a successful transition. In other words, it is necessary to consider a "life course" perspective.

The preparation for this transition requires research attention in several areas. Especially seniors need to have access to the relevant services, including focused training, which they need to facilitate their transition between their working life and retirement to continue their active professional life in combination with leisure activities at the level that they wish. This transition process also needs to take into account the differences and constraints due to gender, sector of activity, and local context.

Although main actors in this process should be the public administrations and private companies that employ these professionals, it is also important to analyze the role that can be played by the associations of senior professionals.

**O6 - Characterise and quantify the uniqueness of what senior professionals can offer the socio-economic system (mature experience, compensation flexibility, etc.) and identify new channels to harness these resources in order to generate wealth and stimulate innovation amongst European businesses, thus supporting the 'silver economy'.**

As we have realized the current difficulty in identifying new *markets* in which senior professionals could maintain their active life, it is necessary to identify new roles that can be played by senior professionals, new areas of activity which can fit their characteristics and knowledge, as well as to investigate and develop the necessary mechanisms so that these activities generate value in the socio-economic system.

Particularly in times of economic crisis, when there is a competition for jobs and a high unemployment among young people, it is critical to find new ways in which all sectors of the society can have a positive contribution. The knowledge and skills of seniors certainly need to be harnessed to generate wealth and stimulate innovation amongst European businesses. The characteristics that seniors professionals present both in terms of work and retribution flexibility, joined with their knowledge and experience, namely in areas for which new generations are not trained, e.g. soft skills, managerial skills, make it worthwhile to investigate new forms and principles under which their knowledge can be used for a better future of the European society.

## 2.4 Technological perspective

Proposed actions under the technological perspective:

T1	Establish <b>formal conceptual models</b> for people's professional life cycle and the support environment for active ageing.
T2	Develop and integrate <b>self-adaptive</b> and <b>configurable technology solutions</b> in ICT environments to enable customized involvement of seniors.
T3	Develop ICT <b>collaboration platforms</b> for communities of senior professionals that are enhanced by affective computing, context awareness, and trust establishment.
T4	Design and develop support <b>collaborative tools and systems</b> to facilitate value creation.
T5	Develop environments that <b>empower seniors to leave a legacy</b> that capitalizes on their personal / professional experience and is usable and transferable to the society.
T6	Develop approaches that <b>discover patterns and model</b> "the evolution of senior professionals' interests and their involvement in the socio-economic system" and "the behavior and emotional health of senior professional networks".

### Discussion:

#### **T1: Establish **formal conceptual models** for people's professional life cycle and the support environment for active ageing.**

Conceptual modeling is a well known technique of data modeling, together with logical modeling and physical modeling. A conceptual model may include a description of the meaning of terms and concepts used by domain experts to discuss the problem, and to find the inter-relationships between different concepts. It attempts to clarify the meaning of various usually ambiguous terms, and ensure that problems with different interpretations of the terms and concepts cannot occur. Once the domain concepts in an environment have been modeled, the model becomes a stable basis for subsequent development of applications in the domain. The conceptual model is explicitly chosen to be independent of implementation details, such as concurrency or data storage.

There is a lack of comprehensive understanding and a suitable formal conceptual model to represent and support people's professional life cycle and thus it is essential to establish a reference model for the regulation of active ageing and extension of professionals' active life, along with the elaboration of a common ontology for the senior professional communities. Other components are the development of contractual models and business models for the communities of senior professionals. As such, in relation to development of required formal conceptual models the following research and development of required models need to be further addressed:

- (1) Development of conceptual models to support the design and implementation of collaboration support services, including services supporting (virtual) teams' formation and management as well as "user friendly interfaces" for senior professionals
- (2) Discovery and management of collaboration ontology that supports a variety of stakeholders in communities of active senior professionals as well as in the configured teams of senior professionals
- (3) Design of templates for novel cooperation contracts and agreements, as well as designing models and support environments for the implementation of negotiation processes among actors
- (4) Development of models to guide the implementation of advanced marketing and brokerage services

- (5) Designing new networking models for elderly communities' involvement with the socio-economic system.

**T2: Develop and integrate self-adaptive and configurable technology solutions in ICT environments to enable customized involvement of seniors.**

Because there are some seniors that may require special training and assistance when dealing with technology, it is necessary to have self-customizable collaboration environments that empower seniors to better use the ICT solutions. Here, several solutions may be developed, such as: self-adaptive interface systems and technology assistance wizards. To deal with emerging technologies, seniors should also have access to several training approaches. Therefore, in relation to this topic further research is needed to address the development of "Configure yourself" based philosophy infrastructure, and easily adaptable and customizable user interfaces.

The technology solutions (e.g. software systems) that are self adaptive and configurable evaluate their own behavior and change behavior when their evaluation results indicate that they do not accomplish what they were intended to do, or when better functionality or performance is possible [1] [2]. Thus the technology solution modifies its behavior in response to changes in its operating environment – e.g. end user input, external hardware device and sensors, etc. This implies that the technology solution has multiple ways of accomplishing its purpose, and has enough knowledge of its own construction to make effective changes at runtime. Systems built in this way should therefore include functionality for evaluating their behavior and performance, as well as the ability to re-plan and reconfigure their own operations in order to improve their operation. Self adaptive technology solution should also include a set of components for each major function, along with descriptions of these components, so that components of systems can be selected and scheduled at runtime. It also requires the ability to match changing input/output of sequenced components, and the ability to generate some of this code from the specifications.

**T3: Develop ICT collaboration platforms for communities of senior professionals that are enhanced by affective computing, context awareness, and trust establishment.**

ICT collaboration platform is a unified electronic platform that shall support synchronous and asynchronous communication within a network through a variety of devices and channels. It offers a set of software components and services that enable actors to find each other and the information they need, and to be able to communicate, interoperate, and work together to achieve common business goals. The core elements of a ICT collaboration platform include messaging (email, calendar scheduling, contacts, etc.), team collaboration (activity coordination, file synchronization, ideas and notes in a wiki, task management, full-text search, etc.), real-time collaboration and communication (e.g., presence, instant messaging, web conferencing, application / desktop sharing, voice, audio and video conferencing), and Social Computing tools (e.g., blog, wiki, tagging, RSS, shared bookmarks). Effective communities of senior professionals need to be supported by an appropriate ICT collaboration platform. Such platform, besides governance systems of the community, should also provide an advanced management system, and a trust building management system, supported by an affections / emotions –based management system. Furthermore, to realize a proper ICT collaboration platform for senior professionals, further research needs to be performed addressing the following:

- (1) Development of advanced collaboration support services, including (virtual) teams' formation and management
- (2) Development of affective computing and context aware enriched environments
- (3) Formulation of mechanisms and development of systems supporting the establishment of trust among stakeholders
- (4) Provision of security and ethical / privacy support.

**T4: Design and develop supporting collaborative tools and systems to facilitate value creation.**

Collaborative processes in networks, namely through co-working among partners, need to be supported by advanced ICT collaborative tools and services in order to effectively achieve the creation of intended values. As such, strategies established to facilitate the operation of communities of active senior professionals need to be dynamic and aligned with the developments of ICT tools and competitively support them through enhancing time/cost effectiveness of their business climate. Furthermore, services are needed to support networks publicize their name and brokerage brand

including the advertising, public relations, customer service efforts, etc. To enable such community members to co-perform their professional activities, ICT services and tools shall facilitate the following aspects that are in need of further research:

- (1) Advanced collaboration support services for formation of virtual teams
- (2) Advanced services for negotiation and e-contracting in virtual teams
- (3) Support for virtual team management and collaborative problem solving
- (4) Management of intellectual property and performance
- (5) Tools supporting the process of value creation
- (6) Advanced marketing and brokerage services
- (7) Security and ethical / privacy support services.

**T5: Develop ICT- environments that empower seniors to leave a legacy that capitalizes on their personal / professional experience and is usable and transferable to the society.**

Senior professionals' involvement in societal and market activities is not only to provide more economic gains in the market and society but also to transfer the accumulated knowledge and experience to younger generations and other professionals. For the later process to be achieved, considering that the current working environments are mostly ICT-enabled, an ICT environment must be built to support empowering seniors, making them feel useful and needed by the society, as well as easing the process of transferring their knowledge to the intended recipients. As such, innovative mechanisms and tools need to be developed to facilitate the modeling and capturing of talents and skills of senior professionals. Namely, these models can be used to develop services to support acquiring, storing and managing of knowledge assets from senior professionals. Therefore, for these aspects to be realized in communities of active senior professionals, further research is needed to address the following topics:

- (1) Development of tools supporting inheritance and sharing of user-generated knowledge assets
- (2) Design of new networking models providing incentive for involvement of elderly communities in the socio-economic system.

Furthermore, training and methodological support for using available technologies for content creation need to be developed.

**T6: Develop approaches that discover patterns and model “the evolution of senior professionals’ interests and their involvement in the socio-economic system” and “the behavior and emotional health of senior professional networks”.**

The explosive growth in personalized devices, social networks, and novel user interfaces is transforming our daily lives by changing the way we interact with each other and co-exist in society. In case of senior professionals, a deeper understanding of human behavior is useful to discover the technology needs of the next generation of collaborative networks such as communities of active senior professionals. Namely, it is needed to explore the broad spectrum of discovering, measuring, modeling, and leveraging human patterns and behavior, in order to develop better ICT infrastructure to support, sustain, and enhance these networks. The evolution of the behavioral patterns and emotional status of senior people when facing a transition from their previous fully active professional life to a retirement phase need to be better understood and properly modeled. Furthermore, the collective patterns and behaviors of involved participants in a network will represent the behavior and emotional health of the respective network. Some promising areas of further research for this particular purpose is the development of a conceptual base for behavioral modeling, data-mining / machine learning approaches for behavioral patterns discovery, forecasts and simulation methods as well as tools for behavioral analysis, and the models and tools for networks emotional health management. In this direction of research, the following specific topics need to be addressed:

- (1) Development of easily adaptable and customizable user interfaces for acquisition of data for behavioral pattern analysis
- (2) Development of tools supporting affective computing and context aware enriched environments
- (3) Formulation of mechanisms and development of systems supporting the establishment of trust and social bonds among stakeholders
- (4) Design of new networking models for elderly communities' involvement with the socio-economic system.

Detailed actions:

Under each strategic action a number of more detailed actions are suggested.

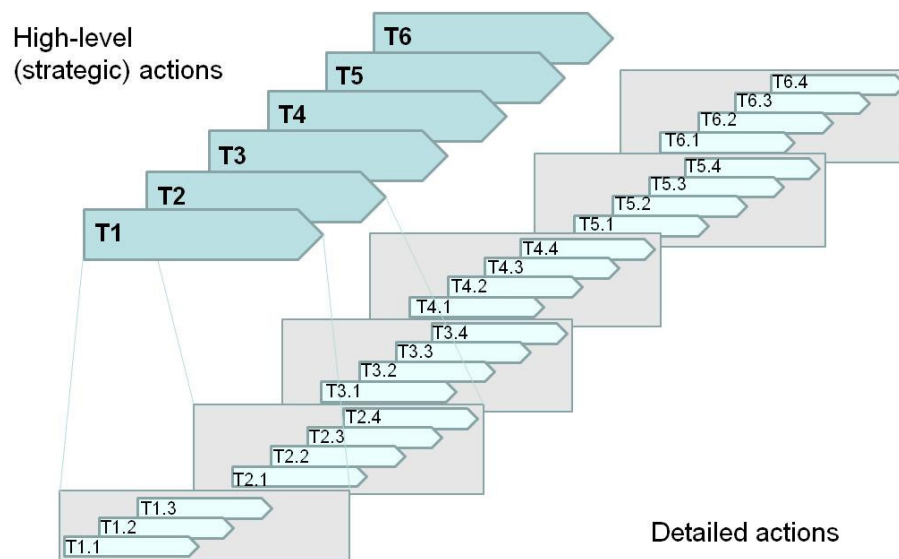


Figure 3 – Strategic and detailed actions

**T1: Establish formal conceptual models for people’s professional life cycle and for the support environment for active ageing.**

*T1.1 - Establish a reference model for extension of professional active life and active ageing.*

There is a lack of comprehensive understanding and a suitable formal conceptual model to represent and support people’s professional life cycle. On the basis of existing reference models for collaborative networks such as ARCON [3], it is essential to establish a reference model to act as the abstraction template for regulating and developing more specific models in the given domain of active ageing and extension of professionals’ active life.

*T1.2 - Elaborate common ontologies for communities of senior professionals.*

Similar to other forms of collaborative networks, communities of active senior professionals may constitute large number of members who originate from different professional disciplines in which the usage, understanding as well as the specification of terms and concepts could be different. To unify the usage and specification of terms and concepts among senior professionals in these communities there is a need to define and elaborate common ontologies, specifying the representational vocabulary of the domain.

*T1.3 - Develop contractual and business models for communities of senior professionals.*

To enhance the speed and effectiveness of reaching agreements in communities of active senior professionals there is a need for designing business models and the support frameworks for the implementation of the negotiation processes among actors, as well as designing templates for cooperation contracts. Furthermore, new business models that take into account the specific working conditions of seniors and the social security and other legal constraints (e.g. taxation laws) need to be developed.

**T2: Develop and integrate self-adaptive and configurable technology solutions in ICT environments to enable customized involvement of seniors.**

*T2.1 - Develop self-adaptive interface systems.*

Systems supporting senior professionals must provide their basic functionalities in a synthetic and adaptive way to suit this community. Namely, it is necessary to build system interfaces which are adaptable to different senior user’s perceptions, to the extent possible. An essential characteristic

of self-adaptive interfaces for senior professionals is the ability of the interface to evolve itself in order to match different available computing environment (e.g. at senior's residence) as well as different users' profiles and behaviors. These systems need to be specifically designed and developed.

*T2.2 - Develop **self-customizable** collaboration **environments** empowering seniors to better use ICT.*

Self-customizable systems have the potential to change themselves to the evolving user requirements and to their changing environment. One way to address this challenge is through automatic component composition, namely, through systematically (re-)building systems, according to different existing requirements, through composing pre-existing reusable components. Approaches and mechanisms supporting the development of reusable components that address specific seniors' user requirements need to be researched and developed.

*T2.3 - Develop **technology assistance wizards**.*

In addition to training, and considering the growing complexity of ICT systems, it is critical to accompany the development of new systems with the design and implementation of technology assistance wizards that guide (senior) users through their use and understanding of the underlying concepts.

*T2.4 - Develop **training approaches** for seniors regarding emerging technologies.*

Considering that certain abilities of senior professionals may gradually diminish in time, also with advances in technology their know-how may become out-dated, it is necessary to identify specific technological areas for which special training packages shall be developed, to fit senior professionals' requirements. Furthermore, to be trusted by their potential customers, regulations must be defined for periodical certification in professional technological areas. Also considering that basic use of computers for collaboration is not pervasive, special training packages shall be developed for this purpose for the various involved stakeholders.

**T3: Develop ICT **collaboration platforms** for communities of senior professionals enhanced by affective computing, context awareness, and trust establishment.**

*T3.1 - Develop advanced **functionalities and systems** for management of communities of senior professionals.*

Specific functionalities are required to support different collaboration tasks and activities performed by senior professionals. Management of heterogeneous information as well as the handling of diverse business processes within the communities of active senior professionals, need to be researched and supported through advanced collaboration infrastructures. It is required to establish the base ICT infrastructure to support senior communities with their networking, interaction, inter-operation and co-working. Therefore, advanced management systems (e.g. including the management of community members and their competencies) that meet all specific requirements of these new forms of collaborative networks need to be developed.

*T3.2 - Develop **affections / emotions management** systems for communities of senior professionals.*

The process of designing systems and tools that shall support senior professionals in collaborative community environments must take into account the social and affective aspects related to seniors when interacting with computers and with each other online. Some few examples related to these aspects include managing online individual identities, adapting to the specific needs of the individuals on both ends, matching organizations and professionals, overcoming challenges in online communications, fostering feelings of inclusion and value, and establishing and using trust in technology, trust in each other, and trust in one's own ability to contribute. Emotions can play an essential role in decision making, individual perception, learning process, personal interests, etc., and influence rational thinking of an individual. These social and affective aspects need to be properly addressed in research and development with thorough consideration of specific related requirements of senior professionals.

*T3.3 – Design and support **governance systems** for communities of senior professionals.*

Active senior professionals collaborative environments have some unique features and characteristics and thus further research is needed to either support tuning of the existing management system to match requirements of these communities, or to develop their own specific

systems required to regulate their working and sharing principles and establishing the federation or some governing hierarchies.

*T3.4 - Develop **trust building management** systems for communities of senior professionals.*

To properly analyze, measure, and establish rational trust among partners in collaborative senior professionals' environments, a number of aspects need to be addressed such as designing the required models and mechanisms for trust assessment, depending on different purposes for establishing trust. The designed models and mechanisms shall then be used for rational measurement of trust level in different stakeholders in the communities and the development of required trust management systems.

**T4: Design and develop support **collaborative tools and systems** to facilitate value creation.**

*T4.1 – Develop **marketing and brokerage** support tools for communities of senior professionals.*

Nowadays, locating opportunity advertisements (such as call for tenders), as well as bidding against the emerged opportunities can occur online. As a result, it is now necessary that every market actor makes the information related to his/her competencies, products he/she can offer to the market, etc., accessible online. To better facilitate value creation for seniors in the market, properly organized communities of active senior professionals can facilitate this task. Therefore, it is necessary to develop marketing and brokerage tools supporting the brokering stakeholders in these communities.

*T4.2 - Develop tools for **virtual team creation, negotiation and e-contracting**.*

One fundamental aspect of communities of active senior professionals' operation is related to effective and fluent creation of targeted virtual teams, comprising less setup costs and time. As such, tools shall be developed to facilitate the search and selection of most fit senior professionals as well as the processes related to their collaborative negotiation and contracting, to be conducted as efficiently as possible as required for quick response to the opportunities in the market/society. Developing tools that automate some of these processes or support their handling shall enhance the effectiveness of the process of creating virtual teams.

*T4.3 - Develop tools for **virtual team management** and **collaborative problem solving** support.*

To ensure that virtual teams meet the requirements of their customers, all processes required to run within the virtual teams need to be properly managed. With time the amount of information that needs to be collected and analyzed to support the management of virtual teams shall increase and requires proper classification and organized storage. Challenging opportunities emerged in the market/society require collaborative problem solving among a number of stakeholders. To facilitate these processes it is necessary to develop tools that will support the decomposition of these problems, as well as their resolution in a collaborative way. Machine learning and decision-making approaches need to be further researched to support this area.

*T4.4 - Develop models and tools for management of **Intellectual Property and performance**.*

Similar to other collaborative environments, seniors may also collaboratively develop new concepts or products that in turn will need careful assignment and management of their intellectual property right. Since communities of active senior professionals are unique in terms of their characteristics, it is necessary to develop specific models and tools capturing these rights, as well as the measurement of the performance of each stakeholder towards development of the joint results within the collaborative networks. Soft computing approaches provide the base for these studies.

**T5: Develop environments that **empower seniors to leave a legacy** that capitalizes on their personal / professional experience and is usable and transferable to the society.**

*T5.1 – Develop talents modeling and user-centered **knowledge acquisition** tools (e.g. Domain Specific Languages).*

Novel mechanisms and tools shall be developed to facilitate the abstraction, modeling and capturing of specific "talents, knowhow, and skills" that the senior professionals own. These models shall then be used to develop services to support acquiring, storing and managing variety of knowledge assets from senior professionals and providing the inherited knowledge/wisdom pool in their professional communities.

*T5.2 - Create **reward mechanisms** (system of **incentives**) to attract user-generated knowledge.*

Senior professionals need to be motivated and in one way or another rewarded for contributing to the market/society. Therefore, a proper system of incentives (monetary or otherwise) needs to be established, and criteria shall be identified for deciding on the type and level of rewards that can be considered in communities of active senior professionals. This system shall create the atmosphere indicating that senior professionals are valued within the society for what they contribute.

*T5.3 – Develop knowledge **assessment and intellectual property models**.*

In order to assess the quality and conditions of use of the knowledge and experience of senior professionals, new tools are needed. Complementarily there is also a need for the development of new models and support tools to handle intellectual property and quantify the individual contributions to value creation in a collaborative context.

*T5.4 - Mechanisms to promote **inter-generational inheritance**.*

One focus of communities of active senior professionals is to transfer the accumulated knowledge and experience from the senior professionals to the younger generations and other professionals, as a fundamental inheritance. In order to make this process effective: mechanisms, tools and ICT environments must be designed and developed to support empowering seniors, and to make them feel useful and needed by the society, which in turn will also ease the process of transferring their knowledge/wisdom inheritance to the intended recipients.

**T6: Develop approaches that **discover patterns and model** “the evolution of senior professionals’ interests and their involvement in the socio-economic system” and “the behavior and emotional health of senior professional networks”.**

*T6.1 – Develop a **conceptual base** for behavioral modeling.*

A thorough understanding of human behavior in the pre- and post-retirement stages is needed to be established in order to analyze the requirements for developing on ICT supported environment for the next generation of collaborative networks for senior professionals. Namely, it is needed to explore the broad spectrum of discovering, measuring, modeling, and leveraging human behavior patterns when using the ICT supported systems, in order to develop better ICT infrastructure to support, sustain, and enhance seniors’ collaboration in these networks as well as to contribute to the individual’s well-being.

*T6.2 - Develop **data-mining / machine learning** approaches for behavioral patterns discovery.*

Learning is necessary to be able to properly discover patterns of behavior, for modeling and development of suitable tools and systems. Data mining and machine learning are two of the disciplines that can be applied to deal with challenges related to discovery of human behavioral patterns out of the experiential data collected through collaboration platforms. New approaches need to be developed in these disciplines to support the effective capturing of patterns of behavior of senior professionals.

*T6.3 - Develop **forecasts and simulation** methods and tools for behavioral analysis.*

Both forecasting as the technique applied to predict the future, and simulation which provides better understanding of how the predicted future can emerge when given the available empirical or assumed data, can be applied to study and analyze behavior of senior professionals within their collaboration networks. Although some forecasting and simulating of human behavior is performed in past research, there is a lack of models and tools suitable to capture specific changes and evolution of behavior in elderly. Furthermore, research is required on forecasting the behavior of collaboration networks themselves, and to support managing group behaviors in communities of active senior professionals.

*T6.4 - Develop models and tools for **emotional health management**.*

The collective patterns and behaviors of involved senior professionals will represent the behavior and emotional health of their respective collaborative communities. Thus models and tools need to be developed to support capturing the emotions of individual senior professionals, and to analyze the collective behavior of all members together, in order to indicate the emotional health of the collaborative networks as whole. Furthermore, tools can be developed to enhance the health of communities of active senior professionals, e.g. through mediation or by applying self-healing.

### 3. VERIFICATION OF PROPOSED ACTIONS

#### 3.1 Introduction

Once a set of strategic actions emerged as a result of the brainstorming exercise, it is then necessary to proceed with a verification of those actions. The adopted verification process, at this stage of the roadmapping process, comprises two main activities:

- i) Verify if the set of proposed actions adequately cover the vision, i.e. if they are expected to cover all stated facets of the vision.
- ii) Assess the feasibility of each action considering the results of the gap analysis.

This verification needs to be conducted by experts and depends on the perception of each individual according to his/her background knowledge. Therefore a qualitative scale (using terms such as Moderate, High) was adopted.

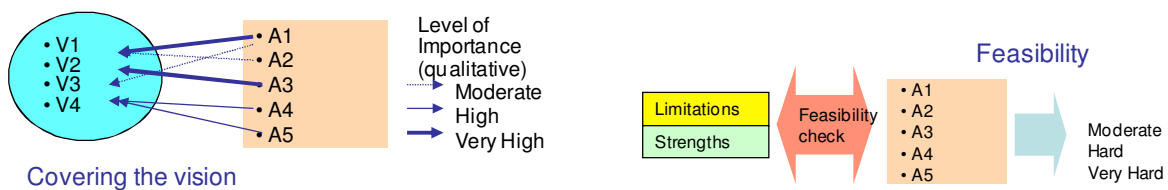


Figure 4 – Verifying the proposed actions

As a result of this verification process it might be necessary to revise some of the actions (or their formulations) made in the previous step. The actions and their formulation included in this report are already the result of this iterative process.

#### 3.2 Social perspective

##### Covering the vision:

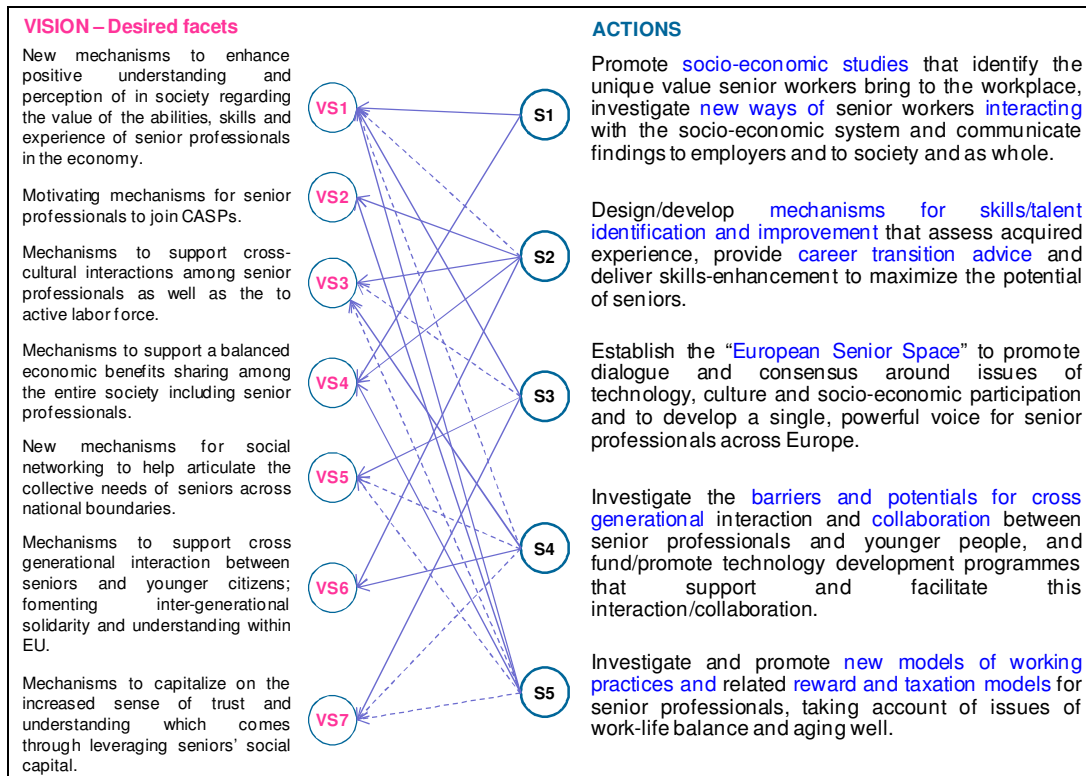


Figure 5 – How well proposed actions cover the vision facets – social perspective

In the above figure, a solid arrow means that the action has a(n expected) “High” contribution to cover the connect facet of the vision. A dashed arrow means a Moderate contribution.

Feasibility analysis:

The approach here is to consider how the Strengths and Limitations identified in the gap analysis facilitate or make difficult the implementation of each action.

**Strengths**

**S1** The increasing scarcity of younger workers, leading some companies to start changing their view of older workers

**S2** Improvements in modern medical science, increasing the duration of healthy senior life

**S3** Increased competitiveness in the EU Marketplace as a result of globalisation, which may open new opportunities for highly experienced professionals

**S4** Cross Cultural Understanding in Business means improved collaboration

**S5** Motivation and awareness of seniors of the benefits of active ageing

**S6** Motivation and awareness of society for the need to find more sustainable social security mechanisms

**S7** Senior mentoring and volunteering organisations for seniors are established across the EU and a variety of new experiences are emerging

**S8** The private sector in some fields is beginning to recognize the need for compensation and benefit packages tailored to senior professionals

**Limitations**

**L1** Negative and outdated assumptions regarding the abilities of senior professionals persist

**L2** There is still evidence of discrimination against senior professionals in the workplace

**L3** Lack of understanding of the specific needs of senior professionals

**L4** Education in the EU lacks flexibility, with more emphasis needed on life-long learning and retraining opportunities for seniors

**L5** Lack of a research into those socio-economic sectors in which senior associations could play an increased role

**L6** Lack of access to computer and high speed internet connections systems in many seniors’ homes

Table 1- Feasibility analysis – social perspective actions

Action	S1	S2	S3	S4	S5	S6	S7	S8	L1	L2	L3	L4	L5	L6	Difficulty
S1-socio-economic studies / new ways of interacting	x	~	x	x		x	x	x			x			~	Moderate
S2-mechanisms for skills/talent identification and improvement / career transition advice		x	x	x	x	x	x	~		x	x	x	x	x	Hard
S3-European Senior Space		~	x	x	x		x				~			x	Hard
S4-barriers and potentials for cross generational collaboration	x	x	~	x			x				x		x		Moderate
S5-new models of working practices and reward and taxation models	x	~	x	x	x	x	x	x	x	x	x		x	x	Very Hard

**Legend**  
(level of importance)

Not important		Important	x	Moderately important	~
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### 3.3 Organizational perspective

#### Covering the vision:

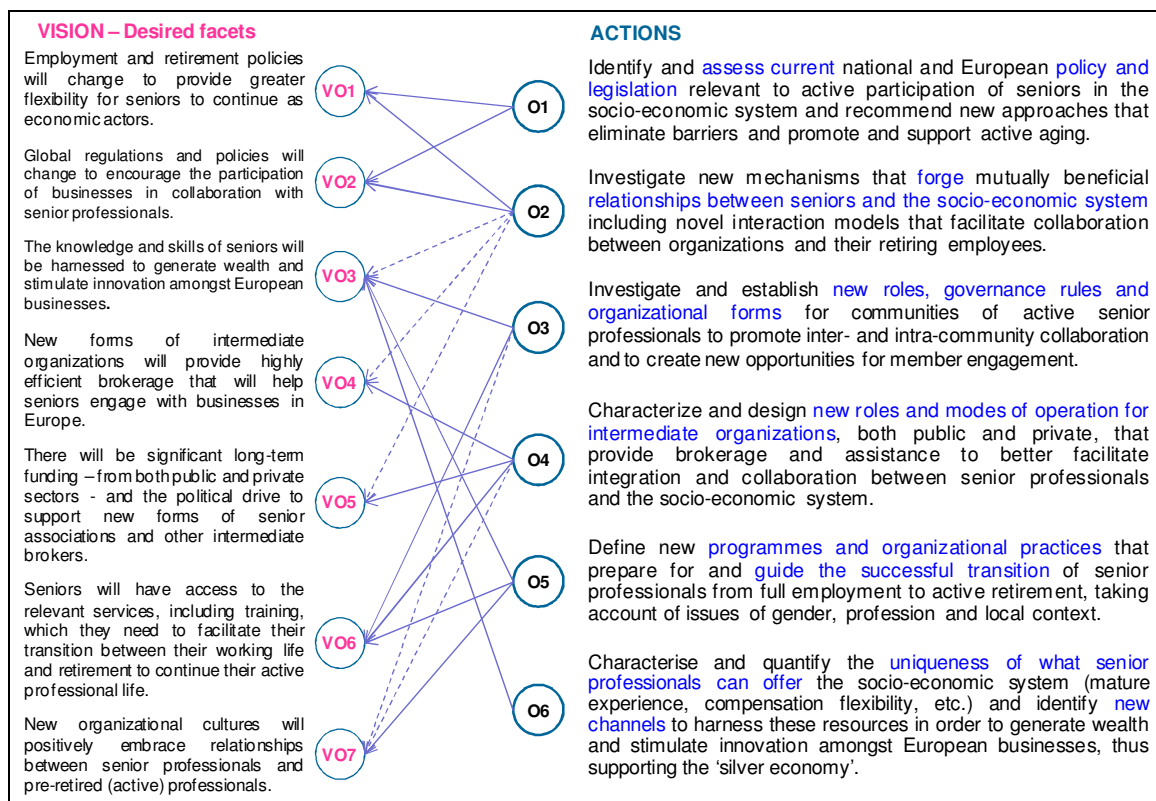


Figure 6 – How well proposed actions cover the vision facets – organizational perspective

#### Feasibility analysis:

##### **Strengths**

- S1** Some organizational approaches have manifested in practice, focused on the use of the experience and knowledge of senior professionals e.g. senior professionals associations
- S2** Changes have emerged in ways of working, such as freelancing and service based contracts, which are more suitable for senior professionals
- S3** There are some new initiatives, laws and policies across Europe oriented towards supporting active ageing for senior professionals
- S4** New conceptual frameworks and organizational forms, e.g. the collaborative networks paradigm, as well as the implementation of pilot cases, demonstrate new ways of supporting senior professionals who wish to remain active
- S5** There is a growing increase in awareness on the part of managers and leaders regarding the need to keep in contact with their retired employees in order to continue using their experience

##### **Limitations**

- L1** Lack of common EU-level policies among European countries and the EU itself on the enhancement of active life of senior professionals
- L2** Lack of proper organizational/operational models to support the establishment and management of associations of senior professionals effectively involved in socio-economic activities
- L3** Lack of committed organizations and their related business models to act as brokers for senior professionals and to build trust between senior professionals and their potential clients
- L4** Lack of comprehensive policies, regulations, and laws which favour the involvement of senior professionals in the silver economy, in particular, related to formal positions, payments, and access to opportunities
- L5** Lack of stable financial sources and supports for associations of senior professionals to enhance their operations and guarantee their continuity. Currently they are operating on the basis of small membership fees which is not enough
- L6** Lack of specialized and well formalized continuing education for senior professionals to update themselves with the new developments in the market

Table 2- Feasibility analysis – organizational perspective actions

Action	S1	S2	S3	S4	S5	L1	L2	L3	L4	L5	L6	Difficulty
S1-assess current policy and legislation		x	x		~	x			x	~		Hard
S2-forge relationships between seniors and the socio-economic system	~	x	x	x	x	x	x	x	x			Moderate
S3-new roles, governance rules and organizational forms	x	x		x			x	~		x		Moderate
S4-new roles and modes of operation for intermediate organizations				~				x		x		Very Hard
S5-programmes and organizational practices / guide the successful transition			~		x	~					x	Hard
S6-uniqueness of what senior professionals can offer / new channels		~			~			~	x		x	Very Hard

**Legend**  
(level of importance)

Not important		Important	x	Moderately important	~
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### 3.4 Technological perspective

Covering the vision:

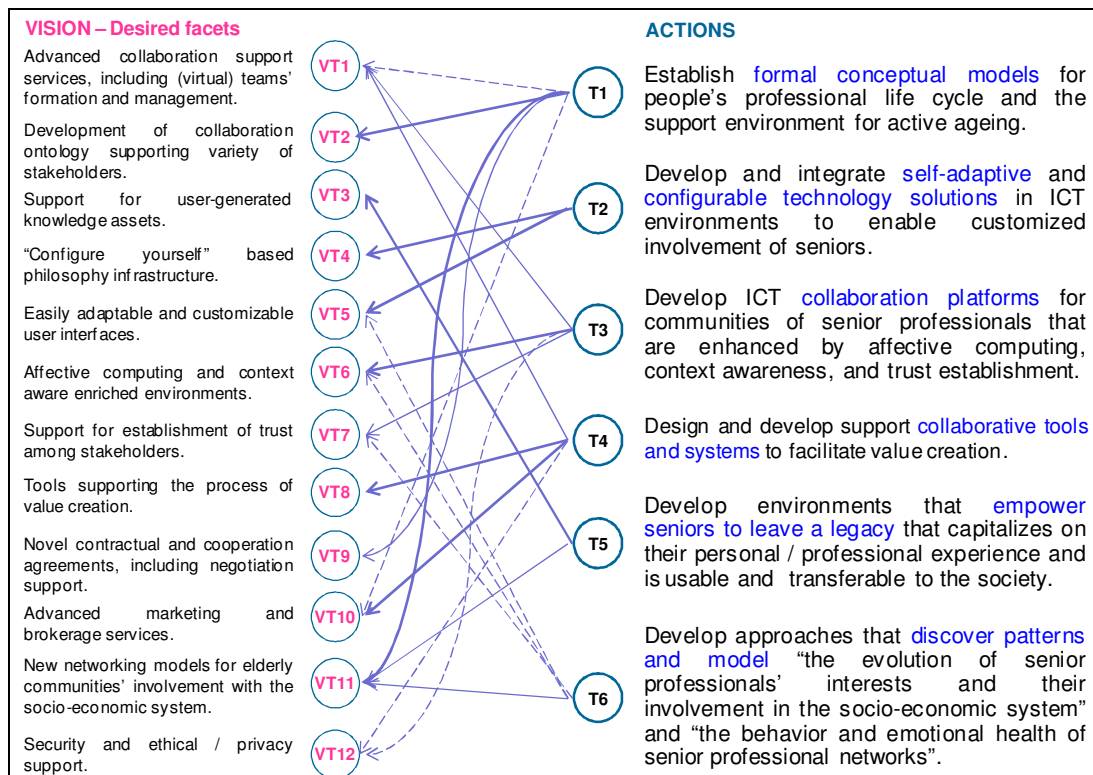


Figure 7 – How well proposed actions cover the vision facets – technological perspective

Feasibility analysis:

**Strengths**

- S1** Good progress in conceptual models for collaborative networks (although mostly focused on industry)
- S2** There is already an understanding of the needed management functionalities for VO breeding environments and professional virtual communities
- S3** Various partial models and advanced prototypes (e.g. negotiation, trust promotion, value systems) have been developed to support collaborative environments
- S4** ICT infrastructures exist across Europe to provide the basic communication building blocks that will be needed to implement the ePAL vision
- S5** Generic tools in the areas of CSCW and social networking (including chats, forums, emails, VoIP, etc) are becoming widely available
- S6** Configurable document management platforms supporting multiple users, with different roles, over the network are becoming available
- S7** A large panoply of mechanisms and tools for safe communications (including cryptography), user identification and authentication (including biometric systems), access / visibility rights definition and control have been developed

**Limitations**

- L1** Lack of consolidated theoretical base in areas such as reference modelling for active ageing support systems
- L2** Lack of effective and integrated ICT support for collaboration (till large fragmentation of functionalities)
- L3** ICT research in this area too much focused on the “last phases of life”, reducing the needed attention to active ageing support
- L4** Fast proliferation of new tools and functionalities without a holistic approach, an obstacle for adoption by seniors
- L5** There is an increasing trend to focus on a techno-centric approach for ICT R&D, which hinders proper understanding of the critical issues of the socio-technical systems needed to support active ageing
- L6** Support for Business related content (processes, architecture design, and other technical data) is limited and there are also many interoperability problems
- L7** There is a lack of sound models and tools for IPR and risk management as well as supporting ethical principles in collaborative networks, which are fundamental in promoting value creation
- L8** Current regulations in some European regions restrict any sort of financial gains for retired professionals, and therefore for ePAL scenarios, new value systems and related supporting tools need to be developed
- L9** Very little use of collaborative technologies is made in online senior communities, which only have access to basic tools
- L10** Lack of proper reference architectures which allow a combination of leisure/social with professional activities

Table 3- Feasibility analysis – technological perspective actions

Action	S1	S2	S3	S4	S5	S6	S7	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Difficulty
T1-formal conceptual models	x	x	~					x		~		x		x			x	Very Hard
T2-self-adaptive & configurable technology solutions				~	x	~	~	x	~	x	x					~		Very Hard
T3-collaboration platforms	~	x	~	x	x	~	x	~	x				x			x	~	Moderate
T4-collaborative tools and systems	~	x	x	x	x	x	x	~	x	~	x	~	x	x		x	~	Hard
T5-empower seniors to leave a legacy				~	x	x		~	~	x	x	x		x		~		Very Hard
T6-discover patterns and model behavior		~	x		~				~			~		~				Very Hard

**Legend**  
(level of importance)

Not important		Important	x	Moderately important	~
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## 4. NEXT STEPS

According to the roadmapping method being followed, the next phase is the refinement and consensus building phase. For this purpose, the main results of previous phases, namely the baseline, the vision statements, and the plan of actions, are organized in a synthesis document (see Annex) and that will be used as a basis for discussion in a series of events with invited stakeholders (results to be reported in D5.1).

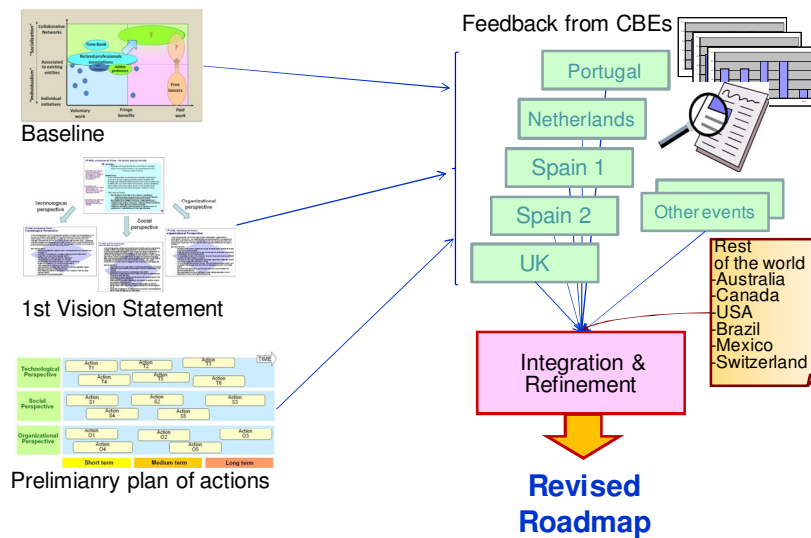


Figure 8 – Refinement and consensus building

Collected feedback and recommendations will then be taken into account when preparing the revised version of the roadmap. Once a revised set of actions is established, the following activity will be the identification of the necessary efforts, for each strategic action, in terms of base research (RTD), trials, and take-ups.

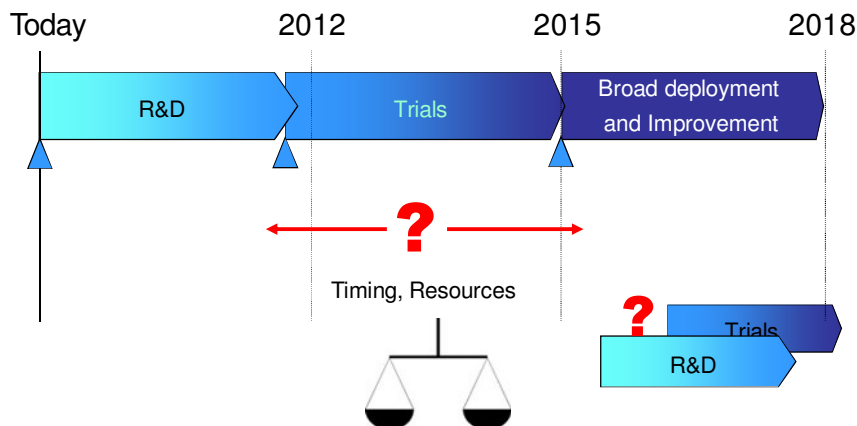


Figure 9 – Identifying needed RTD, trials and take-ups regarding each strategic action

The final “looks” of the roadmap will be similar to the following illustration:

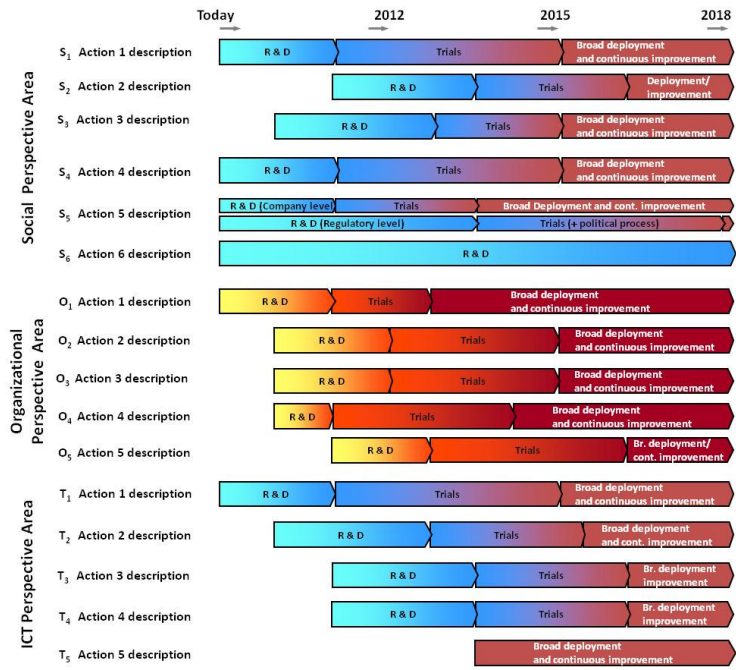


Figure 10 – Expected final “looks” of the roadmap

The final roadmap will be reported in deliverable D6.2.

## 5. REFERENCES

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- [2] Oreizy, P.; Gorlick, M.M.; Taylor, R.N.; Heimhigner, D.; Johnson, G.; Medvidovic, N.; Quilici, A.; Rosenblum, D.S.; Wolf, A.L., "An architecture-based approach to self-adaptive software," *Intelligent Systems and their Applications*, *IEEE* , vol.14, no.3, pp.54-62, May/Jun 1999  
URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=769885&isnumber=16695>
- [3] Camarinha-Matos, L. M. ; Afsarmanesh, H., "Collaborative networks – Reference modeling", Springer, 2008.

## **ANNEX – MATERIALS FOR THE CBE**

Executive summary that is sent to the stakeholders invited to the Consensus Building Events as preparatory material for the planned discussions.

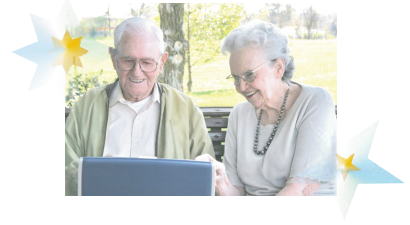


**ICT and Ageing**

# ePAL draft roadmap

**Executive Summary**

for participants in Consensus Building Events



### GOAL

The primary objective of Project ePAL is to consider and define new ways of promoting a balanced active life for retiring and retired professionals in Europe. ePAL will develop a roadmap – a set of plans for research actions, activities and steps – that will assist in placing Europe at the forefront of active aging and development of an extended notion of silver economy with a wide societal impact, moving us towards realising a more positive future for Europe’s elderly population.

This roadmap is developed in three key stages:

**Stage 1: Identify where we are now (the baseline):** which involves understanding the current trends and initiatives around active aging and, in particular, considering the ways in which retiring and retired professionals contribute economic and social value to industry and to the community.

**Stage 2: Identify where we want to go (the vision):** articulating a vision for the future – what scenarios would we like to see develop in the coming years; how can the EU build a society that values the elderly as important assets; what will be the specific roles of all major stakeholders in this area?

**Stage 3: Identify how we can get there (the roadmap):** by understanding where we are currently and then articulating a clear vision for the future, we will be able to identify the steps we need to take in order to bridge the gap between the two. This roadmap will address the sort of activities – technological; research; socio-economic – that need to be undertaken to fulfil the vision, and will provide a clear set of prioritised actions.

Throughout the project, we are working towards building a community of interest around these issues. This community will perform two critical functions:

- **Provide experience, expertise and knowledge at each key stage of the project.** It is only through broad consultation with relevant visionary actors across Europe and beyond that we will be able to understand where we are now, where we need to go and how we can get there.
- **Ensure that project outputs are disseminated.** In order for ePAL to have significant impact, we aim to continually communicate the vision and ideas we develop throughout the project to relevant stakeholders.

Engagement with this community of interest will happen in a number of ways: through workshops run across Europe involving interested parties and inviting active contributions; through a series of interviews with key visionaries. Through this activity we will develop areas of consensus that will influence decisions and direction at every stage of the project.

### ePAL FACTS

The project is funded by the European Commission as part of the 7<sup>th</sup> Framework Programme. ePAL is coordinated by Uninova, a non-profit University-Enterprise Association based in Lisbon, Portugal. The other key partners are the University of Amsterdam, The Netherlands, Skill Estrategia, a consultancy based in Seville, Spain, White Loop Ltd, a consultancy from London, UK and SECOT, an association of retired executives offering management and development services to companies across Spain.

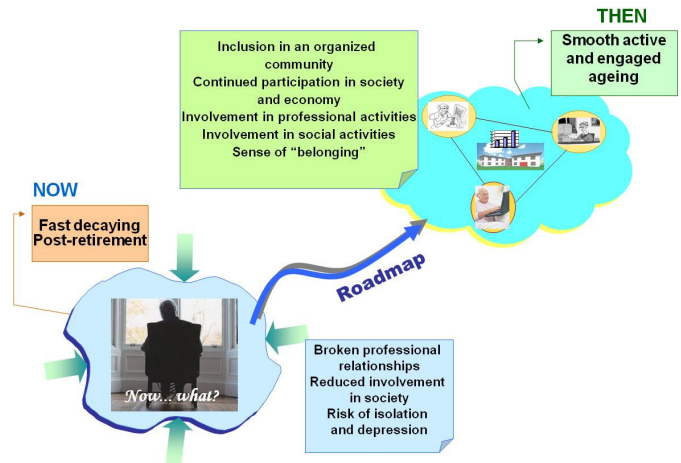
The project began in February 2008 and will run for 24 months.

Visit our website and get involved!  
[www.epal.eu.com](http://www.epal.eu.com)

### The approach

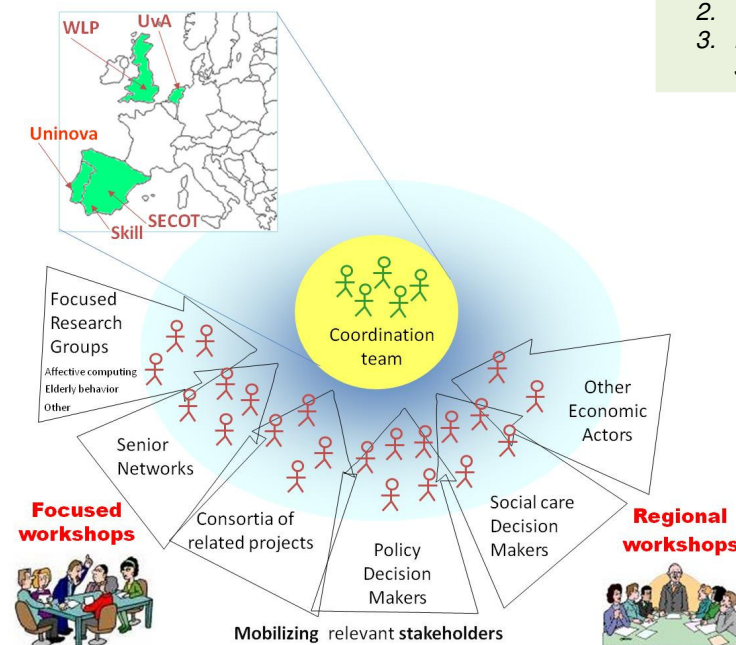
The potential of ICT to support better ageing and individuals' well-being has been widely recognized, which has led to many R&D projects during the last decade.

However, the sensitivity of the area, the dependency on the "parallel" introduction of new organizational models and creation of a new culture in society, the lessons learned with the limited success of existing associations of senior professional, the risk of continuously developing technology that is not taken-up by the target users, among others suggest the need for a careful analysis and a new approach towards what concerns new developments. It is thus clearly very important at this point in time to design a strategic R&D roadmap focused on active ageing.



ePAL roadmap comprises three main components:

1. Baseline – characterization of current situation
2. Vision – characterization of a desirable future
3. Roadmap or plan of strategic actions that will help society to move towards achieving the vision.



ePAL is mobilizing relevant stakeholders in the roadmapping

In the first phase of ePAL, performed activities included baseline consolidation, identification and analysis of drivers and trends, elaboration of future scenarios and vision statement, gap analysis, identification and assessment of emerging organizational forms, and elaboration of a first set of strategic research actions.

Studied associations of senior professions

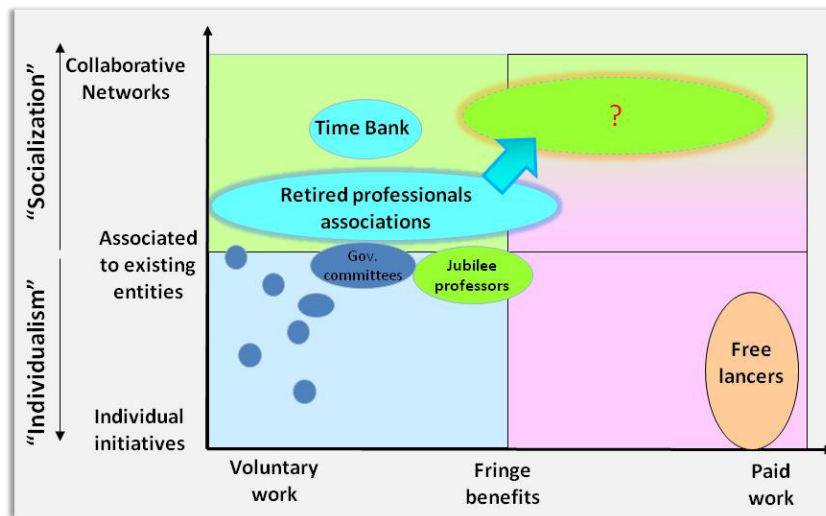
Organization	Country
AGIRabcd	France
APCS	Portugal
ASECAT	Colombia
ASEP	Austria
BSC-I	Belgium
COGAMA	Spain
CONFEMAC	Spain
CONJUPES	Spain
ECTI	France
EGEE	France
FRAE	Spain
ISES	Italy
JUBIQUÉ	Spain
KOS	Poland
NESTOR	Finland
OTECI	France
PUM	Netherlands
REACH	UK
RSVP	UK
SECOT	Spain
SEN@ER	Spain
SENA	Belgium
SENIORES	Italy
SES	Germany
SFPA	Slovenia
SHARE	Portugal
SWB	Denmark
UDP	Spain
VIS -Vitalis	Poland

### Main achievements

ePAL is pursuing a **new concept of silver economy**. This term has been traditionally considered under very restricted view referring to the business of providing services to the elderly. However, this view of elderly as just "consumers" with financial abilities is quite limited. Another view of the term silver economy refers to elders' direct contribution and value creation in the society. ePAL is mostly focused on the creation of conditions and mechanisms to leverage the potential of this second view.

As part of the baseline characterization phase of the roadmapping process, an extensive analysis of the existing associations of senior professionals was conducted. Inputs from 29 associations from 14 countries contributed to this study. These associations are mostly composed of "professional elite" (people

with a high education and that had high positions in the socio-economic system before retirement). In most cases, these people have reasonable pensions (although varying from region to region) and therefore can afford to do voluntary (unpaid) activities. However, the number of people involved in such mechanisms is not very high. On the other hand, considering the current difficulties of the social security systems all over Europe, most governments are trying to implement new formula for pension calculation which in practice means a reduction of the pension. In such context, it is foreseeable that more and more retirees will have fewer resources than needed to satisfy their standards of life and thus need to continue being involved in value creation activities. Elements gathered from the interaction with many senior professionals reveal a desire to “move” to a different organization model in which some economic benefits can be perceived by those involved in professional activities.



#### A trend?

*Moving from purely voluntary work to some forms of economic compensation...*

*Moving from individual activities to some socialization through collaborative networks ...*

Most current organizations operate on a relatively passive basis, basically “expecting the client or the business opportunity to show up”. As a consequence of the lack of proper brokerage mechanisms or support of intermediary entities they do not have many projects. A frequent complaint is that they do not have enough work for all their members. And yet, many SMEs and start-ups world-wide that cannot afford to pay market prices for consultancy and coaching, can greatly benefit from the accumulated knowledge and experience of senior professionals.

In addition to these associations, various other mechanisms and practices towards active ageing can be found. Examples include the maintenance of some links to the former employer (as in the case of jubilee professors), free-lancing, time bank, etc.

In addition to the need to move from voluntary (only) activities to (some options of) paid work, it is also important to find new forms of “socialization”, a critical issue after retirement for which collaborative networks can be an answer.

One important aspect when designing a roadmap to extend professional life of individuals is to consider the organizational forms that can best support the main objective of keeping seniors involved in the socio-economic system. There are two challenges which are facing retired people when they do want to provide their knowledge and experience to beneficiaries as described below:

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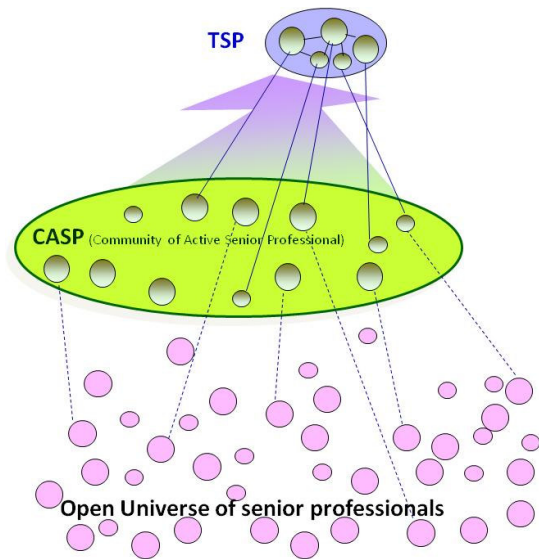
- Finding opportunities to apply their knowledge and experience. As mentioned by many associations, it is difficult for retirees to individually acquire opportunities in the socio-economic system that are also being targeted by other formal service providers, such as consultancy and other organizations. Even when such opportunities are brokered, the process of building trust for each individual retiree to beneficiaries might be very challenging.

- Some acquired opportunities cannot be responded to by one senior professional alone, in what is considered the normal practice in traditional associations. For example, SMEs which need consultancy on a subject may require more than one kind of expertise. Thus for such opportunities a number of retirees might need to collaborate with each other in order to provide the required knowledge or expertise. Special attention has been devoted to the role of the ICT technologies in this field.

To address these challenges a new kind of collaborative networked environment – **Community of Active Senior Professional (CASP)** can be envisioned:

**CASP** constitutes a long term association of senior professional individuals that are largely autonomous, geographically distributed, and potentially heterogeneous in terms of their: capabilities, offered capacities, culture, system of values, etc., but sharing their main compatible and/or common goals of increasing their active professional life in the society and/or market, through co-working with others in Teams of Senior Professionals (TSPs) supported by computer networks.

**TSP** is a dynamically configured collaborative network of individuals which is established within the CASP in response to opportunities in the society and market that are in need of their wisdom and/or knowledge assets that they can offer, which as a consequence supports the retired professionals remaining professionally active.



The effective involvement of seniors in the socio-economic system needs to consider other entities. Thus ePAL proposes a tri-partite network, involving, besides seniors, the intermediary entities and the recipients of the services provided by seniors.

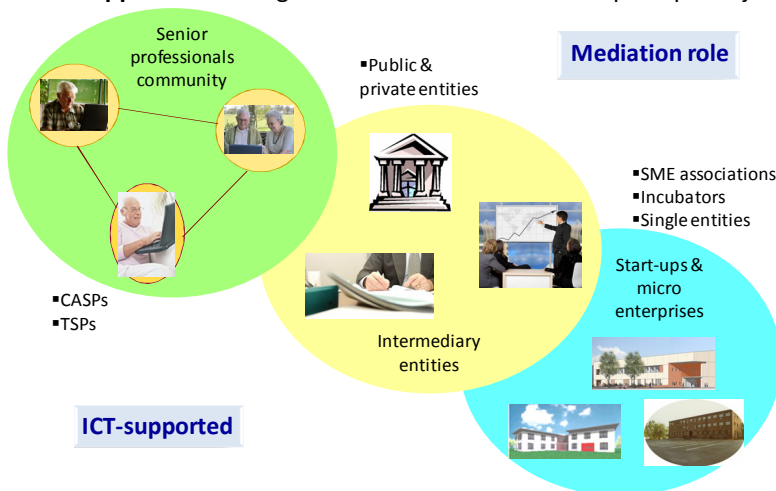
**Intermediaries:** Organizations or people which act as mediators or agents between CASP (or individual TSPs) and recipients.

**Recipients:** These can range from individual persons, groups of people, entrepreneurs and start-ups, SMEs, or large organizations. Recipients include the categories of clients and beneficiaries.

There are further two categories of intermediaries depending on their objectives, i.e. the brokers and supporters:

- **Brokers** are organizations or people whose principal objective is that of making it possible for senior professionals to be able to supply their services (experience and knowledge) to the market and society. This type of entities plays a very important role in extending professional active life of seniors.

- **Supporters** are organizations that have as their principal objective the maintenance of an active life for



the elderly and improvements in their quality of life, providing a range of services that allow the elderly to provide a service in a more structured manner. These types of organization basically offer three types of support: financial support, service support, and ICT support.

Each one of these groups might have distinct organizational forms. For instance, recipients can be organized around SME Associations, start-up incubators, etc.

### Perspectives of analysis

Although **focused on ICT support for active ageing**, ePAL considers that the development of successful technologies in this sector strongly require consideration of the socio-organizational context. Therefore three perspectives of analysis are considered:

1. **Social Perspective** - analysing the wider EU's recognition of the rationale behind fully supporting the extension of active professional life.
2. **Organizational Perspective** - addressing the capacity of the service sector to fully support these activities and the provision of a regulatory and fiscal policy environment which can complement and support this sector.
3. **Technological Perspective** - addressing the need for development of adequate ICT support (infrastructure and software tools), in which the specific needs of senior professionals are considered in their design process.

## Baseline

The following tables summarize the current situation according to the three perspectives of analysis.

### Social Perspective

<b>Demographic Shifts</b>	<ul style="list-style-type: none"> <li>▪ Seniors form an increasingly larger percentage of the potential EU workforce.</li> <li>▪ Senior workers are going to become an increasingly scarce resource and those younger workers who are just entering employment are going to have to learn quicker than ever in order to plug the skill gaps that are already emerging in European Society.</li> <li>▪ Senior workers have a role to play in increasing knowledge transfer efforts so that these younger workers are prepared earlier for the demands of the workplace.</li> <li>▪ Seniors are needed to participate in the economic growth of Europe by continuing to generate wealth and responding to the demands of the marketplace directly.</li> </ul>
<b>Social welfare mechanisms</b>	<ul style="list-style-type: none"> <li>▪ Since the end of the 19th century all European countries have set in motion a variety of social security systems, amongst which retirement pensions are notable.</li> <li>▪ Continental systems are based on the payment of a pension that is entirely State-funded and linked, in varying degrees depending on the country, to the tax payments to the social security system made by the working population.</li> <li>▪ In Nordic systems the payment of a minimum state pension, sometimes statutory and independent of tax income, is complemented with the availability of income from private pension systems. Private pensions can be either voluntary or obligatory.</li> <li>▪ In both systems there are usually specific groups of workers (civil service, army, rural workers, house care etc) that have special pension systems.</li> </ul>
<b>New adaptable frameworks to facilitate social collaboration</b>	<ul style="list-style-type: none"> <li>▪ There are a number of local, national and international organizations which organize the knowledge transfer (on a voluntary basis) between seniors and younger workers, with a focus on the SME market.</li> <li>▪ One key model is "mentoring" whereby senior retired workers help younger workers overcome business challenges either on a one to one or group basis.</li> </ul>
<b>Mechanisms to enable social cohesion</b>	<ul style="list-style-type: none"> <li>▪ Many not for profit organizations in the EU coordinate philanthropic activities on the part of seniors.</li> <li>▪ Seniors voluntary networks also often play a key role within their local communities.</li> <li>▪ However the involvement in active economy is still limited and even senior associations face difficulty in attracting "customers" to the services they are willing to provide.</li> </ul>
<b>Frameworks to support social knowledge and experience exchange</b>	<ul style="list-style-type: none"> <li>▪ Affective or emotionally intelligent computing even at present stage of development can potentially help facilitate intergenerational communication as well as positively influence the development of social networks.</li> <li>▪ This is already observed in a few cases that represent a kind of pilot experiments, but more scalable initiatives are needed.</li> </ul>
<b>New human resource policies</b>	<ul style="list-style-type: none"> <li>▪ The need for HR departments to plan for an ageing society has been a relevant topic of concern for a number of years now.</li> <li>▪ Older employees will require a whole different set of benefit packages to their younger counterparts having a different set of health insurance and care requirements corresponding to their more advanced years.</li> <li>▪ Compensation packages are also likely to change as employers look to reduce their overheads through structuring pay around performance rather than seniority.</li> </ul>
<b>New approaches to promote life-long learning</b>	<ul style="list-style-type: none"> <li>▪ Education in the EU needs to become more flexible and work in ways that help people work for longer through providing a constant update of skills in reaction to the changing needs of the labor market.</li> <li>▪ In order to make these transition more fluid life-long learning, the EU is looking to learn from a state labor model pioneered in Denmark of "flexcurity", whereby citizens are prepared for a more unstable/flexible labor market partially through provision for life-long learning.</li> </ul>

### Organizational Perspective

<b>Employment and retirement policies</b>	<ul style="list-style-type: none"> <li>▪ Keeping an active and paid activity creates conflicts with unions' agendas that try to keep early retirement ages.</li> <li>▪ Low level pensions in various European regions force retired professionals to look for an extra income. A very large percentage of them tend to be self-employed.</li> <li>▪ Two future lines are developing: (1) increasing the retirement age, (2) allowing retired people to earn extra benefits from work/services rendered. Sources of remunerated jobs for seniors need to be identified.</li> <li>▪ New forms of employment are appearing for senior professionals - part-time work, working reduced hours, flexible work schedules, job sharing and telework - but this is not yet a widely disseminated practice.</li> <li>▪ Securing the continued successful development of the EU requires, from national/regional bodies with the help of private sector to redefine the traditional role of pre &amp; post retirees.</li> </ul>
<b>Global regulations and policies regarding collaboration of businesses with senior professionals</b>	<ul style="list-style-type: none"> <li>▪ Some companies, namely multi-nationals, start to realize the potential of keeping some links with their former employees and thus new organizational forms are emerging for that purpose.</li> <li>▪ The number of senior organizations which have as principal goal giving professional help to young people, SMEs and other organizations that cannot afford to pay consultancy companies is increasing.</li> <li>▪ Significant adjustments need to be made in the private sector in order to accommodate an older workforce. The situation is especially true for women who have been the most penalized.</li> </ul>

<b>Use of knowledge and skills of seniors to generate wealth and stimulate innovation</b>	<ul style="list-style-type: none"> <li>▪ Senior professionals clearly feel the need to remain active and involved in the socioeconomic system after retirement in order to continue feeling useful by sharing their experiences, skills and knowledge.</li> <li>▪ Some specific mechanisms are available or emerging with the potential of using the professional knowledge and experience of senior people (e.g. the concept of jubilee for retired university professors, free lancing, and time bank). However these mechanisms are still quite limited.</li> <li>▪ In some regions, concerns with talent shortage are leading to studies on how to keep human resources. The society needs to facilitate knowledge transfer from elder to younger workers.</li> </ul>
<b>New forms of intermediate organizations to provide efficient brokerage</b>	<ul style="list-style-type: none"> <li>▪ It is difficult for retirees to individually acquire work opportunities in the society that are also being targeted by other formal service providers. The process of building trust and fulfilling expectations for each individual retiree is also very challenging.</li> <li>▪ There is a need for entities that develop mediation services between the senior professionals and the recipients of their services. Such entities do not exist or the interaction mechanisms are not yet in place.</li> <li>▪ North American organizations seem to have a completely different model regarding remunerated activities. There are several initiatives helping seniors to find jobs (particularly in the USA and Canada).</li> <li>▪ The governance rules are practically common to all current senior associations and in terms of organization's structure they practically run over similar hierarchies and governance principles.</li> <li>▪ Most senior organizations make limited use of ICT to manage their activities or to facilitate interaction with recipients. No adequate profile / competency models seem to be in place.</li> <li>▪ The development of new collaborative tools supported by Internet and a better understanding of collaboration mechanism start leading to new organizational forms in some sectors.</li> </ul>
<b>Financial support to associations and other intermediaries</b>	<ul style="list-style-type: none"> <li>▪ Most organizations depend on a membership fee (typically around 30€ - 50€) which by itself is not enough for their needs. Some do not charge any fee resorting only to external public or private funds (sponsors).</li> <li>▪ Most organizations operate on a relatively passive basis, not having enough work for all their members.</li> </ul>
<b>Seniors' access to (re)training services</b>	<ul style="list-style-type: none"> <li>▪ Senior associations try to provide some re-training to their members but this training does not seem to be enough. Familiarity with technology is advancing in newer generations but there is still a long way to go.</li> <li>▪ The universities (except the so-called 3<sup>rd</sup> age universities) do not yet offer education for seniors. The concept of life-long learning seems to be mostly focused on younger ages.</li> <li>▪ Education and employment status in the EU needs to become more flexible and react to the new demographic aging reality of the EU's population.</li> </ul>
<b>Organizational culture embracing relationships between senior professionals and pre-retired (active) professionals</b>	<ul style="list-style-type: none"> <li>▪ A number of different organizational forms and mechanisms are emerging, focused on providing ways to help senior professionals remaining active, in professional terms, after retirement.</li> <li>▪ Associations of senior professionals are an important organizational structure to support active aging.</li> <li>▪ Existing organizations of professional seniors are mostly composed of a "professional elite" which have reasonable pensions (in some countries) and can afford to do voluntary activities. However, the number of people involved in such mechanisms is not very high.</li> <li>▪ Organizations such as Age Concern are working to address the negative stereotypes surrounding older workers. We also need to recognize the role of and support those who provide a home environment for elderly workers and have a large responsibility for supporting them financially and socially.</li> <li>▪ Workplaces are also a social hub and continued employment can have the positive effect of extending the social side of work which many retirees miss upon leaving work. This is available in universities (jubilee professors) and a few large companies only.</li> </ul>

### *Technological Perspective*

<b>Theoretical foundation for technological developments</b>	<ul style="list-style-type: none"> <li>▪ Good progress was achieved on conceptual models for collaborative networks (CN) during recent years, including reference models (e.g. ARCON), CN taxonomy, CN ontology, understanding of the VO creation process, etc.</li> <li>▪ Achieved research results in the area of collaborative networks mostly address challenges related to collaboration among organizations. Considering ePAL, these results need to be adapted and extended to meet the requirements and challenges related to collaboration among senior professionals.</li> <li>▪ More research is needed on "soft issues", including trust management, collaboration readiness assessment, value systems alignment and credit assignment, emotional health of the network, etc.</li> </ul>
<b>Collaboration support services, including (virtual) teams' formation and management</b>	<ul style="list-style-type: none"> <li>▪ Various advanced prototypes have been developed for management systems for VO Breeding Environments and Professional Virtual Communities, including tools for VO / VT creation and negotiation have been developed (e.g. ECOLEAD project), but still with limited use in real businesses.</li> <li>▪ Generic tools in the areas of CSCW and social networking (including chats, forums, emails, VoIP, etc) are becoming widely available.</li> </ul>
<b>Support for user-generated knowledge content</b>	<ul style="list-style-type: none"> <li>▪ Configurable document management platforms supporting multiple users &amp; different roles, over the net are becoming available (e.g. JOOMLA, DRUPAL).</li> <li>▪ Various successful experiments (and supporting platforms) for "mass creation" of generic multimedia content (videos, photos, podcasts, etc.) are available (e.g. YouTube, Flickr, blogs). This is also creating a "culture" of content sharing.</li> <li>▪ Regarding the generation of business related content (processes, drawings, and other technical data) the possibilities are much more limited and there are also many interoperability problems.</li> <li>▪ This area also raises many unsolved issues e.g. IPR, ethical principles, ownership and protection.</li> </ul>

<b>“Configure yourself” based philosophy infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Some preliminary attempts to let the user configure his/her user interface and customize his/her desired functionalities/services through composing / assembling the system's components have started to appear (still in a rudimentary form) in some Internet systems (e.g. FaceBook, iGoogle).</li> <li>▪ Sustainable development of this concept requires the creation of libraries of components and proper interoperable reference architectures.</li> </ul>
<b>Easily adaptable and customizable user interfaces</b>	<ul style="list-style-type: none"> <li>▪ The growing number of application features and the desire to optimize usage of screen space raise the need to allow users or applications to customize the interfaces. Adaptive interfaces that can change their appearance based on some algorithm, such as a least-recently used criterion (e.g. the Microsoft XP/ Vista desktop icons, Portlet internet technology, etc.) start to appear.</li> <li>▪ One of the simplest forms of user interface customization is the notion of skins and themes available in some applications and user interface toolkits (e.g. Microsoft OP themes, iGoogle).</li> <li>▪ Other efforts are being directed towards automatic adaptation of different output channels (PCs, mobile phones, PDAs, etc.).</li> <li>▪ This area is likely to have fast developments in the coming years.</li> </ul>
<b>Tools supporting the process of value creation</b>	<ul style="list-style-type: none"> <li>▪ Preliminary conceptualization of value systems and benefit analysis for collaborative networks is emerging, but no practical support tools are available yet.</li> <li>▪ Most existing value systems focus on providing guidelines related to optimizing and/or sharing organization's or individual's gains, and are typically related to financial gains. However, the current regulations in some European regions restrict any sort of financial gains for retired professionals, and therefore for ePAL scenarios, new value systems and related supporting tools need to be developed.</li> <li>▪ There is a lack of sound models and tools for IPR and risk management in CNs, which are fundamental in promoting collaborative value creation.</li> </ul>
<b>Affective computing and context aware enriched environments</b>	<ul style="list-style-type: none"> <li>▪ Affective computing is a new and very active research field. So far most efforts have been put in the perception/recognition of emotions (e.g. biosensors, digital cameras, speech treatment) and expression of emotions through complex media (e.g. robots, avatars, music). However, results are still at an early stage.</li> <li>▪ Other research activities in affective neuroscience and psychology indicate that human affects and emotional experiences play a significant and useful role in human learning and decision-making.</li> <li>▪ The utilization of emotions to regulate virtual environments (to motivate, engage or create trust) is a promising approach, but no developments yet exist in this direction. In the ePAL context, new directions for affective computing can be opened such as identification of the emotional state of the community / network (collective emotion), use of affective principles to smooth collaboration, development of self-healing mechanisms in case of conflicts, development of emotional models focused on elderly, etc. But all these areas are practically untouched.</li> </ul>
<b>Contractual and cooperation agreements, including negotiation support</b>	<ul style="list-style-type: none"> <li>▪ Some contract models / frameworks were developed for specific domains (e.g. civil construction) but this is still a research issue.</li> <li>▪ Various prototypes and models of negotiation, namely following a multi-agent systems approach, have been proposed, but are still far from practical use.</li> <li>▪ There are also some conceptual and prototypical developments on e-institutions such as e-notary, including safety infrastructures, but still with poor integration with collaboration environments.</li> <li>▪ For the support of electronic contracts and negotiation some facilitating tools have been suggested such as “Contract wizards”.</li> </ul>
<b>Marketing and brokerage services</b>	<ul style="list-style-type: none"> <li>▪ Intensive developments around Service Oriented Architectures turned this approach and associated technologies a “popular” stream in systems integration, service publishing and access. Various standards try to facilitate the interoperability issues. However, the usage of this technology still requires good technical skills.</li> <li>▪ Considering the universe of SMEs and senior professionals, further developments are needed, namely in the following directions: <ul style="list-style-type: none"> <li>- Facilitating the technology usage by people not very skilled in SOA.</li> <li>- Development of new conceptual and technological approaches to introduce a “pro-active” component in the software services.</li> <li>- Elaboration of libraries of template services oriented to consultancy activities (and particularly to the kind of consultancy services to be provided by senior professionals).</li> </ul> </li> </ul>
<b>Networking models for elderly communities' involvement with the socio-economic system</b>	<ul style="list-style-type: none"> <li>▪ In addition to the free-lancing activities, several (virtual) communities try to organize groups of retired professionals and promote their active ageing.</li> <li>▪ One fundamental role for the establishment of collaborations among senior professionals is related to the intermediation of the interactions between seniors and clients. There is still a lack of clear understanding of how this role can be handled and who (or which organization) is responsible.</li> <li>▪ These communities try to promote the involvement in the socio-economic system but currently face a number of limitations: <ul style="list-style-type: none"> <li>- Most actions are carried out by single individuals (no real notion of CN / team work).</li> <li>- Very limited brokerage functionality.</li> <li>- Poor integration with the other stakeholders of the socio-economic system.</li> <li>- Very little use of collaborative technologies is made, only having access to basic tools.</li> </ul> </li> </ul>
<b>Security and ethical / privacy support</b>	<ul style="list-style-type: none"> <li>▪ A large panoply of mechanisms and tools for safe communications (including cryptography), user identification and authentication (including biometric systems), access / visibility rights definition and control have been developed.</li> <li>▪ Most of the base building blocks in this area are available, but their integration and configuration according to the specific needs of each application scenario is still a difficult issue.</li> <li>▪ For ePAL scenarios, in which it is necessary to combine leisure / social activities with professional activities, there is a need to design proper reference architectures that cope with such contexts.</li> </ul>

## Vision

To guide Europe towards a balanced life of its ageing professional population, a desired *vision* is being developed. This vision aims to provide clear directions for what the European society strives to achieve in order to enhance the life of its senior professionals.

Both in large environments such as a society and small environments such as an organization, when everyone thoroughly understands and shares the same vision they become intensely motivated and their production and cooperation increases. In other words, they will apply themselves entirely to achieve the common vision.

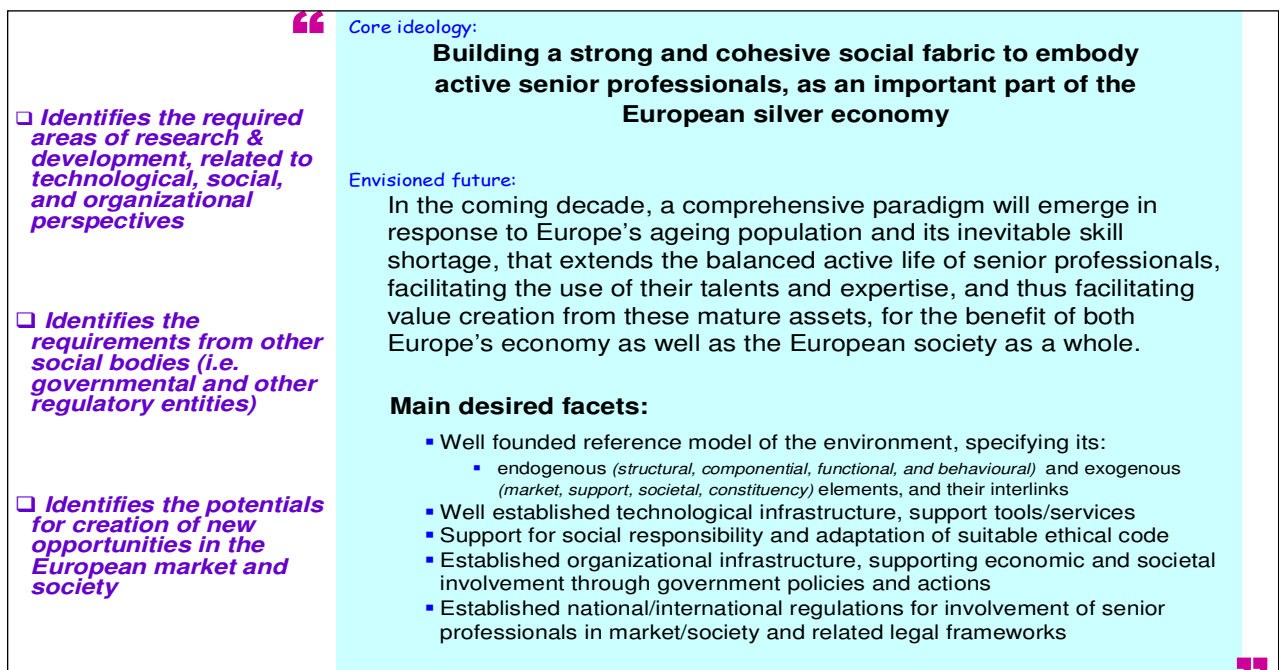
*“Vision is typically defined as a deeply held picture of where a person, a group of people, an organization, or a society wants to reach in future”*

The vision for an environment shall provide:

- (1) **Compelling image** of the future,
- (2) **Credible and attractive** view of what's potentially feasible,
- (3) **Unifying guides** to what the environment both wishes and can become, and
- (4) **Inspirational focal point** for the spirit of the environment and its members.

Formalized definition of a well-conceived vision consists of two major components, namely the **Core Ideology** and the **Envisioned Future**<sup>iv</sup>. The **Core Ideology** is the first primary component of the vision framework including the *core values* and the *core purpose*. The core ideology therefore represents the essential and enduring tenets of an organization or a society, and points to certain fundamental reason for the organization/society to exist. The **Envisioned Future** is the second primary component of the vision framework, which consists of *long-term audacious goals* and a *vivid description* of how it would be when the goals are achieved.

In ePAL, one focus is on development and presentation of a **vision for the establishment of the environment** (called the ePAL environment) **for extending Professional Active Life of seniors in Europe**. It specially argues that in future, with proper motivation, infrastructure, and support, senior professionals become both eligible and capable of contributing to the economical/societal state of Europe while having balanced and active lives for themselves. Based on all the results achieved so far in this project, a well-conceived 1<sup>st</sup> vision for the ePAL environment is developed, as represented in the following figure.



1st desired ePAL environment vision for European society

<sup>iv</sup> Cummings, T. G. *Organization Development and Change*. Thomson South-Western, 2005.

### Instantiation of 1<sup>st</sup> vision of ePAL environment

This vision statement is instantiated into the three perspectives that together comprehensively address all aspects that are required to be covered by the vision: **social, organizational and technological**, which capture the involvement of all stakeholders in European society.

Each vision instantiation represents the vision statement for that perspective, its related actions that are needed to be performed, and the topics that need further research in order to support realization of the vision for that perspective, as summarized in the following Table.

Instantiation of the ePAL environment vision into the three perspectives:

Vision instantiation statement		
Social	Organizational	Technological
<p>In the coming decade, extending active professional life will be a high priority strategy in addressing Europe’s aging population. The social infrastructure will mature to accommodate demographic shifts through the creation of mechanisms to support active involvement of elderly people in the silver economy. Attitudes in society will evolve towards positive acceptance of elderly people as a value-creating pool of talent, thereby creating opportunities to support and promote active aging. Both senior and young professionals will derive greater benefit from the exchange of knowledge and experience. As the social environment evolves, new support mechanisms will arise to sustain an aging but more active and inclusive population.</p>	<p>In the coming decade, the primary organisational stakeholders – governments, intermediaries, and businesses –will adopt positive and proactive policies and approaches that enable senior professionals to continue their active life and generate income that compensates for pension shortfalls and facilitates a valuable contribution to Europe’s economy.</p>	<p>In the coming decade, the ICT collaboration platforms and tools will be developed as an easy to use enabler of new approaches for continuation of the active involvement of elderly people in the socio-economic system. As such, novel infrastructures and intelligent functionalities will act as a catalyst of new organizational forms, supporting geographically disperse communities of retired professionals. Furthermore technology will enable seniors to leave their legacy, expand their human capabilities, and facilitate their active participation in the socio-economic system.</p>
Main desired facets		
<ul style="list-style-type: none"> <li>▪ New mechanisms to enhance positive understanding and perception of in society regarding the value of the abilities, skills and experience of senior professionals in the economy.</li> <li>▪ Motivating mechanisms for senior professionals to join CASPs.</li> <li>▪ Mechanisms to support cross-cultural interactions among senior professionals as well as to the active labor force.</li> <li>▪ Mechanisms to support a balanced economic benefits sharing among the entire society including senior professionals.</li> <li>▪ New mechanisms for social networking to help articulate the collective needs of seniors across national boundaries.</li> <li>▪ Mechanisms to support cross generational interaction between seniors and younger citizens; fomenting inter-generational solidarity and understanding within the EU.</li> <li>▪ Mechanisms to capitalize on the increased sense of trust and understanding which comes through leveraging seniors’ social capital.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Employment and retirement policies will change to provide greater flexibility for seniors to continue as economic actors.</li> <li>▪ Global regulations and policies will change to encourage the participation of businesses in collaboration with senior professionals.</li> <li>▪ The knowledge and skills of seniors will be harnessed to generate wealth and stimulate innovation amongst European businesses.</li> <li>▪ New forms of intermediate organizations will provide highly efficient brokerage that will help seniors engage with businesses in Europe.</li> <li>▪ There will be significant long-term funding – from both public and private sectors - and the political drive to support new forms of senior associations and other intermediate brokers.</li> <li>▪ Seniors will have access to the relevant services, including training, which they need to facilitate their transition between their working life and retirement to continue their active professional life.</li> <li>▪ New organizational cultures will positively embrace relationships between senior professionals and pre-retired (active) professionals.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Advanced collaboration support services, including (virtual) teams’ formation and management.</li> <li>▪ Development of collaboration ontology supporting variety of stakeholders.</li> <li>▪ Support for user-generated knowledge assets.</li> <li>▪ “Configure yourself “based philosophy infrastructure.</li> <li>▪ Easily adaptable and customizable user interfaces.</li> <li>▪ Affective computing and context aware enriched environments.</li> <li>▪ Support for establishment of trust among stakeholders.</li> <li>▪ Tools supporting the process of value creation.</li> <li>▪ Novel contractual and cooperation agreements, including negotiation support.</li> <li>▪ Advanced marketing and brokerage services.</li> <li>▪ New networking models for elderly communities’ involvement with the socio-economic system.</li> <li>▪ Security and ethical / privacy support.</li> </ul>

## Plan of actions

Considering the current situation described in the baseline, in order to achieve the desired vision in what concerns a truly active ageing and silver economy, the following **strategic actions** are suggested under the three perspectives of analysis: **technological, organizational and social**.

### Social Perspective

#### **S1 Promote socio-economic studies that identify the unique value senior workers bring to the workplace, investigate new ways of senior workers interacting with the socio-economic system and communicate findings to employers and to society and as whole.**

Many older people want to work, learn and earn but are encountering difficulties in doing so. Main barriers include: actual or perceived age discrimination, especially by employers. Research and investigation into schemes and employment models that provide opportunities for work trials, work sampling and work experience so that seniors can try out their skills, learn about unfamiliar occupations and prove themselves to employers would be highly beneficial. Knowledge of what information campaigns and voluntary codes of practice for employers could help support the implementation of further anti age discrimination legislation is needed.

The main vision facets covered are:

- New mechanisms to enhance positive understanding and perception in society regarding the value of the abilities, skills and experience of senior professionals in the economy, and
- Mechanisms to support a balanced economic benefits sharing among the entire society including senior professionals.

#### **S2 Design/develop mechanisms for skills/talent identification and improvement that assess acquired experience, provide career transition advice and deliver skills-enhancement to maximize the potential of seniors.**

Many seniors are now finding themselves working into retirement age without necessarily having planned to do so. The role of high-quality advice and guidance in helping many mid-life and older adults to work, learn and earn needs to be thoroughly investigated. The potential benefits for individuals, employers, government revenues and personal savings of such schemes are high. ICT tools are needed that help automate classification/quantification of the experience that senior professionals bring into easily recognizable universal skill-sets that makes it easier for employers to judge the value this experience brings across industry sectors.

The main vision facets covered are:

- New mechanisms to enhance positive understanding and perception of in society regarding the value of the abilities, skills and experience of senior professionals in the economy,
- Motivating mechanisms for senior professionals to join CASPs,
- Mechanisms to support cross-cultural interactions among senior professionals as well as to the active labor force,
- Mechanisms to support a balanced economic benefits sharing among the entire society including senior professionals, and
- Mechanisms to support cross generational interaction between seniors and younger citizens; fomenting inter-generational solidarity and understanding within the EU.

#### **S3 Establish the “European Senior Space” to promote dialogue and consensus around issues of technology, culture and socio-economic participation and to develop a single, powerful voice for senior professionals across Europe.**

Currently, European organisations that represent seniors (including associations of senior professionals) mostly recruit on a national basis. In order to fully leverage the weight of senior’s voice across Europe – and in order to develop a coherent approach at European level – a network of Europe-wide seniors, supported by technology, could be launched to address issues at a pan-European level. This would help insure that seniors are able to provide Peer group support – to extend networks, provide motivation and encouragement, and support each other in achieving personal and collective objectives. For proper consensus on the debate around senior professionals, all regions must be able to take an equal part in the debate. The main vision facets covered are:

- New mechanisms to enhance positive understanding and perception of in society regarding the value of the abilities, skills and experience of senior professionals in the economy,
- Mechanisms to support cross-cultural interactions among senior professionals as well as to the active labor force,
- New mechanisms for social networking to help articulate the collective needs of seniors across national boundaries, and
- Mechanisms to capitalize on the increased sense of trust and understanding which comes through leveraging seniors’ social capital.

#### **S4 Investigate the barriers and potentials for cross generational interaction and collaboration between senior professionals and younger people, and fund/promote technology development programmes that support and facilitate this interaction/collaboration.**

Advanced senior professional networks are needed to catalyse the development of better communication between senior professionals, their associations with SMEs and the younger generation. Online social networks could provide one mechanism for developing meaningful inter-generational interactions across national boundaries and could ensure a fuller participation of all societal groups, taking into account such issues as gender. The main vision facets covered are:

- New mechanisms to enhance positive understanding and perception of in society regarding the value of the abilities, skills and experience of senior professionals in the economy,
- Mechanisms to support cross-cultural interactions among senior professionals as well as to the active labor force,
- New mechanisms for social networking to help articulate the collective needs of seniors across national boundaries,
- Mechanisms to support cross generational interaction between seniors and younger citizens; fomenting inter-generational solidarity and understanding within the EU, and
- Mechanisms to capitalize on the increased sense of trust and understanding which comes through leveraging seniors' social capital.

#### **S5 Investigate and promote new models of working practices and related reward and taxation models for senior professionals, taking account of issues of work-life balance and aging well.**

Research is needed to develop new employment models that better fit with the life dynamics of seniors whilst continuing to provide value for employers. Furthermore, greater emphasis is needed on helping employers recognize the benefits of adopting flexible working patterns that enable individuals to balance better aspects of work and life. These include promoting, among other things, flexi-time, staggered hours, shift swapping, job-sharing, and working from home with the intention of enhancing motivation and productivity, and extending working life through reducing work-related ill-health. Studies are also needed into the changing financial needs of work related benefits/incentives required by senior professionals. What are the financial benefits that would attract a senior professional to work for a business? The main vision facets covered are:

- New mechanisms to enhance positive understanding and perception of in society regarding the value of the abilities, skills and experience of senior professionals in the economy,
- Motivating mechanisms for senior professionals to join CASPs,
- Mechanisms to support cross-cultural interactions among senior professionals as well as to the active labor force,
- Mechanisms to support a balanced economic benefits sharing among the entire society including senior professionals,
- New mechanisms for social networking to help articulate the collective needs of seniors across national boundaries, and
- Mechanisms to capitalize on the increased sense of trust and understanding which comes through leveraging seniors' social capital.

### **Organizational Perspective**

#### **O1 Identify and assess current national and European policy and legislation relevant to active participation of seniors in the socio-economic system and recommend new approaches that eliminate barriers and promote and support active aging.**

To identify legislation best practices that allow senior professionals to combine their pension allowance with the maintenance and extension of their professional life and thus complementing their incomes in order to maintain a similar lifestyle to pre-retirement. Evaluate future sustainable pension systems and forms of legal extension of "silver economy". Addressed vision facets:

- Employment and retirement policies will change to provide greater flexibility for seniors to continue as economic actors,
- Global regulations and policies will change to encourage the participation of businesses in collaboration with senior professionals.

#### **O2 Investigate new mechanisms that forge mutually beneficial relationships between seniors and the socio-economic system including novel interaction models that facilitate collaboration between organisations and their retiring employees.**

To identify new systems and new types of intermediaries that help in reducing the current barriers to the involvement of seniors in the socio-economic system, identify mechanisms to help keeping relationships between seniors and their former employers, find smooth ways of transition between a pre- and post-retirement situation and investigate new structures and organizational models that favor the creation of relationships between senior professionals and industry (companies, associations, financial entities, etc).

Main vision facets addressed:

- Global regulations and policies will change to encourage the participation of businesses in collaboration with senior professionals,
- New forms of intermediate organizations will provide highly efficient brokerage that will help seniors engage with businesses in Europe,
- There will be significant long-term funding – from both public and private sectors - and the political drive to support new forms of senior associations and other intermediate brokers.

#### **O3 Investigate and establish new roles, governance rules and organizational forms for communities of active senior professionals to promote inter- and intra-community collaboration and to create new opportunities for member engagement.**

Analyze and propose new operating rules for the existing organizations of senior professionals, identify and establish new roles for seniors associations and senior professionals, leading to an increment of their activity level as well as the engagement of new members. Identify new organizational forms that favour the creation of new relationships between their members and the different types of stakeholders in the socio-economic system. Main facets of the vision considered:

- The knowledge and skills of seniors will be harnessed to generate wealth and stimulate innovation amongst European businesses,
- Seniors will have access to the (re)-training services they need to facilitate their continued professional life,
- New organizational cultures will positively embrace relationships between senior professionals and pre-retired (active) professionals.

**O4 Characterise and design new roles and modes of operation for intermediate organizations, both public and private, that provide brokerage and assistance to better facilitate integration and collaboration between senior professionals and the socio-economic system.**

Since existing organizations (e.g. regional development agencies, business innovation centers, etc.) do not properly consider the needs and specificities of senior professionals and do not effectively put in contact potential clients with the senior professional that can provide services, it is necessary to analyze and define new roles for the existing organizations and develop new forms of intermediaries.

Main facets of the vision addressed:

- New forms of intermediate organizations will provide highly efficient brokerage that will help seniors engage with businesses,
- There will be significant long-term funding – from both public and private sectors - and the political drive to support new forms of senior associations and other intermediate brokers.

**O5 Define new programmes and organisational practices that prepare for and guide the successful transition of senior professionals from full employment to active retirement, taking account of issues of gender, profession and local context.**

At this moment retirement is not a smooth process but rather an abrupt step which makes this transition in people's life a difficult one. It is thus necessary to properly address issues such as the necessary training for the transition, and the associated psychological, cultural and social aspects, in order to guarantee a successful transition. In other words, it is necessary to consider a "life course" perspective.

Main facets of the vision covered:

- Seniors will have access to the relevant services, including training, which they need to facilitate their transition between their working life and retirement to continue their active professional life,
- New organizational cultures will positively embrace relationships between senior professionals and pre-retired (active) professionals.

**O6 Characterise and quantify the uniqueness of what senior professionals can offer the socio-economic system (mature experience, compensation flexibility, etc.) and identify new channels to harness these resources in order to generate wealth and stimulate innovation amongst European businesses, thus supporting the 'silver economy'.**

As we have realized the current difficulty in identifying new *markets* in which senior professionals could maintain their active life, it is necessary to identify new roles that can be played by senior professionals, new areas of activity which can fit their characteristics and knowledge, as well as to investigate and develop the necessary mechanisms so that these activities generate value in the socio-economic system. Main facet of the vision covered:

- The knowledge and skills of seniors will be harnessed to generate wealth and stimulate innovation amongst European businesses.
- New organizational cultures will positively embrace relationships between senior professionals and pre-retired (active) professionals.

## **Technological Perspective**

**T1 Establish formal conceptual models for people's professional life cycle and the support environment for active ageing.**

To regulate people's professional life cycle it is essential to establish a reference model for the extension of professional active life and active ageing, along with the elaboration of a common ontology for the senior professional communities. Another component that must be supported, of a different nature, is the development of contractual and business models for the communities of senior professionals.

The main vision facets covered are:

- Advanced collaboration **support services**, including (virtual) teams' formation and management,
- Development of **collaboration ontology** supporting variety of stakeholders,
- Novel **contractual** and cooperation agreements, including **negotiation** support,
- Advanced **marketing** and **brokerage** services, and
- New **networking models** for elderly communities' involvement with the socio-economic system.

**T2 Develop and integrate self-adaptive and configurable technology solutions in ICT environments to enable customized involvement of seniors.**

Because there are some seniors that may require special training and assistance when dealing with technology, it is mandatory to have self-customizable collaboration environments that empower seniors to better use ICT. Here, several solutions may be developed, such as: self-adaptive interface systems and technology assistance wizards. To deal with emerging technologies, seniors should also have access to several training approaches. The main vision facets covered are:

- “Configure yourself “based philosophy infrastructure, and
- Easily adaptable and customizable user interfaces.

**T3 Develop ICT collaboration platforms for communities of senior professionals that are enhanced by affective computing, context awareness, and trust establishment.**

In this context it is of extreme importance to have access to an ICT collaboration platform for communities of seniors. Such platform, besides governance systems of the community, should also provide an advanced management system, a trust building management system, together with an affections / emotions management system. The main vision facets covered are:

- Advanced collaboration support services, including (virtual) teams' formation and management,
- Affective computing and context aware enriched environments,
- Support for establishment of trust among stakeholders, and
- Security and ethical / privacy support.

**T4 Design and develop support collaborative tools and systems to facilitate value creation.**

In order that the collaboration platform enables the community members to perform their professional activities, it must provide facilities and tools for:

- Marketing and brokerage,
- Virtual Team creation, negotiation and e-contracting,
- Virtual Team management and collaborative problem solving support, and
- Intellectual Property and performance management.

The main vision facets covered are:

- Advanced collaboration support services, including (virtual) teams' formation and management,
- Tools supporting the process of value creation,
- Advanced marketing and brokerage services,
- Security and ethical / privacy support

**T5 Develop environments that empower seniors to leave a legacy that capitalizes on their personal / professional experience and is usable and transferable to the society.**

Seniors' personal and professional experience should be made available to be used by others, namely the younger generations, or to allow the other members of the senior community to profit from it. This legacy can be used if mechanisms to promote inter-generational inheritance and collective legacy are developed. These mechanisms should use other instruments such as a talent modeling and user-centered knowledge acquisition tools. A mean to incentive seniors to contribute leaving their legacy is by creating some rewarding mechanisms, never discarding the importance of the models for knowledge assessment and intellectual property.

The main vision facets covered are:

- Support for user-generated knowledge assets, and
- New networking models for elderly communities' involvement with the socio-economic system.

**T6 Develop approaches that discover patterns and model “the evolution of senior professionals’ interests and their involvement in the socio-economic system” and “the behavior and emotional health of senior professional networks”.**

This action is mainly based on the development of a conceptual base for behavioral modeling, data-mining / machine learning approaches for behavioral patterns discovery, forecasts and simulation methods and tools for behavioral analysis, and models and tools for networks emotional health management. The main vision facets covered are:

- Easily adaptable and customizable user interfaces,
- Affective computing and context aware enriched environments,
- Support for establishment of trust among stakeholders, and
- New networking models for elderly communities' involvement with the socio-economic system.

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