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**Systems for anticipation
of skill needs in the
EU Member States**

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The European Centre for the Development of Vocational Training (Cedefop) is the European Union's reference Centre for vocational education and training. We provide information on and analyses of vocational education and training systems, policies, research and practice. Cedefop was established in 1975 by Council Regulation (EEC) No. 337/75.

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Foreword

Cedefop has always been looking at the responsiveness of vocational education and training to labour market needs. Since 2001 Cedefop has particularly intensified its work on early identification and anticipation of skill needs. Already at that time this topic was addressed by many countries and believed to be of considerable importance. Since then substantial progress has been achieved in developing national systems and methods as well as information collection and analysis at European level. Interest in early identification of skill needs has grown remarkably and skill needs are now on the top of the policy agenda in the European Union and most Member States. Interest is closely related to the increasing importance of matching skills with labour market needs as the demand for skills in Europe is changing rapidly due to challenges arising from technological development, innovation, globalisation and demographic change.

The March 2008 European Council invited the Commission 'to present a comprehensive assessment of the future skills requirements in Europe up to 2020 [...] and to propose steps to anticipate future needs'. A new initiative 'New skills for new jobs' is now being launched by the European Commission to respond to this request. The initiative aims to reinforce the EU strategy for growth and jobs, by promoting better anticipation and more comprehensive information on future skills and jobs requirements in Europe.

To support the Commission's initiative, Cedefop provides this review of systems for anticipation of skill needs in the EU Member States. Experience of Member States offers a wide variety of approaches and examples of good practices. We hope the information collected in this working paper will be useful for policy-makers and others involved in the anticipation of skill needs.

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Table of contents

| | |
|---|----|
| Foreword | 1 |
| Acknowledgments | 2 |
| Table of contents | 3 |
| 1. Introduction | 4 |
| 2. General trends in approaches and systems for anticipation of skill needs in Europe | 6 |
| 3. Difficulties and obstacles related to early identification of skill needs in EU Member States | 9 |
| 4. Methods, approaches and tools in use | 12 |
| 4.1. Measuring skill shortages | 16 |
| 4.2. Forecasting skills demand and supply | 19 |
| 4.3. Employers' surveys | 20 |
| 5. Partnership and cooperation | 23 |
| 6. Types of approaches in building systems on anticipation of skill needs | 25 |
| 7. A short review of systems | 26 |
| 8. Conclusions | 30 |
| List of abbreviations | 33 |
| References | 34 |

1. Introduction

This working paper has been prepared in the context of the 'New skills for new jobs' initiative which was introduced and presented in the July 2008 Communication on the renewed social agenda for opportunities, access and solidarity (European Commission, 2008). The initiative and related Commission Communication of December 2008 on new skills for new jobs will respond to the Councils (Education, Youth and Culture, November 2007 and Employment, Social Policy, Health and Consumer Affairs, June 2008) and European Council (December 2007, March 2008) requests to the Commission to present a comprehensive assessment of the future skills requirements in Europe up to 2020 and to propose further steps to anticipate future needs.

To support the European Commission, Cedefop reviews in this paper systems for anticipation of skill needs in the EU Member States. The last short review of the systems was done in the framework of the conference of Cedefop's network Skillsnet which took place in Dublin in November 2004 (Cedefop, Strietska-Illina, 2007). The present review of the systems is largely an updated version of the former one.

The information available on systems of early identification of skill needs and its comparability across the Member States has improved considerably since 2004. There is an abundance of information on systems of early identification of skill needs in Member States. The systems as such have already roughly a half century history. They developed under different circumstances and served different objectives, and it is therefore not surprising that they differ greatly across countries. Nevertheless, there are clear similarities in trends in systems' developments and in approaches and methods used in various European countries.

The information base has substantially been enriched in recent years by Cedefop with the help of its networks, namely the network on early identification of skill needs, Skillsnet, and ReferNet, which served as the main source for this short review of systems. The most useful description of systems in the Member States is the detailed thematic analysis on anticipation of skill needs within the Cedefop's database on national vocational education and training (VET) systems available at http://trainingvillage.gr/etv/Information_resources/NationalVet/Thematic/analysis.asp (Cedefop, 2008a).

The reports were produced in 2007/08 on the basis of templates which asked Member States via ReferNet to describe their systems of anticipation of skill needs answering a range of questions. Even though the coverage is still not entirely comprehensive, the database which resulted from the exercise provides a unique opportunity to gather comparable information across countries.

The database is filled gradually and the information is published after a quality check performed by Cedefop. Therefore, not all Member States are covered yet. This review used the information available for the following countries: the Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Hungary, the

Netherlands, Austria, Poland, Slovenia, Slovakia, Finland, Sweden and the UK. Additionally, some basic information from shorter thematic overviews on the same subject ⁽¹⁾ were used for Ireland and Portugal (Cedefop, 2007a). Belgium, Bulgaria, Luxembourg, Malta and Romania are still missing from the database.

The database provides information in the following structure:

- (a) anticipation of skill needs: general background;
- (b) policy development on anticipation of skill needs;
- (c) legal, administrative and institutional framework;
- (d) methods, approaches, practices and tools used;
- (e) building partnerships and raising awareness;
- (f) financing the anticipation of skill needs.

Still existing information gaps are expected to be closed gradually for all countries, so the database can be harmonised. In the meantime some other Cedefop publications and working papers, produced mostly by Cedefop and members of its network Skillsnet ⁽²⁾ were used, covering issues linked to systems of early identification of skill needs in various countries. This refers in particular to a comparison of systems of medium- to long-term forecasting of skill needs at macroeconomic level in Member States (Cedefop, 2007b) and a comparison of employers' surveys in Member States based on the template prepared by Cedefop (2007c). Again, both last-mentioned comparative exercises do not cover all Member States, but provide valuable information additional to the aforementioned database.

Additionally ReferNet members were asked to fill in a questionnaire on policy development in strengthening the links between VET and the labour market in their country (Cedefop, 2008b). Responses were submitted by the following countries: Belgium, Bulgaria, the Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Austria, Poland, Portugal, Slovenia, Slovakia, Finland, Sweden and the UK. In parallel, a survey of the Directors General for VET in Member States was carried out, based on a questionnaire which included several questions related to identification of skill needs (Cedefop, 2008c). Information was provided for the following countries: Belgium, Bulgaria, the Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Finland, Sweden and the UK.

⁽¹⁾ Available from Internet: http://trainingvillage.gr/etv/Information_resources/NationalVet/Thematic/ [cited 24.9.2008].

⁽²⁾ Skillsnet is an international network on early identification of skill needs coordinated by Cedefop. Cedefop established the network in 2004. More information available from Internet <http://www.trainingvillage.gr/skillsnet> [cited 24.9.2008].

2. General trends in approaches and systems for anticipation of skill needs in Europe

Although the comparability and coverage of the above mentioned information bases are not complete, some observations of common trends in approaches and systems for early identification of skill needs in Europe can be made.

Manpower planning assisted by more or less computerised – mostly econometric – models as a major and only way of forecasting labour needs has become a matter of the past. At present there are two main functions of labour-market needs forecasting by occupation and qualification: a policy function where forecasting serves as a point of reference, and an information function where the available forecast data are used, among others, by guidance and counselling services. This requires fairly detailed and robust data, ‘well processed’ for the end user. Labour-market information becomes a public good going beyond serving a restricted group of experts, decision-makers and social partners. The prevailing question for future oriented research into skill needs is not: ‘How many people in this profession will be required in 5 to 10 years?’ but: ‘Which professions and what kind of new qualifications and skills?’ and: ‘What qualities of the workforce will be in demand?’. The new functions and research questions require non-mechanistic approaches and enriched methods and, therefore, more than computerised manpower forecasting models.

The prevailing trend in Europe is, therefore, a holistic approach and combination of various methods seeking to achieve robust and reliable results. Forecasts have become one of many pieces of information that contribute to a more detailed, consistent and plausible picture. This is the case in Germany, France, the Netherlands, Austria, Sweden, the UK, and on the way to develop such an approach in the Czech Republic, Estonia, Italy and Poland.

There is greater awareness of research activities in different countries and at various levels. Universal access to the Internet pushed forward not only publication of research results and sharing research methods but also creation of networks and related information platforms. These increased awareness of and cooperation among institutions, experts and projects on identifying skill needs at different levels. (Sub)national activities unite at national level and seek to go beyond national borders for research cooperation.

Generally, there is better access to higher quality – though still not fully satisfactory – labour-market information. Much effort in standardising data collection was put in by national statistical offices which mostly use classification systems which could be translated or are fully compatible at European level. The role of Eurostat in collecting harmonised data brought significant improvement also at national level, especially in new Member States (for example, the labour force survey which is a major statistical input into national analyses of future skill needs). Nevertheless, the length of time series, even in generally standardised and reliable statistics, sometimes is not sufficient for projections. This is especially the case in new

Member States, although problems with the availability and quality of statistics often also occur in old Member States (various breaks in time series, etc.).

Box 1: UK's holistic approach

The introduction of the UK-wide Sector Skills Development Agency in 2002 and the development of the sector skills councils signalled government's intention that the anticipation of training and qualifications needs should be driven largely by labour-market needs at national and regional/local levels.

Traditional labour-market forecasting techniques have been refined and more holistic approaches are being adopted. Quantitative methods include extrapolative techniques, behavioural/econometric models, surveys of employers' opinions and skills audits. Qualitative approaches include Delphi techniques, case studies, focus groups and holistic modelling approaches, such as scenarios. The sector skills councils also consult with employers in the sector and gather qualitative information from sector experts and employers. They may commission bespoke, sector specific forecasts and, with awarding bodies, review the uptake of qualifications.

The anticipation of skills needs is taken forward initially on a sectoral basis; then, a regional and local dimension comes into play – but still based on sectoral skills needs analyses. In England the regional development agencies take this forward.

Each of the 25 sector skills councils coordinated by the Sector Skills Development Agency are required by government to develop a sector skills agreement between employers and providers of learning and training in their sector. The sector skills councils are employer-led organisations with the role of representing employers' skills needs to government and raising employer demand for skills, also representing the interests of other stakeholders, particularly the unions. The process of developing agreements starts with a skills needs assessment. Within this, the sector skills councils are required to forecast employment and skills needs within their sector. This is achieved through two means:

- by using the existing quantitative forecasts for the UK (Working futures 2004-14) which provide cross-sector, comparable projections using national sources of information system or bespoke, sector specific forecasts;
- qualitative scenarios developed with sector employers.

The sector skills agreement is now recognised as the mechanism through which employers' skill needs in the UK are identified and met.

Strengths of the system of anticipating skills needs can be summarised as follows:

- grounded in employer consultation;
- combines cross sector, comparable sources of information based on robust national sources of information structured by the standard industrial classification (SIC) with qualitative information gathered from sector experts and employers;
- each sector skills council is required to follow the same process facilitating easier interaction with the supply side.

Such detailed and sophisticated forecasting would not be feasible without a substantial investment in statistical infrastructure, including: national accounts; input/output tables; the annual business inquiry; the labour force survey and the census of population. The scale of this investment is much larger than that involved in actually commissioning the projections. Of course, these data sources are used for many other purposes as well.

One outcome of the skills forecasting and survey work is the development of national occupational standards. These are specified in the form of units, aggregated to meet the qualifications needs of specific occupations, which are identified by a parallel process of occupational mapping.

Sources: Cedefop, 2008a; 2008b.

Early identification of skill needs, however, requires a high range of information and data on both supply and demand sides of the labour market. Such data are collected by different institutions – national, regional, sectoral, independent research centres, universities, non-governmental organisations (NGOs) – under the patronage of different State structures and various beneficiaries, and/or as one-off activities (project-based). Harmonisation and

comparability of data, their reliability and robustness, and finally their long-term sustainability (comparability time wise) depend on various factors and actors.

Box 2: National system of permanent observation of training and occupational needs in Italy

The system is built on collection and optimisation of project outcomes and available information on skill needs anticipation. The system was developed by ISFOL under assignment of Ministry of Labour and Social Security within the European Social Fund (ESF) programme 2000-06. It is designed as an interface available from Internet (<http://fabbisogni.isfol.it>) to provide a flow of information (qualitative, quantitative and estimates) on training needs emerging from economy and the labour market. This system arranges data and information coming from different sources:

descriptions of training needs arising from national survey conducted by social partners established in bilateral bodies;

short-term hiring forecasts of the project Excelsior realised by Unioncamere;

mid-term (five years) forecasts of economic employment trends for sectors of activity based on reports conducted by ISFOL;

mid-term (five years) forecasts on employment career's perspectives both at national and regional level based on reports conducted by ISFOL

The link between various types of information is provided by the use of official classifications of economic activities (Ateco 91 national classification) and of the professions (CP 2001 national ISTAT classification).

In 2003 the Ministry of Labour and Social Security set up a *Cabina di regia* (steering committee) represented by regions and social partners with the task of addressing, coordinating, evaluating and eventually reorganising the system. The system has especially contributed to the improvement of the classificatory and descriptive structure of occupations which would allow a greater integration and communication among the quantitative dimension of occupational needs (in statistical terms) and the qualitative dimension of occupational needs expressed by the labour market.

The strong points of the national system of observation of needs include the possibility to proceed to a systemic intervention able to integrate the regional/local/sectoral dimensions in the national context. Nevertheless, some obstacles are still to be addressed, such as the need to harmonise the national initiative with those taking place at local level.

ISTAT: Italian National Statistics Institute.

ISFOL: Institute for the Development of Vocational Training of Workers.

Source: Cedefop, 2008b.

3. Difficulties and obstacles related to early identification of skill needs in EU Member States

Several problems in early identification of skill needs are mentioned by Member States. The major concern is a lack of coordination and as a consequence various efforts often take place in parallel without being linked. Research approaches and activities are not always entirely transparent even at national level. A holistic approach to early identification of skill needs depends more on 'entrepreneurial' skills and the initiative of a researcher than on a systemic arrangement: there are still very few collaborative teams/networks which have access to various information sources and use diverse tools and methods for analysing skill needs. It can be observed that many efforts in Europe are similar but differ in specific methodological approaches and, therefore, the results are not comparable.

The time lag between producing useful – detailed and robust – analyses and incorporating the knowledge into VET courses remains a problem: medium to long-term projection is needed to cater for the time lag but such projections are mostly not detailed enough and need to be enriched by other – qualitative type – information, which takes time and exacerbates the time lag. Implementing research results into policy and practice still remains the most difficult stage of any project or initiative: a lack of systemic arrangement does not help neutralise the conflict of institutional and/or political interests of different actors. Also insufficient flexibility, resources and capacities in education and training institutions to adapt the information on labour-market needs to the study programmes are often identified as weak points.

Box 3: Support from levy funds and ESF for anticipation of skill needs in Spain

Studies on training needs in specific sectors and for specific target groups, transversal sector studies (environment) and the activity of the permanent observatory of occupations are funded in the framework of the public employment administration through the national plan of training and professional insertion. The plan is financed through the vocational training taxes from companies and workers, collected along with the social security contributions, and by contributions from the ESF.

Anticipation of skills and training needs in the framework of the Tripartite Foundation for Training and Employment, also linked to the employment administration, is performed through the programme of complementary training actions. This programme is also financed through the vocational training tax paid by workers and entrepreneurs, and through ESF subsidies.

Source: Cedefop, 2008a.

Many difficulties in anticipation of skill needs are related to financing. Insufficient funding still can be observed, although availability of the ESF funds is largely recognised as an important contributor to the development process. However, there are also sometimes insufficient capacities to use the available funds efficiently – even where funds are available, there are sometimes indications of insufficient human resources and expertise in skill needs analysis (leads training), especially in new Member States.

Box 4: ESF national labour market research programme in Latvia

There was a lack of systematic labour-market research and forecasts of medium and long-term skills needs in Latvia. To improve skill need forecasting and to explore economic trends and demands the ESF national programme labour market research (2005-07) was launched.

Several research projects were carried out to identify and to solve economic issues and to foster achievement of broader policy objectives. The programme priority was the development of human resources and fostering employment. In the framework of the research programme under the Ministry of Welfare research was implemented at national and regional levels.

The project explored economic trends and the state of the labour market. For instance, career and educational development of graduates was analysed, procedures for the development of occupational standards and their correspondence to the labour market, and reasons influencing the choice of studies were studied, as well as occupational and geographical mobility of the workforce. Research on working conditions and risks will be used for improving the legal base of the labour market, and for implementing social, economical, technical, preventive and organisational activities. Another study will assist in combating unemployment and social exclusion.

The data gathered in research will be applied in further education long-term planning policy to ensure education compliance with economic and social demands. The project initiated labour-market studies on a large scale and set foundations for further research on skill needs. The outcomes of the national programme will be integrated in further long-term policy planning.

The reports are available from Internet <http://www.darbatirgus.gov.lv/index.php> [cited 30.9.2008].

Source: Cedefop, 2008b.

Insufficient statistics collection and database development, insufficient time series, samples, etc., belong to the main obstacles. To develop and put in place an efficient system for anticipation of skill needs requires availability of 'hard data' as the most important input. A substantial investment in statistical infrastructure and better quality data at national and European levels is therefore urgently needed. The scale of such investment is usually much larger than that involved in actually carrying out the projections. However, these data sources are used for many other purposes as well (the UK).

Although social partners increasingly participate in all the necessary stages of VET development in all the Member States, convincing employers (mainly small and medium-sized enterprises) to be involved in the process of identification of skill needs and in strengthening links between VET and labour market remains a challenge reported by many countries. There are also sceptical voices on the capacity of the employers regarding their evolving responsibilities in this area (Hungary).

To overcome some of the above-mentioned difficulties, methodological and expertise assistance would be welcomed in many cases (mainly by new Member States). The important role of Cedefop's network on early identification of skill needs (Skillsnet) in sharing and transfer of knowledge and expertise is often mentioned by Member States.

Despite the difficulties mentioned, it has been observed that the Lisbon agenda, EU-level resolutions and initiatives, and subsequent national programmes for the implementation of the Lisbon strategy have been an important trigger for development of systems of identification and anticipation of skill needs, especially in those countries where such systems were not very developed (new Member States, Greece, Portugal). Also ESF funds have substantially contributed to the development of systems and to data collection and improvement of the information base.

4. Methods, approaches and tools in use

Main methods used at present in Europe vary from quantitative and semi-quantitative approaches such as econometric forecasting models (national level, sometimes allowing spatial disaggregation), surveys among employers, skills audits; to qualitative, such as Delphi method, case studies, focus groups, sector scouting and determining qualification requirements among trendsetting companies (see more in Cedefop, Abicht and Freikamp, 2005), and finally combined/holistic approaches, such as foresights, shared diagnosis, scenarios (including some proactive approaches to construction of the future – strategies, backcasting, etc.), observatories (sector, regional). Other approaches used include sector studies, alumni surveys and monitors, specific branch/type of activity/occupation/field of qualification studies, studies on skill requirements for specific target groups (unemployed, disabled, low/non-qualified, ethnic minorities, foreign workers) and so on.

Box 5: French Trades in 2015

Trades in 2015 is the result of work carried out in the framework of the skills and forecasting group by the *Centre d'analyse stratégique* (CAS) and the Ministry of Employment and Social Cohesion's Directorate of Research and Statistics Activity (*Direction de l'Animation de la Recherche et des Statistiques* – DARES).

The report examines in detail a score of professional fields:

- from agricultural trades to personal assistant services;
- from the perspective of both labour demand (how many individuals will be retiring from these trades? how will employment evolve in the relevant sectors?);
- labour supply (what is the profile of individuals in these trades today?).

In particular, it takes a close look at trades supplying assistance and care to the ill and elderly and clarifies the economic and social stakes involved in the development and professionalisation of these jobs.

Source: Chardon and Estrade, 2008.

All methods and approaches have their strengths and weaknesses. For example, quantitative model-based projections are generally comprehensive, consistent and transparent but they are data-demanding, costly and not everything can be quantified. Ad hoc sectoral or occupational studies are usually strong on sectoral or other specifics but might be partial and inconsistent across sectors, areas, etc. Surveys of employers or other groups asking about skill deficiencies and skill gaps involve directly the user/customer but may be very subjective, short-term, inconsistent and can also easily focus on the margins (current needs, vacancies) rather than skill gaps within the current workforce. Focus groups, round tables, observatories and other Delphi style and holistic methods also involve directly the user/customer but could be non-systematic, inconsistent and subjective (Cedefop, 2007b).

Although each Member State uses many methods to identify its current and future skill needs, some methods and approaches are more frequent in certain countries than in others.

This can be explained by cultural specificity, structures of cooperation with social partners at sectoral and national levels, and most importantly by the system of initial and continuing VET. There is no purity of this or that approach in a given Member State, as different methods are used by different institutions in each country. Yet, although somewhat over-simplified, a certain map of the most 'indicative' approaches across Europe can be drawn.

Vocational qualification focused research caters for the VET systems in Germany and Austria. Scenarios and strategies are used more frequently in Anglo Saxon and sometimes in Nordic countries, whereas observatories (sectoral and regional) which use (semi-) qualitative surveys and involve several different actors to produce so called 'shared diagnosis' are frequent in France and in southern Europe. For example, the shared diagnosis approach is popular among regional observatories of employment and training (OREFs) in France. Their sectoral contract perspective studies include use of macroeconomic forecasts with other quantitative surveys data enriched by qualitative information. Intermediary and final results are broadly discussed with various actors (regional government, social partners, schools) and the final recommendation is produced by consensus. Although not entirely smooth, such an approach supports commitment and helps implementation of the agreed recommendations into policy and practice.

Quantitative econometric forecasting combined with elements of qualitative research and sector studies are typical for the Netherlands, where very elaborate forecasting produced by the Research Centre for Education and the Labour Market (ROA) now incorporates spatial disaggregation to meet regional information needs. The results of national forecasts published as labour-market indicators adjusted to users' needs (qualitative description of labour-market prospects) are disseminated through the career guidance and vocational counselling system.

A more policy-oriented approach has been recently adopted in the UK where the government commissioned a special review of skills (the Leitch review) to identify the UK's optimal skills mix in 2020 to maximise economic growth, productivity and social justice, and to consider the policy implications of achieving the level of change required (Box 7).

In new Member States there are various methods but most are in a developing and testing phase, developed often in cooperation with an old Member State and thus borrow some features of the 'host' system (Dutch approach in the Czech Republic, Irish methods implemented in Estonia, Swedish forecasting methods and the Irish sectoral study approach in Lithuania). Also observatories were introduced to new Member States to monitor VET response to labour-market needs. Although the initial idea was imported from France, observatories in these countries are small analytical centres that apply various methods and holistic approaches rather than the observatory approach in its original form. New Member States try to balance what is desirable and feasible for implementation in their context and, therefore, select approaches which fit their own conditions. In these countries research into

identifying skill needs is often developed around standards, updating curricula and setting up qualification frameworks.

Box 6: The French Observatory of Pharmaceutical Companies Association

The Observatory of Pharmaceutical Companies Association (LEEM) on professions and qualifications was established in 1994 and denotes strong determination in the sector to create awareness about its professions and bring its skills sets forward. It is one of the leading branch observatories in France.

Objectives:

- to forecast and monitor jobs and employment in the pharmaceutical sector;
- to inform and communicate with a comprehensive set of tools on all professions in training.
- Its primary missions:
- to anticipate and analyse the development of the sector's professions;
- to become more familiar with the professions and spread knowledge about them;
- to tailor the training offer to actual needs;
- to promote forward-looking skills management.

Its work methods:

to capture information, capitalise on it and report on it: the Observatory as a technical and methodological unit works in close connection with companies' operational and human resources teams;

to respond to the requirements/expectations of companies in the branch: to support human resources projects, the observatory offers tools and methodological guidelines;

to communicate with human resources teams and employees in the sector's companies, other partners (journalists) and young people: to promote the sector, inform about the businesses and training programmes.

The tools deployed by the observatory:

- studies on strategic or developing businesses;
- qualitative and quantitative forward-looking studies;
- a study on bridges between professions;
- a study-initiative on technological changes and employment;
- a guide of professions;
- economic environment studies on employment and recruitment;
- updated collections of brochures on the professions.

Tools on the observatory website:

- a job market,
- a database of professions,
- a database of qualifications.

In France several branch observatories were set up as a result of contract perspective studies in sectors. There are now over 20 branch observatories on professions and qualifications in France. Apart from them, the administrative regions manage employment and training regional observatories (OREF). Since 2003 there has been an attempt to create a national platform for exchanging the experience in observing developments of professions, qualifications and training ^(a). The aspiration is to put together the results of observatories' studies to give the impetus for policies development in employment and vocational training.

^(a) Available from Internet: <http://www.interef.com/> [cited 30.9.2008].

Source: Cedefop (2008a; 2008b), *Observatoires prospectifs des métiers et des qualifications*. Available from Internet: <http://www.interef.com/ateliers/observatoires/presentation.htm> [cited 30.9.2008].

In many countries a permanent monitoring system of labour-market needs is linked to online provision of results, sometimes interactively (an ongoing project in Italy which aims to set up a permanent national system for observing and forecasting skill and training needs –

information technology and network-based; Austria's skills barometer). In some cases, online information on jobs and occupations – used in career guidance – is attempted to be linked to information on skill needs in the labour market (integrated system of typical working positions called ISTP in the Czech Republic).

Box 7: The Leitch review of skills in the UK

The UK Government commissioned Lord Leitch in 2004 to undertake an independent review of the UK's long-term skills needs. In particular, the review was asked to examine the UK's optimum skills mix to maximise economic growth and productivity, and consider the different trajectories of skill level the UK might pursue. The final report of the Leitch review of skills, *Prosperity for all in the global economy – world class skills*, was published on 5 December 2006 drawing on evidence from many sources (a call for evidence was sent to over 250 organisations, including employers and their representatives, unions and organisations providing education and training). The review team worked with key stakeholders, including government, agencies, education and training providers, businesses and trade unions. The review sets out a compelling vision for the UK. It shows that the UK must urgently raise achievements at all levels of skills and recommends that it commit to becoming a world leader in skills by 2020, benchmarked against the upper quartile of the OECD. This means doubling attainment at most levels of education. It also recognises that responsibility for achieving ambitions must be shared between government, employers and individuals.

Source: Leitch review of skills (2006).

Overall, almost all countries have inbuilt mechanisms in their systems for updating qualifications and including new and emerging qualifications. Such mechanisms are mostly provided in an institutional setting (sectoral committees). At regional and sectoral levels, bipartite and tripartite bodies, which deal with initial and continuing VET and include expertise on skills and labour-market needs, can be found (in Italy, the Netherlands, Norway). Many countries, however, went further by establishing cross sectoral decision-making and expert bodies for early identification of skill needs (for example, expert group on future skill needs in Ireland, Human Resource Development Authority in Cyprus, etc.). One can speak nowadays about emerging systemic arrangements in early identification of skill needs in several countries.

Box 8: Online information service on skill needs in Finland

The online information service on skill needs, called ENSTI, was developed particularly to serve users and producers of anticipation data for education and the labour market. There are for example national, regional and local administrations, universities, advisory boards for VET, guidance counsellors, researchers and experts on anticipation and follow-up of education and training.

ENSTI was developed at the Finnish National Board of Education in 2001-04 with funding from the Ministry of Education and ESF. The development involved representatives from ministries, regional administration and labour-market organisations. Also researchers and participants in anticipation projects were involved.

The objective of ENSTI is to bring the users and producers of anticipation data closer to each other.

According to the user statistics the average user ratio per month has grown considerably in 2004-07, from less than 2 000 users to 75 000. In the same period the number of those using the service more than once a month has increased from 140 to 3 500.

Surveys point to the fact that most users work either in educational organisations or national and regional administrations.

The information found in ENSTI is used mainly for preparing decision-making.

The most important parts, according to the users, are anticipation-related news, numerical forecasts (job-openings in different professional groups and the training needs in different levels and sectors of education). Further, important for users are anticipation reports and projects (links to these and descriptions). The newsletter published four times per year has received a lot of positive feedback and is considered an information channel.

Source: Cedefop, 2008b.

4.1. Measuring skill shortages

A short overview of approaches and methods for measuring skill shortages was provided in a paper on skill shortages for Cedefop's fourth report on VET research in Europe (Cedefop, Strietska-Illina, 2008). Given the lack of reliable vacancy statistics, most Member States use alternative quantitative and qualitative methods and sources for identifying skill and labour shortages.

Employer surveys, which ask questions on the difficulties experienced in finding suitable personnel, is a widely used source of information on skill shortages in most Member States (detailed information on employers' surveys is provided in Section 4.3). The surveys are mostly used with the aim of producing an analysis of short-term skill shortages at national, regional, local and/or sectoral levels. However, evidence from such surveys is often criticised for not being representative and for producing a static picture. These problems, however, can be solved by conducting surveys with a large and representative sample at regular intervals. The reliability of information gathered through surveys is very questionable when the data gathered are evaluated in quantitative terms because they present the situation not entirely objectively but as perceived by employers and thus usually arrive at inflated figures ⁽³⁾. This

⁽³⁾ There is also evidence from case studies that skill problems are under-reported by respondents – not all skill shortcomings are necessarily recognised as such by managers in companies (Mason, 2004). It is therefore difficult to conclude to what extent and on which aspects the reporting from companies is either exaggerated or undervalued.

causes major problems for interpreting the results of such surveys. Nevertheless, they can often yield some interesting information on employer perceptions of the skills required from potential recruits and of existing skills deficits within their organisations. The greatest value of such surveys is their qualitative approach in identification of skill gaps –information which can never be discovered by quantitative analyses or forecasting which uses occupations or formal qualifications as proxies for skills.

Box 9: Employers skills surveys in the UK

The first report of the national skills task force was published in 1998. It gave important definitions and framework for identification of skill shortages. A regular employers skills survey was introduced in 1999, and examined the nature, extent, causes and implications of skills deficits in the UK. The main objective was to provide policy advice on the priority skill areas to which resources should be allocated. The methodology was based on a telephone survey of 23 000 employers and a face-to-face survey of 4 000 employers, case studies, analyses of employment projections by occupation through 2009, estimates of rates of return on vocational qualifications and basic skills, and comparisons between the UK, France and Germany (NSTF, 1999).

Later surveys were commissioned by the Learning and Skills Council in partnership with Sector Skills Development Agency and the Department for Education and Skills. An earlier longer time series on skill needs in Britain (1990-98) in combination with the employers skills survey provides valuable time series data on employers' recruitment difficulties, skill deficiencies and workforce development activities in companies. The most recent study was undertaken in 2007 among 79 000 employers via telephone, followed by a subsample survey undertaken with 7 000 employers that had funded or arranged training.

Whereas findings of earlier studies were worrying, the findings of the latest one were positive with fewer employers reporting skills gaps and the percentage of all vacancies caused by skills shortage showing a marked fall. There had also been an increase in the proportion of employers providing training, holding a training plan and budget, which led to an increase in the cost of training for employers (LSC et al., 2007).

The survey is a valuable source of information on skill deficiencies and hard-to-fill vacancies, including the reasons, and it is a valuable tool for formulation of short-term policy responses to skill shortages, including migration measures. The positive dynamic reflected in findings marks the contribution of the survey to well-informed and intelligent policy actions and to encouraging practical changes.

Source: NSTF (1998; 1999), IER (2003), LSC et al. (2005; 2007).

The deficiencies of vacancy data and their insufficient coverage of real vacancy posts are sometimes solved by analyses of job advertisements in media and on the Internet. For instance, the Federal Institute for Vocational Training (BIBB) conducted research of job advertisements for the information technology sector in Germany. The analysis used a representative sample of job advertisements in the sector and a subsequent survey of the advertisers. The objective was to compare the skills and qualifications employers were looking for with what proved to be available in the market. The study found that about one fifth of job vacancies remain unfilled six months after being advertised. Employers described the lack of multiskilled specialists and soft skills as candidates' principal shortcomings (Cedefop, Bott, 2004). Studies of advertisements are often used as an additional tool to measure skill shortages along with forecasting and employers' surveys (Strietska-Iliina, 2003).

One of the most frequent methods of measuring future skill shortages is a forecasting macro-model on supply and demand with an occupational and qualification matrix (see more on the method in Section 4.2). Such models are widely used in the Netherlands (produced by ROA, see Box 10), Ireland (ESRI), Germany (WZB, IAB), France (BIPE), Finland (NBE), the UK (IER) and others (Cedefop, Tessaring, 2003) ⁽⁴⁾. The models vary across countries but use in principle the same approach: they project demand side information derived from employment demand by industries and the supply side information on demography, education and training, comparing demand and supply, and eventually identifying – by comparing demand and supply – future surplus and shortage occupations and qualifications. The main strength of such an approach is nation-wide level of projection and a possibility of longer-term forecasts (5-10 years), indicating future skill shortages and thus giving policy-makers the potential for policy adjustment. The weakness of such forecasts is roughness of information, level of aggregation and lack of information on the quality of skills and qualifications required. Another serious deficiency of forecasting models is extrapolation of previous trends to the future, which appears especially flawed in the circumstances of reforming economies, policy interventions and exogenous shocks.

Box 10: Forecasting model in the Netherlands

The Research Centre for Education and the Labour Market (ROA) of Maastricht University has developed a forecasting model for the labour-market situation of different types of education on the Dutch labour market. ROA compiles forecasts of changes in the labour market in the medium-term (for a period of five years) to give those making choices on further studies the best possible information on the state of the labour market. This project focuses in particular on the match between education and occupation, the substitution processes in the labour market, and the labour-market perspectives of more than 100 education programmes and occupations. The project includes the collection of a large amount of topical data, trends, and indicators. For each of the types of education and occupational groups, forecasts are made of the medium-term developments of employment rates, replacement needs, and the influx of school-leavers into the labour market. Every other year, the results of this research project are published in a widely available report *The labour market by education and occupation*. The most recent forecast was produced for the period 2007-12. An indication of future labour-market prospects for newcomers to the labour market is calculated, for each type of education, by comparing the expected flows of demand and supply, and surplus as well as shortage education categories are identified. The National Careers Guidance Information Centre (LDC) incorporates ROA's labour-market information in various information products for vocational and educational guidance. Besides various ministries (education, social affairs, economic affairs, agriculture), public employment services, educational institutes, personnel managers, advisory councils, etc., all use different parts of the information system for their decision-making. The project is funded by the Ministry of Education, Culture and Science, the Association of Centres of Expertise on Vocational Education, Training and the Labour Market (COLO), the National Employment Office (CWI), the National Career Guidance Information Centre (LDC), the Council for Work and Income (RWI), Randstad Nederland and the Ministry of Agriculture, Nature and Food Quality.

Source: Cedefop, Cörvers, 2003; ROA website: <http://www.roa.unimaas.nl> [cited 30.9.2008].

⁽⁴⁾ ESRI – Economic and Social Research Institute; WZB – Social Science Center; IAB – Interactive Advertising Bureau Europe; BIPE – Office for Information and Economic Forecasting; NBE – Finnish National Board of Education; IER – Institute for Employment Research, University of Warwick.

4.2. Forecasting skills demand and supply

In 2005, Cedefop collected information specifically on systems of medium to long-term forecasting of skill needs at macroeconomic level in Member States (Cedefop, 2007b). The following 14 countries were included in the analysis: the Czech Republic, Germany, Estonia, Ireland, Greece, France, Italy, Cyprus, the Netherlands, Austria, Poland, Romania, Finland and the UK.

The comparison showed that most countries apply a specific macroeconomic model. Forecasts of gross domestic product (GDP) growth rate, projections on value added for the whole economy and other indicators (output and related indicators; wages and prices; trade statistics, etc.) are part of it. Employment forecasts on general and sectoral levels are also usually carried out. Projections of demographic variables are considered in some countries. The Czech Republic and Germany do not use any formal and regular macroeconomic model for skill needs forecasts, however, for different reasons: in the Czech Republic, no regular macroeconomic forecasts have been carried out so far. Researchers used the national version of the Hermin model⁽⁵⁾ as the best sectoral macro model available and experts' employment sectoral forecasts along with other data inputs. Recently, thanks to cooperation through Cedefop's Skillsnet network, there has been an attempt to use E3ME model⁽⁶⁾ in the Czech national forecast. In Germany, however, it has been a methodological decision of researchers not to apply any formal macroeconomic model to skill needs forecasts any more, as their reliability and validity in general is doubted. For skill needs forecasting, labour force survey data are used extensively by Member States as well as data from the European system of national accounts (ESA95). Ireland uses additionally the quarterly national household survey. Some countries also use unemployment records or business inquiries.

Besides these, data from the population census are applied, together with regular/current statistics obtained from national statistical offices and other sources, such as the Ministry of Education, Youth and Sport (the Czech Republic), Social Security Agency (Austria), Government Actuary Department (the UK), etc.

Although expansion demand is perceived to be the basic measure in employment forecasting, it is not the only source of changes in employment demand. Even if the number of workplaces for certain occupations does not grow, or even if it decreases, there is still certain demand created by people leaving due to retirement, temporarily for maternity leave or for other reasons. In most countries, both – expansion and replacement – demands are included in skill needs forecasting methods. For the remaining countries, Greece and Poland

⁽⁵⁾ Hermin-type models were designed and used to analyse the convergence and structural changes during integration of new countries into the EU (Ireland, Greece, Spain and Portugal).

⁽⁶⁾ The E3ME model was designed as a framework for assessing energy-environment-economy issues and policies. The model has been used for general macro and sectoral economic analysis and for more focused analysis of policies (available from Internet: <http://www.e3me.com> [cited 30.9.2008]). The recent mid-term occupational skill needs forecast for the EU used this model (see <http://www.trainingvillage.gr/skillsnet>, section 'Forecasting').

only forecast total demand, while in Ireland replacement demand measures are being implemented currently. Poland is also working on the division of expansion and replacement demand in its systems.

Even if not always at the same level of precision, the supply side is considered by most countries. The main parameter to predict is the inflow of school-leavers by the type of education/qualification, which in many studies is complemented with estimates of the amount of short-term unemployed ready to take up a job. This is then compared with job openings for specialists with certain qualifications (the forecast done by the Netherlands is a typical example of this model).

Skill mismatches and shortages of specific qualifications are estimated by comparing supply and demand. France and Ireland also carry out analyses at more general level, regarding trends in sectoral employment demand and thus looking for potential mismatches. None the less, not all countries analyse comparison between supply and demand. Germany and Austria, for instance, carry out supply and demand studies independently with only rough comparisons at a later stage. In their view, the complexity of looking at supply as a factor of demand conditions and vice versa renders this impossible.

Italy and the UK draw attention to major difficulties of supply estimates. Qualifications that people possess in a given occupation are so diverse that it is impossible for researchers to identify an indicative match of a certain qualification with a certain path in one's working life. Another trend is that younger workers have explicitly higher qualifications than older ones, and it is not possible to draw a straightforward conclusion whether this implies overqualification/overeducation of the workforce or is related to ever-increasing demand for the abilities and skills to perform a particular job.

Quantitative models should not be seen as a universal remedy and should be enhanced by other sources of information. Nevertheless, they constitute an essential cornerstone in most countries that conduct regular assessment of occupational and skill needs at national level.

4.3. Employers' surveys

In 2007, Cedefop collected information on existing national employers' (or enterprise) surveys from the following 16 Member States: Belgium, Bulgaria, Czech Republic, Germany, Estonia, Ireland, Greece, France, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Finland and England – the only part of the UK covered (Cedefop, 2007c). The comparison revealed that all 16 Member States conduct some kind of enterprise surveys relevant to a broader subject of identification of skill and training needs. The surveys however differ greatly in their objectives, regularity, sample sizes and in a range of questions covered in questionnaires.

Objectives of enterprise surveys can be divided into five broad categories:

- (a) design of policies in the field of initial and continuing education and training;
- (b) design of training programmes, vocational training standards;
- (c) identification of skill deficiencies according to level and type of education/training;
- (d) work organisation, operating environment, business and technological changes and their impact on company's skill and training needs;
- (e) human resources management/development, recruitment practices and problems, skill gaps and labour shortages.

In practice surveys pursue more than one objective and in many cases they have a combination of several of the above-mentioned objectives. Out of 16 countries, 11 conduct surveys in specific sectors/industries/occupations or territories. Some surveys are particularly targeted at small and medium-sized enterprises. At the same time the Czech Republic, Germany, Estonia, Ireland, Greece, France, Portugal, Romania, Slovakia, Finland and England have conducted or conduct now some sort of a nation-wide survey. Nine countries have regular enterprise surveys of varying periodicity (monthly, annual, biennial) and five more countries plan repeating existing surveys in future, subject to support, interest and funding. Altogether 13 countries envisage continuing enterprise surveys in future.

Although methods and tools used for enterprise surveys differ across countries, several similarities were identified. All countries use structured questionnaires. Six conduct face-to-face interviews either with help of computer-assisted personal interview (CAPI) or not; others use a combination of online, postal, e-mail and telephone interviewing techniques.

Response rate depends on the surveying method. Those using face-to-face interviewing enjoy around 80 % response rate, postal, telephone and online interviewing brings between 20-50 % of responses with the exception of France where telephone interviewing succeeds in gaining an 80 % response rate.

A unit of analysis is an establishment (nine surveys) or an entire enterprise/organisation (eight surveys), whereas in Greece and Romania different surveys apply both approaches. Respondents are mostly human resources managers/officers, in smaller companies – owners, directors or top managers. Some Member States complement surveys with focus groups or additional surveys among social partners and other stakeholders (regional/local representatives). Only six Member States cover in the same survey or run a complementary survey among respondents-employees, of which four have results matched with responses by employers to make identification of skill gaps and training needs more robust.

The sample size largely depends on objectives pursued and level of detail needed but in general surveys seek to provide a good coverage of the segment under scrutiny (sector, profession, region, etc.). Many Member States survey a large number of enterprises (75 000 in England, 16 000 in Germany, 15 000 in France) aiming at covering a large proportion of the labour force. Most Member States use targeted or non-targeted sampling stratified/ weighed by type and size of enterprise/organisation/establishment (in terms of number of employees), sector and region.

In their analyses Member States widely use international classifications, such as NACE, ISCO-88 and ISCED ⁽⁷⁾. Only few Member States use national classification systems trying to make them compatible with the international ones. This, under certain conditions, provides good grounds for potential comparability.

Responsibility for surveys is mostly in hands of ministries and their research bodies but also it often belongs to private or public research institutions, consulting companies or universities. Funding mostly combines several sources: 12 countries enjoy funding from ministries and public employment services, four countries (Luxembourg, Poland, Romania and Finland) report (co)funding from EU sources (ESF, Leonardo da Vinci, Eures, Phare, ETF), two countries (the Netherlands and Finland) had support from social partner organisations and/or their training funds, and finally in Germany there is also some *Länder* support.

No matter how different methods and objectives of enterprise surveys are in individual Member States, it is very encouraging that all countries expressed their willingness and preparedness to discuss and to look for possibilities to make their results comparable to similar surveys in other countries.

⁽⁷⁾ NACE – Statistical classification of economic activities; ISCO-88 – International standard classification of occupations version 88; ISCED – International standard classification of education.

5. Partnership and cooperation

Partnership and involvement of stakeholders, including social partners, is in most countries already imbedded in the system. Member States have been putting considerable emphasis on the increased involvement of their stakeholders since the beginning of the Copenhagen Process (2002). To identify and anticipate the competences and the qualifications needed has become a priority in the social partners' framework of actions for the lifelong development of competences and qualifications (2002). Several new bodies have been established or enlarged, social partners' functions have been expanded, educational acts and training regulations have been modernised answering the new needs and challenges of the labour market, requiring deeper involvement of representatives of employers and employees.

Most Member States point to efficiency of accreditation, assessment and quality assurance systems for ongoing cooperation which assists incorporation of competence and skill needs of the labour market to VET provision. Particularly the development of occupational standards in a tripartite mode of cooperation and their subsequent link to qualification and competence-based profiles are recognised as a pillar for making VET responsive to labour-market needs (Hungary, Poland, Slovenia).

The importance of national/sectoral qualifications frameworks and their compatibility with the European qualifications framework are also often regarded as an important trigger for linking training to labour-market requirements. Only in exceptional cases the negative effects of 'centralisation' of the processes of qualifications' design on skill needs analysis are reported (Latvia) where probably less systematised bottom-up initiated research was overtaken by a more regulated State initiative with longer-term development objectives but lack of immediate outcomes. Other remaining challenges reported by some Member States include missing or outdated legislative frameworks. Capacity, competence and accountability of partners are not always adequate, and sometimes contradictory interests among partners damage the process.

Several countries reported on the development and increase of work-based learning and the crucial role of labour-market partners in developing VET and better anticipation of skill and training needs. One of the central aims has been that the content and quality of work-based learning are developed and improved together with the enterprises and other relevant stakeholders.

Networking in early identification of skill needs has been around for some time but it has now become massive and involves different kinds of institutions. Networks do not put together only research institutes or universities but a whole range of partners whose interest in the subject might make them useful as partners during research planning, implementation, dissemination and transfer into practice. Examples of successful networking include the 'glocal network' in Spain in the Barcelona region combining information gathering on global

sectoral trends in industry with local specific trends in skill requirements. Also in Spain the observatory of the Spanish National Institute for Qualifications was created as a network of networks providing a metastructure for research and cooperation.

Another particularly good example is the network on early identification of qualification needs FreQueNz in Germany.

Box 11: FreQueNz network in Germany

In 1999 the German Federal Ministry of Education and Research (BMBF) launched the initiative for early identification of qualification needs. An essential element of this initiative is the FreQueNz research network (FreQueNz is an abbreviation of the German for Network for early identification of qualification needs), which is concerned with questions on skill trends. The emphasis is on the early identification of new skills and on assessing the significance of findings for vocational training. The network comprises 12 institutes and organisations working on projects with a mainly qualitative focus on specific sectors of activity, enterprises and target groups. Research activity is linked through the network, making it possible to retain an overview of the work and to discuss methods, approaches and results in progress. The network makes it easier for project partners and users to contact one another and thus to communicate, cooperate and disseminate results efficiently. The findings contribute to modernisation of vocational training and allow a prompt reaction to changes as they reveal themselves. The aim of the initiative is to identify skill needs, make findings rapidly available and formulate options for action in initial and continuing training.

The network includes research institutions, universities, State institutions, business, social partners and others. FreQueNz implemented many innovative projects in close cooperation with their members, such as a method for regularly monitoring skill developments (IDQ), sector scouting and identifying trendsetters, research into new technologies and international qualifications, etc.

Source: Cedefop, Strietska-Ilina (2007); Dworschak and Zukersteinova (2007).

FreQueNz, aware of the deficit of information on early identification of skill needs at European level, was one of the first partners of Cedefop's network on early identification of skill needs at European level, Skillsnet, established in 2004. The role of Skillsnet in networking at international level and transfer of knowledge and expertise among partner countries is often mentioned by Member States.

6. Types of approaches in building systems on anticipation of skill needs

Every system has a combination of features and, therefore, any typology is of course tentative. The available information and data, however partial, allow a very rough indication of mainstream types of systems. It is important to bear in mind that systems are in constant change and development and, therefore, what is true for today may be deliberately (policy decision) or accidentally (unintended result of projects, research or impact of EU-level measures) changed. Moreover, any typology is a certain oversimplification produced for pure analytical reasons. Each national system has some features of several types. Therefore, the allocation of countries to this or that type is tentative and depicts only a predominant line of current development. The typology provided is by no means a ranking. Every national system of early identification of skill needs has its internal logic which corresponds to the country's system of education and training, legal and institutional environment, economic situation and, last but not least, culture and mentality:

- (a) decentralised system. The system is developed mostly at trade, sector or local levels. Systematic anticipation of skill needs at national level is not very pronounced. The skill needs analysis is performed in the framework of development of occupational standards, sectoral and regional analyses. In some countries of this group a more systematic approach is nevertheless under planning (Denmark, Greece, Spain, Latvia, Lithuania, Hungary, Portugal, Slovenia, Slovakia);
- (b) coordinated non-holistic system. The system is well-developed around quantitative forecasting which is a major building block of the system, although some qualitative elements are incorporated into the forecast and qualitative surveys are conducted in parallel (Ireland, Cyprus, Finland);
- (c) building a coordinated holistic system. The system is mostly based on medium-term macro-level quantitative forecasting which incorporates some qualitative elements of sectoral and/or other trend projections. Several efforts at national, regional and sector levels aim at a more systematic, complementary and holistic approach. These countries attempt permanent skill needs monitoring with eventual dissemination through an online information platform (the Czech Republic, Estonia, Italy, Poland);
- (d) coordinated holistic system. Countries with very well-developed and long-established systems based on medium and/or short-term macro level forecasts, system of sectoral studies, regular questionnaire skills surveys among employers, regular regional surveys on employment, and with an efficient system of dissemination and application of findings to policy and practice (Germany, France, the Netherlands, Austria, Sweden, the UK).

7. A short review of systems

The Czech Republic

The country has started actively developing the system of anticipation of skill needs during the last decade. It is based on medium-term macro-level quantitative forecasting which incorporates some qualitative elements of sectoral projections. In parallel qualitative sectoral surveys covered several selected sectors and are now planned to be linked to a more permanent system of sector counsels. Although there is no developed system yet, several efforts at national, regional and sector levels aim at a more systematic approach.

Denmark

The system is based on the involvement of social partners in funding and in direct research collaboration, developing mostly at trade and local levels. Systematic anticipation of skill needs at national level is not very pronounced.

Germany

The system is well developed being based on common sharing of research activities and experiences by networking (FreQeNz). The system includes qualitative research into sectors, branches, occupations, econometric forecasting and qualification standards development research.

Estonia

The country has started actively developing the system of anticipation of skill needs during the last decade. It is based on medium-term macro-level quantitative forecasting which incorporates some qualitative elements of sectoral projections. In parallel qualitative sectoral surveys cover several selected sectors. Although there is no developed system yet, several efforts aim at a more systematic approach.

Ireland

The country enjoys a fairly well-established system based on combination of sector studies, general labour-market and employment trends analyses, and on medium to long-term employment demand forecasting by occupational categories.

Greece

The system has started developing only recently. It is based on local partnerships, alumni surveys and other transition-to-work type of research. Some econometric forecasting and other quantitative and qualitative surveys are under development.

Spain

Anticipation of skill needs is done through work on development and update of vocational qualifications, sector studies, permanent observatory of occupations and the network of observatories of the labour market.

France

A well and long established system of anticipation of skill needs based on macro-level medium-term forecasts, sector perspective studies, regional surveys and employers skills surveys. Active involvement of social partners and regional actors.

Italy

The system is based on sector and regional studies, hiring surveys and short and medium-term econometric forecasting by sector and occupation. The country now attempts to build a more systematic approach of permanent skill needs monitoring and a linked Internet platform for data dissemination.

Cyprus

The country enjoys a long-established system of macroeconomic medium to long-term forecasts by sector and occupation complemented by short-term forecasts and annual surveys of skill needs among employers in collaboration with social partners.

Latvia

There is no developed system of skill needs anticipation yet. Many actions are planned including developing a more systematic approach and research. Upcoming projects are in the ESF pipeline.

Lithuania

Anticipation of skill needs is done through sector studies and development of qualification standards and forecasts based on available statistical indicators and employers' surveys. There is no developed system of skill needs anticipation yet but planning to attain a more systematic approach is in place.

Hungary

The system features regular short-term labour-market projections by Public Employment Service based on enterprise questionnaire surveys, recently started development of medium to long-term macro-level forecasting (to be published), regional activities. There is no systematic anticipation of skill needs yet but several efforts to build continuous monitoring of skill needs into the VET system are present.

The Netherlands

The country has a very well-developed and long-established system with multi-source funding and strong involvement of social partners, quantitative and qualitative information, very detailed results serving decision-making as well as counselling individuals.

Austria

The system is well developed and incorporates several elements: qualification barometer as a comprehensive and continuing monitoring of skill demand with an online information system, macro-level medium-term forecasts of skills demand, accreditation system of universities of applied sciences, networking researchers in the framework of public employment services, and employers skills surveys.

Poland

The country has completely destroyed the interdepartmental efforts of the last decade to develop a system of labour market skills demand forecasting. Planning to develop a new system is in place as well as efforts to 'profuse' data (establish a more holistic approach for more robust and reliable results). Poland has applied an interesting method of observation of trends and changes in skills demand in old Member States to anticipate their own skill needs.

Portugal

The system is based on sectoral analyses linked to the development of professional profiles and qualification standards.

Slovenia

There is no developed system of skill needs anticipation yet. Skill needs analysis is performed in the framework of development of occupational standards, including few sectoral analyses. The promising systematic development of anticipation of skill needs takes place in the Podravje region with suggestions and attempts to disseminate the good practice to other territories.

Slovakia

There is no developed system of skill needs anticipation yet. Awareness of the need of such a system as well as planning to develop the system are in place but there are indications of lack of available expertise. Promising development at sectoral and regional levels.

Finland

The system is quite well developed. Quantitative forecasting is a major building block of the system, although some qualitative elements are in-built in the forecast, and qualitative surveys and focus groups are conducted in parallel. Partnership and cooperation are important elements of the system. Electronic information bank is a product.

Sweden

The country has a very well-developed and long-established system with several complementary long, medium and short-term forecasts, system of sectoral studies, regular questionnaire skills surveys among employers, and regular regional surveys on employment (past and planned).

United Kingdom

The country enjoys a very well-developed and long-established system (although still under further development and change) based on several pillars:

- well-coordinated sectoral and regional research into skill needs identification through the national Sector Skills Development Agency and a network of 25 Sector Skills Councils;
 - medium to long-term sophisticated forecasting which provides the necessary level of detail at sectoral and regional levels as well as implications for qualifications;
 - regular employers skills surveys at national and regional levels.
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8. Conclusions

Recent economic developments, decreasing supply of skills due to demographic change and increasingly felt shortages of workforce in many Member States have become an important push factor in developing systems for early identification of skill needs. Also the recent EU-level resolutions and initiatives, and subsequent national programmes for the implementation of the Lisbon strategy have been an important trigger for development of such systems, including their incorporation into legislation and national development strategies in many Member States. ESF funds have substantially contributed to the development of systems and to data collection and improvement of the information base.

There has been a shift in the objectives of identifying future skill requirements from knowledge of manpower demand in terms of numbers to knowledge on the kind of skills required and changes of job contents in different occupations. New objectives demanded different approaches. Thus, systems of early identification of skill needs have become sophisticated and complex. There is a clear trend to combine methods and efforts of different institutions and projects. More complex approaches pushed forward collaborative modes of work and networking among institutions and experts at different levels. This supported greater awareness of research activities and methods among institutions, regions, sectors and countries. Better interinstitutional cooperation and communication of research results has been further reinforced by information technology-based solutions.

However, the implementation of research results to policy and practice remains the most difficult point. Despite creating complex structures (institutional, decision-making, involvement of social partners), it is still difficult to recognise a coordinated process of early identification of skill needs. Research and analysis often appear as one-off activities. There is a lack of coordination to research planning, implementation and transfer as integral parts of a project cycle. Systematic sector and regional activities are still rare.

We can conclude from the information available that the systems of early identification of skill needs across EU countries, although having several similarities in features and development trends, are in fact very different. Many efforts in Member States are similar but differ in methodology, and thus do not produce comparable results at European level. With greater mobility of labour in Europe, knowledge of future skill demand of the European labour market is becoming imperative. This confirms the need for a European system of early identification of skill needs with an adequate capacity to produce robust, reliable and regular information at European level. This could be achieved by a holistic approach with an active input of various data sources and combining quantitative and qualitative surveys at European level. Effectively this is only possible if Member States continue to provide their input. More collaboration between European institutions and larger investment will be needed to push the process forward.

At European level, recent developments brought up some new research activities and information collection initiatives on early identification of skill needs. Cedefop has developed a first pan-European forecast of skill needs and is currently carrying out a complementary forecast of skill supply to identify potential labour-market imbalances. This is accompanied by a broader assessment of different types of skill mismatch. Another Cedefop initiative explores the possibility to use employers' surveys as a tool for identification of skill needs in Europe. The Directorate-General for Employment of the Commission launched a comprehensive sectoral analysis of emerging competences and economic activities in the EU covering 16 sectors sensitive to restructuring and skill needs.

Standardised data collection across countries and sectors is, however, still limited. Major investment of expertise and funding is necessary to improve the European labour-market intelligence database. The data available from Eurostat, the Directorate-General for Employment of the European Commission, OECD and other bodies should of course be fully used for EU level comparisons of skill needs on the labour market and for identifying information gaps and data problems for subsequent solutions. However, investment into collection of comparable across-Europe data in Member States, expansion of samples and reinforcing time-series continuity is a prerequisite for reliable knowledge on future skill needs in Europe.

Current policy agenda favours further developments in this area. In November 2007, the Council (Education, Youth and Culture) adopted a resolution on 'new skills for new jobs' (Council of the EU, 2007a) aiming at a more coordinated approach, based on existing structures, to respond better to the objectives of the integrated guidelines of the Lisbon strategy. The December 2007 European Council stressed that 'Member States and the Commission should give priority to the implementation of [...] the new skills for new jobs initiative' (Council of the EU, 2007b, p. 11). The March 2008 European Council confirmed that investing in people and modernising labour markets remains one of the four priority areas of the Lisbon strategy, and invited 'the Commission to present a comprehensive assessment of the future skills requirements in Europe up to 2020, taking account of the impacts of technological change and ageing populations and to propose steps to anticipate future needs' (Council of the EU, 2008a, p. 9). In June 2008, the Council (Employment, Social Policy, Health and Consumer Affairs) also invited 'the Commission [...] to report, by the 2009 Spring European Council, with its first assessment of the future skills requirements in Europe up to 2020' (Council of the EU, 2008b, p. 4).

The new Commission initiative 'New skills for new jobs' introduced within the renewed social agenda (European Commission, 2008) aims at proposing further steps to anticipate future needs at European level. Member States are rather positive about developing a common approach or a common European tool for anticipating skill needs. As a main problem most of the countries mention the diversity and differences in current methods, tools, statistics, definitions, but also different stages of economic development. Nevertheless,

countries recognise the need for a common approach and overall coordination to be agreed by all Member States. According to them, such a common approach should consider the data limitations and local knowledge. It should complement rather than substitute the activities at national level as well as represent added value for Member States by pulling together existing analyses and research. Cedefop together with its expert network Skillsnet plays an active role in this process, supporting the European Commission in improving the capacity to anticipate skill needs at EU level.

List of abbreviations

| | |
|-----------|---|
| ESF | European Social Fund |
| EU | European Union |
| Eurostat | Statistical Office of the European Communities |
| FreQueNz | Network for early identification of skill and qualification needs, Germany |
| OECD | Organisation for Economic Cooperation and Development |
| ReferNet | European network of reference and expertise, Cedefop |
| ROA | Research Centre for Education and the Labour Market, University of Maastricht |
| Skillsnet | Cedefop network on early identification of skill needs |
| VET | Vocational education and training |

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