INNOVATION, SKILLS AND JOBS

Pilot-project
to develop a European foresight methodology
to identify emergent jobs and their skills needs

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I. INNOVATION, SKILLS AND JOBS

1. General Background

The purpose of this project is to put a stronger focus on **new jobs for Europe**, by encouraging a more effective interaction between innovation, skills development and jobs creation. This should contribute to fostering the implementation of the European strategy for growth and jobs.

The renewed Lisbon strategy is now in implementation using enhanced political and financial instruments:

- the integrated guidelines for growth and jobs and the national reform programmes adapting them to the national specificities;
- the new cohesion guidelines and the national strategic frameworks for structural funds;
- the Lisbon Community programme encompassing the legislative and the political initiatives as well as the new generation of thematic Community Programmes, notably for research, competitiveness and lifelong learning;
- the revised Stability and Growth Pact and State aids as well as the new instruments launched by the European Investment Bank.

In the meantime, the global landscape is changing. The emergence of new competitive players coupled with more evident ageing trends should fully be taken into account by the Lisbon strategy, but its approach remains valid and becomes even more urgent – this was the position adopted by the Spring European Council, when making the mid-term review in 2005. "Europe must renew the basis of its competitiveness, increase its growth potential and its productivity and strengthen social cohesion, placing the main emphasis on knowledge, innovation and the optimisation of the human capital" (Council 7619/05, §5). Fostering growth and jobs by stepping up the transition to a knowledge-intensive society remains the central direction. In the same line, the Spring European Council of 2006 has called for a comprehensive approach to innovation as a main driver for growth and jobs (Council 7775/06, §22).

Hence, the restructuring processes underway in Europe should be placed in this broader context of redeploying the European economy to new

activities with more added-value and providing new and better jobs. In order to be successful, this redeployment should be underpinned by a more strategic management of human resources, encouraging a more dynamic and future-oriented interaction between labour supply and demand. Otherwise, there is the risk that bigger shortages, gaps and mismatches of skills will coexist with structural unemployment.

2. Restructuring Process and Jobs Creation

The activities of the European Restructuring Forum should not only take stock of the problems, but also develop the possible solutions. From the social, economic and political view point, it seems particularly important to identify new possibilities of jobs creation in terms of new economic activities, new occupational profiles and new skills. This concerns the core theme of the Lisbon Strategy: to foster growth and employment by redeploying the European economy to new areas of investment and jobs creation.

Improving the management of the restructuring process requires evolving (see Table 1):

- from the traditional passive approach which puts the focus on reducing the social impacts of the restructuring process. This is necessary but not sufficient;
- to the active approach, which involves various instruments of the active labour market policies and of the regional development policies. This is also necessary, but not sufficient;
- and to a pro-active approach which mobilizes the several instruments of the innovation policy, in a good mix with trade, competition, employment and training policies, in order to create stronger framework conditions for more and better investments and jobs. Taking into account the current trends for rapid change in the global economy, this approach should be urgently developed.

The purpose of this project is to provide strategic information for the various actors which should take initiative in order to make better use of these opportunities, notably: big, small and medium enterprises, education and training institutions, local authorities, employment services, business support services, social partners, financial institutions, which should be encouraged to develop partnerships for change with this purpose.

The final outcome of this project can be a useful infrastructure to support the strategic management of human resources in Europe. The European Union needs a more powerful infrastructure of this kind.

TABLE 1
Managing Industrial Change – Levels and Stages

Stages / Levels	Passive	Active	Pro-active
Company	• Lay-off process • Unemployment insurance • Early retirements	• Corporate social plans for restructuring (CSR) • Competence report ("bilan des compétences") and personal plan • Outplacement services • Training for new jobs in the region • Incentives to geographic and occupational mobility	• Strategic management of innovation • Strategic management of human resources • Competence building • New models of work organisation • Innovation agreements
Sector/Regional	• Sectoral programmes of restructuring and downsizing • Social programmes with minimum income	• Rapid Response System and change managers • Sectoral/Regional programmes for labour force transfers between companies and sectors with specific training • Financial incentives for recruitment by new companies • Local employment initiatives • Incentives to new investments, both national and foreign • Local partnerships for growth and employment	• Clusters development • Networks and partnerships for innovation • Innovation poles • Plans for regional development • Learning regions
National	• Labour law on lay-off • Social protection regimes for unemployment and retirement	• Active labour market policies • Vocational guidance services • Training programmes to tackle labour market mismatches • Coordination of employment and industrial policies • Labour market regulations: flexibility with security • Social partners consultation • National Employment Observatories • Housing market and geographic mobility	• Coordination of employment, industrial, innovation, education and trade policies • Partnership for change involving social partners • Foresight system for new sources of job creation • Pro-active programmes for education and training • Lifelong learning strategies • Labour market regulations: Transitions and competence building
European	• Directives (lay-off, information and consultation) • Social protection guidelines	• Coordination of employment, competition and industrial policies • European Employment Strategy • European Social Fund (ESF) • Directive on works Councils • Directive on portability of pensions	• Lisbon Strategy • Partnership for growth and jobs • European Social Dialogue (sectoral and cross-sectoral) • Community Programmes for R&D, innovation, employment and lifelong learning • ESF+ERDF • European Monitoring Centre for Change • European foresight system for new sources of job creation

3. The Relationships between Innovation, Skills and Jobs

In a knowledge-based society, building and spreading new skills can play a central role in paving the way to new areas of jobs creation. Jobs creation is increasingly intertwined with innovation in all its dimensions: innovations not only in processes but also in products and services, not only in technologies but also in organisation, marketing and design. At the core of innovation there is the capacity to turn knowledge into more added value, and this requires skilled people with specific job profiles such as: designers, engineers, different specialists of marketing, management, logistics, telecommunications, among many other examples because the transition to a knowledge intensive economy has implications to almost all occupations.

Lifelong learning activities are very often hindered by a lack of relevant information and awareness about skills needs, in addition to the lack of key competences on which to build at individual level. Companies complain about education institutions not being able to cope with their needs and education institutions argue they should not be completely subordinated to short term economic needs. Nevertheless, behind the success cases of European regions and clusters, we will find new patterns of interaction between skills demand and supply.

Drawing some lessons from this experience, the goals of lifelong learning should be defined not only in terms of qualification levels, but also in terms of job profiles and their specific competences. The purpose is not coming back to the traditional models of human resources planning, setting a mechanical and unidirectional relationship between the industrial pattern of growth on the one hand and the skills needs on the other, even if forecasting remains useful to provide basic references. On the contrary, the purpose should be to develop a permanent interaction between skills and the growth pattern at European, national, sectoral and local levels, involving the relevant actors and taking into account both long and short term needs.

A permanent strategic exercise should be fostered involving the relevant actors at each level, encouraging partnerships for innovation, jobs creation and competence building.

4. For a Strategic Management of Human Resources

The strategic management of human resources becomes an important priority when:

- globalisation and European integration are redeploying investment and jobs creation to new sectors and areas;
- the transition to a knowledge-intensive economy is requiring new kinds of skills;
- the demographic trends are leading to labour shortages.

This is exactly the current situation in the European Union. That is why there are an increasing number of companies, regions and countries which are taking initiatives to enhance their instruments for a more strategic management of human resources.

These instruments comprise:

- identifying skills needs;
- defining job profiles;
- setting qualification standards;
- developing new curricula;
- improving vocational guidance;
- validating individual competences, to support capitalisation and mobility.

A regular foresight on skill needs is critical for a sound development of all the other instruments. Specific skills needs can only be identified at company, sector and region levels, but a general and strategic framework can be provided not only at national but at European level, taking into account the global trends of trade, technologies, investment and jobs creation.

Many of the Member States are developing their national systems to identify skills needs, but the available mechanisms at European level are only embryonic, by contrast with the USA or China. Yet they can be very useful:

- to support the national initiatives;
- to facilitate labour mobility in the EU;
- to enhance European cooperation in education and training;
- to improve vocational guidance;
- and to foster jobs creation in new frontier sectors and areas

The European foresight on skills needs should be developed by building on the existing mechanisms using a bottom approach, but some European initiatives should be launched in the short term as a catalyst for something which should no longer be postponed. These initiatives are a logic complement to other European instruments for human resources management, notably the European qualifications framework, the Europass and the database Proteus for lifelong learning.

The recently created *Skillsnet* should be enhanced in order to provide basic references for this process at European level, building on the already very diversified work across Member States, which combines very different techniques: enterprise and labour force surveys, case studies, expert inquiries, analyses of jobs advertisements, forecasting models, observatories on skills developments.

5. The political mandate

The political mandate for these initiatives is clear:

a) The European Council of 22-23 March 2005, when re-launching the Lisbon strategy, stated §5 *"Europe must renew the basis of its competitiveness, increase its growth potential and its productivity and strengthen social cohesion, placing the main emphasis on knowledge, innovation and the optimisation of human capital";*

b) The European Council of 16-17 June 2005, when endorsing the integrated guidelines for growth and jobs, which underpin the national reform programmes, points to *"improve matching of the labour markets by:…better anticipation of skills needs, labour market shortages and bottlenecks"* (Guideline 20);

c) The Commission's contribution welcomed by the Meeting of Heads of State and Government on 27 October (last page), underlines *"giving people the skills they need"* as a top priority for the new partnership of the EU and Member States;

d) The Commission's communication on industrial policy (COM(2005)474, p.10), endorsed by the Competitiveness Council, includes *"improving sectoral skills"* as one of the main initiatives to be taken;

e) The Council of Ministers on Education, Youth and Culture of 14-15 November 2005, invites the Member States to:

1. *"ensure effective collaboration between relevant ministries in the development of strategies for skills and competences, including during the preparation of their annual Lisbon national reports and as part of their national lifelong learning strategies;*
2. *build partnerships, at national, regional, local and sectoral levels with key stakeholders, including employers and trade unions, in accordance with national legislation and practice. These partnerships should create a system which responds to demand, takes account of long-term skills and competence needs, encourages investment in skills and competences and addresses the specific needs of disadvantaged groups";*

This Council has also invited the Commission to:

1. *"establish in 2006 a cluster of those Member States wishing to develop a peer-learning activities on sectoral skills, as part of the "Education and Training 2010" Work Programme;*
2. *invite CEDEFOP and, where appropriate, the European Training Foundation to complete in 2006 an overview of different sectoral approaches to skills and competences across the EU and in the accession and candidate countries"*

(To be completed)

6. Developing a European Infrastructure for Skills needs Identification

The main initiative on skills needs identification being developed at European level is *Skillsnet,* launched by CEDEFOP. *"The Skillsnet brings together highly qualified researchers and other stakeholders to present and discuss outcomes and methods of research and analysis on new changing skill needs as well as medium to longer-term prospects of skills available in the market…Approaches include enterprise and labour force surveys at different levels, forecasting techniques, analyses of job advertisements, expert inquiries, scenarios and observatories. Similarities across territories, sectors and occupations help to identify common European or international trends in skill requirements… Priority is given to holistic approaches and innovative solutions that can cater for the time gap between changes in labour demand and the supply response"* in CEDEFOP website.

Another very important instrument under preparation is the European Qualifications Framework, proposing a European framework of eight qualifications levels which can facilitate the communication between the national references, the mobility of students, trainees and workers, the common validation of competences and the accumulation of credits. With this purpose, the EQF should also be connected with Europass and Proteus, an information service for lifelong learning opportunities. The common references provided by the EQF should be mentioned by the national systems of identification of skill needs, not only at general but also at sectoral level.

Furthermore, the EQF should be complemented by ECVET, a European Credit System for Vocational Education and Training is also being prepared to support the transfer, the accumulation and the recognition of learning outcomes.

Against this background, the development of the *Skillsnet* should be fostered, by enhancing the Member States cooperation and encouraging the convergence of their national initiatives, notably on the following areas:

- forecasting models;
- scenarios approaches;
- sectoral studies.

Nevertheless, this bottom-up approach will take a quite long time to achieve results due to the diversity of the national references, classifications and analytical tools.

Therefore, they should be complemented by some concrete initiatives to be launched on the short term at European level. Regarding forecast, a European initiative is already being developed by the Project "Pan-European Skills Forecasts" coordinated by the Warwick Institute for Employment Research, in connection with CEDEFOP, under the umbrella of *Skillsnet.* The pilot-project on "Innovation, Skills and Jobs" should be envisaged as a complement more focused on foresight.

II. BACKGROUND FOR THE METHODOLOGY PROPOSAL

1. The available experience at European and international level

The international and European experience on the early identification of skills needs is quite diversified (Tessaring, 2004). It combines forecasts based on econometric models, with more qualitative techniques such as case studies, job analysis, surveys by questionnaire, expert meetings. The level of analysis can be either national or sectoral, regional or even company level. More recently there are some attempts of developing a foresight approach by combining structural analysis, games theory and scenario building.

Hence, it is possible to identify two main streams:

- one putting the emphasis on quantitative techniques and on forecasting methods;
- another putting the emphasis on qualitative techniques and on foresight methods.

The general conclusions which can be drawn from the current debate (European Commission, 2006 and Hilbert 2004) is that:

- both methods are needed and should be complementary;
- we need to keep a holistic approach able to combine different techniques, depending on the outcome we are looking for.

In some cases, as in Germany with Frequenz (Schmidt and Steeger, 2004), there is permanent network involving all the relevant national bodies which want to exchange their experience. The tradition of ISFOL in Italy is also to combine both methods (Gatti, 2004). It is in Finland that a more systematic intertwining between quantitative and qualitative methods can be found (see Annex 1), enabling the outcomes of the forecasting models to be discussed in sectoral committees, which compare them with the outcomes of the qualitative research.

1.1. The forecast methods

The forecast methods to project employment trends have a quite established traditions in almost all EU Member States, even if with a large variety of econometric models and different use of the statistical classifications (Cedefop, 2006). A process of exchange and coordination is being developed in CEDEFOP, under the label of Skillsnet, by a

special project to develop a Pan-European Forecast on skills needs. Nevertheless, there is still a long way to go, notably if we take into account the experience of building the a forecasting system in the USA, which is able to provide nowadays regular projections on employment trends covering 250 industries and 500 occupations (Barnow, 2004 TO COMPL).

1.2. The qualitative methods

A central purpose of the qualitative research is the identification and analysis of occupation profiles leading to national catalogues which characterize them notably by the following items: mission, main activities, main theoretical, technical and social competences, working conditions, education requirements and professional prospects. Many Member States have this kind of catalogues such as those provided by BIBB in Germany, ROME in France or QCA in the United Kingdom.

The EU cross-national collaboration in this field has been hindered by different methodological traditions, including some linguistic and conceptual misunderstandings when using the terms "qualifications" "skills", "qualifications" and "competences". It is now often assumed (Tessaring, 2004) that "qualification" refers to the official requirements in education or certification for an individual to enter in a concrete occupation. "Skills" refer to abilities to perform this occupation. "Competences" can be used to characterise these skills by identifying theoretical, technical or social competences. In spite of these difficulties, a general methodological trend can now be clearly identified, putting the emphasis on the competences, rather than on activities to define the occupation profiles.

These assumptions have paved the way for a stronger consensus to build the EQF and the ECVET by focusing on learning outcomes, meaning competences, and not on learning contents, in order to create more flexibility in this European system (European Commission, SEC (2006) 1431 and SEC (2005) 957). The convergence of the EU Member States towards common frameworks concerning qualifications is still at a very early stage, not to speak about common frameworks concerning occupation profiles, which do not exist. About this, it is useful to analyse the USA experience to build the national occupation system which is now O*NET, an on-line system that characterizes over 950 occupations,

with about 100 occupations updated every 6 months. A new methodology is also being developed to identify and validate new and emerging occupations (National Center for O*NET Development, 2006). In the meantime, a convergence process of O*NET with the Canadian and Mexican systems is being defined, to support labour mobility in North America.

We can easily conclude that the means which have been mobilised so far by the European Union to tackle this kind of problems are far behind the American experience. It seems out of question to go back to the heavy process of the eighties aiming at defining the correspondence between occupations of different Member States, but new means should mobilised to develop a stronger European infrastructure to support occupational mobility. A good combination of a common framework of qualifications and a flexible instrument to present individual competences such as the Europass, can be more effective to improve these conditions for labour mobility. In the meantime, a cross-national cooperation in the EU to identify strategic competences at sectoral level should also be encouraged. This leads us to the relevance of the sectoral level

In most of the EU Member States, the sectoral level plays a central role to identify skills needs and to define human resources policies, including learning strategies (Bois d'Enghien, 2006):

- in Germany, the Chamber of Craft and Trades and the Chamber of Industry and Commerce play a key role in planning and organising vocational training for their sectors and occupation, being supported at federal level by the BIBB, Federal Institute for Vocational Training;
- in France, the sectoral observatories for employment and training have been put in place, involving the main stakeholders and getting public support by the "contrats d'études prospectives"
- in UK, a network of employer-led Sector Skills Councils is being supported by the Sector Skills Development Agency and leading to sector-based Skills Academies;
- in the Netherlands, sector specific knowledge centres have been created and are collaborating with the national body COLO to update a report on a competence based occupational standard;
- in Spain, social partners can create bi-partite sectoral joint committees for continuous training, supported by the Tripartite Foundation for on the Job Training;

- in Check Republic, sectoral committees are also in charge of planning continuous training;
- in Finland, sector-specific training committees comprise representatives of the education administration, social partners, teachers and other interest groups.

At international level, a very interesting experience is taking place in Canada, building on the Sector Councils, which involve the main stakeholders in a variety of tasks of human resources management in each sector, such as: occupational standards and certification, career awareness, training projects, apprenticeship, job banks.

More recently, this relevance of the sectoral level to identify skills needs is also being strengthened by another methodological concern (Coles, 2004): to design professional standards which are not only a portrait of the present or the past, but can become future-oriented qualifications. This calls for putting scenarios method into the tool box. Several possible instruments are being identified with this purpose (Leney, 2004) and it is at sectoral level that more systematic attempts have been made, because it makes it easier to identify new skills in connection with the main economic, technological and social drivers for change (Fressynet, Rodrigues, Valente, Afriat, Abicht 2006).

All this rich experience at European and international level should be taken into account and adapted to meet a new ambition: to develop a European infrastructure to support human resources management in vocational guidance, education and training, validation of competences and occupational mobility.
Nevertheless, this European infrastructure should be adapted to the present conditions, notably:

- the pace of change stemming from globalisation, new technologies, new business models and new individual choices;
- the large variety of occupational standards across EU Member States;
- the increasing fluidity of the occupational categories if we want to grasp the variety of professional trajectories over the life-cycle of each individual as well as the processes of competence building which are underlying them

Therefore, a European infrastructure should be focused on providing only general references for human resources development which are:

- strategic, meaning being able to connect to the main economic, technological and social drivers for change;
- flexible, meaning be able to take into account the evolution of the occupation profiles and the different ways to combine competence units;
- general enough to encompass the European variety

2. Framing the Project "Innovation, Skills and Jobs"

The purpose of this project is to provide some generic references for this strategic management of human resources, placing the European economy in its global context and encouraging these references to be adapted to the national and regional specificities.

The central axis of this project should be innovation, skills and jobs, connecting and building on other initiatives which are already underway, notably:

- the European Restructuring Forum coordinated by DG Employment and involving other DGs;
- the monitoring of industrial sectors organised by the DG Enterprise;
- the development of clusters of innovation and lead markets promoted by DG Enterprise;
- the technology platforms promoted by the DG Research;
- the support to partnerships for innovation promoted by the DG Regional Development;
- the *Skillsnet* which is being developed the CEDEFOP;
- the European Monitoring Centre on Change, based on the EFILWC, Dublin;
- the European Qualifications Framework and the Euroskills Forum which is being prepared by DG Education;
- the monitoring of the national reform programmes for growth and jobs and the national frameworks for structural funds.

This project has been designed bearing in mind its possible uses, which can notably be the following:

1. to identify new drivers for jobs renewal to be presented in the European Restructuring Forum;
2. to support innovation, employment and regional policies by developing foresight instruments to analyse emerging activities, shaping factors and job profiles;
3. to spread new jobs profiles in the vocational guidance and the competence validation systems;
4. to improve strategic planning in education and training systems;
5. to encourage the development of partnerships for innovation, skills and jobs, at regional and sectoral levels, involving all stakeholders.

Taking into account these purposes and the available elements, this project aims at developing a European foresight process combining two main strands:

1. framing the general employment trends in Europe against the international employment trends;
2. exploring and focusing on new activities where new job profiles are emerging by a combination between innovation and skills development.

Before presenting the methodology, we will introduce some of its theoretical foundations:

- foresight and strategic governance;
- clusters and competence building;

3. Foresight and Strategic Governance

Foresight activities can give a relevant contribution to improve governance and develop a knowledge-based society. The existing foresight capacity in social sciences is being underutilised at European level, but it is possible to reverse situation with a focused implementation.

Foresight comprises a set of science-based activities which aim at supporting the analysis, the debate and the action about the future. It differs from other kinds of more traditional activities for strategic planning such as forecasting because it is based on other approaches regarding time and the

relationships between the present and the future. Rather than building on the mechanic projection of the past trends for the future, foresight assumes a more complex pattern of interactions between the shaping factors and actors underlying these trends. That is why foresight is more appropriate to deal, on the one hand, with uncertainty and indeterminism regarding these trends and, on the other hand, with the possible influence of human action to shape the more possible and likely scenarios.

Foresight mobilises a great diversity of techniques which were improved in social sciences over the last decades, from surveys and statistical analysis to expert analysis, cross impact, system analysis, games theory and computer simulation (see Godet, EFILWC) . Nevertheless, the most recent elaborations about foresight put emphasis on using these techniques in the framework of a more comprehensive methodology aiming at:

- identifying and bringing together the relevant agents of change and sources of knowledge in order to use interactive and participatory methods in the phase of analysis, debate and choice for action;
- developing strategic visions, by identifying the main shaping factors and actors, analysing their interaction and defining possible scenarios with their challenges, threats and opportunities;
- supporting decision making, by identifying more desirable scenarios among the possible ones and translating them into priority setting and agendas for action;
- as more or less spill-over effect, increasing the level of consensus or of mutual understanding and developing specialised networks and partnerships for action.

Taking into account these features, foresight seems particularly appropriate to be used in fast changing societies, where analysis, debate, choice and action are in permanent interaction, requiring the "art of strategic conversation" (Van Der Heijden,1996) . These features seem even more appropriate in the present stage of development of knowledge-based societies and multilevel systems of governance, where specific knowledge is being mobilised in order to support decision making of a wide variety of stakeholders at the local, national, regional or international levels of governance and where huge amounts of complex knowledge should be considered by the central poles of strategic decision.

4. Clusters and Competence Building

Foresight can address the general employment trends taking into account the global context, but should also focus more concrete processes of creating new jobs and competences. This is the advantage of the sectoral approach or, even better, of the cluster approach, if we want to grasp the evolution of the economic activities and of the underlying competences.

Apart from improving the general conditions, the European and the national policy can also focus on special catalysts to speed up the innovation process. For example, the approach based on clusters should aim at developing partnerships for innovation, jobs creation and competence building, involving all the relevant actors: companies, research institutions, education and training institutions and financial bodies.

A cluster can be defined as a set of companies connecting between themselves and with institutions of knowledge production and diffusion in order to build new competitive factors and new competences and to increase the added value. A cluster can be identified and developed at different levels according to the main policy purpose:

- at local/regional level, if the purpose is to strengthen the concrete and personal relationships which underpin all clusters;
- at national level, if the purpose is to improve the framework conditions for clusters which are spread over the national territory;
- at European level, if the purpose is to improve the framework conditions for clusters which are present in various Member states.

The main policy objectives for supporting clusters development are:

- to create a self-sustained process of cooperation for competition, gathering companies, education, research, business support and financial institutions;
- to identify a critical path to develop a network and key-connections in order to add value;
- to speed up the transition to a knowledge intensive economy;
- to improve the comparative advantages in a globalised economy.

The main cluster activities which can be supported as partnerships for innovation are:

- the cooperation between enterprises regarding areas of common interest such as trade, e-business, organisation of the supply chain, diffusion of new technologies and certification;
- the development of joint research programmes;
- the development of joint education and training programmes;
- the development of joint business support services;
- the support to start-ups.

More precisely, clusters can become strategic platforms to define and implement more effective learning strategies. To fulfill this role, they should use more effective tools for foresight and strategic management.

III. PROPOSAL OF METHODOLOGY

1. Framing a European foresight methodology on skills needs

1.1. Main features of the methodology to be developed

a) Developing a forward looking approach, notably by:
   - focusing on activities with relevant potential for jobs creation
   - identifying the main drivers and their implications for skills needs

b) Enabling a strategic conversation by identifying consistent, plausible but contrasted scenarios to support strategic choices by the main stakeholders

c) Keeping a flexible approach on occupations evolution, open to different combinations of competence units

d) Able to be adapted to different national contexts

e) Enabling two-ways interfaces between foresight and forecast analysis, and therefore, ensuring the compatibility with NACE, ISCO and ISCED

f) Able to be used within short delays and with limited resources

g) Focusing on the different possible uses:
   - early identification of emergent jobs and skills needs
   - building qualification standards according to the levels defined by the EQF, European Qualifications Framework
   - supporting a credit system for transfer, accumulation and recognition of learning outcomes, as proposed by ECVET
   - curricula development
   - vocational guidance (possible use by PROTEUS and EURES)
   - organisational development
   - human resources management at company, sectoral, regional, national level
   - sectoral learning strategies and competence building projects

- partnerships for innovation, skills and jobs, in connection with the industrial high level groups, the clusters, lead markets and technology platforms which are being promoted at European and national level

h) Easy to be used and adapted by the main stakeholders

1.2. Main research techniques to be used

The main techniques to be used are:

- web-search
- desk analysis
- statistical and forecast analysis
- foresight techniques, notably systems analysis, scenarios building and actors games; in this stage of pilot project, their main purpose should be nor simulation, neither optimisation but rather exploration of possible scenarios;
- expert workshops involving top experts in the focused economic activities, dealing with markets, technologies, human resources, research or education and training and coming from forefront big, medium and small companies, business consultants, research, education and training institutions.

The selection of these experts is crucial for the outcome of these workshops as well as the role of their chair and their rapporteur. Their preparatory phase is also particularly important to provide a good background report to all the participants. Moreover these workshops should conducted with a quite precise methodology which will now be presented.

2. Presentation of the methodology

Taking into account the framework already defined, we will now present a draft methodology by describing step by step the way to run the expert workshop, assuming that it should be prepared in detail and that its outcomes should be further developed by its rapporteur.

The sequence of steps to be performed with a clear direction to be provided by the chairperson and the rapporteur should be the following:

DAY 1

MORNING SESSION

1. What is the purpose of this workshop?

2. What are the economic activities to be considered?

3. What are the main economic and employment trends in these activities?

4. What are the main drivers of change in these activities?

AFTERNOON SESSION

5. What are the main emergent competences by function in each of these activities?

6. What are the main scenarios and their implications for the employment trends?

DAY 2

MORNING SESSION

7. What are the implications of these scenarios for competences and occupation profiles?

8. What can be the main strategic choices to meet these skills needs?

9. What are some of the more specific implications for education and training?

10. Main recommendations

THESE METHODOLOGICAL STEPS WILL NOW BE PRESENTED IN DETAIL

Step 1. What is the purpose of this workshop?

The chairperson will make a short introduction, presenting:

- The general purpose and the possible uses of the outcomes of this workshop
- the composition of the participants
- the main problem to be addressed
- the possible outcomes
- the steps to be followed
- the discussion method to be used

Step 2. What are the economic activities to be considered?

1. To locate these activities in a general map of activities complying with the following criteria (see Figure 1):

- focusing on the global final demand, defined by the general human needs: food, health, education, habitat, mobility, leisure, etc;

- placing central activities (such as ICTs, mechnical equipement) with important spill-over effects for many others activities, at the centre of the Figure;

- identifying (at the top left) the main horizontal activities which are connected with all the other activities, such as energy or financial services;

- covering all sectors covered by NACE (Figure 2-A in Annex) and all the occupations covered by ISCO (Figure 3-A);

- connecting to occupation families defined by main functions and interest areas;

- supporting the identification of the activities with more potential to create jobs in Europe (see Figure 4-A);

- useful to map the existing initiatives of high level groups for industrial policy (Figure 5-A), technology platforms (Figure 6-A), clusters (Figure 7-A) or lead markets (Figure 8-A);

2. To identify the main segments of these activities to be considered
See example in Figure 9

3. To identify the main connections defining this cluster, encompassing these segments, their main suppliers and clients in the value chain as well as the supporting institutions in research, education and training and finance (see Figure 10).

FIGURE 1
GENERAL MAP OF ECONOMIC ACTIVITIES

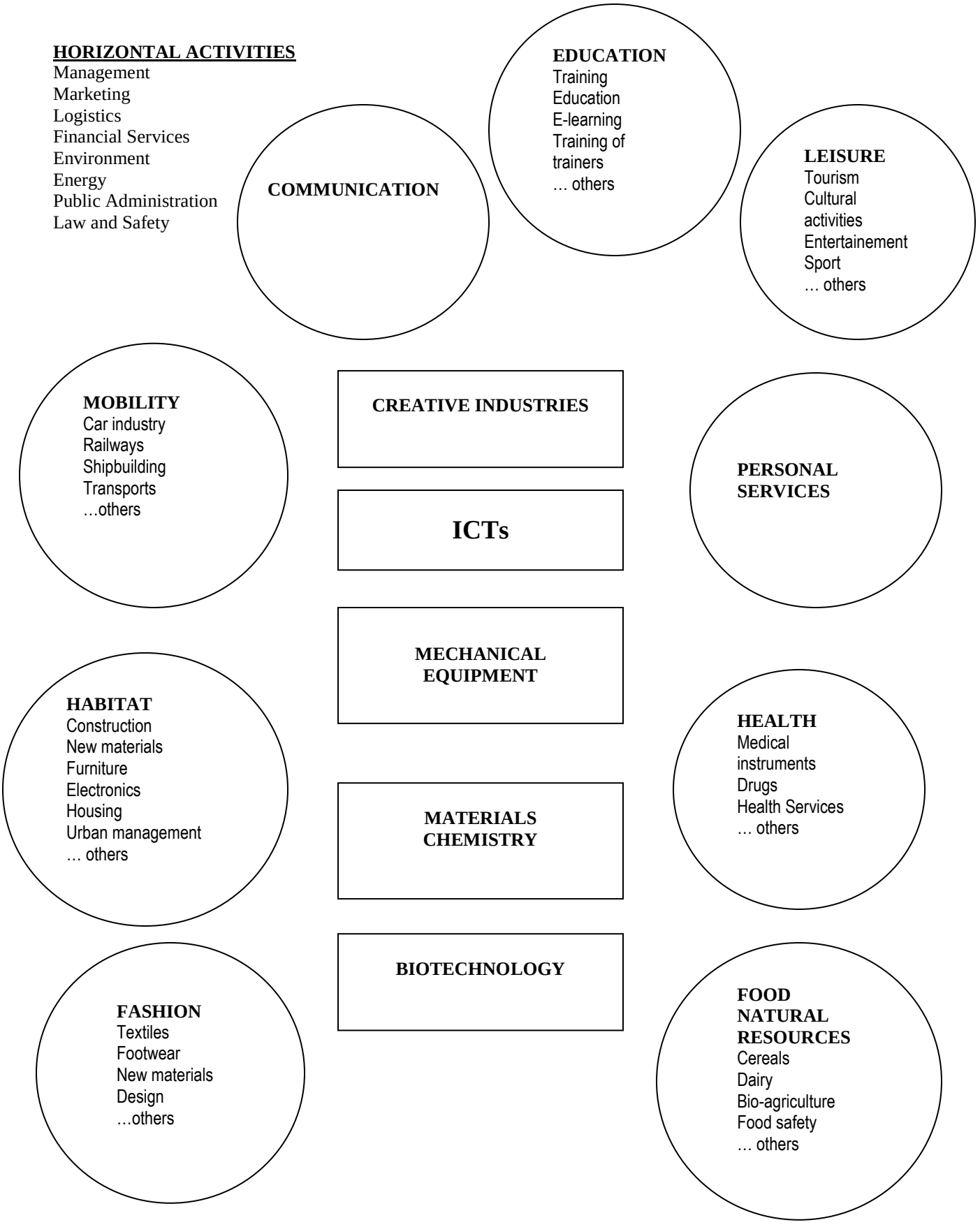


FIGURE 9
THE MAIN SEGMENTS IN ICTs

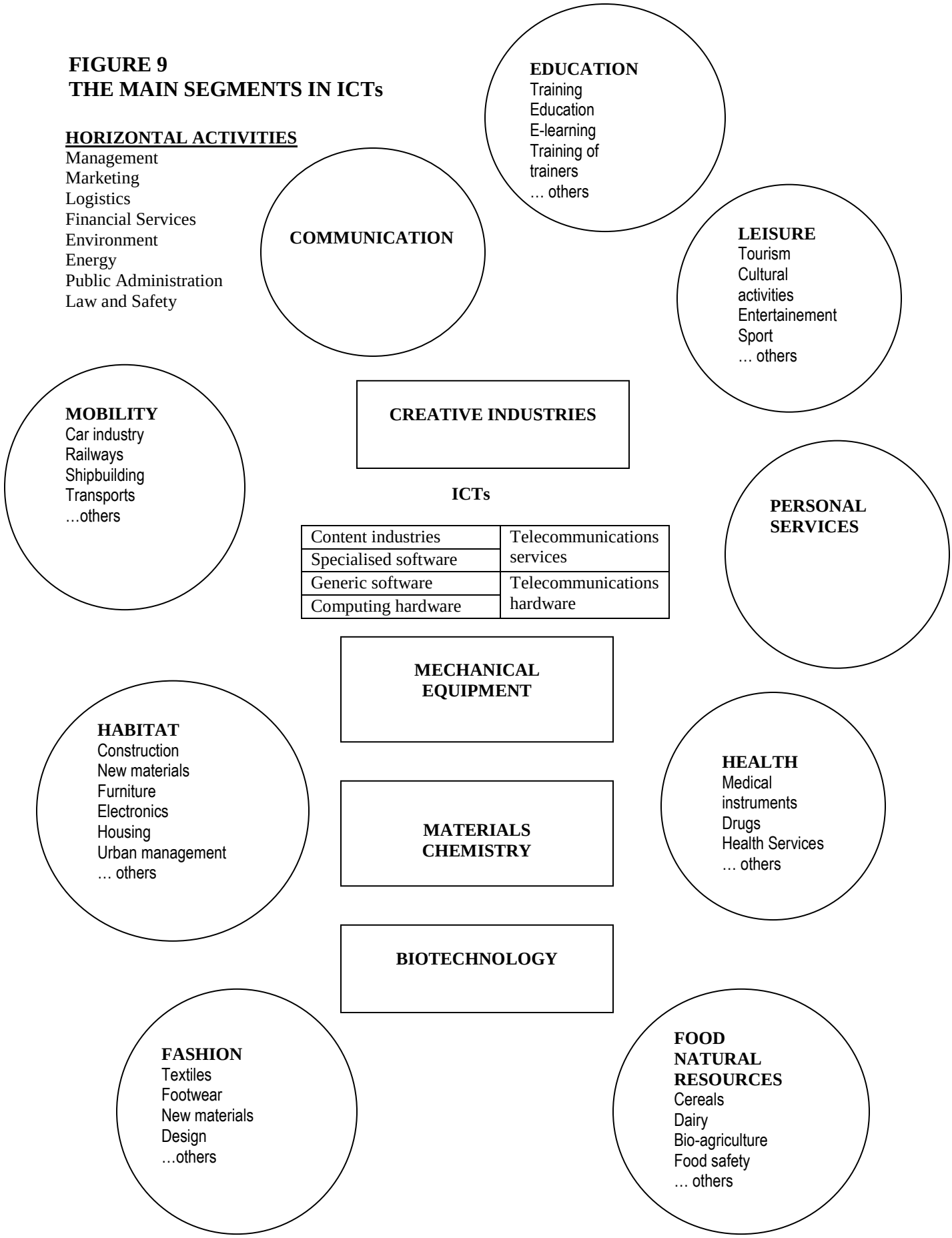
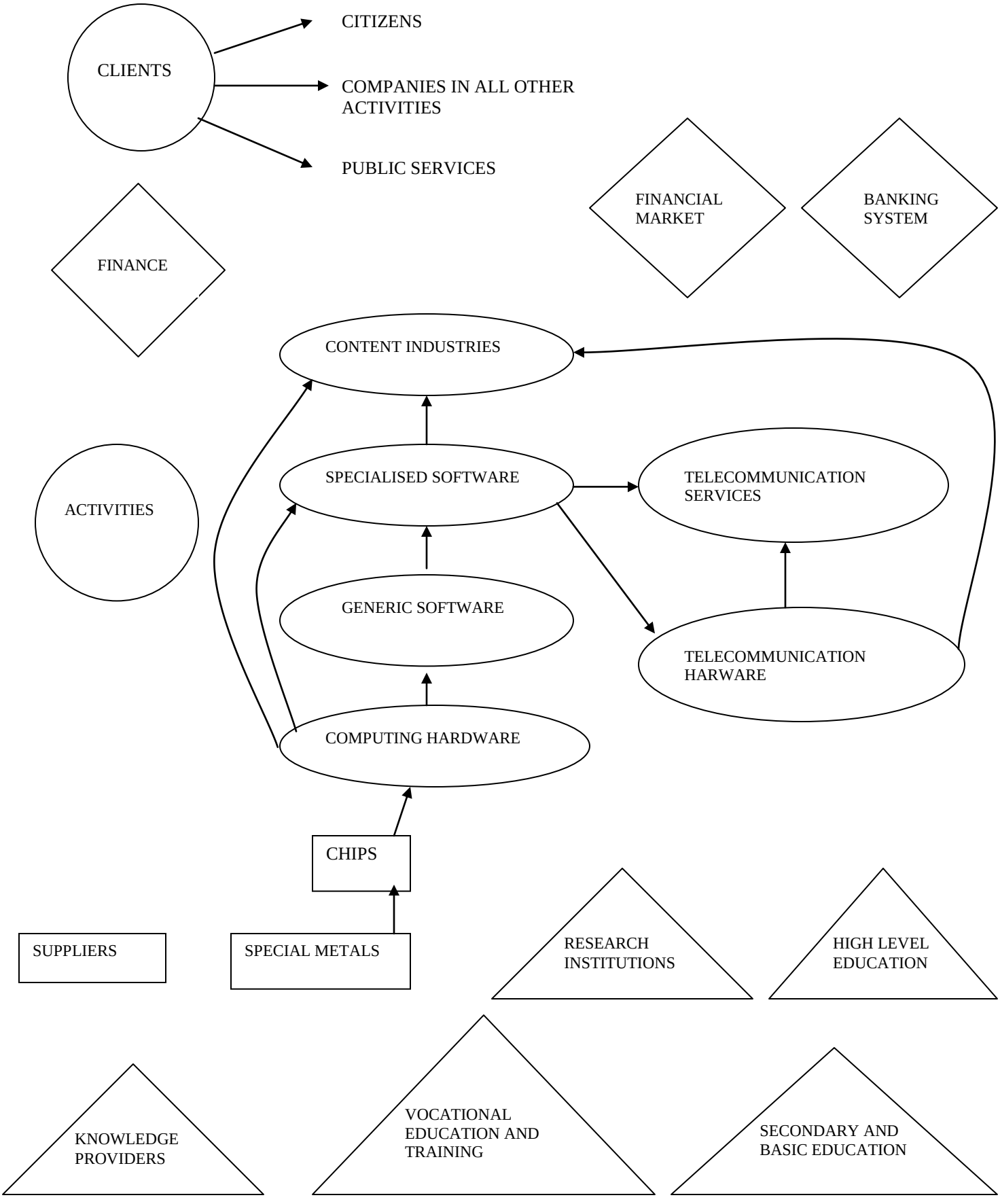


FIGURE 10
THE CLUSTER OF ICTs



Step 3 What are the main economic and employment trends and structures in these activities?

To present a brief statistical portrait of these activities, focusing the considered industries as disaggregated as possible to get statistical data:

- comparing EU and its main international partners;
- comparing EU Member States with EU total

in 3 different dates over the last 15 available years, if possible, when the purpose is to analyse the main trends.

It would also be very useful to take into account the projections to be provided by the forecast project "Pan-European Skills Forecasts".

At least, the following tables would be particularly relevant for this exercise.

In order to compare the employment trends and the relative specialisation of the EU versus other international partners:

- Table 1: Employment trends by industry in the EU, USA, Japan and others (notably in BRICS)

- Table 2: The same in vertical shares

- Table 3: The same in horizontal shares

In order to compare the employment trends and the relative specialisation of the EU Member States:

- Tables 4: Employment trends by EU Member States in each considered industry

- Tables 5: The same in vertical shares, of each MS/total EU

In order to measure the key economic trends:

- Table 6: Output trends by industry in the EU, USA, Japan and others (notably in BRICS);

- Table 7: Trade balance by industry in the EU Member States

- Table 8: Knowledge intensity by industry in the EU, USA, Japan and others (notably in BRICS);

In order to measure the qualification content of each considered industry

- Tables 9: Employment trends by educational level in each industry in the EU

In order to measure the occupational structures of each industry:

- Tables 10: Employment by occupation in the EU Member States in each industry in the EU

- Table 11: Employment by form of work organisation in the EU Member States

Step 4. What are the main drivers of change in these activities?

The following grid aims at identifying the main drivers of change with possible implications for employment and competence trends.

These drivers, defining challenges and opportunities, are the following:

- in the economic dimension, the main trends in demand and supply;
- in the technological dimension, the main trends in process innovations and in product and service innovations;
- in the organizational dimension, the main trends regarding the more conceptual functions and the more executive functions.

The time horizon to be proposed for this exercise is 7 years. Ten years would be too much and too risky taking into account the present speed of change, five years would be too short to organise large scope initiatives at European scale. Besides, 7 years is a relevant policy-making cycle in the EU, based on the financial perspectives and EU Community Programmes for RTD, innovation or lifelong learning.

Table 7 Main drivers of change in each activity

MAIN DRIVERS **ACTIVITIES**	TECH PRODUCTS AND SERVICES	TECH PROCESS	ECONOMIC DEMAND	ECONOMIC SUPPLY	ORGANIZ CONCEPTUAL	ORGANIZ EXECUTIVE	OTHERS
CONTENT INDUSTRIES							
SPECIALISED SOFTWARE	Interactive Software Customized software	Automati-sation	Very rapid incease Differentiation Price also matters	Networkcompanies Role of start-ups and SMEs Outsourcing Offshoring	Specialisation Creative activity	Routinisation	
GENERIC SOFTWARE							
COMPUTING HARDWARE							
TELECOMMUNICATIONS SERVICES							
TELECOMMUNICATIONS HARDWARE							

Step 5. What are the main emergent competences by function in each of these activities?

In this exercise, we are assuming that:

- competences can basically be of three types: theoretical ("knowledge" in ECVET); technical ("skill" in ECVET); and social ("competences" in ECVET);

- competences are combined in occupation profiles, where they can be core competences, specialisation competences or complementary competences. Most occupation profiles are in permanent transformation by adding new competences up to a point where emergent new occupation profiles can be signalled and recognised;

- these occupation profiles are quite often translated into qualifications standards, which are very diversified across Member States, reflecting their different structures of education, work organisation, collective agreements and social identities;

- a transnational cooperation process to define common qualification standards is taking place in the high-level education with the Bologna process and, under the Copenhagen process, the same progressive change can take place for VET, Vocational Education and Training, using the EQF, European Qualifications Framework as a common frame as well as the method proposed by ECVET, the European Credit system for Vocational Education and Training. This system is based on units of learning outcomes combining the three types of competences

Taking into account these assumptions, the present exercise to identify "skills needs":

- should be general enough to accommodate the national specificities afterwards;

- should be focused on competences and on occupation functions and not on occupation profiles, which are very diverse across Member States. Nevertheless, if the need of new occupation profile is clearly identified, it should be registered;

- therefore, should locate these competences in a general grid defined by the main occupation functions: general management, marketing, financial and administrative management, R&D, logistics, production management, production, quality and maintenance. This grid should be connectable with the 8 levels of the European Qualifications Framework (to be completed);

- should not aim at an exhaustive listing of competences in each occupation function, but rather at identifying some of the emergent critical competences in each function, to meet the challenges defined by the main drivers of change. A quite exhaustive list of competences can be found in several national occupations directories prepared by Member States;

- should take into account the need of defining consistent competence units (or unit of "learning outcomes" as named by ECVET), composed by theoretical, technical and social dimensions.

Table 8 Identifying new critical competences by occupational function in the industry of specialised software

MAIN DRIVERS FUNCTIONS	ECONOMIC DEMAND Very rapid increase Diversification Customisation	ECONOMIC SUPPLY Outsourcing Off-shoring	TECH PROCESS Automati-sation	TECH PRODUCTS SERVICES Interactive software	ORGAN CONCEPTUAL Specialisation Creative activity	ORGANIS EXECUTIVE Routinisation
GENERAL MANAGEMENT	Focus on new customs needs	Global networking Intercultural management			Promoting creative environments	Improving control system
MARKETING	Exploring new market segments	Developing corporate image				
FINANCIAL AND ADMINISTRATIVE		International finance management				
R&D		International cooperation and competition	Applying new languages	Improving mechanisms for interactivity		
LOGISTICS		International supply chain				
PRODUCTION MANAGEMENT		International supply chain				
QUALITY						
MAINTENANCE						
PRODUCTION						

Step 6. What are the main scenarios and their implications for the employment trends?

In this exercise, we will try to identify different possible scenarios for the employment trends, to be defined in terms of specialization patterns, taking into account the international division of labour:

- where some of the considered economic activities can develop, and others decline in Europe;
- where the more conceptual functions or the more executive functions can either develop or decline in Europe

The possible employment trends will be given by comparing the present situation with the possible situation in the time horizon of 7 years. This comparison will be signalled in the following Table 9 by:

- I, increase the employment level
- M, maintain the employment level
- D, decrease the employment level
- ?, uncertain trend

In answering to these questions, the experts opinions should be confronted with the statistical analysis on employment trends presented in step 3.

Table 9 Scenarios and implications for employment trends

ACTIVITIES /FUNCTIONS **SCENARIOS**	**CONTENT INDUSTRIES** **CONC EXEC**	**SPECIALISED SOFTWARE** **CONC EXEC**	**GENERIC SOFTWARE** **CONCEXEC**	**TELECOMMU-NICATIONS SERVICES** **CONC EXEC**	**TELECOMMU-NICATIONS HARDWARE** **CONC EXEC**
A.“Expanding all activities”	**I I**	**I I**	**I I**	**I I**	**I I**
B.“Expanding all Activities, except hardware”					
C.“Expanding conception, reducing execution”	**I D**	**I D**	**I D**	**I D**	**I D**
D.“Focusing on specialised software, content industries and telecommunications”					

These scenarios should be built on plausible trends and their consistent combination. Among these possible scenarios, it will then be possible to identify the most probable ones in analytical terms and, afterwards, the most desirable ones. It can also be useful to launch some "wild cards" by suggesting some possible unattended scenarios.

All these contrasted scenarios provided the basis for a "strategic conversation" in the expert workshop, which should then be deepen on at least 2 scenarios, one best and one worst among the probable ones. This is the purpose of the next step.

Step 7. What are the implications of these scenarios for competences and occupation profiles?

In this step, it should be possible to reach a central outcome of this methodology, by building on the previous steps.

First, we need to deepen the analysis of at least two of the previous scenarios by specifying the implications for each occupational function in terms of jobs expanding, transforming or declining. The following Table should be filled in by indicating the occupational function at stake

Table 10 Jobs in expansion, transformation or decline in the Scenario E "Expanding specialised software, content industries and telecommunications and declining in executive jobs in the other industries"

EMPLOYMENT TRENDS ACTIVITIES	NEW JOBS IN EXPANSION	JOBS IN TRANSFORMATION	JOBS IN DECLINE
CONTENT INDUSTRIES	All functions		
SPECIALISED SOFTWARE	All functions		
GENERIC SOFTWARE	R&D, logistics	General managers, marketing, financial, production, quality	Production, quality
COMPUTING HARDWARE			Production, quality
TELECOMMU-NICATIONS SERVICES	All functions		
TELECOMMU-NICATIONS HARDWARE	R&D, marketing, logistics	General managers	Production, quality

Moreover, building on the previous steps and notably 2.5., it would then be possible to describe the scenarios, as telling possible stories about the future, in the following terms:

SCENARIO E

In scenario E, "Focusing on specialised software, content industries and telecommunications":

a) the jobs in specialised software will expand, requiring new competences, such as:

- in general management: focus on customs needs, building global networks, intercultural management, promoting creative environments, improving control systems;
- in marketing: ….

b) by contrast, the jobs in generic software, in computing hardware and in telecommunications software will decline

This concrete and hopefully rich story about the future can only be exemplified during the workshop. Its detailed drafting can only be made afterwards by the rapporteur, who will circulate it to receive the comments by the experts.

If there is the need to draw concrete implications of these scenarios for some Member States, it will then become possible for them to adapt them by using a correspondence grid such as the following Table 11. Nevertheless, it is never possible to make the mechanical transposition of European scenarios to national scenarios, and several adaptations are required.

Step 8. What can be the main strategic choices to meet these skills needs?

In discussing this issue, it is important to bear in mind that skills needs can be met in quite different ways:

- changing the work organisation;
- re-training employed workers;
- recruiting unemployed workers with or without re-training;
- recruiting young people coming from the education system, with or without re-training;
- recruiting workers from other Member States;
- recruiting workers from non Member States;
- outsorcing and offshoring
- other ways

For some critical skills gaps which were identified, it might be useful to draft a flow chart to identify the possible solutions (to be completed)

Step 9 What are some of the more specific implications for education and training?

Among the solutions to meet skills needs, many of them depend on new replies by the education and training institutions. This methodology can support their future choices by providing notably:

- the Table 8 on the critical competences by occupation function in each industry;

- the Table 10 on jobs in expansion, transformation or decline;

- the Table 11 on occupations profiles by function and industry in a concrete Member State

Step 10. Main recommendations

In conclusion, some recommendations can be formulated by building on the main outcomes of this methodology which are the following:

a) map of emerging economic activities and their main connections

b) employment trends of these activities in Europe in a globalised economy

c) drivers of change and implications for critical competences

d) new critical competences by occupation functions

e) scenarios and implications for employment trends and competences

f) list of some jobs expanding, changing or declining

g) recommendations to meet the skills needs

h) support to sectoral learning strategies

i) support to partnerships for innovation and jobs creation

2. Further developments to adapt the European references to national or local conditions

The outcomes of this expert workshop will lead to references at European level which can be relevant but necessarily quite generic and abstract. In order to adapt them to the national or local conditions, it is necessary to mobilise more information involving key-stakeholders at these different levels. The following tables provide a grid to get this supplementary information

Table 11 Main corporate strategies by activity

CORPORATE STRATEGIES ACTIVITIES	MAIN COMPETITIVE FACTOR Cost efficiency/Product differentiation	SCOPE Broadening /specialisation in the range of products	CORPORATE STRUCTURE Vertical ntergration/ Networking/ Outsourcing/ Offshoring
CONTENT INDUSTRIES			
SPECIALISED SOFTWARE			
GENERIC SOFTWARE			
COMPUTING HARDWARE			
TELECOMMUNICATIONS SERVICES			
TELECOMMUNICATIONS HARDWARE			

Table 12 Key framework conditions by activity

KEYFRAMEWORK CONDITIONS ACTIVITIES	RESEARCH	INTELECTUAL PROPERTY RIGHTS	HUMAN RESOURCES	VENTURE CAPITAL	TAX INCENTIVES	INFRA STRUCTURES	STANDARDS	OTHERS
CONTENT INDUSTRIES								
SPECIALISED SOFTWARE								
GENERIC SOFTWARE								
COMPUTING HARDWARE								
TELECOMMUNICATIONS SERVICES								
TELECOMMUNICATIONS HARDWARE								

Table 13 Occupation profiles by function and activity in the Member State X

ACTIVITIES **FUNCTION /EQF LEVEL**	**CONTENT INDUSTRIES**	**SPECIALISED SOFTWARE**	**GENERIC SOFTWARE**	**COMPUTING HARDWARE**	**TELECOMMU-NICATIONS SERVICES**	**TELECOMMU-NICATIONS INDUSTRIES**
GENERAL MANAGEMENT	**Occupation profiles X1, X2, X3……**					
MARKETING						
FINANCIAL AND ADMINISTRATIVE						
R&D						
LOGISTICS						
PRODUCTION MANAGEMENT						
PRODUCTION						
QUALITY						
MAINTENANCE						

Table 14 Strategic choices to meet skills needs

CHOICES TO MEET SKILLS NEEDS ACTIVITIES	CHANGING WORK ORGANISATION	RE-TRAINING EMPLOYED WORKERS	RECRUITING UNEMPLOYED WORKERS	RECRUITING YOUNG PEOPLE	RECRUITING WORKERS FROM OTHER MS	RECRUITING WORKERS FROM ABROAD	OFFSH AND O
CONTENT INDUSTRIES							
SPECIALISED SOFTWARE							
GENERIC SOFTWARE							
COMPUTING HARDWARE							
TELECOMMUNICATIONS SERVICES							
TELECOMMUNICATIONS HARDWARE							

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Essential Skills: Skills to Build On: http://www.hrdc-drhc.gc.ca/essentialskills

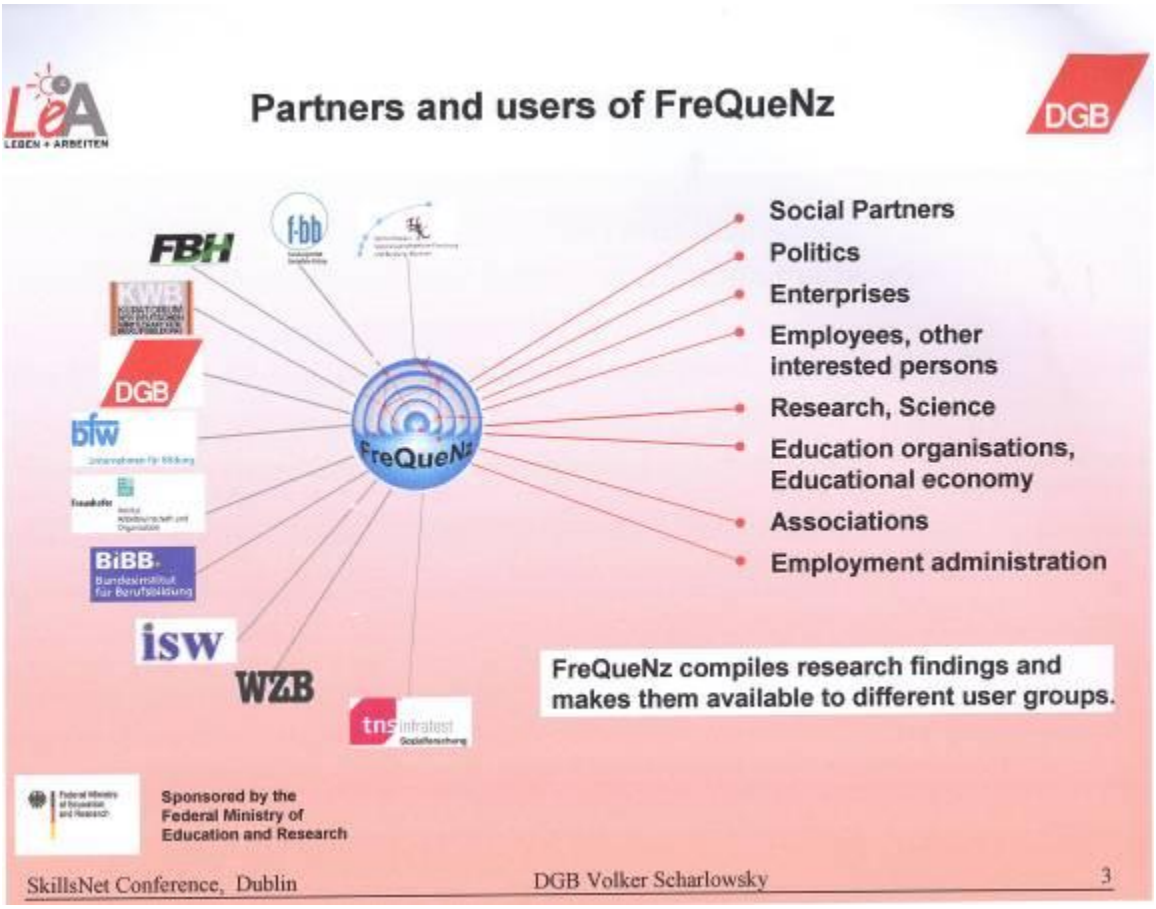
The Alliance of Sector Councils: http://www.councils.org

ANNEXES

REFERENCES TO NATIONAL EXPERIENCES:

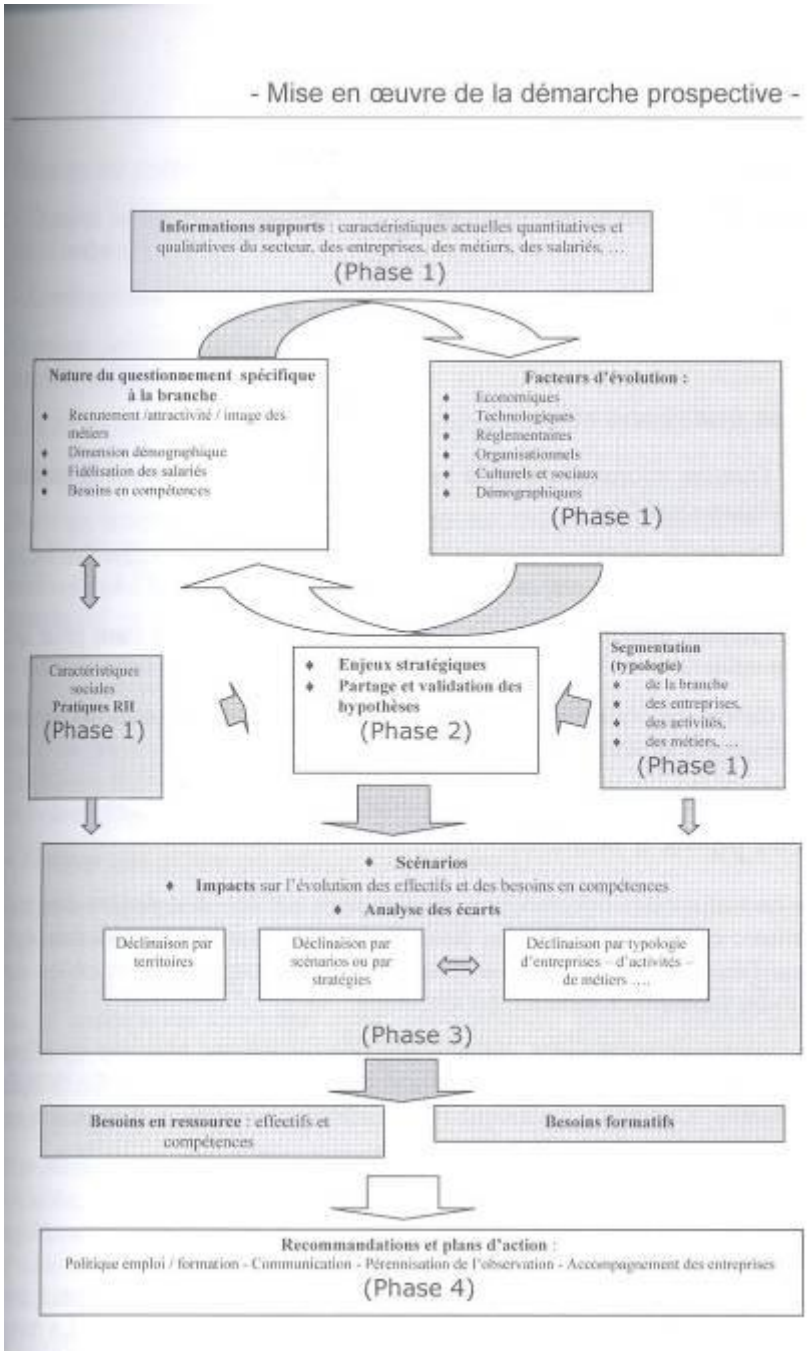
1-Germany
2-France
3-Finland
4-United Kingdom
5-Canada

1- GERMANY



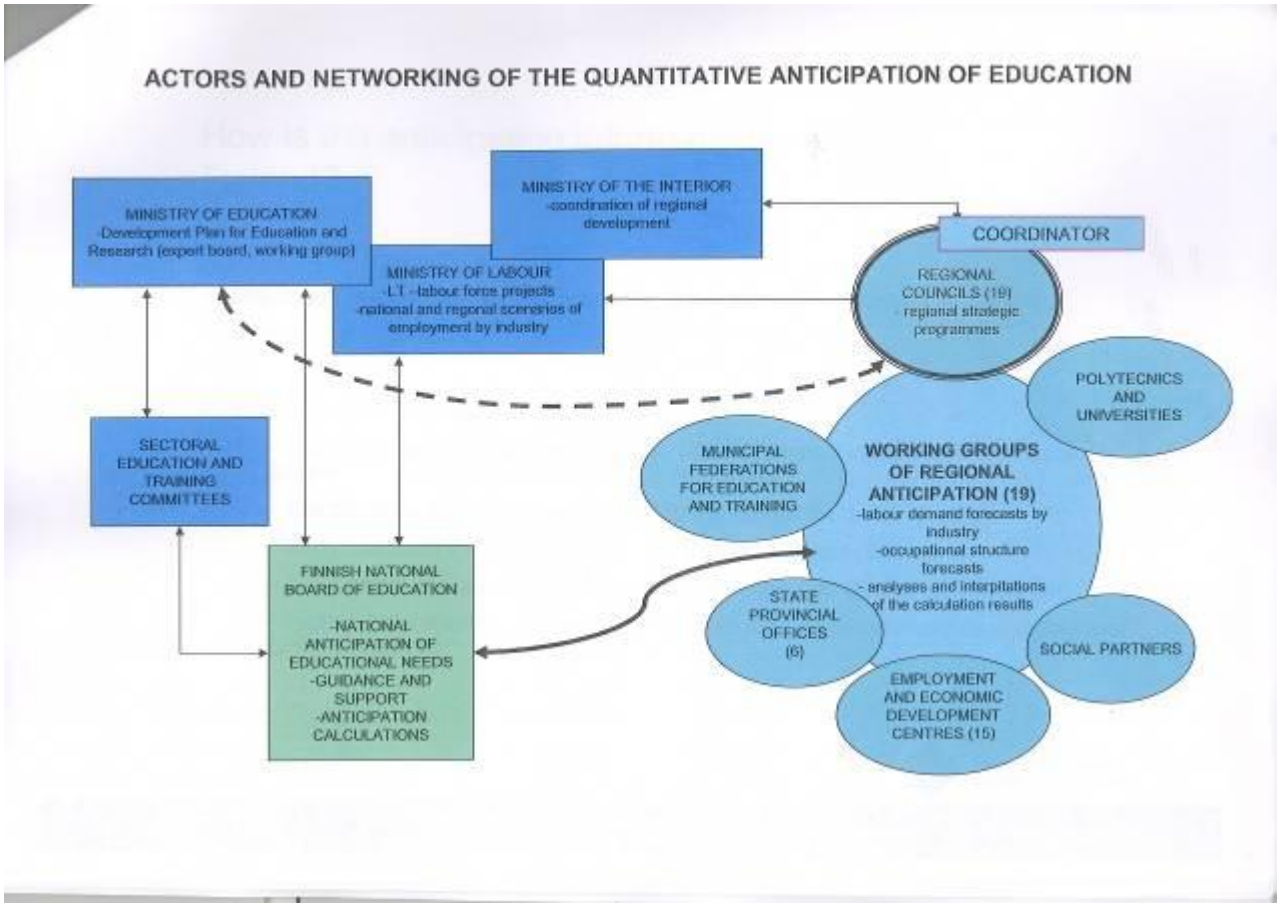
Source: SCHARLOWSKY, Volker (2004)

2- FRANCE



Source: AFRIAT, Christine *et al*, *Quelle Prospective pour les Métiers de Demain? L'Apport des Observatoires de Branche* (2005), p.117.

3- FINLAND



Source: HANHIJOKI, Ilpo (2007)

4- UNITED KINGDOM

7.5. Checklist

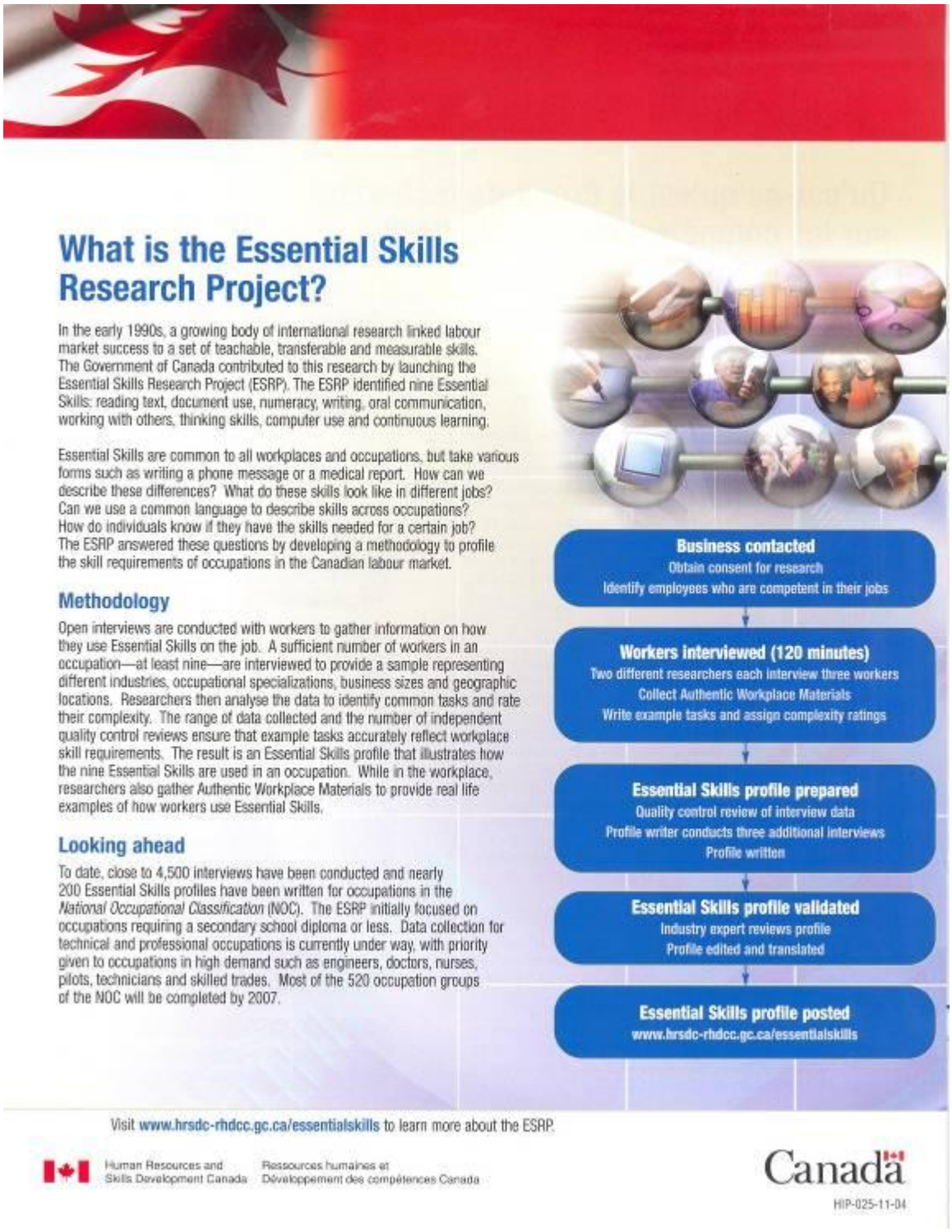
The checklist summarises the steps we have just described

Checklist for developing scenarios

Step 1	Define the problem; set up the scenarios group
Step 2	Identify the key drivers of change in the environment
Step 3	Gather data on the relevant trends
Step 4	Sort the trends into three sets
Step 5	Decide which are the key developments whose outcome is uncertain
Step 6	Construct the basic scenario themes as a matrix or grid
Step 7	Develop provisional scenarios
Step 8	Check out the scenarios for plausibility and consistency
Step 9	Modify, polish and present the scenarios
Step 10	Keep the scenarios under review

Source: LENEY, Tom et al., *Scenarios Toolkit* (2004), p.64

5- CANADA



Source: Brochure from the *Human Resources and Skills Development Canada* (2006).

TASC

Partnerships that Work for Skills Development

What are sector councils?

Sector councils are partnership organizations that address skills development issues in key sectors of the economy.

Today's global marketplace is changing at an unprecedented rate; dramatic shifts in demographics and the pace of technological advancements combine to add pressure to an already competitive market. It is essential that Canadians are prepared to meet these challenges with the skills, knowledge and confidence that are required to succeed in this new economic landscape.

Sector councils work as a uniting element to engage businesses, workers, educators, professional associations and government in a strategic alliance that is focused on determining the specific skills and human resource needs that will enable the sector to thrive.

While there are many labour market issues that Canada's traditional, and emerging sectors share, each has its own unique challenges as well. Sector councils provide this industry-specific focus that highlights the technological advancements, human resource planning, training opportunities and industry forecasting that enable businesses to better prepare for current and future developments. These programs are as diverse as the sectors themselves, and illustrate the value of industry-driven sector councils.

The evolution of sector councils

Over the past 15 to 20 years, a focus on human resource strategies became the catalyst for the creation of sector councils. What was, initially, a resource for purchasing training products, has become a resource for creating industry-specific learning programs and development tools. With some 30 pan-Canadian sector councils to date, involving almost half of Canada's labour market, Canadians and the Canadian economy continue to strive towards excellence. This commitment to excellence is the mandate of all sector councils.

Sector councils generally involve representatives from a wide range of professional and educational arenas, and include:

- business and employers
- employees and unions
- educators and educational institutions
- professional associations

Sector councils nurture a training culture within their industry by establishing pan-Canadian occupational standards and training programs, which are then linked to certification programs. Employers who invest in professional development for employees gain a workforce that is highly skilled and cost-effective; in other words, a globally competitive business emerges. For workers, the opportunity to further skills development offers advancement opportunities, professional mobility and a sense of involvement in the industry's success.

To provide support for these vital not-for-profit organizations, sector councils are partially funded by private sector investment, and the Government of Canada's Sector Council Program through the Department of Human Resources and Social Development.

The Alliance of Sector Councils

Source: Brochure from *The Alliance of Sector Councils*

FIGURE 4-A
EU ACTIVITIES FOR JOBS CREATION

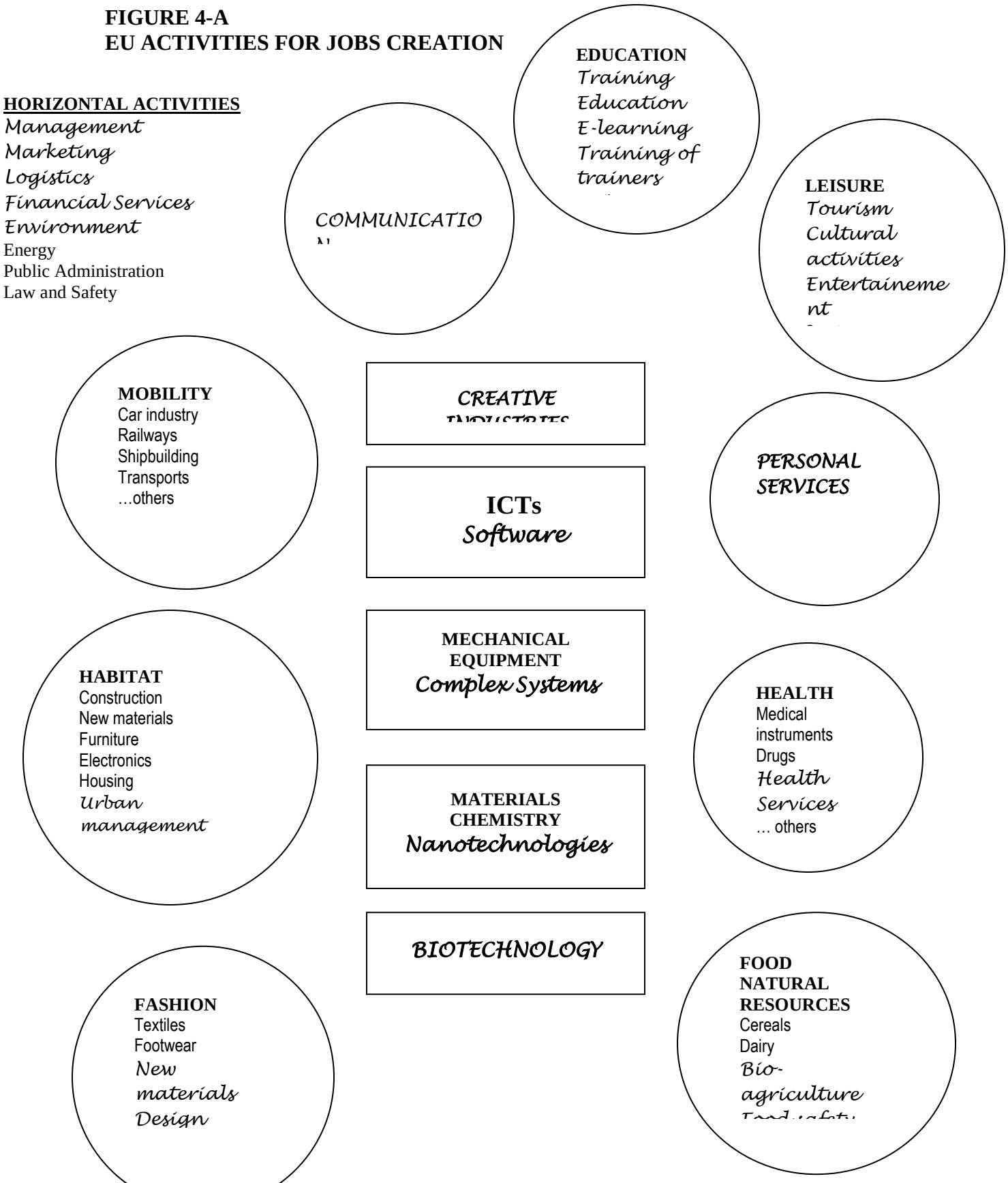


FIGURE 6-A
EU TECHNOLOGY PLATFORMS

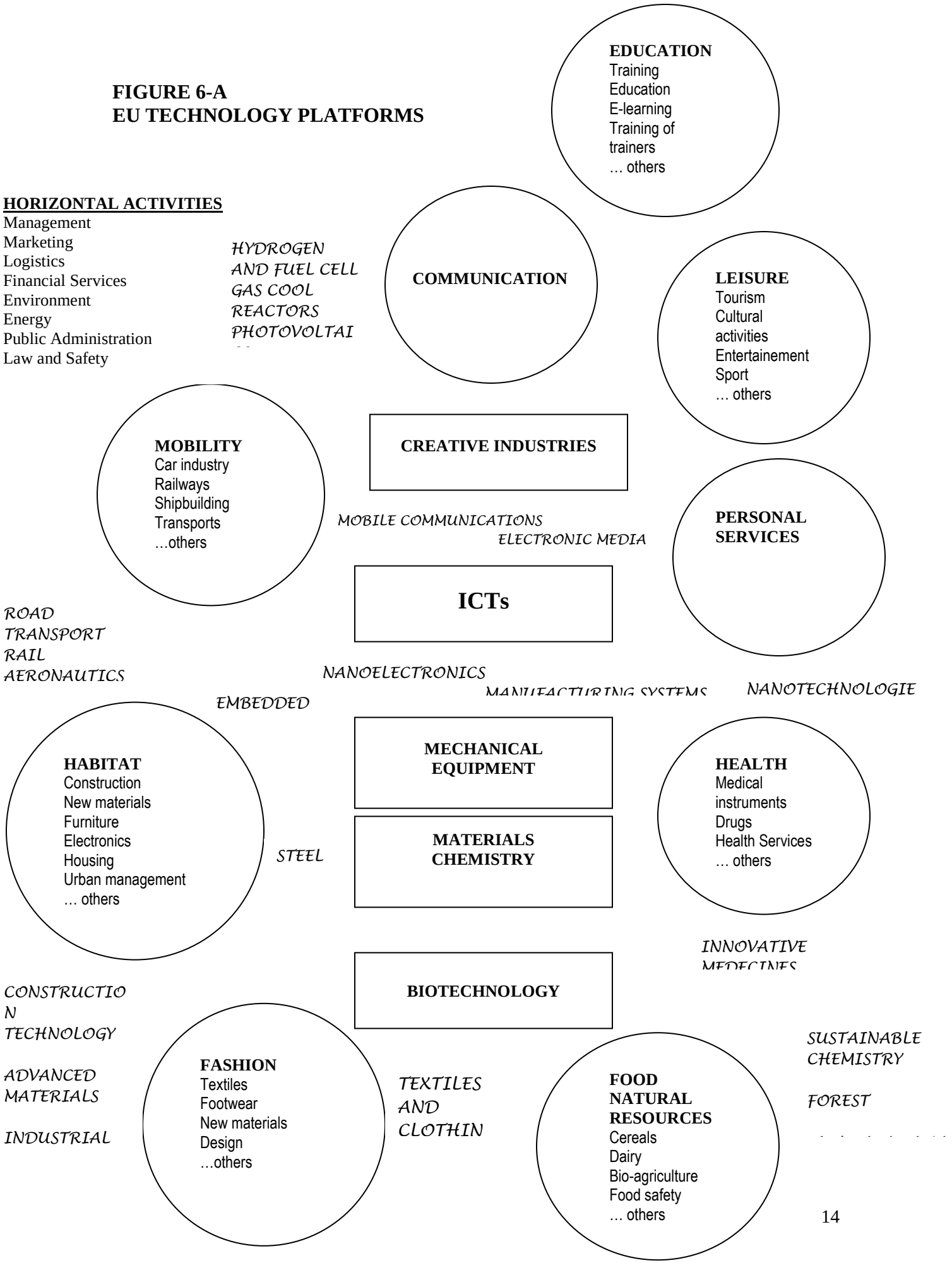


FIGURE 7-A
EU
INNOVATION CLUSTERS AT EUROPEAN LEVEL