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Gap Analysis Report

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- Abstract
- Index

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1. Introduction

The aim of this document is to: a) provide a description of the Gap Analysis framework and the methodology we have used in PROLEARN roadmap (section 1: Methods) and b) present the Gap analysis results (section 2: Implementations).

Currently, there is no standard methodology for Gap analysis, and there is a considerable diversity among practitioners of how a Gap analysis should be performed. Our proposed methodology, integrates several elements from Time2Learn (time2Learn 2004), VOmap (VOmap 2003), ROCKET (ROCKET 2003) and BRIDGES (BRIDGES 2002) roadmaps and it is adapted to meet the PROLEARN objectives and fit within the approach we have developed within the project in terms of roadmapping methodology and framework.

2. METHODS

2.1 Gap analysis in the Framework of Prolearn Roadmapping

2.1.1 Modeling the roadmapping process as a knowledge creation process

As already argued in the deliverable 12.10 “Envisaged future states of Technology Enhanced Professional Learning” (Kamtsiou 2003) the context of NoE Prolearn roadmapping is a knowledge creating process that spirals outwards from the core partners of the PROLEARN Network (individuals, groups, the whole Network) via the Network’s associated partners, to the entire scientific community and industry. Therefore, it is both a learning activity and a knowledge creation process for the community that builds the roadmap. We have modelled this knowledge creation process using the general SECI process framework, known as the “SECI Spiral”. The principles of the knowledge creation spiral are applied to the gap-analysis phase of the Prolearn Roadmapping.

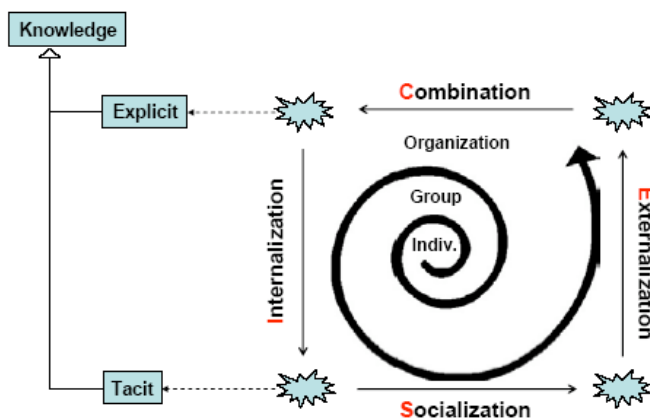


Figure 1: The SECI spiral of knowledge creation [source A. Naeve (2005)]

In our roadmapping process framework (Figure 2) we combined process modelling with the SECI theory of knowledge creation. Our framework is derived from the

general SECI process framework (figure 1) by replacing the triplet of social entities {Individual, Group, and Organization} with {Core Partners, Associate Partners, and Scientific Community & Industry}. (Kamtsiou 2007)

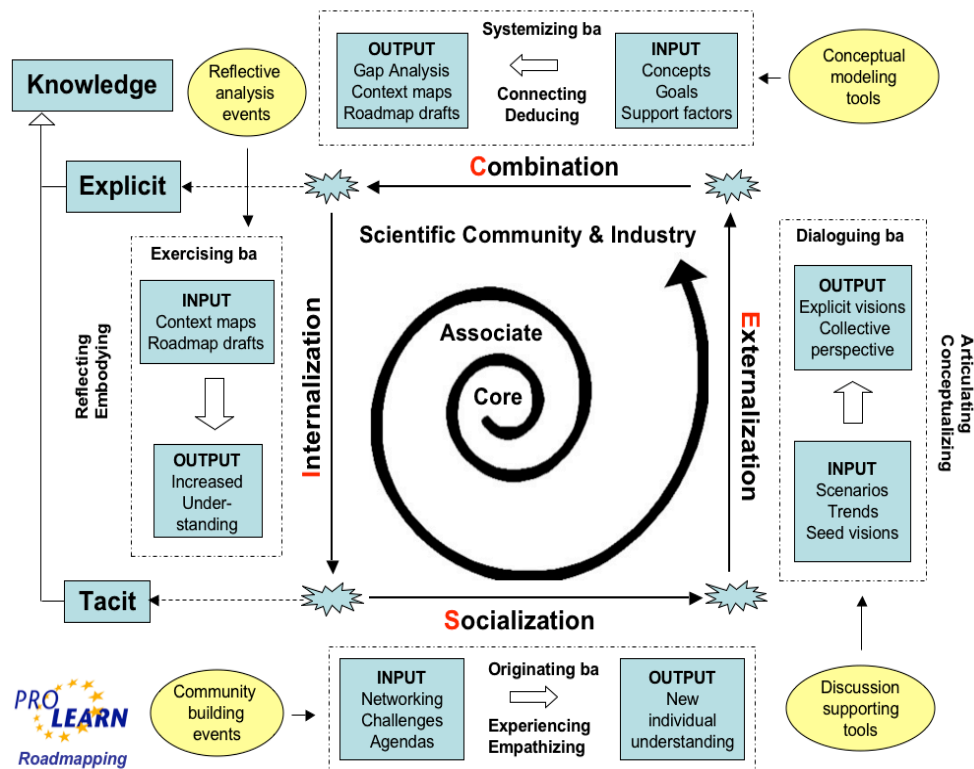


Figure 2: The PROLEARN Roadmapping Process Framework (based on the SECI model).

According to Nonaka (Nonaka 2003) the key to knowledge creation lies in the following four SECI modes of knowledge conversion, which occur when tacit knowledge and explicit knowledge interact with each other:

During the Socialization process, networking activities and community building events are important. Face to face meetings, various workshops, and virtual meetings have been organized in order to bring together the wider community of the PROLEARN network both core and associate partners on a common contextual platform and tap into their collective experience and tacit knowledge. Prolearn teams play a central role in this knowledge creation process of building the roadmap because they provide the shared context where the team members can interact with each other and engage themselves in common projects and activities, on which effective reflection depends. This provides a new individual understanding of the relevant concepts and their relationship.

During externalization processes, awareness of the key issues involved in TEPL has been raised, and the implicit concepts and ideas originated during the socialization process have been expressed. Individual views and visions of PROLEARN partners have been discussed and extended through brainstorming and have also been expressed via scenarios produced by PROLEARN partners, and by other experts and initiatives. These activities have provided a good indication of what TEPL means to different stakeholders in a variety of Professional situations. The aim has been to create explicit core visions that can be used as input for starting a

dialogue with external groups. The next step was to start a dialogue with external experts and industry stakeholders in order to synthesize and combine knowledge. In this activity, it was important to bring together people with different expertise and scientific backgrounds.

During the combination process, the resulting “seed” knowledge is modelled and conceptualized and thus is easily communicated to external groups in order to synthesize information from many different sources and bring in different perspectives and contexts. During the Gap analysis the different context maps of the foresight analysis (Visions statements, goals and support factors) are studied and a gap analysis of what is available and what is needed for the future is performed. The results are elaborated on and extended by others, thus creating new explicit knowledge by combination. Finally, a list of draft recommendations and timelines of actions, will be compiled for each vision statement and for the specific stakeholders the visions are targeting. It is important to emphasize that the SECI spiral of knowledge creation takes place in all roadmapping activities, vision identification, gap analysis and charting actions recommendations. The linearity of the SECI model is not well adjusted to describing what is actually going on in knowledge creation (Naeve, 2007). Nonaka, Toyama and Konno (Nonaka 2000) acknowledge this problem when they describe the knowledge creating process as a collection of intertwined SECI spirals of various sizes that interact with each other. In practice, for instance, several externalization, combination and socialization events took place simultaneously since core partners, associate partners and external experts for the scientific community and industry participated in the same workshops. Therefore, during the gap analysis process the initial work of the PROLEARN partners was communicated via specific workshops to external groups in order to reflect on, validate, extend, combine and refine the first “core” results.

2.1.2 Activities that took place during the spiraling Gap analysis process:

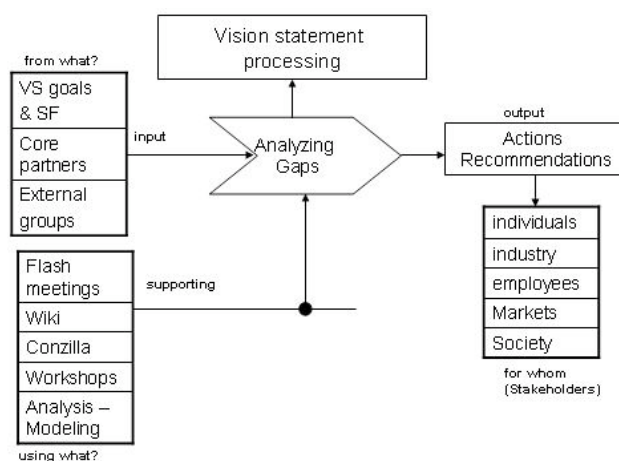


Figure 3: process modeling

In order to proceed with the Gap analysis work the following activities have been organized:

Activities involving Prolearn partners (core):

For each vision statement a responsible rapporteur from PROLEARN partners has been assigned. The group of rapporteurs were formed the core Gap Analysis team also lead a series of flash meetings during which, each vision statement was discussed among the Prolearn Partners. All Prolearners were invited to participate into Vision

Statement specific Gap Analysis Flash meetings (table 1). In order to support the ongoing work of the GAP analysis a wiki dedicated to this task was created. (<http://imsld.learningnetworks.org/course/view.php?id=50>). The purpose of the wiki is to collect all related documents and foster our discussions on Gap analysis. In addition, two face to face working meetings in London (7/2/07 to 14/2/07) and Athens (9/4/07-11/4/07), were organized during which the Gap Analysis rapporteurs consolidated and refined the Gap analysis results.

Flash meeting Date	VS1	VS2	VS3	VS4	VS5	VS6	Conceptual modeling/Conzilla maps
10/11/06					√		
27/11/06		√					
11/12/06			√				
20/12/06	√						
11/1/07	√					√	
19/1/07							√
22/1/07				√			
26/1/07	√					√	√
1/2/07					√		
6/2/07							√
20/2/07							√
22/2/07							√
19/3/07							√
17/04/07	√	√	√	√	√	√	
19/04/07							√

Table 1: dedicated vision statement flash meetings

Activities involving external stakeholders (Scientific community and Industry)

Within our roadmapping framework, the vision statements are in reality different views of the core vision, each with specific focus and scope. i.e. IST view, industry views, employee view and market and societal dimensions. Besides the more informal discussions between various experts and expert groups, several dedicated events were organized with external experts from academia and industry in order to validate and analyse the concepts for each focus area, provide additional input to the Prolearn partners. Additional input was provided by the ongoing dialogue with external groups, such as eLIG, the eSkills Task Force (DG Enterprise and Industry), the MENON Network, IFIP, EDEN, and ongoing projects (figure 4). The nature of the process follows the principles of the SECI spiral of knowledge creation that has been

applied in the previous phases of the Prolearn Roadmapping process and at this stage led to the refinement of the Gap analysis results.

The major events that took place are presented below:

1) **PROLEARN –eLIG joint workshop on skills for Employability.** The Prolearn Roadmapping and futures work was presented in the eLIG/PROLEARN workshop on July 3rd 2006 in Helsinki during, the EU LearningConference2006. The workshop was organised by the European eLearning Industry Group in cooperation with the Prolearn Network of Excellence and WP12. The objective of the workshop was to demonstrate how eLearning can help to address the fast changing skills requirements on a large scale and hence to create a more flexible and adaptable workforce. The conclusions and recommendations of the workshop were used as input for validation of the PROLEARN vision statements and for GAP analysis. Results were also presented during the EU eLearning Conference 2006. The Prolearn visions:4 “Learning as a means to increase employability” and 6 “Access to professional learning for all” were presented and discussed during this workshop.

The workshop consisted of four components:

- Case studies from Industry and public sector bodies
- Conclusions from existing experiences and assessment of broad based deployment potential
- Roadmapping R & D for technology enhanced professional learning
- Recommendations to the European commission and Member States for action

All key stakeholders were invited to join: European Commission, Member States representatives, Employment Agencies, Public and Private Education Providers, Industry representatives from the corporate, SME sectors and academia.

2) **Three Learning Café sessions** were also organized within the **3rd EU eLearning conference** on July 4 and 5, 2006 in Finland, focused on the two industry related vision statements, 2 “Learning as a means to support and enhance work performance” and 3 “Promote innovation, creativity, and entrepreneurship at work.”

The 3 themes of the learning cafes were the following:

- “Learning café on ICT for learning – Innovative new ways for learning”
- “Learning café: Learning to use ICT and Digital skills and e-competences”
- “Learning café: The new partnerships for learning – linking communities and formal and non-formal learning systems”

3) **A learning café** was organized during the **summer school 2006** in Bled on future directions for TEPL. This workshop was focused on the analysis of vision 3 “Promote innovation, creativity, and entrepreneurship at work.” The results from this activity were presented by different PhD student groups at the end of the Summer school programme.

4) Vision statement 3: “Learning as a means to increase employability” was presented and discussed during *the second Workshop of the e-Skills Foresight Scenarios for Europe project, on Key Drivers and Scenario Design organized by CEPIS* – the Council of European Professional Informatics Societies on July 12 2006.

5) **EC-TEL workshop "Making the Future of Technology Enhanced Professional Learning"** (Crete 1/10/2006). This workshop focused on defining the critical capabilities needed to achieve the desired futures. The workshop was organized as a

Learning Café ensuring that all participants can have direct impact on how the gap will be crossed. The workshop focused on the vision statements 1, 2 and 3.

The three main themes of the workshop:

- Personalization: learning for you, where, how and when you want to learn.
- Enhancing work performance: use TEPL to support human performance improvements and to provide links between business processes, competencies and learning processes.
- Self-regulated Learning, Creativity and Innovation: collaborative learning, critical reflection.

6) **European eSkills Conference** “TOWARDS A LONG TERM E-SKILLS STRATEGY”, 5-6 October 2006, Thessaloniki, Greece. Prolearn vision statements 4 and 6 were presented and discussed during the European eSkills Conference. In addition, Prolearn representatives participated in the work of the Dg Enterprise Task Force on ICT Sector competitiveness & ICT uptake (<http://ec.europa.eu/enterprise/ict/taskforce.htm>) as well in the work of the Working Group 5 (skills and employability) of the ICT Task Force, drafting the policy recommendations for Technology Enhanced Learning.

7) **The 10th World Conference for Continuing Engineering Education** (April 18-21, Vienna, Austria) included a dedicated workshop (W3) to analyse the feasibility of the Prolearn vision statements 2, 3 and 4 from the point of view of University Continuing Education. A paper “Categorization of R&D in Professional Learning” describing the results from the work done under WP12 was also presented at the conference and included in the conference proceedings.

Figure 4 is a graphical representation of the combinatory process by which the various contributors have been linked during the gap analysis.

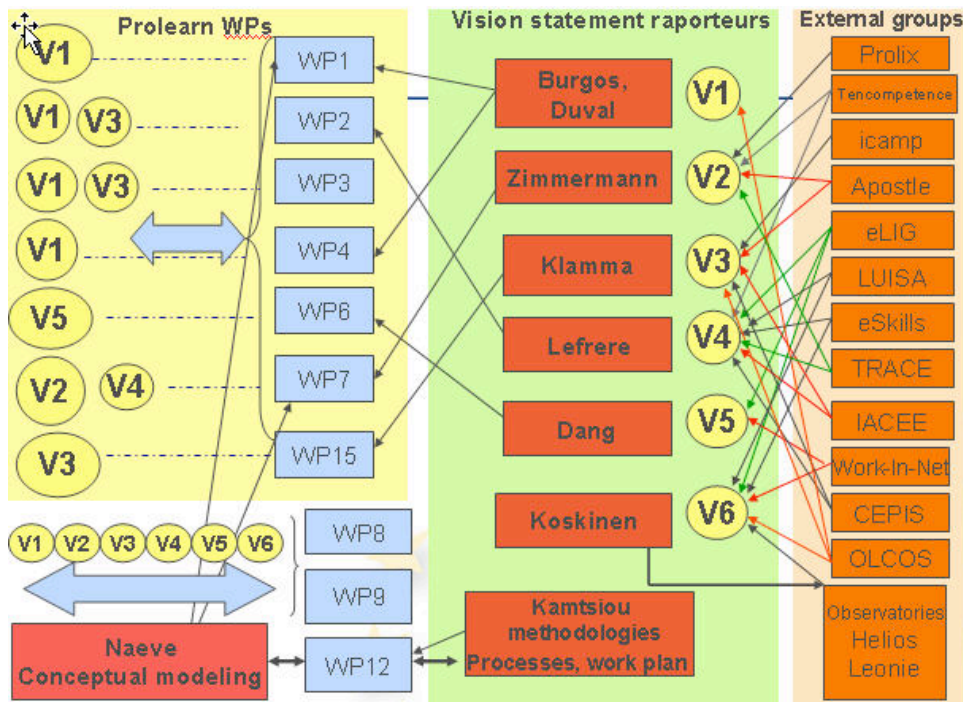


Figure 4: Gap Analysis combinatory process

2.2 Preamble: The PROLEARN Visions as our Starting point

The PROLEARN roadmapping process aims to provide us with information on where we want to go (vision/foresight/desired future) and where we are (current state), so that we will be in a position to determine how we can get there (action plan). In Figure 5, the first two stages comprise *Phase 1 (Where do we want to go? - outputs: Vision statements and Expressed future state)* and the last two stages comprise *Phase 2 (How can we get there? - outputs: Identified Gaps and Recommended actions)*.

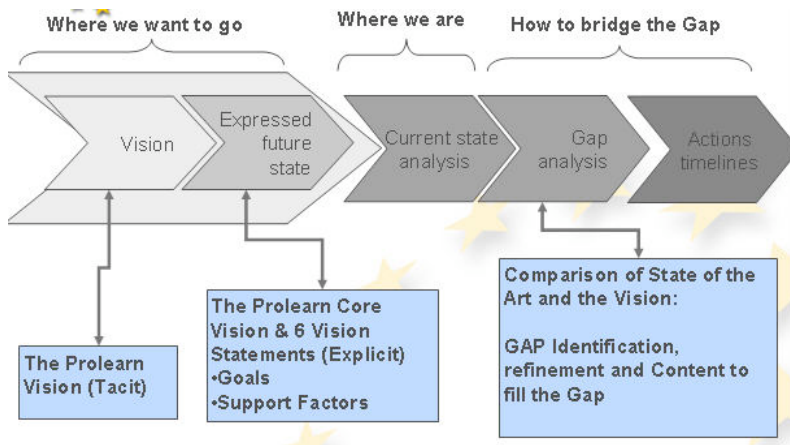


Figure 5: Roadmapping stages

Core vision for TEPL in 2015

Integrated the results from the Prolearn foresight activities came up with the following core vision for the future TEPL: “To support knowledge workers with technology-enhanced learning by promoting motivation, performance, collaboration, innovation and commitment to lifelong learning.” In this context, a knowledge worker is defined as someone who doesn’t just consume knowledge but who is able to create it and who reflects critically on every level of activity in the organization and contributes back.

During phase 1, a foresight study was performed in order to map out the desired future for technology-enhanced professional learning (TEPL) in the form of prevalent visions in the community at large. The prevalent visions for the next 10 years are centered on leveraging technology to: enhance and support work performance for businesses and directly link learning technologies with business needs; and to promote innovation, creativity, and flexibility to support change in organizations; while at the same time promote increased security for individuals in the form of employability and assuredness of equal opportunity, and taking into account the societal and market dimensions. Figure 6 illustrates the six PROLEARN vision statements. As depicted in this figure, the PROLEARN vision statements provide a holistic picture of the desired future of TEPL in an outwards spiraling way that highlights the aspirations of all stakeholders: the individual (V1 & V4), the enterprise (V2 & V3), the market (V5) and the European society as a whole (V6).

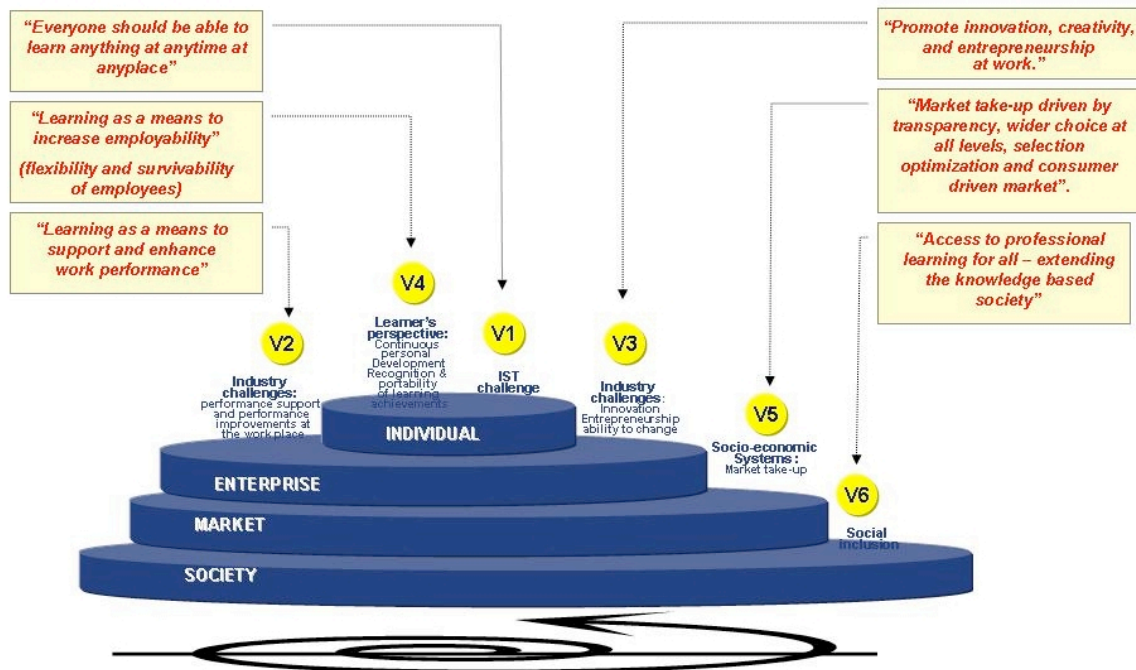


Figure 6: The six PROLEARN vision statements

During the foresight analysis, each vision was described in terms of its main goals and the support factors that must be present in order for the vision to be realized. The six Prolearn Visions form the main input for the Gap Analysis. During the Gap Analysis phase, a comparison between the state of the art and the vision statements will be performed in order to identify the Gaps between what is available today and what is needed for the future, set capability targets and requirements and the content needed to fill these Gaps.

2.3 Gap Analysis Methodology

During the Gap Analysis the work has been focused on analyzing the various training situations of the six Prolearn visions. Figures 7 present the overall framework of Gap Analysis.

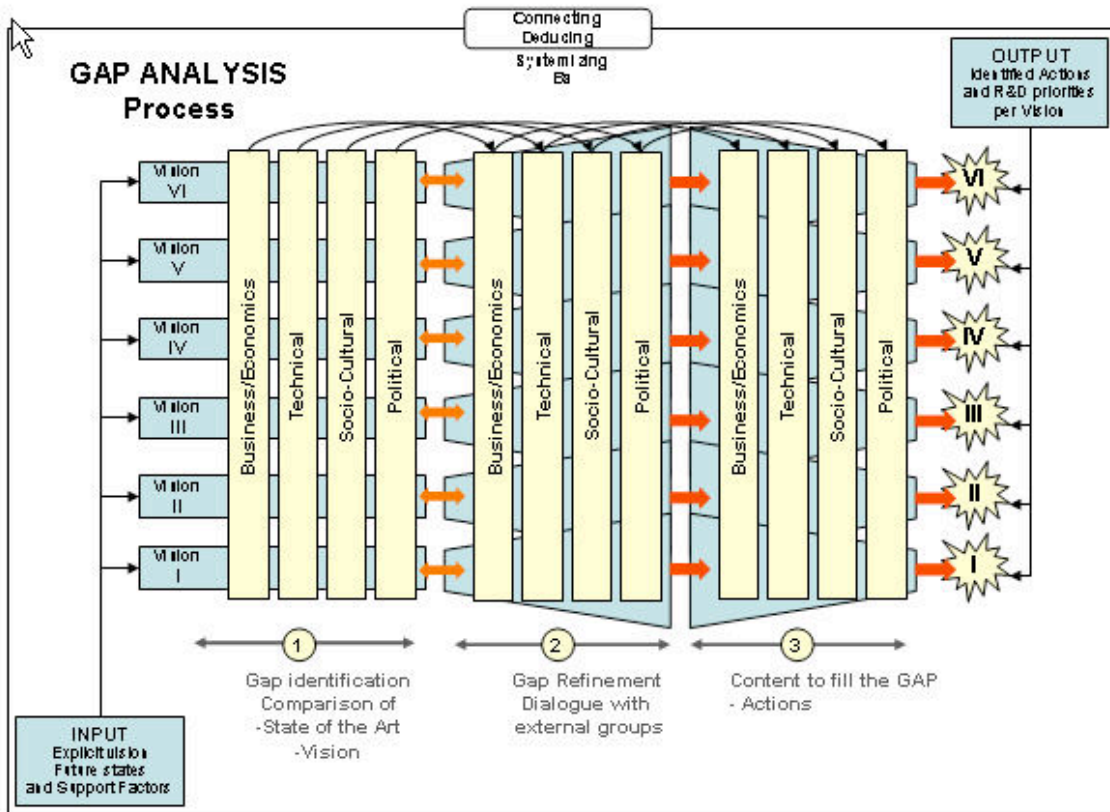


Figure 7: PROLEARN Gap Analysis Framework

The six Prolearn Visions and their respective support factors are the main input for the Gap Analysis. The Gap Analysis process consists of three phases:

1. Comparison of State-of-the-Art and Vision
2. Gap refinement – Dialogue with external groups
3. Content to fill the Gap – recommended Actions

Each cycle includes also analysis of each Prolearn Vision from the point of view of the four Roadmapping core sectors. Consequently the Gap Analysis is divided and approached according to the specificities of the 4 core sectors (a to d below). This is similar to the way that the six Prolearn vision statements were originally instantiated during the foresight analysis.

a) **Business/Economics:** Important impact factors emerging in economy and business (particularly in business processes and strategies), which could have a major impact on the adoption and implementation of Technology Enhanced Professional Learning in Europe.

b) **Technical:** Technology factors that could have a major impact on professional learning and business processes in European companies.

c) **Socio-Cultural:** Important factors stemming from tensions, which shape the emerging social and cultural frameworks affecting the adoption and implementation of Technology Enhanced Professional Learning in Europe.

d) **Political:** Important factors emerging in policy making that could have a major impact on the adoption and implementation of Technology Enhanced Professional Learning in Europe.

The following figure presents the process methodology of the Gap analysis which is explained in detail in the following sections.

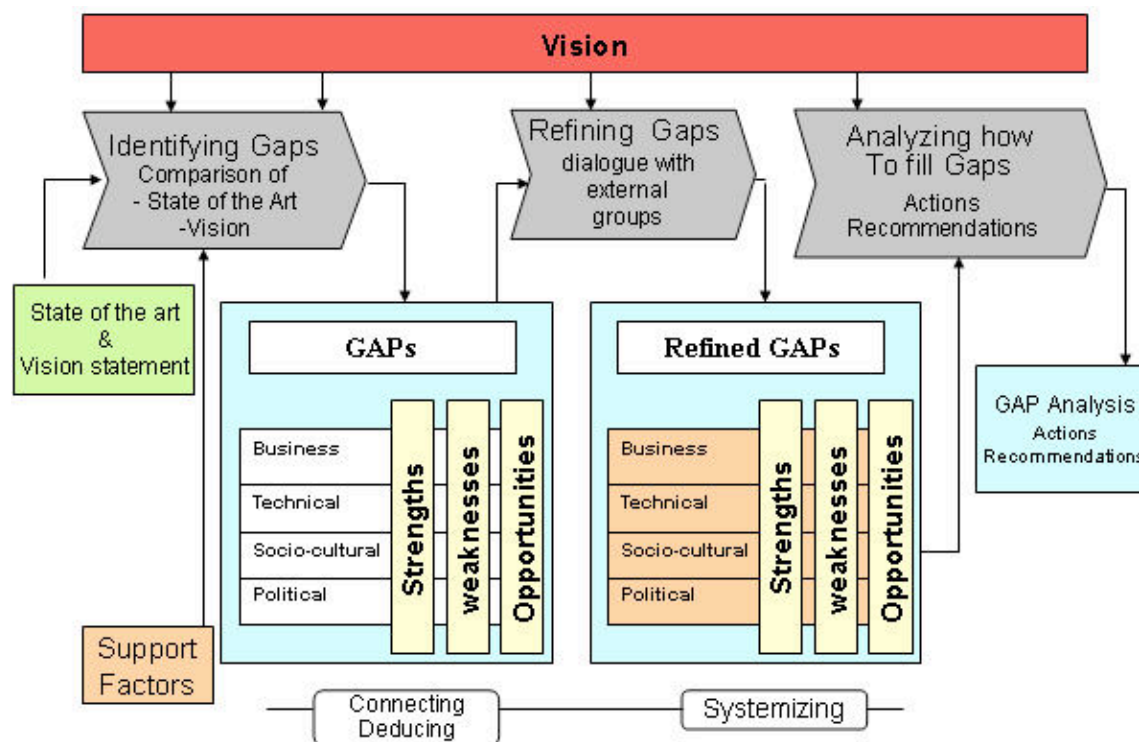


Figure 8: PROLEARN Gap Analysis process

2.3.1 Phase 1- Gap identification (Comparison of -State of the Art – Vision)

Step 1 – Amended SWOT analysis

During this phase, the first step was to identify the strengths, weaknesses, opportunities and competence-related threats to realize each vision statement. This analysis provided us with the distinct competencies that we have today (Strengths) and the key capabilities (opportunities) that we need in the future in order to realize the particular scenario of the vision statement. In addition, the negative or problematic factors (weaknesses, some threats) that hinder the realization of the vision were identified.

According to our Gap analysis methodology, the results should also be grouped and approached not only according to the vision statements, but also according to the specificities of the 4 sectors. This will allow us to better plan for future R&D based on both internal (technology related) and external analysis (environmental factors: Business/economics, Socio-cultural, political) figure 9.

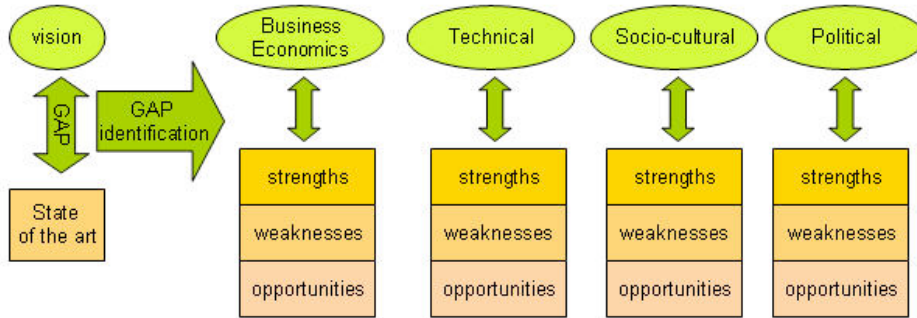


Figure 9: Gap identification (Comparison between -State of the Art and Vision) – phase 1

The results from the foresight analysis performed in the previous phase of the Roadmap were used as input for Phase 1 of the Gap analysis.

Input and support for Phase 1:

- Vision statements
- Goals per vision (a goal is a challenge that is difficult to achieve but necessary to fulfill the vision)
- Support factors per vision (these are critical elements that have been identified for supporting the realization of the vision)
- Trends analysis and impact of trends on TEPL (identified during our foresight analysis)

As shown in Figure 9, in the first step of Gap analysis, Phase 1, we use an adapted SWOT methodology (SWO). This is based upon the conventional SWOT methodology but threats are implicit within a single cell in Figure 10, "What we do not need". That cell covers both weaknesses and threats. The purpose of focusing on what we do not need is to bring out the assumptions and preconditions that have to be fulfilled for the vision to be realized. Our approach aims to identify the current strengths (existing competencies), weaknesses (missing or inadequate capabilities), opportunities (key future capabilities) and capability-related threats (problematic factors such as competition for sources of capabilities and resources needed to acquire new capabilities or re-direct existing capabilities) which will contribute to the realization of the visions.

Figure 10 shows the perspectives associated with the support factors in each vision:

- What we have today and need for the future – Strength
- What we have today and we do not need (is an obstacle) for the future
- "What we do not need" meaning internal obstacles – weakness
- "What we do not need" meaning challenges in the external environment – threat
- What we don't have today and we need for the future – opportunities

Each perspective leads to a series of questions (For example, where are we right now in terms of solutions? What is the status of research in the area? What are the most promising technologies, methodologies and tools, what solutions are commercially available?) In order to answer each question, we are comparing each support factor with the State of the Art today.

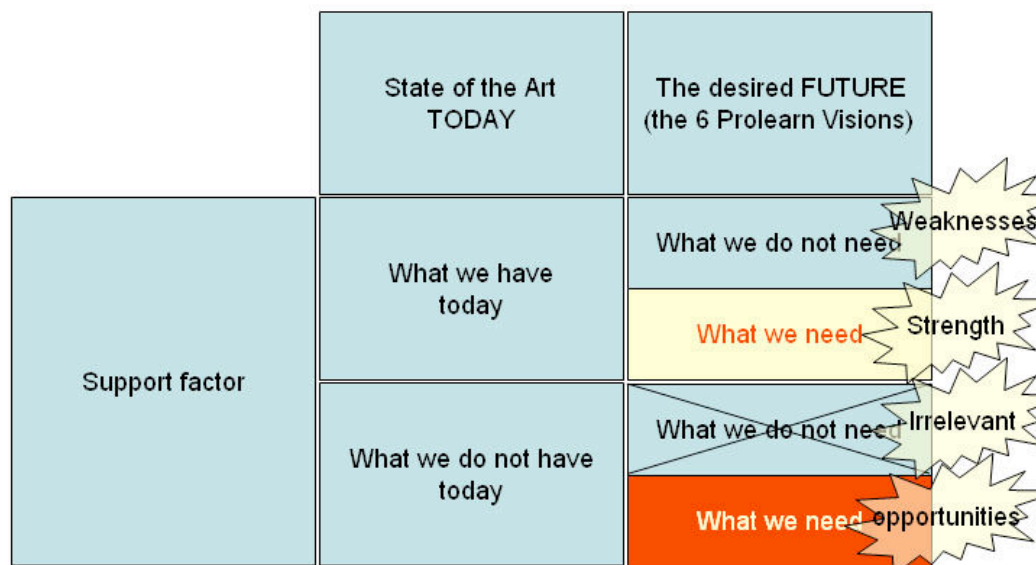


Figure 10: SWO matrix

Step 2 - Define the nature of the GAP

Having completed this SWO analysis, it is important to put the results of the SWO analysis into perspective (how the results are contributing to the key challenges for the future) in order to clearly define the Gap of what is available today and what we need for the future. This section provides a conclusion of the analysis done in the previous section and give us a clear description and understanding of the existing Gap.

In addition, the underlying assumptions and preconditions needed to fulfill the Gap for each Vision statement have been listed.

The difference between an assumption and a precondition is that an assumption is a state of affair which is not under our control (i.e. a trend) while a precondition is an agreement which has to be in place before the technology can be implemented or diffused or used etc.

2.3.2 Phase 2 – GAP refinement

In parallel with the Prolearn core group, external experts and groups from Academia, Industry and Policy makers were providing feedback for extending and validating the results of gap analysis. This input was used by Prolearn Partners to update the gap analysis results. For an indicative list of these activities as well as the different groups and projects involved in this process please refer to section 2.1.2 of this deliverable.

2.3.3 Phase 3 - Content to fill the GAP – Actions

Based on the results of the previous phases, a portfolio of actions was produced. Following the approach taken in the VOMap project, after producing the first results of Gap Analysis, we can derive actions and generate “Influence maps” to represent influences to the achievement of the vision statements. The derived actions will

ensure that the right capabilities are in the right place in the future in order to fulfill the vision statements.

During this cycle the following question was addressed: What is the content needed to fill the Gap? The result is a list of actions that must be planned in order to fulfill each vision (figure 11). The final list of actions and their analysis will be presented in the next deliverable D12.15 "Roadmap for TEPL (version 1).

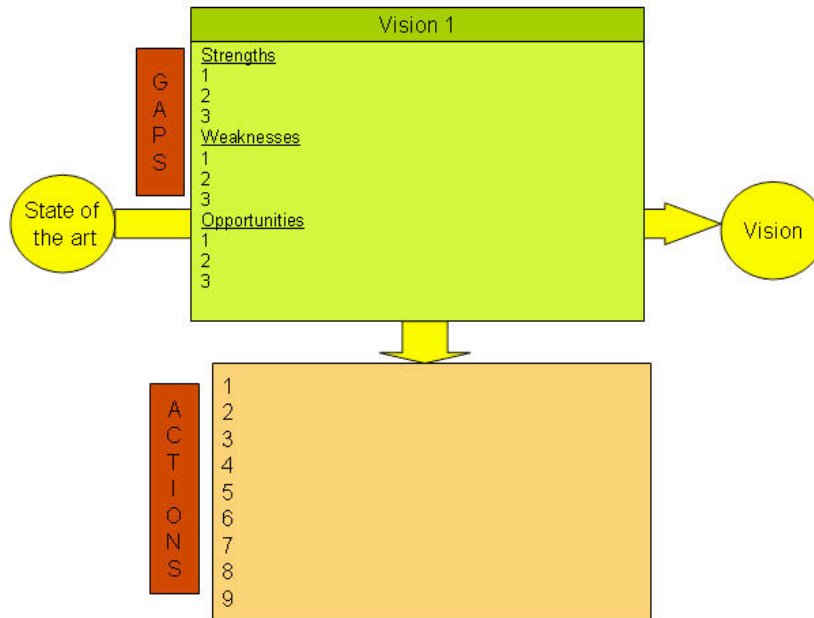


Figure 11: Actions to fill the Gap

References:

(BRIDGES, 2002), Deliverable D8 “Roadmap for Digital Business”, BRIDGES Project, 2002

(Kamtsiou, 2006), V. Kamtsiou, A. Naeve, J. Dang, Y. Denual, P. Lefrere, P. Scott, E. Duval, V. Zimmermann, C. Makropoulos, D. Pappa, “Envisaged Future States of Technology Enhanced Learning”, Deliverable D12.10 of PROLEARN NoE, IST 507310, July 2006

(Kamtsiou 2007) V. Kamtsiou, A. Naeve, S. Stergioulas, T. Koskinen, “Roadmapping as a Knowledge Creation Process: The PROLEARN Roadmap”, Journal of Universal Knowledge Management, Vol 13, No3. pp. 163-173, www.jukm.org/jukm_1_3/roadmapping_as_a_knowledge

(Naeve, 2007), Deliverable D1.10 “SECI-based framework for professional learning processes”, PROLEARN Project, 2007

(Nonaka, 2000) Nonaka, I., Toyama, R., Konno, N. SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation, Long Range Planning, 2000, Vol 33 (2000), Elsevier Science Ltd.

(Nonaka, 2003) Nonaka, I., Toyama, R., “The knowledge-creating theory revisited: knowledge creation as a synthesizing process”, Knowledge Management Research & Practice, 2003, Vol. 1, No.1, pp. 2–1.

(ROCKET, 2003), Deliverable D8 “Roadmap for Digital Business”, ROCKET Project, 2004

(Time2Learn, 2004), Deliverable D3.2 “European Roadmap for professional eTraining, IST Time2Learn Thematic Network”, 2004

(VOMap, 2003), Deliverable D3 “Interim report on gap analysis (identification of needs) Identifying necessary research steps for collaborative networks of the future, VOMap project, 2003

3. IMPLEMENTATIONS

3.1. Gap analysis VS1

(IST challenge): “Everyone (in the community of current, potential and future knowledge workers) should be able to learn anything at anytime at anyplace.”

3.1.1 Description of Vision Statement 1

The statement is closely linked to the IST challenge and is focused on the individual. It embraces issues of digital convergence of communication networks, media, content and devices. The new capabilities offered by recent advances in mobile and internet communications can support and facilitate mobility towards a lifelong learning environment, enabling the creation, storage, management and access to knowledge everywhere and every time. The aim is to create and deliver a personalized learning experience to everyone. The word “everyone” in the vision’s statement title and goals signifies that everyone should have the ability to learn anything where and when he wants.

Goals:

1. Provide the right learning experiences at the right time for the target person (which can be everyone)
2. Everyone should have access to all public learning materials at any time at any place

Vision statement analysis (supporting factors)

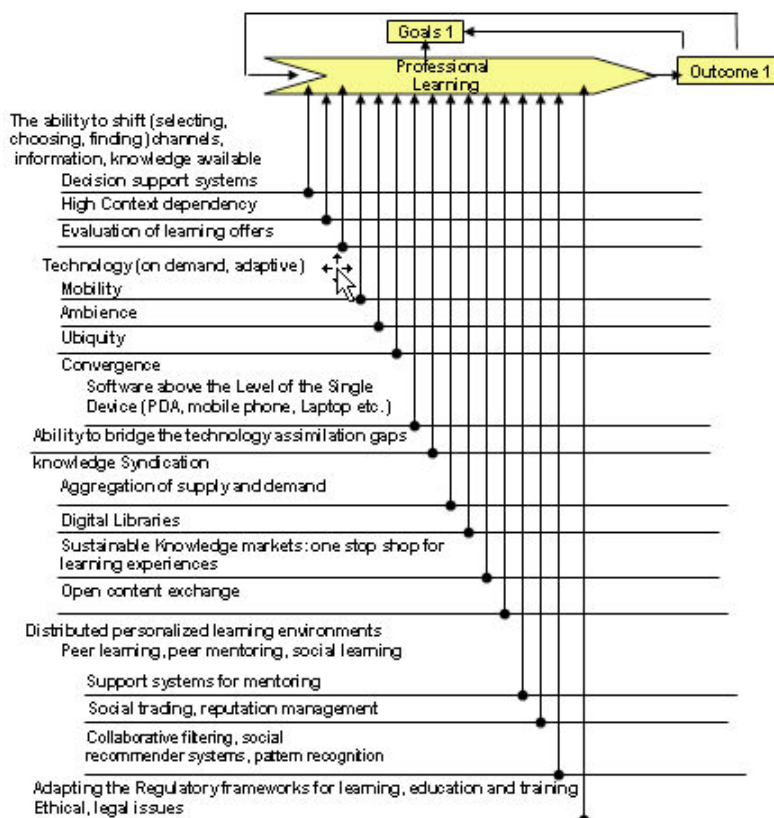
This vision is related both to personalization and to access to learning at any time at any place. Learning as such is a very personal process by itself divided to both the person and the environment. Learning has a very personal view, such as personal development and competencies development in a short and long term perspective. Moreover, in many cases the learner is not aware of what he needs to learn to develop certain competencies. A negotiation mechanism for power alignment is needed (pull versus push): e.g. intelligent systems detect the learner’s behavior and “push” content related to his/her work processes (person related); the other approach is more like pull-type personalization initiated by the learner himself, relating to enabling factors such as support systems for mentoring, social trading, reputation management, size of community contributing to content quality, peer to peer learning and social learning (environment).

This Vision statement tries to integrate all these different interpretations of learning and learning approaches. How technology can support the different learning processes in life of people and provide many choices to learning and how to utilize all different technologies that exists to remove the barriers to learning including what people don’t know that they need to learn. This goal also commands that everyone should have different tools at his disposal available that will help him/her to find, select and choose among the abundance of options. Therefore, the goal of this statement is not only to create many choices but also help people decide what’s just right for them.

Towards this goal, there is also a need for a different type of support infrastructure to assist learners in choosing the most appropriate product, or in gaining access to learning with a variety of access means. The new mobility and ubiquity capabilities

enabled by today's technology have an impact on the ways people live, work, and learn. These highly-promising technologies will radically alter the so-called "learning experience", in terms of salient parameters such as location, time allocation, interface design and real-time support by agents. These new experiences will shape behaviors, practices, and social groupings for knowledge sharing. Mobile and location based technologies can support and provide ambient content management and ambient learning networks. They can keep the same information independently wherever you are and provide ambient learning, meaning that the learner is virtually connected whenever he wants, to whatever and whomever he wants. Whether he is traveling to clients, or during his meetings, or at the office, or at home he has immediate access to all of the facilities available traditionally just in his office.

Moreover, open content exchanges and distribution channels for sharing content support reconciling supply and demand in the "knowledge marketplace". They enable learning and content syndication by many different providers, including provision of value added services such as access to experts, communities of practice, experiences and consulting services. This type of knowledge syndication enables the creation of a big variety of choices, similar to assembling your own media streams. (In the past there were only a few state owned TV channels. Today, we have many sources to choose from.) Self-organization and proactive control of learning in that sense becomes very important, supported by personalized learning environments where the importance of creating and maintaining various kinds of relationships is becoming paramount.



3.1.2 SWO Analysis

(BE=Business Economics, T=Technical, SC=Socio Cultural, P=Political)

ID	Vision Statement 1 (IST challenge)				
Strength: What we have today and we do need					
S1	Rapidly developing information and communication technology		T		
S2	Multiplatform Internet access		T		
S3	E-learning and technical standards and specifications seeking for interoperability	BE	T		
S4	Semantic web initiatives		T		
S5	Various software solutions for learning, communication, collaboration, publishing, including open source		T		
S6	Alternative ways to capture the knowledge (photo, video, text, audio)		T		
S7	Integrative learning based on bottom up approaches (blogs, wikis, media sharing)		T	SC	
S8	Opportunity to establish and use Learning Networks		T		
S9	Professional associations offering learning services	BE	T	SC	
S10	Huge amount of information on the Web	BE	T	SC	
S11	Sophisticated information retrieval facilities		T		
S12	Thematic Learning Networks and Communities of Practice		T	SC	
S13	Good research ground-work on adaptivity and personalization techniques and technologies for learners	BE		SC	
Weakness: What we have today and we do not need					
W1	Heavy use of old (industrial) educational methodologies that do not reflect new conditions and requirements	BE		SC	P
W2	Old curricula forcing students to learn many facts that can be easily found			SC	P
W3	Information overload, too many options to choose from		T		
W4	Many primitive user interfaces		T		
W5	Sometimes unreliable technology		T		
W6	Popularity of low quality content distributed by mass media			SC	P
W7	Low popularity and attractiveness of (life-long) learning			SC	
W8	Lack of standards on Adaptivity and Personalization				

Opportunity: What we do not have today and we need

O1	Individualized personalized learning supported by ICT	BE	T		
O2	Learning based on sound methodologies considering learning processes, development of competences and skills	BE		SC	P
O3	Research based education supported by experiments	BE		SC	P
O4	Interest, motivation, and curiosity driven learning	BE		SC	P
O5	Informal life long learning	BE	T	SC	
O6	Support for discontinuous learning		T		
O7	Adaptive and contextualized learning experience supported by ICT	BE	T	SC	
O8	Exogenous Learning Networks based on the appropriate community of practice and not on the platform		T	SC	
O9	Syndicated and interoperable repositories providing learning objects and activities, as well as competence development programmes	BE	T	SC	
O10	Effective and efficient information, community, and expert retrieval, based on context and semantics		T		
O11	Learning evaluation showing its effectivity, efficiency and satisfaction of learners		T	SC	
O12	New business models for learning, including knowledge markets with one-stop shops	BE	T	SC	
O13	Robustness, resilience, and security of network infrastructure and service platforms		T		
O14	Harmonization of e-learning standards		T		
O14	Continuous user assistance provided by autonomous software agents		T		
O15	Multiplicity and interoperability of delivery modes (networks, devices and service infrastructures) to support ambient and nomadic learning		T		
O16	More fluent, dynamic and transparent collaboration between research groups. No unrecognized overlap. Cross-functional groups and networks not focused on only one area	BE		SC	P
O17	Conceptual modeling of different knowledge domains			SC	P

3.1.3 Assumptions – Preconditions

Assumptions:

- The statement doesn't imply that companies should allow access to everyone to their proprietary knowledge that the companies have developed in-house. By "access" we mean access to all learning material publicly available.
- Web 2.0 has created a new attitude towards learning (knowledge sharing, networking, learners communities, learn from informal network). New business models and opportunities are emerging because of the web 2.0 phenomenon.
- People more and more don't feel as part of a nation or a state anymore but part of "communities" worldwide. The exogenous approach to resources and platforms merges different inputs within a single community of practice focused on the topic and the relation and not on the technical or affiliation restrictions.

- The separation between work and not work is becoming very blur today. The whole Professional area is becoming blur (what is used to be actual work as working “formally in the office”).
- The Internet is expanding, and there is a huge and further raising amount of public information on the Web
- Information retrieval facilities are becoming more effective
- Semantic Web is under development
- Capturing information is easier than before
- Bottom-up learning approaches become popular

Preconditions:

- Interoperable learning repositories
- Harmonization of learning standards
- Knowledge management based on semantics
- Innovative educational methods (e.g. interest, motivation, curiosity driven learning)
- Attractive forms of learning (e.g. integrated into leisure time, entertainment – game based learning)
- Individualized personalized and contextualized learning supported by ICT
- Support for informal life-long learning
- Support for ambient and discontinuous learning
- Appropriate business models for learning
- The individual in community is taken control of the learning process

3.1.4 Nature of the Gap

In the *business* area separation between work and not work is not clear today anymore, especially for knowledge workers. Learning tends to be transparently integrated into work processes, thus it needs to be ubiquitous and nomadic. Traditional educational institutions prevail and new appropriate business models for learning services are still missing, which is a major drawback nowadays.

The *technical* field witnesses the most rapid development, particularly of information and communication technology. Originally separated technologies are being integrated, combining various benefits. Mobile devices enable ubiquitous communication services and access to huge amount of information. Anyway, standards and specifications are not harmonized, what causes interoperability problems, for instance there is a need of interoperable learning repositories.

From the *socio-cultural* perspectives there are essential differences in the availability of the modern technology and services, as well as in digital literacy that is often missing. One sixth of the world population has access to the Internet and can benefit from its innovative services – information, publication, communication, and collaboration. A major issue of information overload has been addressed by effective information retrieval and recommendation services. Huge popularity of mobile communication devices shows a promising direction for development of learning services. Open content exchanges and distribution channels are crucial for integrative learning based on bottom-up approaches. The modern trends focus on individualized and personalized learning, as well as ambient and nomadic learning.

In the *political* sphere there is a demand to support new educational models and methodologies that are necessary for both formal and informal life-long learning.

3.2. Gap analysis VS2

3.2.1 Description of Vision Statement 2

(Industry Challenge): “Learning as a means to support and enhance work performance.”

The statement is related to specific industry challenges, such as performance support and performance improvements at the work place.

Goals:

1. to support human performance improvements and to provide links between business processes, competencies and learning processes
2. to use TEPL to design high quality work-based learning activities so that learning and working becomes interlocked

Vision statement analysis (supporting factors)

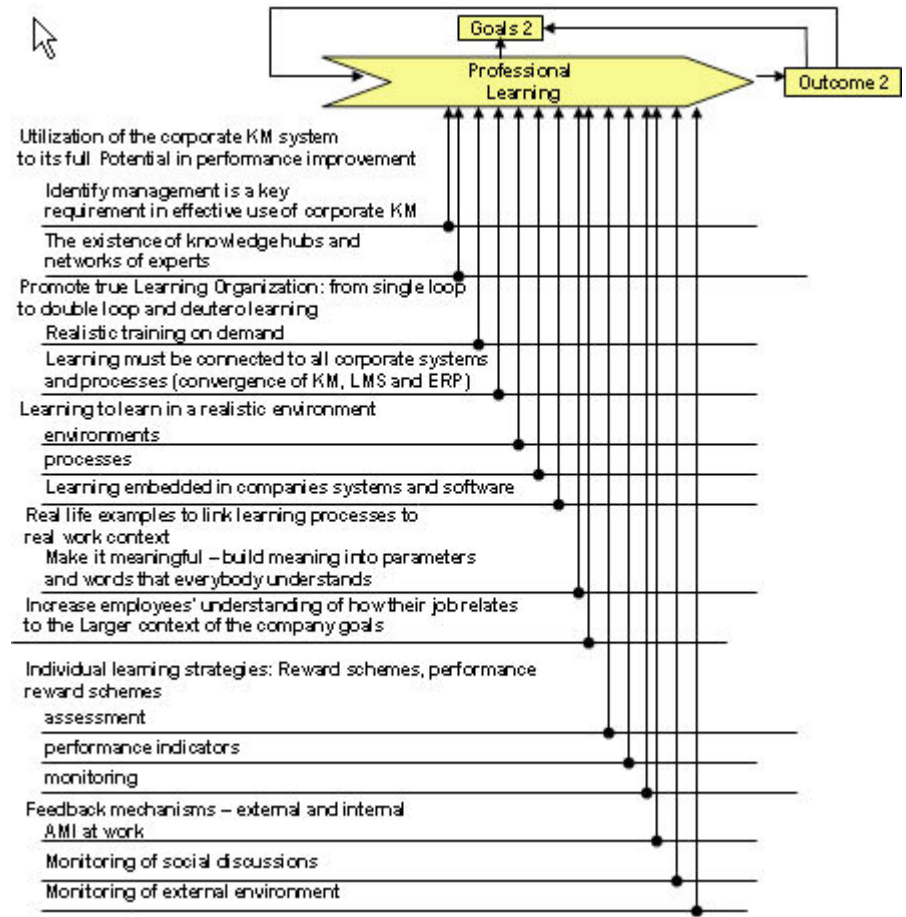
Vision statement 2 is related to industry and it is focused on the organization. Use TEPL as support and enabler for work performance. It is linked to organizational issues where the company wants to deal with work performance in the area of giving the company increased productivity. This statement is therefore more related to the structured and known business processes of the organization. This differentiates this statement from Vision Statement 3 which focuses on using TEPL to support innovation and creativity in the company and support large scale changes in the organization related to unstructured and iterative business processes.

It is increasingly acknowledged that learning and business process management cannot continue to be treated as “separate worlds”. The problem with today’s e-learning systems is that they are still lacking the necessary interfaces between the learning systems and the business information systems in order to align learning technologies with business processes. This necessitates to link learning to corporate Knowledge Management systems in order to identify Learning Management as a key requirement and built learning into the enterprise’ organizational structure. Including, being able to find who knows what and where to go inside and outside the organization to find the information that you need.

There is also a need for real life examples to link learning processes to real work context and make it meaningful for the employees, by providing learning that is based on real work environments and work processes. In the context of learning to learn in realistic environments, we also need to empower employees to acquire and deploy new knowledge very quickly at their job, (i.e. just in time learning which provides instant access to resources while the employees are working) and provide continuous learning to employees in a sense that are constantly on a learning curve.

A conceptual framework of how to link learning technologies to work performance and link the results of learning performance to work performance is of paramount importance. This translates in a need for new tools and methodologies and services to a) link business process management to learning design methodologies (i.e. Competency based business process analysis) and b) to measure learner performance in relation to the defined learning goals and business needs. The new learning systems should be able to understand the skills and competencies required by the new business processes and match them with learning experiences in a way

that will be transparent to the user. At the same time individual learning strategies for assessment performance and indicators to monitor the results of learners and their performance must be in place in order to effectively measure the impact of learning on performance. (“How many/much?” or “How well?”)



3.2.2 SWO Analysis

(BE=Business Economics, T=Technical, SC=Socio Cultural, P=Political)

ID	Vision Statement 2 (industry challenge)			
Strength: What we have today and we do need				
S1	We have strong business awareness on the need of informal learning and knowledge as key driver for change: a) for knowledge workers: working, communicating and learning grow together in real life; b) HR managers are challenged to link professional learning with work improvements; c) learning technologies are being used in enterprises for professional learning	BE		
S2	Personalized Learning Environments are available (learning portals, knowledge management platforms, learning management systems)		T	
S3	Skills & Competency Management Systems are available		T	
S4	Virtual networks are available but should be improved		T	
S5	We have the conceptual and didactical frameworks for performance management: a) Concepts for integration of instructional design, learning processes and competency management; b) measures for learning performance; c) adaptation methods for learning based on individual skills and situations as well as working tasks			SC P
Weakness: What we have today and we do not need				
W1	Management driven approaches purely looking on business performance neglecting employee self-creativity: a) Peoples' needs should not be neglected; b) Performance management has to be done seriously	BE		
W2	Over designed complex software solutions in a monolithic form		T	
W3	Redevelopment of existing technologies already available in the internet as day-to-day tools for knowledge work and management (e.g. google, wikimedia, wikis, blogs, instant communication, etc.)		T	
W4	Inappropriate (complex) Methodological Approaches: a) Only top down, or only bottom up solutions are not sufficient; b) measures for performance that are too difficult to handle or to collect the data c) over engineered procedural models and application guidelines	BE		SC P
Opportunity: What we do not have today and we need				
O1	Alignment of top level management views and bottom up reality: a) user behavior of knowledge workers does not match to management view and philosophy; b) experiences, best practices and guidelines in order to provide better alignment between the various processes and increase work performance	BE		
O2	Methods and Technologies for measurement of work performance: a) relations between measures for learning; b) measures for work	BE		

	performance; c) integrated Assessment methods that enable identification of skills gaps of knowledge workers; d) contextualized assessment of the Collaboration process				
O3	We need a clear methodological approach characterizing work performance: a) get a better and clear understanding of the relation of business needs, skills/competencies, learning and work processes; b) collect experiences, best practices and guidelines for the use of learning technologies that help to increase work performance; c) clear measures for learning and work performance, linked to ROI, but not only	BE			
O4	We need better measurements for work performance: Competency management technologies in the middle of business needs and learning technologies	BE			
O5	We need better measurements for work performance: Business views on social, informal learning and how to use web 2.0 technologies best in companies	BE			
O6	We do not have Flexible Learning Services Frameworks: a) interfaces/webservice frameworks that integrate the existing technologies both from a user's view (bottom up) and a management view (top down), e.g. based on SOA; b) technologies should support the knowledge worker as well as the management; c) Web 2.0 applications and social software is still not in use enough		T		
O7	Competency management technologies for knowledge workers are missing, supporting instant search and semantic retrieve of knowledge and learning resources and individualization of learning		T		
O8	Open and interoperable technology platforms are missing (the interface itself should not be standardized the technology to build the interface should be standardized)		T		
O9	Tools should be easy to manage, deployable in companies and accepted by employees		T		

3.2.3 Assumptions – Preconditions

Assumptions:

- Learning technology must get higher management awareness through positive success stories and having an ROI impact
- Companies coming from knowledge intense businesses prove that performance of people through investing in learning technologies have an ROI impact
- Unions don't see it as negative if companies aim to measure peoples performance.
- Standard technologies for learning performance monitoring and measuring come into place
- Knowledge management technologies and web 2.0 technologies have positive impact on learning technologies.

Preconditions:

- Human resource business units need to stronger interlink their activities with business units and training units.
- ERP solution providers must be open to integrate learning technology by offering open interfaces and webservices to learning technologies

- Management awareness for learning technologies should be increased as a key element of company performance
- Unions should take into account the positive effect of learning technology in relation to the company's performance.

3.2.4 Nature of the Gap

In the **business area** work performance is strongly linking business needs, competency needs and learning to help knowledge workers. We still have to bridge the gap between a top down view and a bottom up view:

- Top down View: companies must make sure, that learning fits both to the individual competency gaps and the business needs. Only if both aspects are in balance, they reach acceptance at employee level and can increase business performance through learning at workplace.
 - "time2Competency" matters; link to competency management
 - Performance Management must be business driven
 - Configurable personal learning environments come into place
- Bottom up View: Knowledge workers use learning technologies as one element of information and knowledge gathering and exchange. "Instant learning technology" and social learning forms support knowledge workers stronger than managed learning technologies
 - Web 2.0 applications - User-centric views - Exchange of all kinds of content will be necessary (rating, feeds, ...)
 - Learning technologies must be linked

From a technical point of view we have to bring competency management technologies into place that can be used also for knowledge workers. Projects at EU level address this issue, so that we can expect that results come up in the next two to three years. The interoperability of knowledge management technologies, learning management and web 2.0 technology is of critical importance for that.

From the socio-cultural perspectives there are essential efforts to do concerning the awareness and use of learning technologies at management level. The topic is not in focus of a company's management as the ROI impact has not been proven. In addition, there is missing openness from the side of unions. Depending on the country we use the technology, there is more or less openness and active support for the vision.

In the political area there is a demand for policy makers to continuous support projects in the area of vision 2 in order to ensure, that new technologies come into place. The funding of related projects should continue at least 5 to 8 years in order to ensure, that proven technologies come into place. We are still at the beginning of this.

3.3. Gap analysis VS3

3.3.1 Description of Vision Statement 3

(Industry Challenge): “Promote innovation, creativity, and entrepreneurship at work.”

The statement is related to industry challenges such as investment and development of the company’s human capital and use of learning to support ability to change in organization.

Goals

1. learning supporting radical change in an organization and improving ability to change;
2. to support innovation in an organization by enhancing knowledge sharing and collaboration;
3. To develop specific competences related to thinking out of the box, creativity, asking the right questions, leadership.

Vision statement analysis (supporting factors)

This Vision Statement is focused on the organization and the role of its employees as something much more than just simple actors in a process chain. It recognizes human capital as the key to organization’s complete advantage. Employees are not passive consumers of knowledge, but are capable of critical reflection and they can provide feedback to the processes of the organization. This is a new view of the organization, where search-based learning is coupled with reflection within the organization. The big challenge is how to create an atmosphere of collaboration within the organization to foster innovation but also how to create an atmosphere and attitudes of people in the organization to make room for reflection and contribution to get new products out of TEPL. To facilitate this type of innovation, a new educational culture and mindset is also required.

The success of knowledge-based organizations today depends on how well they are able to organize their collaborative and innovating processes. Organizations are becoming more and more project based with multidisciplinary teams working together around the world (within and across companies). Globally integrated enterprises are very different today, because they manage and optimize their processes at a global scale. The organization’s processes are no longer focusing on individual companies. The question is where things can be done best way and how this can be linked around the world. In such a collaborative, contribution based environment, the role of the traditional enterprise is sifting to manage and facilitate these complex networks of individuals, groups and projects.

An important change relating to the organization of jobs and company structures is emerging, which tends towards the demise of hierarchy as well as of specific titles and job descriptions, with a strong tendency towards flexible types of jobs defined by the particular “project” assignments. At the workplace there is a move from close supervision to more independence and responsibility. The knowledge worker is highly self organized, triggered by objectives not by tasks, and performs process-oriented activities that are themselves unstructured and complex and assumes personal responsibility for setting their own direction. This implies leadership

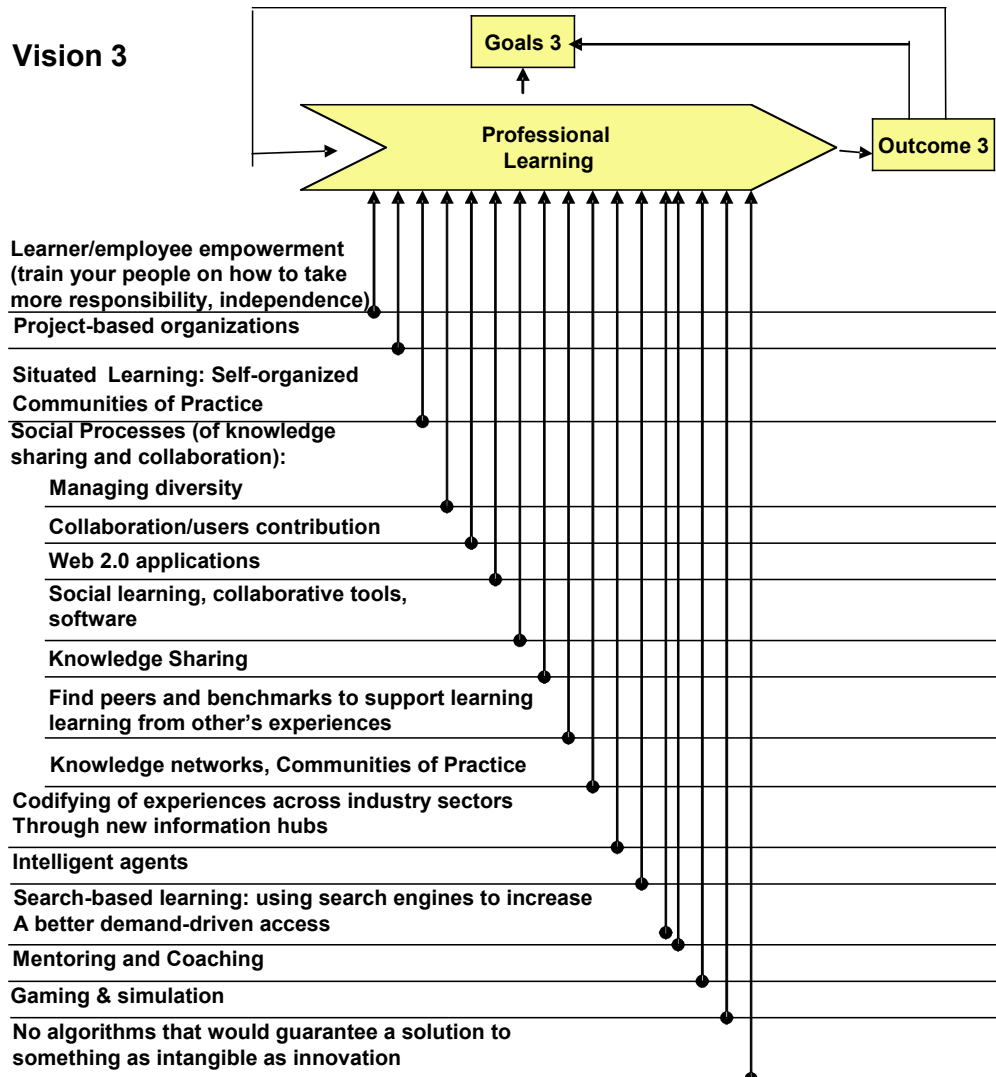
qualities. We need to link the top down management views of today to this new bottom up business reality. Move away from central control and allow for the chaos, fluent behavior and redundancy needed for collaboration, creativity and innovation. These bottom up models also require for training people of how to take more responsibility and independence for their learning, professional advancement and for their jobs.

This vision statement is driven by the new meaning of innovation today. More and more, innovation results from people working together in new integrated ways, therefore, true innovations are coming from whole eco-systems not by one individual or groups. In addition, complex problems require more knowledge than any single person possesses, therefore it is necessary that all involved stakeholders participate, communicate, collaborate, and learn from each other. The role of interaction and collaboration is critical to creativity. Instead of cooperation, when the different individuals or groups are not required to know what goes on in the other parts of the project, in collaboration people communicate with each other and are aware of the work of their colleagues.

When we look at learning as a collaborative knowledge creation process, there are new elements that go beyond formal learning. More and more deep learning processes happen outside these traditional educational approaches. New educational culture and mindset to facilitate innovations related to this informal type of learning are needed away from teacher centric models and allow for creativity and collaboration to be at the center of the learning process. Networking and Collaboration technologies play a big role on supporting this type of learning and knowledge sharing such as web2.0 applications and Social Software. (blogs, wikis, RSS, pod/vodcasting, social bookmarking, media sharing, video/phone etc.)

Knowledge networks and communities of practice are enabling people to interact outside the boundaries of the organization i.e. building on professional associations, alumni, etc. In addition, knowledge workers are expected to form these types of networks within and outside their organizations, master the skills of creative collaboration and respond to frequently changing situations and priorities.

Intelligent agents can be used to increase a better demand-driven access: intelligent search engines to locate valuable content, communities and experts. Simulations and games can also play an important role in learning since they provide a safe environment for experimentation where people can try new things without mistakes matter.



3.3.2 SWO Analysis

(BE=Business Economics, T=Technical, SC=Socio Cultural, P=Political)

ID	Vision Statement 3 (Industry challenge)				
Strength: What we have today and we do need					
S1	Web 2.0 /Social Software: Networking and collaboration technologies that support knowledge sharing and collaborative knowledge creation (e.g. blogs, wikis, RSS, pod/vodcasting, social bookmarking/tagging, media sharing, video/phone conferencing, instant messaging etc.)		T		
S2	Simulations, games, mobile technologies		T		
S3	Technology as enabler!, changing attitudes of learners		T		
S4	Open Innovation	BE			
S5	Flexible productivity and working model	BE			
S6	Cross functional teams and project-based work	BE			
S7	Companies allow usage of social tools	BE			
S8	Social movement, people want to share			SC	
Weakness: What we have today and we do not need					
W1	Learning = formal training as side activity	BE			
W2	View of knowledge as content that can be captured and stored (today we capture information rather than knowledge, tacit knowledge is hard to formalize and capture)	BE			
W3	Focus on capturing best practices (Knowledge as content rather than process; knowledge life is short, yesterday's solutions don't always work today, we should rather focus on good or proven practices and learning from failures)	BE			
W4	Delivery of static and pre-defined learning content (knowledge push)		T		
W5	Centralized, feature-rich and complex KM/LM systems (KMS, LMS, LCMS, CMS), centralized LORs (lack of adoption)		T		
W6	Inflexible business models and control (enemies of innovation and creativity)			SC	P
W7	Competitive culture i.e. culture that rewards knowledge workers based on what they know			SC	P
W8	Creativity is not productivity			SC	P

Opportunity: What we do not have today and we need				
O1	Aggregated combination of formal and informal learning, KM, and Web 2.0 concepts	BE		
O2	Small pieces loosely joined principle: Distributed content, distributed services, distributed control	BE		
O3	Bottom-up models (let structure emerge naturally, driven by the learner/knowledge worker, based on sharing rather than controlling)	BE		
O4	Multi-user game-based learning		T	
O5	Knowledge-pull models, intelligent search engines to locate valuable content, communities and experts (Awareness of expertise)		T	
O6	Create, sustain, and share tacit knowledge through socialization, discussion, dialogue, and participation			SC P
O7	Effective ways to share explicit knowledge (information)			
O8	Community building, knowledge networking, and knowledge clusters(exogenous knowledge, go outside the organization boundaries to involve customers, partners, suppliers, and other organizations)			SC P
O9	Culture that supports failure documentation (Learning from failures)			SC P
O10	Culture that supports knowledge sharing and fosters trust (create opportunities for people to meet and interact, reward rather than punish collaboration initiatives, collaboration as key part of the performance evaluation of knowledge workers, new reward schemes)			SC P
O11	Move away from one-size-fits-all content-centric models towards a learner/knowledge worker-centric model (Personal Knowledge Management PKM, Personal Learning Environment PLE)			SC P
O12	Develop new pedagogical models based on distributed cognition (i.e. ability to interact meaningfully with tools that expand mental capacities) and connectivism which presents learning as a connection/network-forming process			SC P
O13	Need for new crucial skills including: a) the ability to navigate and learn across different communities; b) Master of the 5 Cs: Content, Conversation, Connectivity, Collaboration, and Context			SC P

3.3.3 Assumptions – Preconditions

Assumptions:

- There is a visible move toward open environments where collaboration is the norm.
- Learning is social, personal, distributed, flexible, dynamic and complex
- Organizations are becoming more and more project based with multidisciplinary teams working together around the world (within and across companies)
- At the workplace there is a move from close supervision to more independence and responsibility.

Preconditions:

- Flexible learning models that are open to change to meet the needs of the new knowledge society.
- A participatory culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe that their contributions matter, and feel some degree of social connection with one another (Jenkins, 2006).
- Trust as a major prerequisite for knowledge sharing

3.3.3 Nature of the Gap

From a **business as well as a socio-cultural perspective**, Peter Drucker argues that in the emerging economy, knowledge is the primary resource for individuals and for the economy overall; land, labor, and capital. He further argues that improving knowledge worker productivity is the greatest challenge of the 21st century (Drucker, 1994). Similar to a knowledge worker, a professional learner is a person who doesn't just consume knowledge but who is able to create it. Over the past few years, the Web was shifting from being a medium, in which information was transmitted and consumed, into being a platform, in which content was created, shared, remixed, repurposed, and passed along (Downes, 2006). We are entering a new phase of Web evolution: The read-write Web; a new generation of the Web where everyone can be a consumer as well as a producer of knowledge in new settings that place a significant value on collaboration. Web 2.0 technologies have been opening new doors to the professional learner for more dynamic and social learning. The new Web trends have offered new means to connect people not only to digital knowledge repositories but also to other people, in order to share ideas, collaboratively create new forms of dynamic learning content, get effective support, and learn with and from peers. Since learning is social, personal, distributed, flexible, dynamic and complex in nature, a fundamental shift is needed toward a more social, personalized, open, dynamic, emergent and knowledge-pull model for learning, as opposed to the one-size-fits-all, centralized, static, top-down, and knowledge-push models of traditional learning solutions.

As far as the technical perspective is concerned, current learning models are following a static and pre-defined representation of knowledge and put a heavy emphasis on content and technology. Learning is however more than static content and technology is just an enabler. At the heart of the learning process lie people. Consequently, current learning models have to be replaced with new models that reflect the social nature of learning and respect the human side of knowledge. In the future, people driven implementations of learning models need to be the norm rather than the exception.

3.4. Gap analysis VS4

3.4.1 Description of Vision Statement 4

(Employee perspective): "Learning as a means to increase employability."

This statement focuses on the Learner's perspective, the employees' continuous professional development, and the need to increase employability.

Goals

1. to promote resiliency, personal growth and fulfilment
2. to enhance mobility, employability and competency of the workforce

Vision statement analysis (supporting factors)

Employability (of all workers, not knowledge workers specifically) was recently defined as "...the combination of factors and processes which enable people to progress towards or get into employment, to stay in employment and to move on in the workplace." (<http://www.scotland.gov.uk/Topics/Business-Industry/Employability/definition>). The mention of a "workplace" in that definition of employability shows the continued influence of mid-20th century forms of employment: coming to a specific location ("the workplace") to do work that was defined by the employer rather than by the employee.

The notion of employability is changing dramatically for knowledge workers. They are gaining much more say in what they do, where they do it, how they do it, why they do it, who they do it with, and what ownership they retain. Compared to the mid-20th century's white collar workers (arguably low-technology precursors to today's knowledge workers), today's social structures and employment ecosystems are changing rapidly. Most of today's students will find their employers can no longer offer long-term employment. They will have to look for new jobs many times over their lifetimes, and will need to pay great attention to their employability, by refreshing their qualifications frequently if they intend to stay in the same line of work, or they will have to change their field and acquire qualifications to suit.

For learners aspiring to be knowledge workers, the word "employment" has broadened to include not only the old stereotype (being hired and retained as an employee of a single organization) but also other ways to work and to live, such as entrepreneurship, portfolio careers, self employment, consultancy, project based work and short-term employment.

Clearly, the "workplace"-influenced definition of "employability" needs to be expanded to take account of those changes. Accordingly, we use the term "employability" in this Vision Statement as "competencies that can increase professional choices". Similarly, the term "workforce" in this vision statement refers to "knowledge workers". In the knowledge economy, everyone can be a knowledge worker: Aggregating knowledge, filtering it, reflecting on it and adding value to it. This vision statement aims at both increasing professional choices for knowledge workers (for example by reducing the barriers to becoming a competent member of other professional communities and sharing their knowledge widely) and also assisting them to find activities (or create activities) that count as being employed. Sharing knowledge within a community of knowledge workers, to help everyone to improve on-the-job performance, is the key towards this aim. In the classic

"workplace" model of employment, if people lose their job based on bad performance it goes on their record and makes it difficult to find another job. In the new "knowledge community" model, people can find mentors within a community, to bring them up to a professional level of competence; but if they do not repay that investment by sharing their own new knowledge, they will get a bad reputation in the community and will gradually become excluded from it.

In our context, we look at employability from a lifecycle point of view: employability = get a job (make a good impression at a certain time) + maintain a job (performance related). What is changing is who has to be impressed: the community of knowledge workers, as well as individual employers.

The word "resiliency" in the vision's goals relates to knowledge workers' ability to adapt to change and minimize risks caused by the frequent shocks in the system. Resiliency in this context is how people cope with realities of life and life challenges. Where do we have the spaces in our lives to deal with important real life challenges, like a threat of losing our job? People are facing challenges at their jobs such as an appraisal of some kind (job interviews, promotion interviews, annual appraisals) and they have only one chance to get it right. In order for someone to maintain a job, it is important to practice in a safe environment. When you look at this vision we also looking at the kind of environment that people can practice and learn without mistakes mattering.

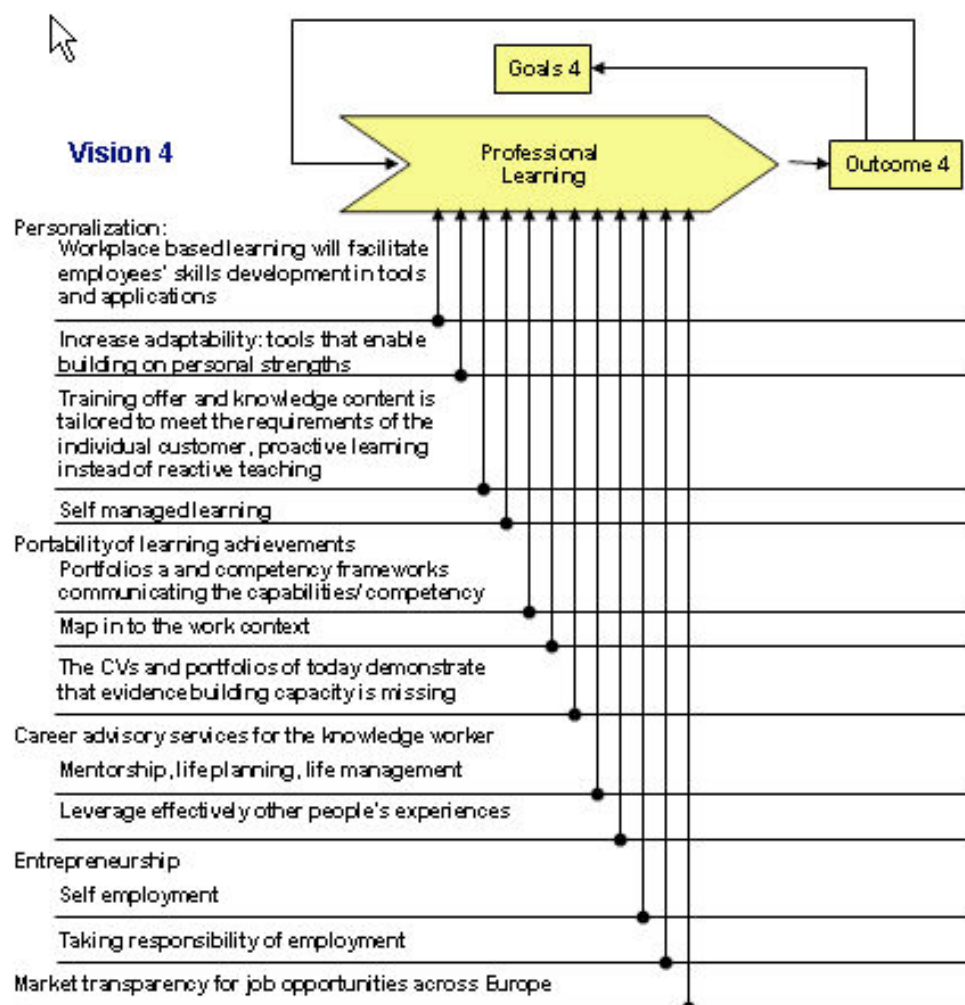
When we look at implications of learning as means to increase employability, increased adaptability is very important: tools that enable building on personal strengths. A knowledge worker needs to choose only the relevant things and build on them. S/he needs to reflect: validate, think about the points made by others and recognize the strengths and weaknesses so s/he knows where to improve. The training offer and knowledge content must be tailored to meet the requirements of the individual customer, and move from reactive learning to proactive learning and from single loop learning (learn how to solve problems) to double loop learning (learn how to admit mistakes) and beyond (eg learn how to anticipate and avoid mistakes). We need mechanisms that move beyond single loop learning. i.e. In the case of benchmarking how you tell a story about yourself that leads others to better practices? We need benchmarking for personalization and portfolios. In a Knowledge economy, everybody is an operator, who has something to sell. We are already going towards project-based employment or short term employment. We need to share good practices on how to maintain a knowledge portfolio (what can I do, what is the value of my contributions, who to talk to, who do I need to connect backwards, what are my resources), and how can I map this to the different work contexts.

Moreover, if we see this statement as employment in the classical way, then it becomes a framework of a zero sum game, either someone gets the job or not – what am I producing, what am I depending on, what are my reactions, what are my sources? When we look at tomorrow's employees as knowledge workers (in the future every employee could become a knowledge worker), the aim of this vision statement is to use learning in order for them to both acquire skills to perform today's job and be able to grow. Their contributions, can give a possibility for both being employable and creating more for all.

The support factors in the career advisory services group is more about how someone makes a transition from being a follower to being a leader. That whole mind set, where we thinking of ourselves as employers, managers of our selves and our brainpower. We don't just consume information but we are able to aggregate information, and connect information. The challenge in these areas needs to deal

with higher order issues than the precise competencies. Where is the confidence building part in personalization, etc. for action taking? How to encourage people to feel confident to “just-do-it”? How to train people as potential project participants? How to educate them to operate under this type of contract? It is more about active choice. It also requires skills that will allow people to present their vision and build a portfolio, not just about the small tasks but about where they are going. They have to build your knowledge their own way. In that sense, self managed learning is very much connecting to this vision statement.

Moreover, there is a need to identify the kinds of capabilities that companies need in the knowledge age and how to build networks of capabilities. Identify the kinds of jobs that will really add to competitiveness. For example if we take entrepreneurship as a category, the aim is to support the kind of entrepreneurship that scales up and creates the next Big Thing (a breakthrough product or service, or new way to reach a market).



3.4.2 SWO Analysis

BE=Business Economics, T=Technical, SC=Socio Cultural, P=Political)

ID	Vision Statement 4 (employee perspective)			
Strength: What we have today and we do need				
S1	The beginnings of market transparency for knowledge workers seeking employment across borders, as part of the development of standardization by HRM departments of ways of describing job opportunities in terms of competencies, levels of performance and their linkages to business processes	BE	T	
S2	Social software easily mastered by knowledge-workers enables them to readily share and build on the ideas of other people		T	SC
S3	Social software makes it easier for knowledge workers to join informal communities of practice, where they find people they trust and feel safe in asking advice		T	SC
S4	Predictable environment for employees, regarding EU adoption of a single framework for qualifications and competencies, which helps to increase the portability of learning achievements		T	P
S5	Social software increases the employability and job mobility of knowledge workers by enabling them to learn fast which qualifications / experiences are most valued by employers			SC
Weakness: What we have today and we do not need				
W1	Qualifications and experiences that are no longer relevant because of technical changes, and which reduce profitability and employability (employers are reluctant to take on people whose experiences hinder them in adapting to modern work-patterns and make it harder for them to acquire the specialized competencies needed today (in some cases the weakness can be overcome through unlearning)	BE	T	SC
W2	Low-grade Privacy protection technologies (anonymity of data). What we have today is not sufficient to hide details of who is working on what kind of project. Threats include poaching staff and industrial espionage.	BE	T	SC
W3	Inflexible business models to manage experience	BE		
W4	In workplaces where competitive culture is the norm, people get rewarded on what they do or what levels of performance they can reach in competition with colleagues and will not direct others to the level of performance they would need to succeed.	BE		P
W5	The use of corporate group working tools (eg Sharepoint) for evidence building portfolios conflicts with private issues (e.g. non-disclosure agreements) and hinders the portability of learning achievements	BE	T	SC P
W6	Easier data-mining and pattern-detection, which makes it easier for trade secrets such as process knowledge to be gleaned from partial information; one implication for knowledge workers with multiple clients is that they need to prioritize between two incompatible goals: increasing employability through disclosure and protecting privacy and information of companies		T	SC P

Opportunity: What we do not have today and we need				
O1	An affordable web service based on Semantic Web technologies and Patterns that makes available to SMEs, portfolio workers and individuals the EU's best-practice methodology and applications for describing competencies, levels of performance and links to specific job roles. This would enhance the mobility of knowledge workers and their opportunities for career management. The semantic aspect would facilitate localization to suit the needs of different groups.	BE	T	SC P
O2	Need for professional ethics competencies becomes increasingly important for portfolio workers who need to be able to prioritize between incompatible goals (e.g. non-disclosure agreements, use of sensitive information)	BE		
O3	Ways to personalize learning strategies so that learners are better able to develop a fruitful blend of the formal e-learning courses they receive from employers, and the opportunities they have to learn informally from practitioners, in authentic settings (e.g. at work and in social networks)	BE	T	SC
O8	Political and business support for schemes to sponsor new kinds of career services, mentorship programmes and courses for prospective knowledge workers, to enable them quickly to acquire the insights of "business-friendly" knowledge workers about how to be of high value to entrepreneurs and to rapidly growing or changing businesses	BE		P
O8	Economies other than cash (e.g. social recognition, visibility, credit points, etc.), which knowledge workers can use to facilitate mentorship programmes, equivalent to the ones we see in web 2.0 applications.	BE		SC
O9	Career advisory services: Scenarios, good practices, examples of failure should be available and easily assembled in order to facilitate community based work.		T	SC P
O10	Lack of interoperability of e-portfolio initiatives (learning information documents should be easily transferable between countries (political level) and information systems (technical level)		T	P

3.4.3 Assumptions – Preconditions

- A widely anticipated trend in the future is a global "race for talent" (meaning high demand for top-quartile performers, especially in knowledge-based industries). Current and aspiring knowledge workers who are talented will have wider choice of how they work, leading to a rise in the proportion of knowledge workers who choose to be self-employed or choose short-term employment. In this scenario, the number of portfolio workers will increase and their employability will demand the ability to anticipate the requirements of constantly changing work community.
- In the skills base associated with high-performance knowledge work, there will be a move from simpler to more complex skills and from skills that suit a slowly changing world to high-agility skills, needed to cope with a faster changing world.

Preconditions:

- This vision statement aims at both increasing professional choices for knowledge workers and also assisting them to stay employed. Having the skills needed for a high level of "On the job" performance is the key towards this aim.
- Knowledge workers who aspire to be high performers should join communities of practice that contain people who perform at that level, and are willing to share their insights. Key insights include: how to be proactive, able to anticipate the problems before they occur; and how to understand how their work is related to a larger context and so be able to anticipate undefined needs of their co-workers in order to be able to adapt effectively to the business process. This is easier done in small organizations than in large organizations. Direct access to high level management information might not be possible in large organizations, which limit access to Knowledge Management systems on a need-to-know basis. On the other hand, top down approaches lead to outcomes of poor quality and tasks not done efficiently. Therefore, someone needs to have the role to document the overall business process and share it with the organization.

3.4.4 Nature of the Gap

This vision statement ("Learning as a means to increase employability") directs our attention at such issues as how knowledge workers can learn to stay employed by anticipating changes in market conditions (or by being agile enough to respond quickly and appropriately to those changes), and refining and adapting what they offer employers, to meet those new conditions. What is needed here is considerably in advance of the state of the art in vocational education and training. For example, globalization is already a problem for knowledge workers in the West, in the sense that their continued employability depends on their ability to compete with low-wage economies elsewhere. Thinking through the implications of the vision statement, one way to compete is to seek out local niches for knowledge work (a "long-tail" approach to finding opportunities), and then acquire new knowledge, appropriate to those niches, which can be turned into services for an employer. The goal is to offer localized forms of knowledge work (localized services are often hard for off-shore knowledge workers to compete with). Localization of e-learning courses, like personalization of those courses, requires fast, effective, low-cost ways to incorporate new content, new methods, tuned to the specific needs of the knowledge worker and their employer or prospective employer. Unfortunately, while research in those areas is beginning to show good results, we are still maybe a decade from affordable, flexible, powerful and personalizable learning technologies, able to make a big difference to employability. The same points can be made about Vision Statement 1 (regarding the need for courses on "anything"); Vision Statement 2 (regarding how to update, quickly and affordably, all information relevant to "Learning as a means to support and enhance work performance"); and Vision Statement 6 (regarding how to cut the cost of personalized "Access to professional learning for all").

3.5. Gap analysis VS5

3.5.2 Description of Vision Statement 5

(market dimension): “Consumer driven market take-up, based on increased market transparency and the availability of a wider range of offers, ”.

This vision focuses on market take up for TEPL. It involves the development of all segments of the market, ranging from the low end commodity market to the high end, upscale, high value added segment, with a succession of different segments offering a consistent variation in the price/benefit ratio, relying on emerging European industry players.

Goals

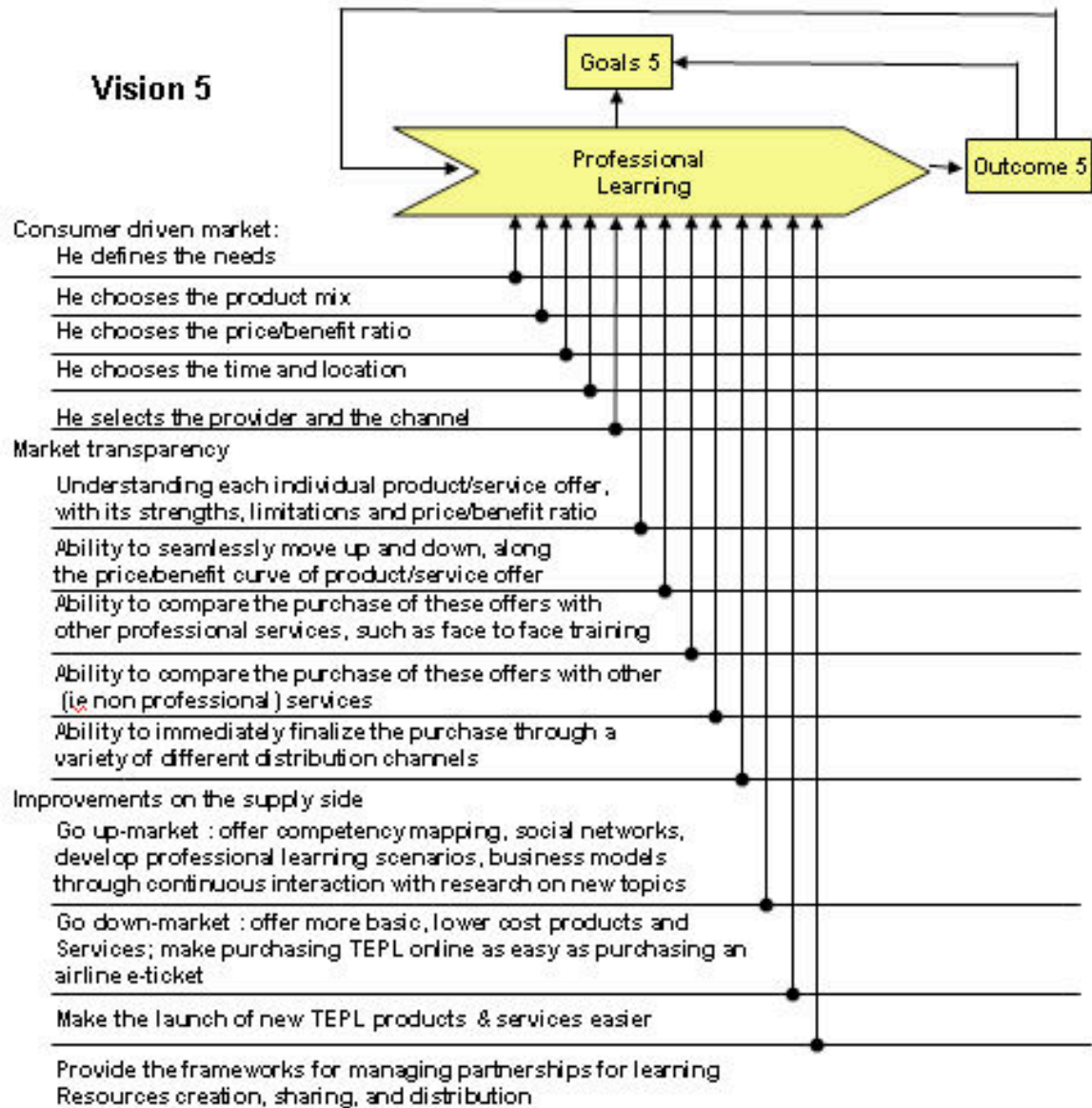
1. To enable the customer to purchase, not only at any time and in any location (as described in vision statement 1),
 - a. any type of professional learning/training technology enhanced service or combination of services, from the most basic ones to the more complex ones
 - b. at any price, as market transparency and the increased availability of products and services allow the customer to understand the price performance ratio of a wide range of offers
 - c. from any channel or vendor, ranging from online marketplaces to high-end consultancies
 - d. for any individual with professional needs in age to be part of the workforce or in retirement
2. To achieve significant TEPL adoption in three different market segments
 - a. large corporations and organizations in knowledge intensive industry sectors: continued leading edge research and investment
 - b. SMEs, which represent 90% of companies in Europe : widespread adoption
 - c. individuals : for life-long learning
3. To address the wide range of needs of these three main market segments, with product/service offerings ranging from the basic low cost offering involving static content to services targeting communities of practice such as content creation and sharing
4. To enable the emergence of strong European TEPL industry capable of competing on a level field with North American and Asian competitors

Vision statement analysis (supporting factors)

This vision focuses on market take up of technology enhanced professional learning, both on the demand side (customer) and on the supply side (provider, investor): give the ability to provide and purchase content and learning services regardless of their type and of the location of the learning supplier in a unified transparent market.

1) In order to support the customer to make an enlightened choice, he needs market transparency. In this vision statement we are defining transparency as:

- A sound understanding of each individual product/service offer, with its strengths, limitations and price/benefit ratio
 - The ability to seamlessly move up and down, along the range of professional TEPL offers, as he changes his expected price/benefit ratio
 - The ability to compare the purchase of these offers with the purchase of other professional services,
 - The ability to compare the purchase of these offers with the purchase of other (i.e, non-professional, such as entertainment and leisure) services
 - The ability to immediately finalize his purchase through different distribution channels when his decision is made.
- 2) The emphasis on the “consumer driven market” dimension requires that :
- The pedagogical needs can be defined by the user on his own, by his company, or with any type of professional advice he chooses to involve
 - The user can choose
 - o the time and location
 - o the type of service (depth, length, ...)
 - o the price/benefit ratio which addresses a specific need at a specific time
 - o the way he buys the product/service
 - On-line market places / open exchanges, through aggregation of the various knowledge suppliers
 - Passive broker : browse, evaluate, select
 - Active broker : matching service
 - Traditional trusted partners
 - Industry sector specific : professional unions
 - Generic : Chambers of Commerce and Industry
 - The user can arbitrate between TEPL and other forms of professional learning/training
 - The user can have different purchasing approaches depending on the context.
- 3) On the supply side, there is a need to increase the range of offers by:
- Going up-market : offer competency mapping, social networks, collaboration technologies, develop professional learning scenarios and business models through continued interaction with the research community for development of new research topics (e.g. informal learning at the workplace)
 - Going down-market : offer more basic, lower cost offerings and make purchasing professional e-learning as easy as purchasing an on-line airline ticket
 - Making the launch of new TEPL products and services quicker and more cost-effective
 - Providing conceptual, economic or legal frameworks or scenarios for managing partnerships for learning resources creation, sharing and distribution



3.5.2 SWO Analysis

(BE=Business Economics, T=Technical, SC=Socio Cultural, P=Political)

ID	Vision Statement 5 (Industry challenge): Focus Large Corporations				
Strength: What we have today and we do need					
S1	Market transparency	BE			
S2	Business model : consultancy and joint research	BE			
S3	Business units in large corporations have an awareness of the needs and are implementing	BE			
S4	Technology platforms		T		
S5	Pedagogical frameworks	BE		SC	
Weakness: What we have today and we do not need					
W1	Personalization of TEL is a problem for everybody - including large corporations. "Strategic management" wants it - as a part of their overall wish to make the workplace learning more embedded and ubiquitous.	BE			
W2	Some Human Resource departments are often actively fighting TEL - and especially competency management technology that allows employees to manage their own competency - since they conceive this as "an invasion" of their traditional domains of power.	BE			
Opportunity: What we do not have today and we need					
O1	Business scenarios for integrating informal learning at the workplace	BE			
O2	Greater business awareness at the corporate level for strategic implementation across business units	BE	SC		
O3	Improved alignment of learning/training with core business processes	BE			

ID	Vision Statement 5 (Industry challenge): Focus SMEs			
Strength: What we have today and we do need				
Weakness: What we have today and we do not need				
W1	High-end, but expensive technology platforms	BE		
W2	High-end HR and pedagogical frameworks that require a strong HR infrastructure	BE		
W3	CRM industry trend whereby the offer goes upmarket and shuts out existing entry-level customers from the market	BE		
Opportunity: What we do not have today and we need				
O1	Lack of a strong professional training culture in some countries			SC
O2	Entry-level, low cost offers that will be used by the majority of SMEs as their standard learning/training service and by a few, more enlightened ones, as a starting point to move along the maturity curve	BE		
O3	Support services (coaching) to enable some enlightened SMEs to move along the maturity curve	BE		SC P
O4	Range of offers: - With different combination of product/services - Allowing the customers to move along the price/benefit curve of offers	BE	T	
O5	Wider access to a wider range of offers from a greater number of competing providers	BE	T	
O6	Wider access to a wider range of offers through distribution channels which enable simple/quick comparison and purchase	BE	T	
O7	Wider access to a wider range of offers, through distribution channels which involve existing trusted partners (Chambers of Commerce, professional unions)			SC P

ID	Vision Statement 5 (Industry challenge): Focus Individuals			
Strength: What we have today and we do need				
S1	Awareness of the need for life-long learning/training	BE	T	
S2	Affordable infrastructure for access	BE	T	
Weakness: What we have today and we do not need				
W1	High-end, but expensive technology platforms		T	
W2	High-end HR and pedagogical frameworks that require a strong organizational infrastructure	BE		SC
Opportunity: What we do not have today and we need				
O1	Life-long training culture that effectively translates into acquisition of products/services	BE		
O2	Affordable offers which enable customers to easily choose between different professional training/learning services	BE		
O3	Affordable offers which enable customers to easily choose between between purchasing professional training/learning products/services and other products/services	BE		
O4	Range of offers with different combination of product/services	BE		
O5	Range of offers allowing the customers to move along the price/benefit curve of offers	BE		
O6	Range of offers from a greater number of providers, attracted by a critical mass in market volume	BE		
O7	Range of offers from a greater number of providers, supported by investors who find a return on capital at least as satisfactory as in other sectors and risk as low	BE		
O8	Wider access to range of offers from a greater number of providers, through distribution channels which enable quick and simple purchase	BE	T	

The overall view integrates both the global market approach as well as the aggregation of the differing approaches across these three market segments, with weaknesses in a given segment being a strength in another one and the need for simultaneous implementation.

ID	Vision Statement 5 (Industry challenge): Focus Aggregated			
Strength: What we have today and we do need				
S1	Limited market transparency	BE	T	
S2	High-end technology platforms		T	
S3	Increasingly accepted open standards in addition to commercial standards	BE	T	
S4	High-end pedagogical frameworks			SC
Weakness: What we have today and we do not need				
W1	Customers shut out from the market through evolution on the supply side	BE		
Opportunity: What we do not have today and we need				
O1	A better offer to enable the customer to make enlightened purchasing decisions – market transparency, wider in range by extending both up market and down-market	BE		
O2	A better offer to enable the customer to make enlightened purchasing decisions - market transparency, wider in range in terms of possible product mix	BE		
O3	A better offer to enable the customer to make enlightened purchasing decisions - market transparency, with an easily understood and adjustable price/benefit ratio	BE		
O4	A better offer to enable the customer to make enlightened purchasing decisions- market transparency, enabling the customer to move along the price/benefit ratio curve	BE		
O5	A better offer to enable the customer to make enlightened purchasing decisions -market transparency, coming from a greater range of providers	BE		
O6	A better offer to enable the customer to make enlightened purchasing decisions- market transparency, available through different, competing distribution channels, including passive or active brokers/marketplaces	BE	T	
O7	A better offer to enable the customer to make enlightened purchasing decisions- more cost effective: Through improved production processes	BE	T	
O8	A better offer to enable the customer to make enlightened purchasing decisions- more cost effective: Through more rational price setting practices by providers : spread the ROI across a greater number of customers	BE		
O9	Greatly increased adoption of professional training culture in SMEs before going into the specifics of technology enhanced professional training/learning	BE		SC
O10	Greatly increased adoption of professional training/learning outside companies in the perspective of life-long training			SC

O11	KISS : please keep it simple			SC	
O12	On-line open exchanges and market places	BE	T		
O13	Widespread adoption of Web 2.0 collaborative applications for content authoring and sharing		T		
O14	Increased interactivity, through entertainment industry quality, standards, simulations and immersive technologies		T		
O15	Rapid and cost effective design		T		
O16	Standards : shifting balance between open-source and commercial standards		T		
O17	Coherent IPR framework for content production and distribution across Europe going into operational details, beyond the EUCD and other directives				P
O18	Increased competitive advantage of technology-enhanced professional training vs other forms of professional training	BE			P
O21	Increased competitive advantage of technology-enhanced professional training/learning as an industry sector where investors can earn a satisfactory level of return on capital when compared with other industry sectors (ex: European entertainment industry)	BE			P

3.5.3 Assumptions – Preconditions

Assumptions:

- Users, both staff in SMEs and large corporations as well as individuals, have an increasing need for TEPL products and services, which translates into increased market volume and market value.
- Everyone, whether he is working in an organization, is self employed or is unemployed, has become a knowledge worker.
- TEPL market development does not depend on a single pedagogical approach or organizational model.

Pre-conditions:

There are no strong pre-conditions. Nevertheless, failure in implementing VS1 and VS6 would definitely mean that VS5 would be very difficult to achieve in two of the three market segments: SMEs and individuals

3.5.4 Nature of the Gap

This vision statement largely complements vision statement 1 “Learning anything, at any time, in any place” and vision statement 6 “Access to professional learning for all”. Building on the view that everyone will be a knowledge worker, it extends the consumer base to every individual, beyond the limits of existing companies and, therefore, significantly increases the importance of market dynamics, making TEPL similar to any other mature market, with offers targeted at a large range of different market segments and purchasing contexts. The gaps therefore involve a large number of deployment and implementation challenges, on the pedagogical, business and social levels.

In the *business area*, there is a strong need to bridge the digital divide that currently separates SMEs from large corporations and successfully develop access for individuals. IMC, with its Slidestar project, which addresses sharing of learning content by all, introduces a significant shift from its traditional approach and exclusive focus on the corporate LMS for large companies. If widely embraced by other providers, this shift would definitely speed up adoption by individuals and lead to substantially lower prices for SMEs for a wider ranges of services.

In the *technical field*, the challenges reside mostly on making available a greater range of services accessible to all at any time and in any location, at a price level acceptable to each market segment and at a cost which is sustainable by the producer. Current research, at the same time, will provide the basis for launching and extending the reach for high-end customized services, such as competency management.

In the *socio-cultural sphere*, effective adoption of life-long learning has not significantly taken off, yet, but is a strong challenge for European society as a whole to maintain its influence in the globalization process.

In the *political sphere*, extending the reach of TEPL is key to maintaining and improving Europe's competitive edge for the entire economy as well as to developing a European industry sector that can both compete with other global players and help sustain highly skilled jobs in Europe.

Gap analysis VS6

3.6.1 Description of Vision Statement 6

(Social inclusion): “Access to professional learning for all – extending the knowledge based society”.

The vision statement is closely linked to social inclusion as it is perceived in the context of knowledge based society. It embraces the various issues of eInclusion: Access Divide, Usage Divide, and Divide stemming from the quality of use. It views the different stages of Digital Divide through the dimensions of Access, eAccessibility & Usability, Service Development, Individual Capacity Building, Human & Social Capital, and Citizen Participation as well through the core Roadmapping sectors: Business Economics, Technical, Socio Cultural, and Political. The issues addressed by vision statement 6 are somewhat similar those addressed by the first vision statement, which is focusing on the individual knowledge worker, while unlike most other visions, this vision statement focuses on societal issues. The focus and the complexity of eInclusion make it impossible to isolate those components of eInclusion that are inherently related to TEPL for the study. Moreover, the concept of eInclusion has not been discussed in previous Prolearn deliverables, therefore the chapter ‘vision statement analysis’ includes a lengthy introduction to concept of eInclusion. The aim of the vision is to ensure that the current knowledge workers, the potential knowledge workers, and the future knowledge workers are able be part of a society that fulfills the criteria expressed by recent European policies and strategies related to the knowledge based society and/or information society.

Goals:

1. To promote e-inclusion and equal opportunities for all
2. To provide the needed support for SMEs to ease the first steps in the acquisition of professional leaning
3. To provide ubiquitous access to multiple channels to information and the knowledge needed to filter, understand and use the information

Vision statement analysis (Supporting Factors)

The Context: Social exclusion, eInclusion, and the digital divide

Social exclusion is a social process built on social inequalities and leading to the marginalisation of individuals and groups as regards shared societal goals. Definitions often include e.g. living standards and income, integration in labour market, educational opportunities. Social Inclusion is a strategy to combat social exclusion, but it is not making reparations for past wrongs as in Affirmative Action. It is the coordinated response to the complex system of problems that are known as social exclusion. The term exclusion involves the concept of being deprived of the economic and social capabilities and opportunities to participate in society. It implies a meaning of dichotomy – being included or excluded – as does the term "divide". It should be emphasized that in reality no such dichotomy exists but a continuous structure in society with different existing but hard-to-define demarcations.

The term eInclusion is a concept about the disparities in terms of citizens' participation in the Information Society. It reflects the "e"-component in processes of social integration. The eEurope Advisory Group has defined eInclusion as follows¹:

"e-Inclusion refers to the effective participation of individuals and communities in all dimensions of the knowledge-based society and economy through their access to ICT. ... Further, e-Inclusion refers to the degree to which ICTs contribute to equalising and promoting participation in society at all levels. ... The digital divide measures the gap between those who are empowered to substantially participate in an information and knowledge-based society, and those who are not."

Recently, emphasis in digital divide research has turned from mere access figures to disparities in skills at using ICT and in benefits deriving from ICT (e.g. de Haan 2003). Evidence has been found, that while access and use equalises within and between some countries, major gaps in skills and benefits remain. Slizard Molnar has developed a model of successive stages of the digital divide. Molnar's model² suggests that three broad types of digital divide can be identified, each associated with different adoption stages of technology or diffusion of innovations. (i.e. Early Adaptation, Take-off and Saturation).

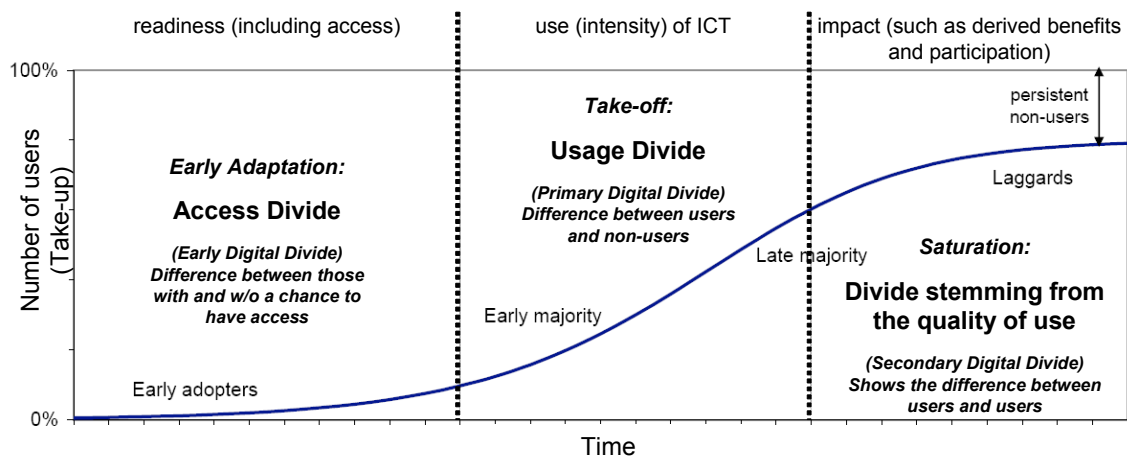


Figure 12: Explanation Frame of the Digital Divide, Molnar (2003)

The diffusion of innovations usually follows an S-curve of adoption. In the early adaptation phase, a minority of some early adopters take up the new technology. Growth in user figures is rather low due to high prices, insecurity about functionality and standards and poor diffusion of knowledge about the innovation. Once prices fall and these insecurities vanish, take-off begins to gain velocity and the large majority of early users and late users become involved. Once a saturation level is approaching, only a small group of late adopters or laggards is still left uninvolved and growth rates decline again.

Since diffusion and adoption are dependent on a range of social, cultural and economic factors the model also suggests that the three main digital divide 'modes' will further reflect configurations of these variables, including gender, age,

¹ Kaplan, Daniel (2005): eInclusion. New Challenges and Policy Recommendations.

² Molnar, S (2003) "The Explanation Frame of the Digital Divide", Proceedings of the Summer School, "Risks and Challenges of the Network Society", 4-8 August 2003, Karlstad University, Sweden

geographical location, income and ethnicity. The table below presents a set of influential social, cultural and economic variables for the three modes of the digital divide. Interestingly, the Molnar model does not make explicit reference to disability as a key variable affecting access, usage and/or quality of use.

Variable	Access	Usage	Quality
Geography	X		
Income	X	X	X
Education	X		X
Ethnicity	X		
Gender	X		X
Age	X	X	X
Period of use			X

Table 2: Influence of social, cultural and economic variables on digital divide modes³

Mapping of European eInclusion Initiatives

In their study “Status of eInclusion measurement, analysis and approaches for improvement” Cullen, Hadjivassiliou and Junge mapped 160 eInclusion initiatives, both trans-national and Member State. The review argued that the ‘quality of use’ dimension could be sub-divided into three distinctive types (citizen participation; social capital and service development). However, the review concluded that the detailed picture is more complex. As Molnar suggested, the three digital divide ‘stages’ in reality show considerable overlap. This conclusion was supported by the mapping exercise. Furthermore the ‘multi-dimensionality’ of eInclusion approaches seems to be more of a norm than an exception, and this undermines the commonly held view that Member States can easily be positioned on a continuum – from ‘infrastructure’ through ‘usage’ to ‘quality’. The model proposed by Cullen, Hadjivassiliou and Junge and used for the classification of eInclusion initiatives comprises of the following six dimensions:

- **Access** is about providing access and ensuring availability of broadband, access and information infrastructure, all of which were prerequisites for e-Inclusion. Availability of Internet, and of Internet access devices, Location of Internet access, Connectivity speed, Availability of broadband, Broadband coverage & uptake, Internet Costs; PIAP – public access to the Internet. A recent survey carried out by Itech suggested that of those who had no access to the Internet in 1996, 40% expressed a wish to get connected. By 2004, this proportion had diminished to only 20%. The issue of the access divide is likely to persist as new technologies and advanced online services enter the market and raise new questions of who has access and who has not. For example, in 2005, broadband was available to about 60% of businesses and households in rural areas of the EU-15, but to more than 90% in the urban areas, with the gap being even greater in the New Member States⁴.
- **eAccessibility & Usability** (Accessibility, Design for All): refers to the degree at which the mediating technologies employed enable the service’s addressees to access the service in question. eAccessibility can be understood as a function of a number of - not necessarily disability related - aspects including , e.g., findability (the ease with which the service can be located), affordability (the

³ J. Cullen, K. Hadjivassiliou, K. Junge, “Status of eInclusion measurement, analysis and approaches for improvement – Topic Report 2: Review of initiatives undertaken outside EU institutions” Tavistock Institute, August 2006

⁴ Bridging the Broadband Gap, COM (2006) 129 final, Brussels, 20.3.2006

degree to which the addressees can afford the cost for accessing/using the services in question), time independence (the extent to which the service is accessible at any time when demand occurs) or platform independence (the extent to which the service is accessible through various alternative hardware/software systems). The actions promoting eAccessibility may include: standards / guidelines, education / skills / technical assistance, awareness raising, market encouragement, financial measures targeting costs / affordability, consumer empowerment, monitoring and evaluation, digital rights management, RTD and assistive technology services.⁵

- **Service Development** in particular with a view to providing relevant content (eGovernment, eServices, public services): the issue of service development sits in between the primary and secondary digital divide. Where measures are primarily focused on service provision and improving the relevance of the content, they fall within measures to address the usage divide. Where activities go beyond information provision (and are moving towards greater interactivity) they are measures aimed at addressing divides stemming from the quality of use. One core features of 'good practice' approaches to service development is ensuring multi-channel delivery as this ensures that people unable to use ICTs will not be excluded from public services. Multi-platform delivery of services includes e.g. the mobile phone and face-toface contact with service providers.
- **Individual Capacity Building** (which can also include building human capital): In consistency with the economic approaches to tackling social / digital exclusion aim at ensuring that all members of society are able to participate in an increasingly demanding labour market, in particularly the most vulnerable groups. Translated into the digital exclusion field, this would encompass policies and measures aimed at providing individuals, and in particular those groups particularly at risk form exclusion, with ICT skills and also those measures that link digital literacy with employment measures.
- **Human & Social Capital** (Peer-to-Peer networking, Communities of Practice, Social Software): promoting human and social capital in terms of supporting different types of peer-networks as well as bottom-up approaches and learning environments. eInclusion is in that way seen as addressing contextual settings, socio-cultural issues and their balance. eInclusion is contributing to the development of social capital, for example through the expansion of social-networking via Web 3.0 into community-based support networks.
- **Citizen Participation:** eDemocracy or eGovernment activities and are still in an exploratory phase. Projects or initiatives aiming at using ICTs to engage citizens in democratic processes are still relatively rare; eVoting is probably the furthest advanced. In addition, there is a distinct policy shift towards enhanced citizen participation in terms of creating interesting content and enabling citizens to participate in issues they are interested in as well as in interactions with policy makers, government (central, regional, local), etc. eInclusion is considered to be closely linked to issues of motivation and active empowerment. Citizen participation in an eDemocracy, as well as the IS in general, requires a high degree of motivation to engage in public life and with new technologies. However, digital demotivation is an increasingly important issue in the EU.

⁵ "Analytic framework - eInclusion and eAccessibility priority issues" Deliverable 1.1. of the project: "Strengthening eInclusion and eAccessibility across Europe" (IST-502553), October, 2004

European Policy Perspective

Already in 2000, the Lisbon strategy included the objective to ensure that all citizens are capable to live and work in an Information Society. eInclusion in this regard was considered as one of the constituents and social dimensions of the development of the knowledge based society, overall inclusion and cohesion policies. As a part of the Lisbon strategy the eEurope action plan (2002 until 2005) contained a dedicated eInclusion action line, which aimed at enhancing a “design for all” and “public Internet access points”. Within eEurope 2005 the fields e-government, e-health and e-learning as well as e-skills and digital literacy required to use ICT were accentuated. The i2010 programme is characterised as the digital economy component of the revised Lisbon strategy for growth and jobs. i2010 introduces “inclusion, better public services and quality of life”. An Information Society that is inclusive provides high quality public services and promotes quality of life. Emphasis is placed on digital literacy as well as on public services.

In the Ministerial Riga Declaration on eInclusion a definition of what is to be understood as eInclusion is given and the current policy challenges are described: “eInclusion” means both inclusive ICT and the use of ICT to achieve wider inclusion objectives. It focuses on participation of all individuals and communities in all aspects of the information society. eInclusion policy, therefore, aims at reducing gaps in ICT usage and promoting the use of ICT to overcome exclusion, and improve economic performance, employment opportunities, quality of life, social participation and cohesion⁶.

The project “Benchmarking in a Policy Perspective” was started by the European Commission in January 2006 with the aim to carry out an in-depth analysis of the results of the annual Information Society Surveys of households and enterprises and to relate them to a number of specific themes. The project published a report⁷ on eInclusion in December 2006. The report presents the following conclusions drawn for measurement of eInclusion in citizen surveys:

- Policy concentrates on **at-risk groups** to prevent that disadvantaged people and disadvantaged groups are left behind in the information society. A key factor is to enable all citizens to keep up with technological developments that affect their daily life and their employment prospects
- Disadvantages can be related to differentials in **access, bandwidth, skills and digital media literacy, service usage and quality of usage** of new services and information and communication technologies
- Disadvantages also entail **regional disparities** in ICT access across the EU. Policy aims to enhance the availability of access, especially broadband access in under-served locations in order to bridge the broadband gap.

⁶ Riga Ministerial Declaration in June 2006.

http://europa.eu.int/information_society/events/ict_riga_2006/doc/declaration_riga.pdf

(accessed in July 2006) and

<http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/769&format=HTML>

⁷ empirica, “Benchmarking in a Policy Perspective – Report No. 5: eInclusion”, Gesellschaft für Kommunikations- und Technologieforschung mbH, December 2006,

National eInclusion Policies

The above mentioned study⁸ “Status of eInclusion measurement, analysis and approaches for improvement”, that had mapped 160 eInclusion initiatives concluded in a set of key trends in policies, as well as listed opportunities, technologies and challenges. Those are quoted below.

The key trends in national eInclusion policies:

- A progressive shift from an initial focus on infrastructure/access issues to the promotion of eSkills to accessibility issues to the development of online services and applications to greater focus on digital content to increased emphasis on e-participation, e-Democracy and active citizenship;
- the aim to provide equal access for all to broadband digital networks;
- support for the development of an inclusive IS, in that specific measures are being targeted at specific at-risk groups;
- ICTs seen as key to individual capacity building, human and social capital creation and enhanced citizen participation and engagement;
- ICTs seen a key to economic and industrial local development;
- Balanced regional planning in terms of broadband and related services availability
- “Opening” of rural and less developed regions to the world through ICTs
- Search for exemplary solutions and for business model that can meet both public and private needs, e.g. through the promotion of public private partnerships (PPPs)
- Community and Voluntary Sector increasingly seen as key in reaching at-risk groups
- Increased diversification of the target groups in terms of developing solutions/approaches that are relevant to specific user requirements.
- Taking appropriate regulatory measures, e.g. ensuring that access costs are low
- The need for a multi-channel and in some case mediated access of services, including face-to-face contact with service providers is acknowledged
- Provision of financial incentives, e.g. cash bonuses, loans at privileged rates, etc. for the purchase of ICT equipment
- Emphasis on improving home access to ICT as a way of promoting inter-generational ICT-related learning.

⁸ J. Cullen, K. Hadjivassiliou, K. Junge, “Status of eInclusion measurement, analysis and approaches for improvement – Topic Report 4: Recommendations for future action”, Tavistock Institute, February 2007

The opportunities for promoting an inclusive knowledge society⁸:

- Providing greater access to more consumers for a wider diversity of consumer products, services and choices
- Supporting a more effective role for consumers in the development of new products and services, and greater control over quality, utility and relevance
- Providing opportunities for the harnessing and utilization of the creative potential of people in the innovation process, and creating conditions for wider and more effective entrepreneurship
- Supporting and encouraging individual self-determination, self-expression and more effective social interaction, through social networking
- Contributing to the development of social capital, for example through the expansion of social-networking via Web 3.0 into community-based support networks
- Increasing participation in decision-making, and thereby supporting increased motivation to participate in democratic processes and a more 'participative culture'
- Supporting participative culture through the expansion of e-government infrastructure
- Reinforcing and enhancing democratic structures, for example through providing more open scrutiny and critical review of government agencies and actions
- Contributing to improving the knowledge base, and the skills base, by promoting knowledge creation, knowledge sharing and acquisition of new skills, through both formal and non-formal learning

Technologies to promote inclusion⁸:

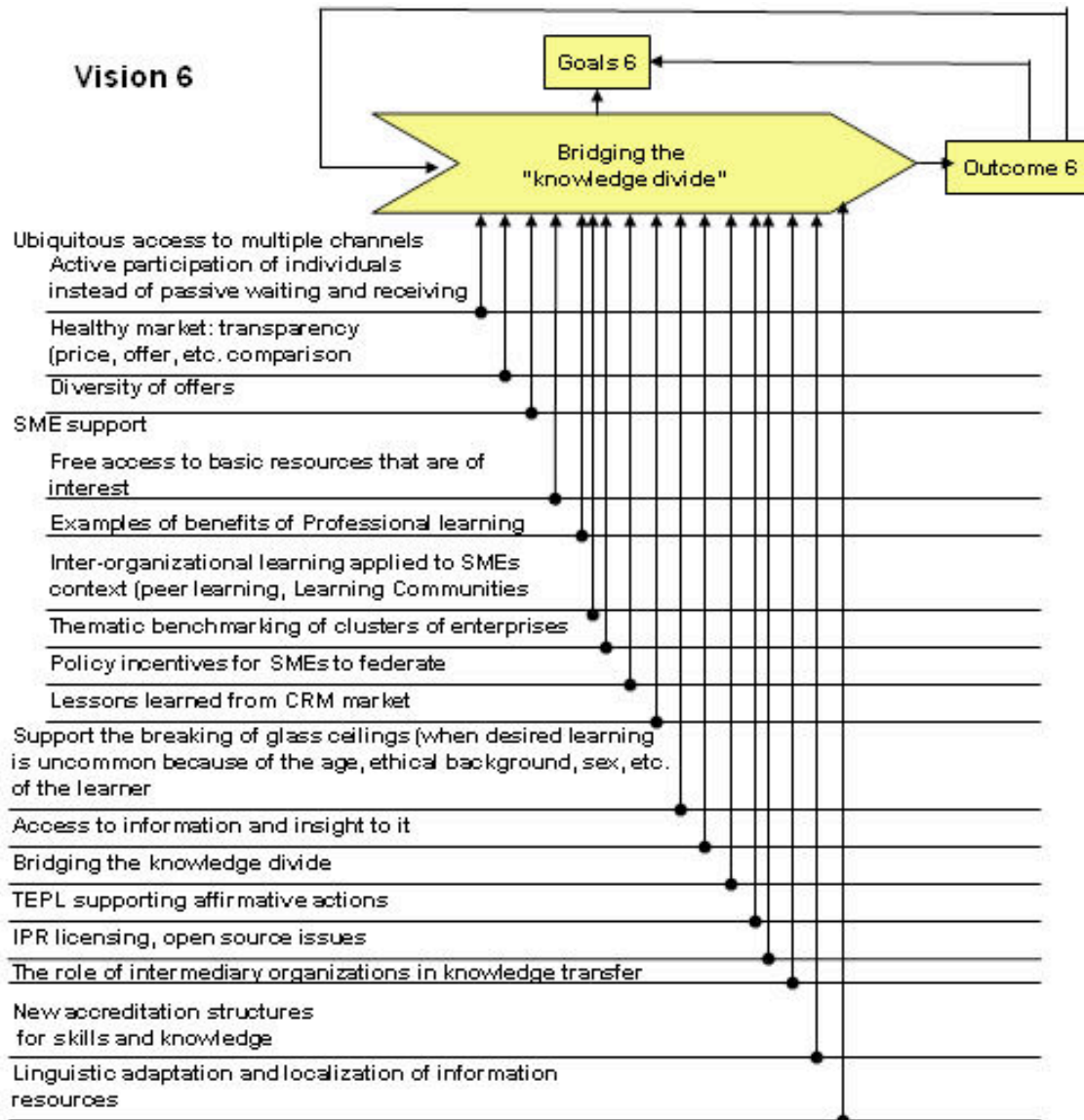
The major development is likely to be a movement away from targeting 'special needs' groups and scenarios, and developing customized services, to a more generic focus on 'customisation and flexibility'.

- Infrastructure and tools that promote flexible computer interactions
- Natural language and speech recognition
- Built-in seamless customization that follows a computer user wherever he or she goes
- The possibilities for an improved user experience for assistive technology

Key challenges for eInclusion⁸:

The main challenges posed by these developments are likely to focus on:

- Increasing polarization of e-included and e-excluded, linked to factors such as real and opportunity cost
- Cultural and social fragmentation
- Surveillance and control



3.6.2 SWO Analysis

(BE=Business Economics, T=Technical, SC=Socio Cultural, P=Political)

Strength: What we have today and we do need					
ID	Vision Statement 1 (IST challenge)	BE	T	SC	P
S1	emphasis on the importance of individuals own initiative in LL				P
S2	rapidly evolving Web2.0 applications contribute to the increasing availability of meaningful information resources	BE	T	SC	
S3	social networking and community tools (Web2.0) to support inter-organisational learning of SMEs		T		
S4	various national and European initiatives have existed for decades for SME support			SC	P
S5	affordable equipment and access to networks; good infrastructure in most areas		T		
S6	promotion of digital literacy skills				P
S7	alternative licensing schemes e.g. Creative Commons			SC	
S8	rapidly increasing use of Web-based services	BE	T	SC	P
S9	ongoing HR XML standardization work		T		
S10	digital portfolios		T		
S11	European Qualifications Framework (EQF)				P
S12	Adult education models are under preparations at HEIs			SC	P
S13	Dynamic and semantic Web technologies; human centered intelligent and dynamic systems		T		
Weakness: What we have today and we do not need					
ID	Vision Statement 6 (Social Inclusion)	BE	T	SC	P
W1	tools and support for individuals to manage their professional learning			SC	P
W2	IMPATIENCE: increased reluctance to work for learning			SC	
W3	Learning service providers focus predominantly on non-formal learning only	BE			
W4	training and professional learning is considered as an expense instead of as an investment to productivity			SC	
W5	majority of the SMEs are operating in local level and view their peers are competitors, while the most important competition often comes outside of Europe			SC	P
W6	various national and European initiatives for SME support are poorly coordinated and overlapping, making use of resources spent ineffective			SC	P
W7	several regions in Europe still lack access to broadband		T		
W8	the difference between those who have and those who do not have is increasing (access to equipment, networks and services)			SC	P
W9	national associations of professionals have protectionistic policies and attitudes that hinder the mobility of European professionals			SC	
W10	Proprietary training patterns are still more effective than open source	BE		SC	

Opportunity: What we do not have today and we need					
ID	Vision Statement 6 (Social Inclusion)	BE	T	SC	P
O1	Learning to learn skills are the key to successful lifelong learning			SC	P
O2	innovative approaches for promoting the desired informal learning	BE			
O3	business models for Web2.0 services				
O4	TEPL related Web2.0 applications/services	BE	T	SC	
O5	public private partnerships for the promotion of open content				P
O6	services for supporting peer-learning in a large scale – the successful existing social software applications focus on other areas	BE			
O7	support (and tools) for SMEs in prioritation of actions	BE			P
O8	affordable Web-based services (CRM, Competency Management)	BE	T		
O9	technology solutions for anonymisation of sensitive (personal/business) data	BE	T		
O10	change of attitudes and policy incentives encouraging SMEs to federate locally and sectoral in order to form communities for learning, knowledge creation (bench-learning)			SC	P
O11	strong promotion of digital literacy skills addressing all age groups				P
O12	policy incentives for initiatives that would offer access to TEPL for disadvantage groups				P
O13	brokerage services for TEPL	BE			
O14	standardised competency descriptor systems Skills, Knowledge and performance	BE			
O14	ontology based models for flexible competency frameworks that would enhance the portability of competency descriptions and make them interchangeable between various systems		T		
O15	digital portfolios	BE	T	SC	
O16	reputation management of accreditation bodies			SC	P
O17	EQF linked to the national frameworks, national frameworks; framework for knowledge work			SC	P
O18	ECTS model extended for professional learning defining the levels of certificate, diploma and masters programmes in adult education; accreditation structures for learning achievements through informal learning for knowledge work.			SC	P
O19	learner centered adaptive environments; and learning-oriented rule based expert systems		T		

3.6.1 Assumptions – Preconditions

Assumptions

The SWO analysis focuses on eInclusion issues that are mostly related to concrete TEPL issues. Therefore the assumption for the realization of the overall goal of the vision requires that the main challenges, as identified previously, do not produce major obstacles for sustainable Knowledge Based Society development:

- Increasing polarization of e-included and e-excluded, linked to factors such as real and opportunity cost
- Cultural and social fragmentation
- Surveillance and control

The approach also assumes that lifelong learning will maintain its priority on political agenda, and learning as such will continue to be considered an activity that contributes to personal fulfillment as well better competitiveness. In addition many of the currently prevailing trends affecting TEPL today will continue:

- shortening the value-chain
- increased affordability of personalisation
- increased individualisation
- shortening response time of the system
- the rapid development and increase in popularity of peer to peer and many-to-many applications will continue
- success means different things to different people

Preconditions

The SWO analysis focuses on eInclusion issues that are mostly related to concrete TEPL issues. Therefore the precondition for the realisation of the overall goal of the vision requires that the desirable opportunities for enhancing eInclusion in the Knowledge Society as a whole, as listed previously, are being realised:

- Providing greater access to more consumers for a wider diversity of consumer products, services and choices
- Supporting a more effective role for consumers in the development of new products and services, and greater control over quality, utility and relevance
- Providing opportunities for the harnessing and utilization of the creative potential of people in the innovation process, and creating conditions for wider and more effective entrepreneurship
- Supporting and encouraging individual self-determination, self-expression and more effective social interaction, through social networking
- Contributing to the development of social capital, for example through the expansion of social-networking via Web 3.0 into community-based support networks
- Increasing participation in decision-making, and thereby supporting increased motivation to participate in democratic processes and a more 'participative culture'
- Supporting participative culture through the expansion of e-government infrastructure
- Reinforcing and enhancing democratic structures, for example through providing more open scrutiny and critical review of government agencies and actions
- Contributing to improving the knowledge base, and the skills base, by promoting knowledge creation, knowledge sharing and acquisition of new skills, through both formal and non-formal learning

3.6.4 Nature of the Gap

In the *business* area The strengths and several opportunities are relying on the development of Social Web applications and the potential that they possess especially for hosting communities of practice type of collaborative knowledge creation and sharing entities. The development of IT and Web-based services is expected to enable application service provision of services that today are common only within proprietary corporate systems. The main weaknesses relate to the old fashioned view of training as an expense and as an activity that is only weakly linked to the actual business processes. Such attitudes may prove difficult to overcome, yet they are obstacles on the way towards exploiting the potential of TEPL in full.

The *technical* field will have to cater the needs and expectations arising from the business and most of all the users with increasing demands and expectations for the Web-based services. The main challenges in standardisation will be in the area of competency, skills, and knowledge. Mobile devices and convergence will make mobile work possible for majority of knowledge workers. This will further blur the line between work and leisure. Access to broadband will become commonly available, even in the new member states and rural areas.

From the *Socio-cultural* perspectives the good news for the knowledge worker will come in the form of systems that recognise learning achievements resulting from informal learning, as well as non-formal and formal. The achievements and competences will be documented in his e-portfolio in format that can easily be understood by potential employers/clients/peers/etc, thanks to standardised representation. Majority of young professionals will not have the luxury of long term employment contracts. They will work on short term project assignments and they may have more than one employer/client at one time. So called portfolio workers will need career counselling, mentoring, and networks for other types of peer-support. Unfortunately those services do not develop at the pace of the demand.

In the *political* sphere the challenge will continue to come from the rapid changes resulting from the evolution of ICT application and digitalisation of everything. How maintain sustainable eInclusion, social inclusion, eAccess etc. development and competitiveness of the Europe. In the education and training arena legislation and regulatory frameworks are needed for the protection of privacy, harmonisation of qualifications frameworks and systems for recognising the learning achievements resulting from informal learning.

References:

K. Abrahamsson, FAS M. Engwall, (2006) VINNOVA, "In Search for Innovative Work Organizations in Transition", Papers presented as background material to the WIN-EF-NCPP- Workshop, Dublin, March 23-24, 2006, WORK-IN-NET project, <http://www.workinnet.org>

Terry Anderson, Denise Whitelock, (Eds., 2004), "The Educational Semantic Web: Visioning and Practising the Future of Education. Journal of Interactive Media in Education", Special Issue, (1) (2004), <http://jime.open.ac.uk/2004/1/>

D. Burgos, C. Tattersall and R. Koper (2006a), "Representing adaptive eLearning strategies in IMS Learning Design", International Workshop in Learning Networks for Lifelong Competence Development, TENCompetence Conference, Sofia, Bulgaria.

D. Burgos, C. Tattersall and R. Koper (2006c), "Re-purposing existing generic games and simulations for e-learning", Computers in Human Behavior.

A. Cristea, "what the Semantic Web do for Adaptive Educational Hypermedia", Educational Technology & Society, 7(4), 40-58

CEN Workshop Agreement "European ICT Skills Meta-Framework – State-of-the-Art Review, Clarification of the Realities and Recommendations for Next Steps", CEN/ISSS, (February 2006), <ftp://ftp.cenorm.be/PUBLIC/CWAs/e-Europe/ICT-Skill/CWA15515-00-2006-Feb.pdf>

CETIS – Centre for Educational Technology Interoperability Standards / Liber, Oleg (2005), "PLE Project Summary", 4 October 2005, http://www.cetis.ac.uk/members/ple/resources/ple_summary

J. Cullen, K. Hadjivassiliou, K. Junge, T. Fischer, "Status of e-Inclusion measurement, analysis and approaches for improvement – e-Inclusion Handbook Version" Tavistock Institute, February 2007, from http://ec.europa.eu/information_society/eeurope/i2010

J. Cullen, K. Hadjivassiliou, K. Junge, "Status of eInclusion measurement, analysis and approaches for improvement – Topic Report 2: Review of initiatives undertaken outside EU institutions" Tavistock Institute, August 2006, from http://ec.europa.eu/information_society/eeurope/i2010

J. Cullen, K. Hadjivassiliou, K. Junge, "Status of eInclusion measurement, analysis and approaches for improvement – Topic Report 4: Recommendations for future action", Tavistock Institute, February 2007, from http://ec.europa.eu/information_society/eeurope/i2010

D. Dazzi, M. Hancock, V. Telljohann, (2005) "Report on Regional Research programmes on work and Labour Innovation", Workshop in Bologna, 9-10 May 2005, WORK-IN-NET project, <http://www.workinnet.org>

Definition and Selection of Competencies: Theoretical and Conceptual Foundations, OECD Project DeSeCo. http://www.oecd.org/document/50/0,2340,en_2649_201185_11446898_1_1_1_1,00.html

S., Downes, "E-learning 2.0", ACM eLearn Magazine, Article. Last retrieved April 19, 2007, from <http://elearnmag.org/subpage.cfm?section=articles&article=29-1>

Stephen Downes (2005), "A panorama of trends: E-Learning 2.0", 10 June 2005, <http://www.downes.ca/files/edmonton.ppt>; in article format <http://elearnmag.org/subpage.cfm?section=articles&article=29-1>

Erik Duval, / Wayne Hodgins, (2004), "Making metadata go away: Hiding everything but the benefits", Keynote address at DC-2004, Shanghai, China (October 2004), http://www.slais.ubc.ca/PEOPLE/faculty/tennis-p/dcpapers2004/Paper_15.pdf

P.F. Drucker, (1994), "the Theory of Business", Harvard Business Review, September/October 1994, pp. 95-104.

eLIG – European eLearning Industry Group (2005), "i2010: Fostering European eLearning Content to Make Lisbon a Reality", 20 October 2005, <http://www.elig.org/downloads/i2010%20Fostering%20European%20eLearning%20Content.PDF>

empirica, "Benchmarking in a Policy Perspective – Report No. 5: eInclusion", Gesellschaft für Kommunikations- und Technologieforschung mbH, December 2006, from http://ec.europa.eu/information_society/eeurope/i2010

European Commission, DG Education and Training (2004), Implementation of the "Education and Training 2010" Work Programme, Working Group B: Key Competences. Key Competences for Lifelong Learning: a European Reference Framework (November 2004), <http://europa.eu.int/comm/education/policies/2010/doc/basicframe.pdf>

European ODL Liaison Committee (2006), "Learning Innovation for the Adapted Lisbon Agenda", Policy Paper (3 May 2006), http://www.odl-liaison.org/pages.php?PN=policypaper_2006

J. T. Guthrie, (1983), "Equilibrium of literacy", Journal of Reading, Nicholson, B. 1997. Inconspicuous Inequities: The Myth of Universal Access. <http://www.cssjournal.com/nicholso.html>

Jos De Haan, "IT and Social Inequality in The Netherlands", IT & Society, Volume 1, Issue 4, Spring 2003, Pp. 27-45, Stanford University

Rachel Heery, / Andy Powell, (2006), "Digital Repositories Roadmap: looking forward", A UKOLN report produced for JISC, Vol. 15 (4 July 2006), http://www.jisc.ac.uk/uploaded_documents/rep-roadmap-v15.doc

i2010, "A European Information Society for growth and employment", The European Commission's strategic framework for the information society, 2005-2010.

i2010 – First Annual Report on the European Information Society, Brussels, 19.5.2006, COM (2006) 215 final

ICT and e-business skills and training in Europe, "Synthesis report", Cedefop, (September 2004), <http://ec.europa.eu/enterprise/ict/policy/doc/cedefop-2004-09-fsr.pdf>

H. Jenkins et al., (2006), "Confronting the challenges of participatory culture", MacArthur Foundation, 2006.

Journal of Educational Technology & Society, published by International Forum of Educational Technology & Society, Endorsed by IEEE Technology Task Force, October 2003, Volume 6, Number 4, <http://ifets.iee.org/periodical>

M. Klann, (2003) "The EUD-Net's Roadmap to End-User Development", Workshop on End User Development at ACM CHI 2003 Conference, Fort Lauderdale, USA.

Lefrere P (2007), "Competing Higher Education Futures in a Globalising World", European Journal of Education 42(2), pp 201-212

S. Molnar, (2003) "The Explanation Frame of the Digital Divide", Proceedings of the Summer School, "Risks and Challenges of the Network Society", 4-8 August 2003, Karlstad University, Sweden

"Mobile Multimedia Services", (2004), BT Technology Journal, Springer Netherlands, Vol. 21, Number 3, November 2004

Alfred Nordmann Rapporteur, (2004), "Converging Technologies – Shaping the Future of European Societies", Report, Converging Technologies for a Diverse Europe, 14-15 September 2004, Brussels, Belgium.

Wole Oyekoya, Sira Group "MANAGING MULTIMEDIA CONTENT A TECHNOLOGY ROADMAP", Report presenting an emerging technology roadmap for a long-term plan of multimedia indexing and retrieval systems, 08 April 2005

Salero project, D5.2.1 "Multimedia Analysis and Representation Techniques and Research Roadmap", Version of 2006-09-14

E. Schmar-Dobler, (2003), "Reading on the Internet: The link between literacy and technology", Journal of Adolescent & Adult Literacy, 47(1). http://www.readingonline.org/newliteracies/lit_index.asp?HREF=/newliteracies/jaal/9-03_column/

Peter Senge, (1990), "The Fifth Discipline: The Art & Practice of the Learning Organization", Doubleday/Currency

Peter Senge, *et al.* (1994): "The Discipline Fieldbook: Strategies and Tools for Building a Learning Organization", Doubleday/Currency

James Stewart, Robin Williams, (1998), "The co-evolution of society and multimedia technology: issues in predicting the future innovation and use of a ubiquitous technology", Originally published in Social Science Computer Review 1998, 16(3). Updated August 1999.

Synthesis Report of the European e-Skills Forum: "E-Skills in Europe: Towards 2010 and Beyond, September 2004, <http://ec.europa.eu/enterprise/ict/policy/doc/e-skills-forum-2004-09-fsr.pdf>

OECD–CERI (2006), “Notes from Expert Meeting on Open Educational Resources”, Malmö, Sweden (6-7 February 2006),
<http://www.oecd.org/dataoecd/12/46/36162143.pdf>

OLCOS Roadmap 2012, Open Educational Practices and Resources, 2006,
www.olcos.org

Tim O’Reilly, (2005), “What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software”, 30 September 2005,
<http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>

Robin Rice (2002), “Barriers to Evidence-based Learning: A Survey on the Use of National Data Resources in Learning and Teaching”,
<http://datalib.ed.ac.uk/projects/datateach.html>

Will Richardson (2006b), “The New Face of Learning. What happens to time-worn concepts of classrooms and teaching when we can now go online and learn anything, anywhere, anytime?”, October 2006
http://www.edutopia.org/magazine/ed1article.php?id=Art_1648&issue=oct_06

Indrit Troshani, Bill Doolin, (2005), “Drivers and Inhibitors Impacting Technology Adoption: A Qualitative Investigation into the Australian Experience with XBRL”, 18th Bled eConference eIntegration in Action Bled, Slovenia, June 6 - 8, 2005

Scott Wilson (2005), “Learning Resources: a (personal) educational view from UK HE” (3 October 2005),
http://www.knownet.com/writing/elearning2.0/entries/scott_wilson_on_using_resources

Marleen Wynants, / Cornelis, Jan (Eds., 2005), “How Open is the Future? Economic, Social & Cultural Scenarios inspired by Free & Open-Source Software”, Crosstalks & VUB Brussels: University Press,
http://crosstalks.vub.ac.be/publications/Howopenisthefuture/howopenfuture_CROSSTALKSBOOK1.pdf

C. Zettel, (2006), “European Programmes and activities on work-oriented innovations”, Joint Secretariat of WORK-IN-NET project, 2006,
<http://www.workinnet.de>

Annex 1

Cap analysis Templates

VISION 1 (template A)						
SF1 (support factor 1)	Short description	Evaluation	B/E	T	SC	P
What we have today and need for the future <i>Strengths</i>	S1		x			
	S2					
				
What we have today and we don't need for the future <i>weaknesses</i>	W1				x	
	W2					
	W3					
What we don't have today and we need for the future <i>opportunities</i>	OP1					x
	OP2					
	OP3					

VISION 1 (template B)					
SF1 (Vision 1)	Short description	B/E	T	SC	P
Identify GAP according to the analysis in template (A)	(GAP 1)				
Assumptions			x		
Preconditions					x
Identify GAP according to the analysis in template (A)	(GAP 2)				
Assumptions		x			
Preconditions				x	