UK approaches to Skill Needs Analysis and Forecasting: Lessons for the Czech Republic

(Contribution to Key activity No. 5: Proposal of a system for regular analyses and forecasts of skills needs in the labour market and its use by employment services in the Czech Republic)

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Glossary (to be completed/extended)

LMI Labour Market Institute
LMII Labour Market information and Intelligence
SNAF –Skill Needs Analysis and Forecasting
MoLSA – Ministry of Labour and Social Affairs
CR Czech Republic
DIUS Department for Innovation, Universities and Skills
DCSF Department for Children, Schools and Families
SSDA Sector Skills Development Agency
CES Commission for Employment and Skills
LSC Learning and Skills Council
SSC Sector Skill Council
SSM Sector Skills Matrix
SNA Skills needs Assessment
SSA Sector Skills Agreement
FSS Future Skills Scotland
FSW Future Skills Wales
DELNI Department for Education and Learning Northern Ireland
CE Cambridge Econometrics
IER Institute for employment Research
ASSC Alliance of Sector Skills Councils
SfB Skills for Business

1. INTRODUCTION

Background

In order to ensure a better understanding of changing skills needs and their future development, the Czech Republic (CR) is exploring the approaches to these issues in other countries.

Virtually all developed countries face problems in terms of meeting the demand for skilled workers and matching these with the supply of people emerging from their educational and training systems. The mismatch between qualification requirements and the level of vocational training and formal qualifications being acquired by individuals is becoming a global problem.

The CR is just beginning to set up a new system for anticipating changing skill needs. Many other countries have been building such systems for many years. The aim is to learn from their experience and the methods they employ to examine the future skills needs.

Ten countries have been selected for detailed comparison: Australia; Finland; France; Ireland; Canada; Germany; the Netherlands; Austria; the USA; and the United Kingdom (UK). This report provides a summary of the experience of the UK.

Aims and objectives

The prime objective is to identify, based on other countries' experience, the best institutional framework, methodological approach and data needed to establish a system for regular analyses and forecasts of skills needs in the labour market. In particular, the remit sets out the need to focus on systems for the regular **preparation of sectoral studies of future skill needs in the CR.** The aim is to establish a Skill Needs Analysis and Forecasting (SNAF) framework that can be operated by a Labour Market Institute within the CR.

This review provides a comprehensive evaluation of methodological approaches used to establish future skill needs, based on a review of practice across the world. The review briefly summarises what is regarded as international best practice, including an assessment of the strengths and weaknesses of different approaches.

The main focus however is on the UK's experience, and especially the methodology used there at a sectoral level. It explores the institutional framework and statistical infrastructure available in the UK and in particular the many forecasting models, tools and approaches developed in the UK in order to help identify future skill needs. This includes a summary of the role of different actors (including enterprises, experts and other groups). A key focus is on more qualitative approaches. The interconnection and ways in which quantitative and qualitative approaches can complement each other is also covered.

The review highlights what approaches have proven useful in the UK and what lessons its experience may have for preparing a similar system in the CR. Lessons are drawn about the role of research institutions, government ministries[1] and other agencies, and public employment services, educational institutions and any other significant players that have a stake in the SNAF system.

Anticipating the conclusions of this review, it is clear that "best practice" worldwide, involves quantitative methods, based on the use of large scale, multi-sectoral models to produce a comprehensive overview of how structural economic and technological changes are affecting the demand for skills. However, it is also clear however that this needs to be complemented by other quantitative and more qualitative methods, especially where data for building quantitative models are inadequate.

The development and use of quantitative models is a very resource intensive process, requiring substantial prior investments in data, and taking many years. There are a number of other tried and tested methods that complement the quantitative approaches which are less dependent upon the existence of such data, and which can be implemented in a much shorter space of time. However at the end of the day there is no substitute for robust quantitative information on the current position and trends.

[1] In the CR the Ministry of Labour and Social Affairs and the Ministry of Education are the key players.

Structure of the report

Section 2 begins with a brief summary of the various methods used across the world to anticipate changing skill needs, with particular emphasis on quantitative occupational employment forecasting. This draws upon a number of previous in-depth reviews by the author and others. All the key approaches are considered, including quantitative methods based on national level, multi-sectoral, macro-models. The reasons for favouring the latter approach are set out in detail, along with some of the problems and pitfalls associated with this method. The review also highlights the importance of qualitative methods.

Section 3 sets out the importance of technical support from the state, including the need for substantial investment in statistical and analytical infrastructure.

Section 4 moves on to consider more specifically the situation in the UK, beginning with a description of the past and present UK Institutional Framework and an overview of the overall system for anticipating changing skill needs funded by the State.

Section 5 concludes by summarising the strengths and weakness of the UK approach and draws out some practical lessons that can be learned from the UK experience.

2. GENERAL LESSONS: AN OVERVIEW OF SKILLS ANTICIPATION WORLDWIDE

2.1 Key Approaches: An Assessment of International Best Practice

There have been a large variety of approaches to anticipating changing skill needs worldwide. These have tended to reflect perceptions of both what is desirable, as well as the practical limitations of what is feasible. Both of these have changed substantially over the past 50 years. The present report draws upon a number of previous reviews, highlighting the key messages for the CR.

From the earliest attempts, those engaged in such work have adopted model based, quantitative methods wherever possible, simply because quantitative results have been seen as a key output required by potential users of the results. The use of formal models has been advocated on various grounds, as detailed below. However, the merit of alternative, more qualitative methods has also been recognised.

Current work in this area is still very much constrained by data limitations. What is feasible in different countries is limited by their "statistical infrastructure". Some countries, such as the USA, have been engaged in this kind of work for over 50 years. The sophisticated analysis conducted there has been based upon very substantial prior investments in statistical surveys and datasets as well as modelling capacity. In contrast, in some other countries, where the same levels of investment have not been undertaken, the data to develop such quantitative models simply do not exist. In such cases alternative approaches have been developed. While these approaches can provide some insights, they are generally regarded as useful complements to the more fully-fledged, model based projections, rather than a substitute for them. This highlights the importance of investment in statistical and analytical infrastructure, which is considered in more detail in Section 3.

The extensive earlier reviews, covering most of the countries in the world which have undertaken work of this nature, make it clear that an enormous number of different methods and approaches have been used to anticipate education and training needs. No attempt is made here to provide a comprehensive description of all these studies; rather the emphasis is on providing some key insights, with some selected examples.[2] The discussion includes the use of both quantitative and qualitative methods.

The main general approaches adopted include:

i. Formal, national level, quantitative, model based projections;

ii. Surveys of opinion of employers or other groups, including setting up "observatories", focus groups, round tables and other Delphi style methods to reach a consensus view (these approaches may include some quantitative aspects but are generally more qualitative);

iii. *Ad hoc* sectoral or occupational studies (involving both quantitative methods) focussing on the situation in particular areas (which may involve elements of both i and ii.

iv. Qualitative methods based on *Scenario development* exercises which are based on expert opinion.

The UK system (if it can be called such) involves elements of all these approaches. Each approach has its own strengths and weaknesses.

Improvements in modelling techniques have been facilitated by the availability of better data, as well as increased computing power. Improvements in the technical means of support for anticipating skill needs offered by the State, and in particular its statistical agencies, is also crucial, as set in more detail in Section 3.

Before describing the different approaches in more detail, and comparing their strengths and weaknesses it is important to consider some more basic questions – in particular for whom is this work being undertaken and why do they need it?

[2] For further detailed discussion, see Wilson (2001 and 2002) and some of the other references in footnote 2..

2.2 Different Audiences and Requirements

It is important to recognise that there are many different audiences for skills analysis and forecasting, and that their specific and detailed needs for labour market information and intelligence (LMII) may be very different. A key set of questions to be addressed when assessing such needs and systems are

- by whom (funding and execution);
- for whom;
- how;
- why /, what for; and
- when.

The main audiences include:

- Government, at National and Regional level (policy makers);
- Stakeholders, including Local Bodies, Industry Training Organizations, Employers, Education and Training Institutions, and Careers Guidance organisations;
- Individuals making occupational choices.

The interests of the different audiences may be very different. They include:

- Occupational demand - future employment levels by occupation/skill;
- Replacement demands - job openings (recognising the need to replace those leaving);
- Education and training requirements - qualifications typically needed;
- Supply/demand balances;
- Terms and conditions of employment (pay).

What is done, and how it is done, therefore depends at least in part on who it is being done for and why. The different audiences may have very different requirements for both detail and general content. Policy makers may be more interested in overall supply demand balances and the general areas where investment in skills is needed. Providers and individuals may be interested in much more detailed information about prospects in particular areas.

In some countries (e.g. the US) much of the work is done centrally by the government departments or agencies. In others, such as the UK, the government has generally chose to fund the work but to distance itself from the execution (by creating agencies, and by contracting the actual work out to academic or commercial research consultancies). Each approach has its advantages and disadvantages, as discussed below.

2.3 General Use of Social Science Methods

Bell (in Slaughter (1996)) argues that many standard social science research methods, such as surveys, statistical and econometric analysis, participant-observation, focus groups, etc, can be used to peer into the future. For example, market researchers ask about consumers purchasing intentions. This has been extended to cover a much wider range of indictors. Such methods can help to understand the past and present (and then possible futures). They can provide insights into both facts, and perceptions and attitudes that people have about the future. Issues of statistical reliability, validity and techniques of triangulation, common from social sciences research, are also widely employed in developing accounts of past and current conditions, and beliefs and aspirations about the future.

The use of computers has revolutionised the ability of analysts to develop ever more complex models, as well as facilitating the collection, access, analysis and dissemination of more detailed data. This has enabled empirical estimation of model parameters which represent relationships between variables specified. Simulations and quantitative computer based models are invaluable in many areas of social science forecasting. This approach can result in a mechanistic approach towards developments of alternative scenarios, but has the merit of being grounded in real data. Other more qualitative methods tend to be less constrained and more speculative. In scenario development, for example, the scenarios are seen not so much as outcomes as catalysts for examination and discussion. They are also capable of providing insights and uncovering previously hidden relationships that may have far-reaching consequences.

Quantitative modelling approaches tend to see the future as a set of key indicators and driving factors to be analysed and projected. An important component of much futures work is focused on providing a normative view of possible alternatives. Trends alone cannot be relied upon since “trends inevitably “bend”. Behavioural models attempt to provide insight into what causes trends to bend, by embedding the models in a theoretical understanding of what drives behaviour and observed outcomes.

2.4 Typical quantitative modelling approaches

Quantitative model based methods include:

- Complex multi-variate time series based behavioural/econometric models;
- Univariate models.

The latter can be further classified into:

- simple extrapolation of past trends (mechanistic techniques);
- more complex time series methods;

Extrapolative techniques are often used, especially where only very limited time series information is available. In many cases, only one or two observations are available on occupational structure and this clearly limits the sophistication of what can be done. Where more time series observations are available, much more sophisticated analysis is possible, which attempts to find replicable patterns in a time series that can be used to predict its future path. Such approaches are widely used in the business and financial world, although they are much better at predicting short-term change than longer-term patterns. Unfortunately, history suggests that most linear (or more complex) trend patterns eventually come to an end (“trends bend”) and that they should therefore not be relied upon for medium to long-term forecasting.

Behavioural analysis is an attempt to move beyond patterns in observed time series data and to provide some understanding of how it is that these patterns have arisen and more importantly, why they may change in the future. Such behavioural analysis draws upon disciplines such as economics and sociology for an understanding of what influences the behaviour of the key actors in the economy and how this is reflected in the key economic and social indicators that can be measured.

Such understanding finds representation in so-called computerised “models”, which take the form of algebraic equations linking key variables. A model is an attempt to provide a simplified representation of reality that can help understanding of the phenomenon of interest (in this case changing patterns of the demand for skills in the labour market). Most are familiar with the idea of engineers building models in order to test out their ideas. For example, testing model aircraft in wind tunnels. Models in the social sciences are rather more like a biological analogy than an engineering one, where for example, scientists have built models of dinosaurs in order to try to understand how they could fly. Social systems are much more akin to the biological than the engineering model. Social scientists attempting to understand how societies and economies work face problems such as:

- Lack of fixed laboratory conditions;
- Lack of good experimental data (they can only observe outcomes).

Social science models are typically built, using quite sophisticated statistical and econometric techniques, and using data drawn from largely official, sources, including National Accounts and related estimates of employment based on surveys of employers and of households.

Having built such quantitative models and used them to make projections, it is important to recognise what they can and cannot do. On the positive side, such projections can:

- Help to make assumptions about the future explicit and transparent;
- Help to enforce systematic and logical thinking;
- Act as a focus for intelligent debate;
- Provide a useful counterfactual to assess policy impacts (i.e. what would have happened in the absence of the policy intervention).

But they cannot provide:

- Mechanistic manpower planning;
- Precise indications of education and training requirements.

The typical quantitative modelling approach involves two key elements. The first key component is a multi-sectoral macroeconomic model of some kind, usually built around a Leontief input-output table, which takes into account the inter-linkages between sectors. Such models are usually estimated using complex and sophisticated econometric methods, although computable general equilibrium models (where parameters are imposed rather than estimated) are also used in a number of countries. A key outcome is consistent projections of employment levels by sector. Of course, in addition to providing projections of sectoral employment, such models are used for a wide variety of other purposes. Details of a typical multi-sectoral macroeconomic model are provided in Wilson *et al.* (2006).

The second key component is a module or set of modules, which translate the outcomes from the multi-sectoral models into implications for the demand for skills. These elements vary considerably across countries. Most commonly, this aspect is much less sophisticated, mainly due to the more limited nature of data available on skills. In most cases, the focus of attention is limited to occupational (or qualification) employment structures within sectors. The trends in such structures are analysed, normally using very simple techniques rather than sophisticated econometric methods. Again the typical approaches used are discussed in more detail in Wilson *et al.* (2006).

2.5 Reasons for favouring a quantitative modelling approach

Most reviews of international best practice in skills forecasting suggest that the use of a national multi-sectoral macroeconomic model based approach is the preferred option. Such models are regarded as essential in order to obtain a robust and consistent sectoral employment scenario, which is the starting point for any comprehensive assessment of changing skill needs.

The advantages of such an approach include:

- The sectoral and other detail it provides;
- The fact that it is typically comprehensive, covering the whole economy;
- Logical consistency;
- Imposition of accounting constraints;
- Recognition of economic constraints and influences;
- The fact that it helps make underlying assumptions explicit;
- Consistent scenarios across all sectors.

2.6 Problems and Pitfalls in Using Quantitative Modelling Approaches

Such methods do, of course have some disadvantages and problems. These relate to:

- Technical limitations, within fixed resource limits;
- Limits to current understanding of the way labour markets work;
- The possibly limited relevance of the past (such models being based on an assumption of a continued of past patterns of behaviour);

- The data requirements of quantitative modelling approaches are substantial. Long time series of consistent data on a range of economic and labour market indicators. Sectoral employment data lie at the heart of any multi-sectoral modelling approach to assessing changing skill needs. Ideally these need to be linked to other economic indicators within a system of National Accounts. This requires many years of substantial investment;
- Data limitations (often the data used to build models were not collected with modelling in mind);
- Resource costs of development and maintenance.

Quantitative models should not, therefore, be seen as a panacea. Nevertheless, in most of the countries that do conduct regular national assessments of future occupational and skill requirements, such models are regarded as an essential cornerstone. Such models are increasingly being adopted in developing, as well as developed, countries, as the availability of data and the capacity for model building improves.

2.7 Other Quantitative Methods

Quantitative methods also include various non-model based techniques, including surveys of various kinds, intended to elicit robust data on matters of fact (current skill structures and trends) or opinions and perceptions. These can include:

- Survey of employers and others to establish facts;
- Surveys of employers and others to test opinions and perceptions;
- Skills audits.

Measuring Changing Occupational Structure

Surveys of Employers (enterprises/establishments) and surveys of Households (Labour Force Surveys) are used to both establish matters of fact, as well as to elucidate opinions. Both have their own advantages and disadvantages for these purposes. Surveys of Employers Surveys are widely used to measure levels of activity and overall employment levels, as well as the structure of employment. They have also been used to assess employers opinions and perceptions on current skill shortages and occasionally future skill needs. In most countries Household surveys have become the norm for obtaining overall measures of occupational employment structure. However, a substantial increase in sample size is often needed to deliver robust statistics at a detailed sectoral and occupational level. In the USA this information is gleaned from detailed surveys of employers.

A major concern is the quality of information available on current occupational structure, and ongoing trends, within sectors. This could be improved by carrying out larger and more consistent surveys as in the USA but this is costly. Although there maybe some merit in getting sectors involved in this process, there are substantial advantages in centralising this process. These advantages include economies of scale, as well as consistency across sectors.

In summary:

Employer surveys can provide immediate information, including a useful measure of occupational structure ***within*** industries, as well as current recruitment problems and other skill deficiencies.

Household Surveys, often disaggregated by sector as well as occupation, can also be useful for monitoring changes in occupational structure. This is often a cheaper option as such surveys are required for other reasons. Their limited sample size may raise question marks about their reliability and suitability for trend analysis. This poses a problem with regard to analysing employment change over time, whether sectoral or occupational. One way of dealing with the problem of small sample size is to pool the data from more than one round of the survey. This can enable a more detailed occupation by industry employment matrix to be constructed than would otherwise be possible, but at the expense of information on changes over time.

Analysis of data from ***Censuses of Population*** can provide a more accurate picture, but these are expensive and infrequent (normally only once every 10 years. Typically a Census does have considerable advantages when it comes to measuring the structure of employment, not least because of its much large sample size. Another factor to consider, with regard to whether or not the Census is the

best option for sectoral and occupational forecasting, is the consistency of classifications used which can often distort time series changes.

Replacement Needs

In addition to changes in overall occupational employment levels it is important to consider ***replacement demand*** arising from retirements, net migration, movement into other occupations and in-service mortality. Estimating replacement demand is not straightforward. It requires the following information:

- Data on the age and gender structure of occupational employment;
- Data on the rates of outflow due to:
  - Retirement (and other reasons for leaving the workforce);
  - Emigration;
  - Inter-occupational mobility; and
  - Mortality.

Information on age and gender structure is required because many of the flows, especially retirements and mortality, are age and gender specific. Age structures vary significantly by occupation – for example, a higher proportion of managers than IT professionals are likely to be nearing retirement age. Differences in age structure across occupations will clearly influence exits, with more, older people retiring, but more, younger people changing occupations. Age structure also affects mortality. From the household survey/population census data, it is possible to analyse the demographic composition of each occupation. This makes it possible to estimate specific rates of retirement and mortality for each occupational class.

Retirements: For the purposes of modelling retirements, it may be helpful to consider the fraction of the occupational class that is aged 55 to 65 (say) in a given year and then to assume that some fraction of this group would retire each year. A fairly wide age category is usually used since the samples are quite small in most cases. It might also be possible to measure retirement flows over time, although this kind of approach could suffer because of the sampling errors being too large.

Mortality: To estimate replacement demand arising from deaths in each occupation it is possible to use age- and gender-specific mortality rates. er the forecast period.

Migration and mobility: The migration of skilled professionals has been an increasing source of concern in many countries over the past few years. Skills migration is clearly a reality and must also be taken into account in the modelling, as these flows impact the supply and demand for higher-level human resources.

Other Aspects of Skill

In addition to occupations, data are also needed on other measures of skill, including ***qualifications*** and ***key/generic skills***. Occupational employment patterns are only one way of measuring skill. From the point of view of training and especially formal educational planning, the types of qualifications typically required are also important. Some (but not all) countries include a qualification dimension in their quantitative projections. Another aspect of skill that has received increasing attention in recent years in many countries, moves beyond occupational job titles and formal qualifications to examine the kinds of skills people actually require in order to undertake the main tasks in their work. These include physical skills such as manual dexterity and strength, general intellectual skills (including literacy and numeracy) as well as social skills such as communication, team-working, leadership, etc. These have been various termed key, core and generic skills. Generally attempts are not made to project such skill needs quantitatively, but many countries now devote considerable resource and effort to assessing how such skill needs are changing and their different patterns across sectors and occupations.

In many countries employment matrices by occupation cross-classified by qualification from the are created from household / census data. This provides a measure of typical levels of educational attainment for all the different occupations, albeit rather crude. Even with only weak data for qualifications it is probably worth developing some extension to “replacement demand” estimates which allows some inferences to be made about implications for qualifications. Alternatively some supplementary information on “typical” qualification structures in particular occupation can be provided to enable users of such results to draw their own conclusions about what this might mean for the demand for formal qualifications.

2.8 Qualitative approaches

General approaches

It is clear from the general review of methods of anticipating changing skill needs across the world, that formal, quantitative model based projections are just one amongst a number of important elements in the tool-kit of those concerned with trying to anticipate changing skill needs. The outputs from the kind of quantitative methods described above can be complemented and enhanced by qualitative approaches to anticipating future skill needs. Based on the experience and practices adopted in other countries, the most popular and useful of these include:

- Ask employers (employer skill surveys);
- Delphi analysis (asking experts);
- The in-depth Sectoral case study (involving interviews and other methods);
- Scenario development;
- Observatories;
- Focus Groups/ Round tables;
- Holistic modelling approaches.

Ask employers

In many ways, it seems that the most natural approach to finding out about future skill needs is to ask employers. This can involve questions about:

- Current skill deficiencies;
- Anticipated future change.

At one time, this approach was a popular technique. However, it soon became apparent that employers are often not very well placed to provide robust answers to such questions. Their responses are more often than not inconsistent and misleading, especially when concerned with the future. More recently, greater emphasis has been placed on using employer surveys to assess current skill problems rather than anticipated future requirements.

Delphi analysis

The Delphi approach harks back to the Delphic Oracle from ancient Greece. In modern parlance it has come to represent consulting expert opinion. In its most systematic incarnations it involves the progressive and iterative administration of questionnaires designed to elicit the beliefs and judgments of a panel of experts in a particular field. The results from each round are then shared with the respondents, who may as a consequence chose to modify their responses.

Rowe and Wright (1999) argue that the method can access the positive aspects of group interaction, while minimising the negative attributes due to political or social conflict or manipulation. They identify four features critical for such an approach to be categorised as “Delphi” in their terms: anonymity;, iteration; controlled feedback; and the statistical aggregation of group response. In practice, standards for some studies do not always match these aspirations. A number of authors (including Bell (2005), Rowe & Wright (1999) and Stewart (1987)) have been critical of the technique, arguing that it has few safeguards against incompetence and deliberate abuse. (Stewart (1987) argues that the results “may be the product of the creativity and ingenuity of a skilled practitioner or of the misconceptions and stumbling of an ill-informed novice, but there is no easy way to tell the difference”. At the end of the day it is based on a selection of expert opinions.

The in-depth Sectoral Case Study

Sectoral case studies refers to a category of work which involves in in-depth assessments of particular sectors (or occasionally occupations). This approach is especially significant given the interest in the current project on the UK Sector Skills Councils (which can be regarded as particular examples of such an approach). In fact, the in-depth sectoral case study is not so such an approach as an object of analysis. Such studies tend to involve an eclectic mix of methods and approaches, depending upon the interests and background of those carrying them out, as well as the data, information and resources available to them.

Employer surveys have often formed the cornerstone of such detailed sectoral assessments, providing immediate results, either on matters of fact or perceptions, attitudes and opinions. Such in-dpeth

sectoral studies often involve a number of other important elements, including in-depth interviews with employers and others, and (where it is feasible) more systematic quantitative modelling methods. A range of different methodologies, and interaction with many different actors (employers, education and training providers and other stakeholders), is used in order to "triangulate" a view of the key problems and likely future developments from various different perspectives.

This type of approach usually involves a range of other non-quantitative methods, including the use of focus groups, round table discussions and similar mechanisms, to enable "soft" qualitative data to be incorporated into thinking about such issues, alongside the "harder" statistical information upon which most quantitative analysis is based.

In recent years such assessments have often also had a strong geographical focus, with the setting up in many countries of regional observatories (and the like) to monitor changing skill needs at a more local level.

Scenario development

Scenarios are essentially stories about how the present might evolve into a possible future. They are narratives constructed within the context of a particular group and topic. They set out a consistent future that can be used to test assumptions about possible paths and actions that might help to generate or avoid them (depending upon whether they are desirable or not). Such scenarios can inform strategic thinking and inspire change.

They may be generated through highly codifed and systematised methods. More often they are the product of a more speculative and subjective process. Scenarios tend to reflect the current concerns and direction of thinking of the participants. One of the difficulties in developing scenarios can be deciding which factors are important and the key trends or drivers of future change. This can lead to a somewhat subjective element, unless the scenarios are firmly grounded in a sound assessment of reality, based on robust data.

Much of the value of scenario development is in the process itself rather than the final outcome. Those participating in the development and construction tend to be the main beneficiaries, rather than the wider audience who may read about the outcomes later (Schwartz, 2005). It is during the process of creating different scenarios that participants may find their assumptions about future events and opportunities challenged. Typically analysts will develop between 2 and 5 scenarios to illustrate the key sensitivities (too many options can confuse rather than enlighten).

Observatories

Sectoral and geographical observatories have been a popular approach to assessing changing skill needs in a number of countries in recent years. They were initially developed in a number of countries to provide a systematic method of assessing a range of conflicting and often more qualitative evidence, where robust quantitative data were more notable by their absence (Wilson (2002), Handley et al (2003)). More recently the approach has been taken up in the UK at a regional level (e.g. the Regional Development Agencies (RDAs), as well as at a more local level. The approach has also been adopted by sectors, with a number of industries establishing observatories focusing on their sector. Effectively, these provide a framework for thinking about key issues as well as a forum for discussion amongst all the interested parties.

Focus Groups/Round Tables

Another method, which has become increasingly popular in recent years, is to arrange "focus groups" or "round tables ". Discussion of the topic of interest is then arranged, possibly based around material submitted in advance, and possibly involving some kind of facilitator to prompt and structure the discussion. This type of approach was a feature of the EMTA ADAPT project (EMTA, 2001) and also been used in many other UK studies such as the Merseyside Economic Assessment (Cambridge Econometrics, 1994).

Holistic modelling approaches

Some analysts have attempted to develop less quantitative, more holistic approaches to assessing long-term futures. Such work is often focused on the notion of sustainable development and social cohesion rather than narrowly on skills. The Henley Centre study of the Future of Work in London is a good example (Henley Centre, 2001). Local Competitiveness is viewed as a function of social cultural and environmental factors as well as purely economic ones. Both long and short term drivers of competitiveness, thus broadly defined, are distinguished. These are proxied by around 50 different indicators to operationalise the concept. The model does not deliver precise predictions of changes in levels of economic activity. Rather it represents a policy tool for exploring long range issues, developing various scenarios and strategies. Applying the model to London enables the different challenges facing each of its 33 boroughs to be identified and appropriate policy responses to be developed, including implications for skills.

2.9 Pros and Cons of Different Approaches

Table 2.1 provides a summary of the main advantages and disadvantages of the different methods. This includes the quantitative multi-sectoral macro modelling approach which lies at the heart of many countries methods of anticipating changing skill needs.[3] Suffice it to say here that, each approach has its strengths and weaknesses and that the ideal is to triangulate the problem by using a variety of methods and allowing them to inform and support each other, rather than seeing them as mutually exclusive alternatives. No approach has the monopoly on "truth" and no one approach on its own can provide a full and complete picture.

Even where forecasting is carried out using hard-nosed, quantitative methods, those involved usually stress that such projections should be seen as part of an ongoing process rather than the final word, and recognising the importance of incorporating more qualitative insights. None of today's forecasters claim that they can predict the detailed skill needs in different sectors with great quantitative precision. Rather, they suggest that they can provide the various participants in the labour market, as well as policy makers, with useful insights into how labour markets are developing in response to various external influences. It is important to recognise that accurate and precise forecasts are a chimera.

The key question to ask is not whether or not such projections are **accurate**, but whether or not they are **useful**. The revealed preferences of national governments from all over the world, who support such activity with substantial funding, suggest that they are regarded as of considerable value. It is also clear that such work is seen as having a wide variety of different audiences and users, including careers guidance, as well as general labour market policy formation and planning education and training programmes. Few, if any, countries now regard such work as resulting in information that can be used to plan the scale and pattern of education and training provision with any precision. Rather it can help to inform all those involved about how economic and other forces are shaping the labour markets and the general implications for those skills that will be required.

It is also important to emphasise that the different approaches may be suited to different audiences and purposes. Scenario development, for example is ideal when the aim is to involve participants and to explore alternative possible futures. The process of carrying out the scenario development is often a critical output and participation is necessary to gain the full benefits. This is ideal for situations involving small numbers of policy makers trying to explore the threats and opportunities they are facing. In contrast, detailed quantitative projections may be ideal where the prime aim is to provide useful labour market information and intelligence to support large numbers of individuals making choices.

[3] The pros and cons of this particular method are discussed in greater detail in sub-sections 2.4 and 2.5.

Table 2.1: Comparison of the Pros and Cons of Alternative Approaches to Anticipating Skill Requirements

Alternative approaches	Advantages	Disadvantages
Formal, national level, quantitative, model based projections	Comprehensive Consistent Transparent Quantitative	Data hungry Costly Not everything can be quantified May give a misleading impression of precision
In-depth sectoral or occupational studies (using a variety of quantitative (model based) as well as more qualitative methods)	Strong on sectoral specifics	Partial Can be inconsistent across sectors
Surveys of employers or other groups, asking questions of fcat and opinion about skills, skill deficiencies and skill gaps	Direct "user/customer" involvement	Can be very subjective Inconsistent Can too easily focus on the margins (i.e. current vacancies) rather than skill needs within the whole workforce
Focus groups, Round tables Observatories Delphi style methods Scenario development	Holistic Less demanding data requirements Direct "user/customer" involvement	Non-systematic Can be inconsistent Can be subjective

3. Importance of technical support from the state (statistical and analytical infrastructure)

National governments can provide technical support for anticipating skill needs in a number of ways. Based on a review of experience worldwide, the key elements have been:

- The development of standard systems of classification (industry, occupation and qualifications);
- The introduction of regular national surveys of households and employers;
- The development of means of access to these datasets electronically;
- Investment in general economic modelling techniques.

Classification of Industries, Occupations and Qualifications

A standard system of classifying industries and occupations, both over time and across different data sources is essential to any systematic attempt to assess future skill needs. For a variety of reasons, until relatively recently, this has not been a top priority in most countries. However, things have improved, making more systematic approaches feasible. In most countries there is a gradual move towards harmonisation with the international standards set by the ILO.

Attempts have also been made to standardise the classification and treatment of qualifications. This has generally made less progress and in most countries there remain serious difficulties of comparison within their own borders over time, let alone between countries.

Development of Regular National Surveys of Employers

Sectoral information lies at the heart of the multi-sectoral models used in employment projections. Good sectoral information (especially output and employment) is therefore essential. In many countries, such as the USA, UK and much of northern Europe, the State conducts good quality *Censuses* or *Surveys of Economic Activity*, which form the basis of such information. These form a key input into the *National Accounts*. In other countries such data are of much lower quality and reliability (if they exist at all on a regular basis). This constrains very significantly the ability of such countries (which include many southern European countries), to develop very sophisticated models.

Note that such information is different from that obtained in many surveys such as the UK's *Employer Skills Surveys*, which are concerned primarily with the patterns of skill deficiencies rather than the scale of economic activity (nor in most cases the structure of employment by occupation).

Surveys of Households (Censuses of Population, Labour Force Surveys)

Most countries conduct regular but infrequent Censuses of their Population. For many years this was the only source of detailed information on the occupational structure of the employed workforce. Such data sets remain a cornerstone for any analysis of changing occupational structure.

More recently Labour Force Surveys (LFS) have become much more commonplace. These are effectively mini-censuses although usually being completed voluntarily rather than as a legal obligation. The LFS has been a key survey in Europe, member states being obliged to conduct such a survey on a regular basis and with a fairly standard set of questions. The gradual improvement in the LFS, and in particular its recent increase in sample size, mean that it is now the prime source of data on occupational employment in the UK. However, it is still limited in its ability to provide accurate data for small geographical areas. Compared to the huge survey of establishments conducted on a regular basis by the Bureau of Labour Statistics (BLS) for the USA, the LFS provides a very fuzzy and erratic picture of trends in occupational structure. However, as always considerations of cost are crucial. However, few other countries have been prepared to devote as much resource to such data collection as the USA.

Other Surveys and Databases

Most countries have a range of other surveys conducted on a fairly regular basis, which contain relevant data. These include surveys of earnings as well as various aspects of employment labour supply. This has improved the ability of researchers to monitor trends. However, with one or two exceptions (such as the Netherlands), these surveys still remain inadequate compared to the much larger surveys conducted by the BLS in the USA, which provide a much more accurate picture of skill mix within sectors.

The vast improvements in IT have also resulted in an explosion in the development of databases and primary data collection exercises at local level. Many of these are intended to assess current positions but many also look forward into the future. These include major Skills Audits of local areas to supplement and update the information from official sources, as well as Surveys of Employers, intended to assess their skill needs. Often such work is subcontracted to specialist survey companies and labour market consultancies. Although this increase in availability of relevant LMII is to be applauded, there are many problems related to inconsistencies in methodology and definitions, which make it much less useful than it might otherwise be. There is a strong case for a more coordinated approach that takes advantage of economies of scale and benefit from synergy and cross-fertilization.

Development of means to access data electronically

The UK and other governments are increasingly making data available electronically, via the internet and other channels. In the UK the National Online Manpower Information System (NOMIS) has been used for many years to make detailed LMII available. The internet is also bing used much more intensively.

Support of economic modelling

Many governments support economic and related research of a very general nature, including econometric modelling. In the UK this has been done for many decades and the current strengths in that area can be seen as the result of many years prior investment.

4. ANTICIPATING FUTURE SKILL NEEDS IN THE UK

There is a very long history of anticipation of changing skill needs in the UK, stretching back some 40 years. There is not a single system or approach. Many organisations and stakeholders have been involved and there have been many institutional and other structural changes that have taken place over this period. Various different approaches have been tried, although there are many common threads.

4.1 INSTITUTIONAL FRAMEWORK

The current institutional framework

The institutional framework within which skills anticipation takes place in the UK is complex. Over the past 40 years it has usually been in a state of flux. The government departments and agencies involved have changed many times over this period and a new round of changes is currently taking place. Handley *et al.* (2003) provides a useful summary of the position that existed until 2007.

In 1997 the incoming government set up a National Skills Task Force (NSTF) to review the general issue of skills and to make recommendations for changes to ensure that the UK had the skills needed to compete in the 21st century. The NSTF recommended various changes, both to institutional structures and methods, including the systems used for assessing and anticipating changing skill needs. The main institutional changes included the setting up of a Sector Skills Development Agency (SSDA) and related Sector Skills Councils (SSCs), and the establishment of the Learning and Skills Council (LSC).

The LSC is responsible for vocational education and training beyond the minimum school leaving age (other than Universities).The SSDA and SSCs were intended to engage employers more actively in the assessing the changing need for skills. Other important institutions include the Qualifications and Curriculum Authority (QCA), which is responsible for standards and content of courses and the Higher Education Funding Council (HEFC) which is responsible for University level education and related research.

Figure 4.1 illustrates the system in England as in 2006. Somewhat different arrangements apply in the devolved administration of Scotland, Wales and Northern Ireland. In England, post-16 provision of education and training is planned, funded and secured by the national LSC, in partnership with Regional Skills Partnerships (RSPs) and colleges, providers and other key stakeholders. In Scotland, Wales and Northern Ireland, with their rather different educational systems, things are slightly different. In Wales, all funding for further and higher education is managed by the Welsh Assembly Government, through the Higher Education Funding Council Wales (HEFCW). In Scotland, all funding for further and higher education is distributed through the newly merged Scottish Funding Council for Further and Higher Education. In Northern Ireland, all funding for both further and higher education is distributed directly from the Department for Education and Learning Northern Ireland (DELNI).

The need for a continuation of regular quantitative employment projections at national and regional level was recognised by the NSTF, resulting in the commissioning of a new series of *Projections of Occupations and Qualifications* [4]by the Department for Education and Skills (DfES), which remained the government Department with overall responsibility for all these matters, including the source of funding for the LSC and SSDA/SSCs). The NSTF also encouraged a broad programme of research to establish the *Extent, Causes and Consequences of Skill Deficiencies*. This was intended to establish a sound statistical data base for analysis, including taking on board employers' views. This resulted in the first National Employer Skills Survey (NESS),[5] as well as a range of more qualitative, in-depth, sectoral case studies.[6]

Once established, the SSDA and LSC took over responsibility for managing much of the programme of DfES funded research. The SSDA commissioned new rounds of national and

[4] See Wilson *et al*. (2000) and (2001).
[5] See Bosworth *et al.* (2000).
[6] See Mason and Wilson (2001) for a reference to all the ECISD studies.

regional employment projections in 2002 and 2005, which become known as *Working Futures*. It also set up the procedures for SSCs to operate, including licensing and setting their detailed remit. Another output was the *Sector Skills Matrix* an on-line one stop depositary for LMII relating to sectors. The LSC took over responsibility for NESS, as well as commissioning an annual review of the state of *Skills in England* (the geographical area for which is responsible).[7]

In 2005 a further review was set up by the then Chancellor of the Exchequer, with the objective of assessing Britain's optimal skill needs in 2020. This review (Leitch, 2005 and 2006), lead to further recommendations for institutional and structural change, as well as some changes to responsibilities for, and the nature of, some related research.

Following these changes, the issue of addressing skills needs at UK level is now the responsibility of the Department for Innovation Universities and Skills (DIUS).[8,9] DIUS took over the immediate responsibility for the SSDA and the LSC.[10] Following recommendations from the Leitch report, from the 1st of April 2008, the SSDA been replaced by the newly formed Commission for Employment and Skills (CES). The LSC is also expected to be replaced by 2010 with a new Agency, although this proposal has yet to receive Parliamentary approval.

In October 2002 the Department for Education and Skills officially launched the Skills for Business (SfB) network. The SSDA was responsible for developing and managing this network. The network consists of 25 Sector Skills Councils (SSCs). From the 1st of April 2008 this responsibility is beng taken over by the CES and the Alliance of Sector Skills Councils (ASSC)).The first five pioneering SSCs were selected in 2002 (the Trailblazer Sector Skills Councils). Since then a further 20 SSC have been licensed. Licences were granted as shown in Table 4.1. Table 4.2 provides more information on subsequent progress.

SSCs are independent organisations set up to represent the interests of employers in specific sectors. They are now licensed by the Secretary of State for Innovation, Universities and Skills, in consultation with the ministers in Scotland, Wales and Northern Ireland. The licensing process has three steps (from presenting the initial intention to the final plan). A licence is granted for 5 years, a contract on co-operation is signed for 3 years. A Sector Skills Agreements – (SSA) is then made with education and training providers, relevant government departments and other partners (local authorities, etc.). The SSAs include joint procedures for addressing shortages and oversupplies in the labour market. A key task is to map current and future skills needs. This mapping consists of five steps (from evaluation of the current state of affairs to a final agreement on joint, co-ordinated procedures to ensure the relevant supply of vocational education). (See Annex B for further details)

Figure 4.2 provides a broad overview of the current (April 2008) institutional framework for anticipating skill needs in the UK. As well as DIUS, the Department for Children, Schools and Families (DCSF) also plays a key role. DCSF is responsible for delivering education up the minimum school leaving age (up age 16). It is currently conducting a broad review of the *Future of Work* and its implications for education (but DCSF is not engaged directly in detailed skills projections).[11]

At present the role of commissioning national level quantitative skill projections has been delegated to the national LSC. The LSC has recently commissioned a third round of *Working Futures*. The LSC is also currently still responsible for commissioning other related research including the regular *National Employer Skills Surveys* and *Skills in England*. All of this work is ultimately funded by DIUS. The LSC works in partnership with DIUS and other government departments and other stakeholders.

[7] In contrast the SSDA's remit is for the whole of the UK.

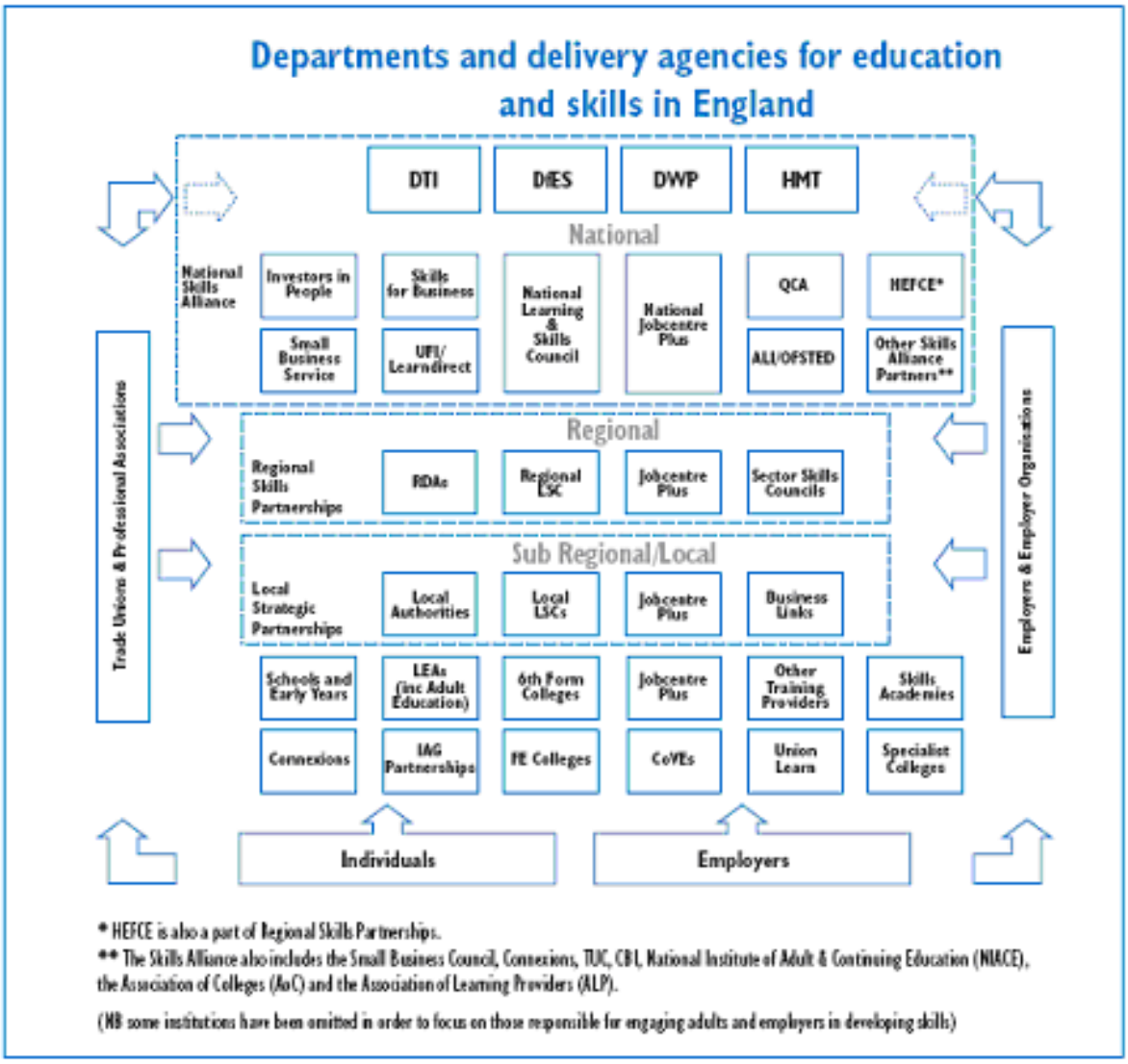
[8] DIUS was set up in 2007 to replace the old Department for Education and Skills who previously held this responsibility) and the Department for Trade and Industry. Part of the DfES's old remit also passed to the Department for Children, Schools and families (DCSF).

[9] Following devolution, there are separate organisations dealing with Scotland Wales and Northern Ireland.

[10] The SSDA and LSC are quasi governmental organisations (quangos) set up as agencies to execute the government's policies as defined by DfES. Both the LSC and SfB network were funded initially by the DFES and now by DIUS..

[11] See the Beyong Current Horizons web site: http://www.beyondcurrenthorizons.org.uk/).

Figure 4.1: Key Features of the UK Institutional Framework for Delivering Skills*



Source: Leitch Review of Skills final report**.**

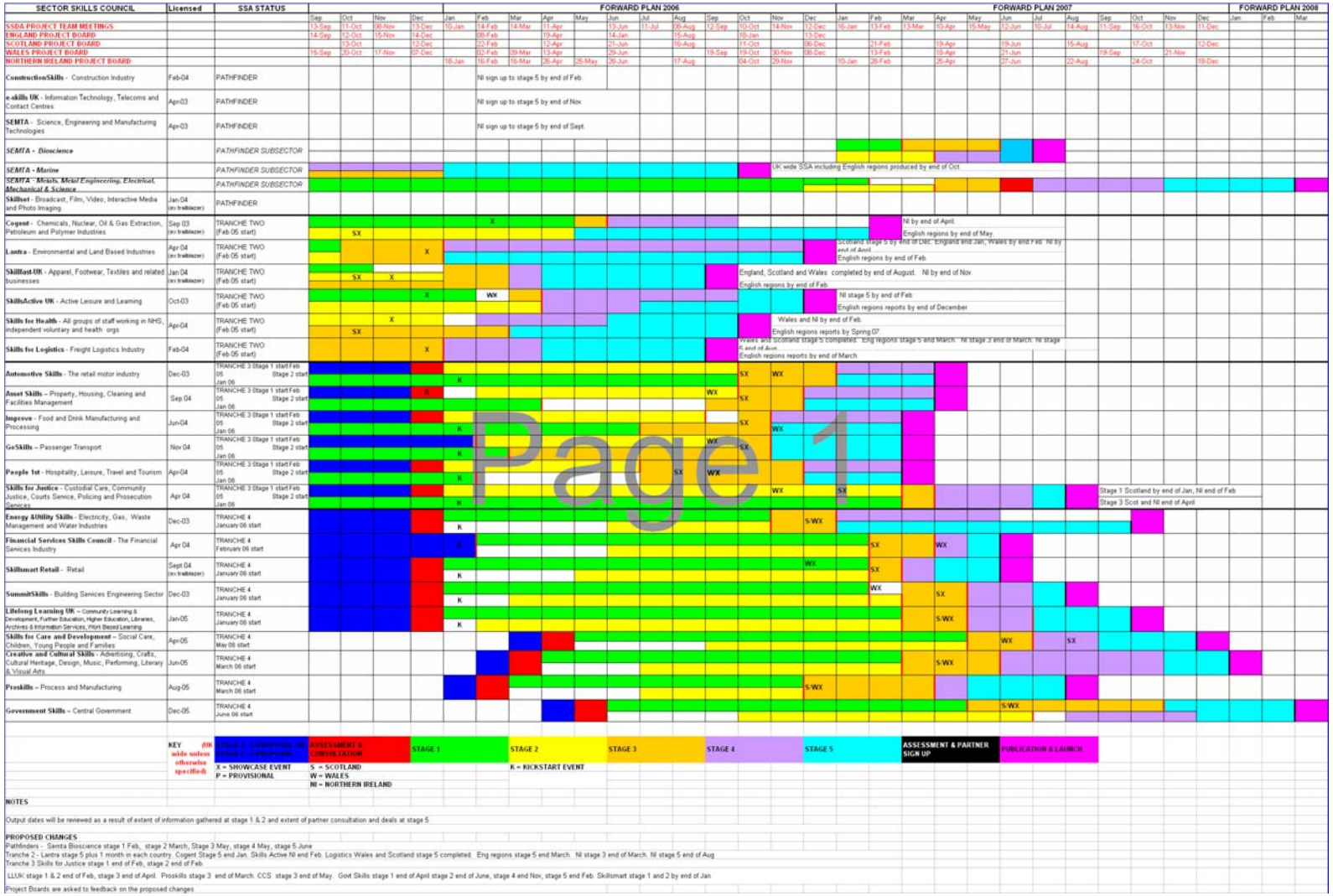
Notes: * The figure describes the systems as it existed in 2006. DfES and DTI have since been merged to form the Department for Innovation, Universities and Skills (DIUS). See main text for other recent changes.

Table 4.1: Licensed SSCs and stage of SSA development as at March 2006

No.	SSC	License date	Forecast launch date at March 2006
1	e-skills UK	Licensed April 03	Pathfinder - complete
2	SEMTA	Licensed April 03	Pathfinder - complete
3	Cogent	Licensed September 03	June 06
4	SkillsActive	Licensed October 03	July 06
5	Automotive Skills	Licensed December 03	January 07
6	Energy & Utility Skills	Licensed December 03	April 07
7	SummitSkills	Licensed December 03	April 07
8	Skillfast-UK	Licensed January 04	June 06
9	Skillset	Licensed January 04	Pathfinder - complete
10	ConstructionSkills	Licensed February 04	Pathfinder - complete
11	Skills for Logistics	Licensed February 04	May 06
12	Lantra	Licensed April 04	August 06
13	People 1st	Licensed April 04	January 07
14	Financial Services Skills Council	Licensed April 04	March 07
15	Skills for Justice	Licensed April 04	November 06
16	Skills for Health	Licensed April 04	July 06
17	Improve	Licensed June 04	January 07
18	Assetskills	Licensed September 04	December 06
19	Skillsmart Retail	Licensed September 04	March 07
20	GoSkills	Licensed November 04	November 06
21	Lifelong Learning UK	Licensed January 05	June 07
22	Skills for Care & Development	Licensed February 05	September 07
23	Creative & Cultural Skills	Licensed June 05	July 07
24	Proskills	Licensed August 05	July 07
25	Central Government	Licensed December 05	To be confirmed

Source: The report published in August 2006 prepared for SSDA by Institute for Employment Studies(IES) and Policy Research Institute(PRI).

Table 4.2: Sector Skills Agreement Timeline January 2007



Source: SSDA: http://www.ssda.org.uk/ssda/default.aspx?page=2136

Figure 4.2: The New Institutional Framework for Forecasting Skills Needs in the UK (2008)

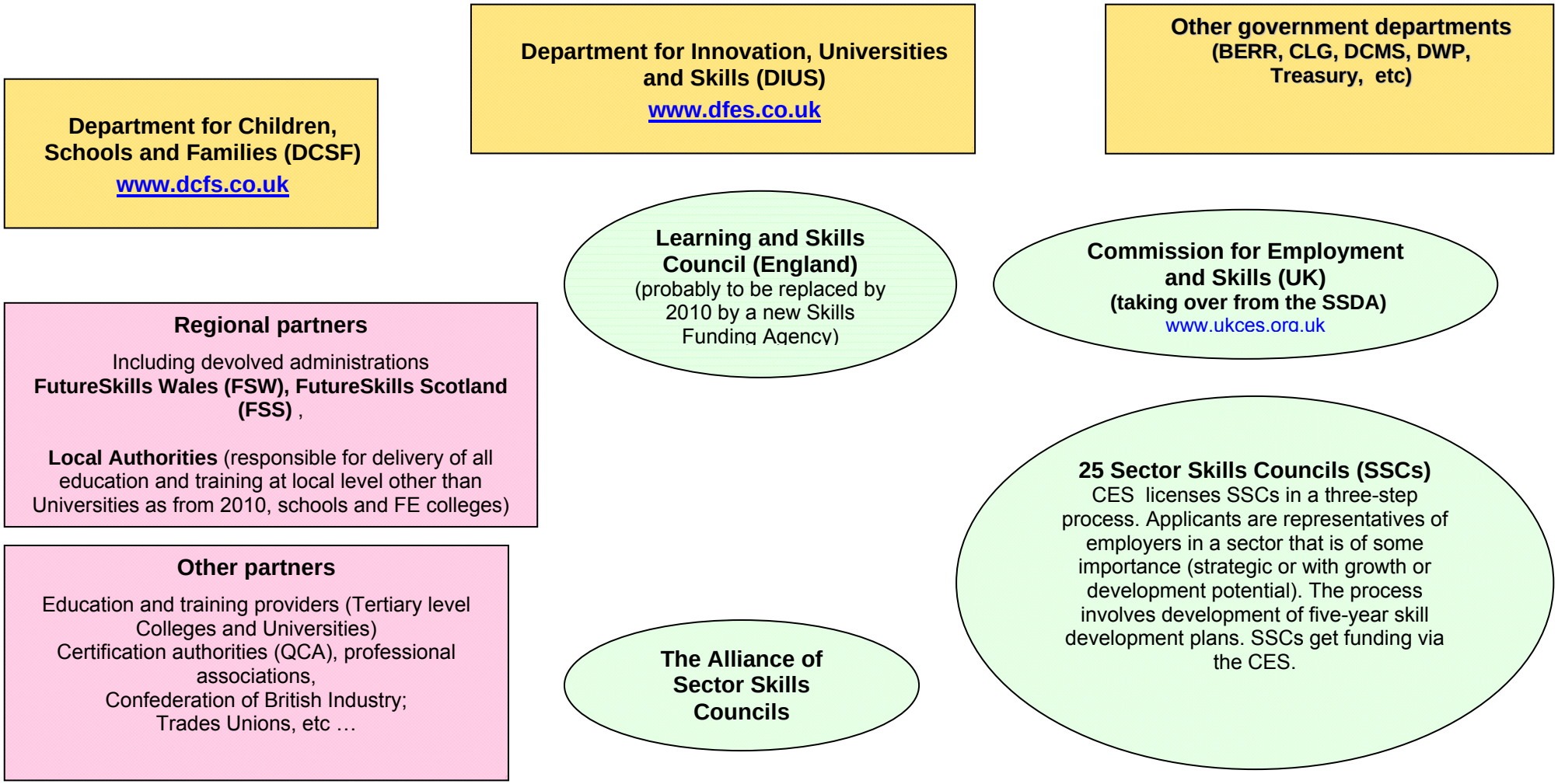


Figure 4.3: Key outputs from the UK system for assesssing changing skill needs

Main research outputs/products

(Funded by the State but undertaken by Universities and research consultancies)

Working Futures
- Projections 2002-date

Employer Skills Surveys
- biannually, 2003-date)

Skills in England
- annual reviews 2002-date

Sector Skills Matrix / Sectort Skills Almanacs
- on line database and related outputs

Other research projects
- myriad smaller projects

Sector Skills Agreements (SSA)

Funded by the state, carrying out analysis in-house and by use of external contractors, to develop sectoral Skills Needs Assessments (SNAs)

SSAs/SNAs are key functions of SSCs. They map current and future skills needs in sectors in a five-step process:

- Evaluation of short- and long-term priorities for development of the sector and requirements for skills
- Evaluation of existing capacity for education, training
- Description of major gaps in the labour market in terms of skills needs, identification of priorities
- Proposal for joint approach to meeting priorities in the sector
- Agreement on funding and implementation of priorities in the sector.

***Working Futures*: Main Outputs from the quantiative model based methods**

The main multi-sectoral macroeconomic model used is one developed by Cambridge Econometrics called MDM. This has been extended by IER to include a skills dimension covering both occupations and qualifications)

The main model outputs include:

- Various macroeconomic indicators (gross domestic product, consumer spending, GFCF, etc), Detailed sectoral information (41 sectors, based on Standard Industrial Classification, plus results for SSC footprints);
- production and employment , productivity, etc trade performance by industry;
- Occupations /Qualifications (25 categories based Standard Occupational Classification 2000, and 15 NQF categories);
- Employment is also disaggregated by gender, employment status (FT, PT and self-employment);
- Various supply side indicators including population and workforce by age and gender and unemployment.

Most data are available for some 50+ geographical areas (over half a million time series are projected for employment alone).

Over the last 5-10 years the prime research outputs from this process are set out in Figure 4.3. The most important, as far as assessing changing skill needs, have been:

SSDA/SSC output

- *Working Futures* (detailed model based quantitative projections);
- *Sector Skill Matrix*: website collating a range of economic and labour market indicators presented in a consistent fashion and designed to meet the needs of the SfB network;
- *UK Sector Skills Almanac* (a stand alone document covering the same ground as the Sector Skills Matrix), separate almanacs have also been developed for Scotland and Wales;
- Sector *Skills Needs Assessments* and *Sector Skills Agreements*: sector focused skills needs assessments and joint agreements on the priority areas on which education and training should focus in the future.

LSC Output

- *National Employer Skills Surveys* (large and detailed surveys of employers, including theirperceptions);
- *Skills in England* (regular annual overview of skill demand and supply in England).

Others (DfES/DIUS. Devolved administrations, etc)

- *Skills Survey* (focussing on generic skills as discussed in section 2.7);
- Various national based assessments (by for example FSS or FSW).

The outputs range from short reports to much longer studies and substantial databases that can be mined and analysed by interested users.

Other Departments also have an interest in peering into the future. So, for example, the UK, s Foresight project (http://www.foresight.gov.uk/) is the responsibility of the Office for Science and Innovation, within the Department for Business, Enterprise and Regulatory Reform (BERR) This came about primarily in order to improve wealth creation within the UK through supporting technological R&D. Another example is the DCSF which is currently supporting an initiative to asses the implications of the Future of Work for education (see http://www.beyondcurrenthorizons.org.uk/).

4.2 Typical quantitative modelling based approaches in the UK

***Working Futures* projections**

The UK government has for many years recognised the need for some kind of regular assessment of labour market prospects and for related skills projections. It has therefore funded research to develop models and produce national (and more recently regional) projections on a fairly regular basis since the mid 1970s.[12] Unlike the USA (and a number of other countries) it has chosen not to do this 'in house' within a ministry or government department, but to commission others to do it, on its behalf. This has certain advantages. It allows the government and others to distance themselves from the results. It also means that those producing the projections do not need to be quite so concerned about the political sensitivities of any results produced. It has also lead to the establishment of a range of organisations competing to provide such services, which can help to reduce costs. However, while the latter may have some advantages it also tends to result in pressures to cut costs which can impinge on the quality of the work undertaken.[13]

[12] Initially annually and more recently every couple of years or so.

[13] The commercial competitive approach works best when the intellectual property rights associated with the outputs can be protected. It is less successful when the aim is to widely disseminate the results as a 'public good'. Such dissemination tends to undermine the market for those providing such results if they are trying to sell the information elsewhere. The USA approach provides some lessons for the UK in terms of the benefits of centralised government support for such work with very substantial amounts being invested and where the outputs are regarded as a public good and freely disseminated.

This work has been funded by the UK government via various government departments and agencies over the years. These national level labour market projections for the whole of the UK and its constituent countries and regions have been produced by University research units or commercial consultancies. For most of the period since the early 1970s they have been carried out by the Institute for Employment Research (IER) at Warwick University, in collaboration with Cambridge Econometrics (CE).[14] The IER/CE approach to such projections is fundamentally quantitative and model based (using econometric methods) but also recognising the importance of more qualitative methods and evidence.

Wilson (2005) provides a general description of the sources and methods used to generate the set of occupational employment projections presented in *Working Futures 2004-2014* (Wilson *et al.*, 2006a). More technical descriptions of the methods and data sources are available in Wilson *et al.,* (2006b). These are the latest projections produced on behalf of the UK government available in the public domain [15] They were prepared on behalf of the Sector Skills Development Agency (SSDA), which was at that time part of the Skills for Business network.[16] They update an earlier set produced in 2002/03 (Wilson, 2003). The latter were the most detailed and comprehensive ever published in the UK (involving the projection of over half a million time series on employment alone). However, unlike those produced in the US the main focus is on sectoral and spatial rather than occupational detail.

A multi-sectoral macro-economic model is used to produce an assessment of the prospects for sectors at a detailed level. They distinguish some 41 sectors, defined using the UK Standard Industrial Classification (SIC). This is broadly consistent with international systems. This approach attempts to reflect the various drivers affecting the prospects for each sector, including the world environment, international competitiveness and government policy.

Implications for skills are derived from an analysis of differences in occupational requirements within sectors and how these are changing over time. Information on occupations is complemented by data on qualification patterns within occupations. The occupational assessment also recognises the need to measure replacement needs as people leave the workforce for whatever reasons. Occupations are classified using the Standard Occupational Classification which is compatible with ISCO. Qualifications are measured using a new national Qualifications Framework (NQF) developed by the Qualifications and Curriculum Authority (QCA). The UK systems of classification are designed to try to differentiate sector, occupation and qualification dimensions. The supply side is focused upon gender, age and qualifications.

Other quantitative projections

Other quantitative projections are also produced in the UK, both by, and on behalf of, a variety of organisations. These are too numerous to detail here, but they generally adopt similar methods (for a review see Wilson *et al*., (2004)). It is worth summarising two main sets of work here. **First,** there are a number of organisations with a geographical focus. These include the devolved administrations of Scotland, Wales and Northern Ireland, as well as various regional and sub-regional bodies within England. Their focus is often on more general economic development issues and not simply on skills. Many of these use quantitative model based approaches to assessing possible futures.[17] A considerable amount of work has also be done at a sub-regional level (see Wilson (2008) for a review). One of the main models used in the United Kingdom for sub-regional analysis is called the Local economy Forecasting Model (LEFM) and it was developed by IER in collaboration with CE.

Second there are various bodies that have a strong sectoral focus. In particular a number of the Sector Skills Councils conduct quantitative assessments as part of their Skills Needs Assessments. The longer established SSCs tend to be more advanced in this regard. Organisations such as Construction Skills and SEMTA, which trace their origins back to the old Industry Training Boards established in the 1960s, have well established quantitative models. Younger organisations have had less time to do this and

[14] IER and CE have also developed various regional and sub-regional model based approaches to anticipating changing skill needs. These are marketed commercially under the Local Economy Forecasting Model (LEFM) brand name.

[15] IER and CE have recently been commissioned to produce *Working Futures 3*, which will be published in the autumn of 2008).

[16] The role of the SSDA has now been taken over by the newly formed Commission for Employment and Skills.

[17] Including the use of the LEFM method (see footnote 14 above and Wilson (2007) for further details.

therefore tend to rely on more qualitative approaches.[18] The latter also tend to be much less well served by available data, with sectoral "footprints" that bear little relationship to Standard Industrial Classifications systems, (and therefore there is no readily available data). Annex B summarises recent efforts by SSCs to anticipate changing skills needs.

Other Sectoral organisations also have an interest in this area. In particular the National Health Service has for many years conducted quantitative assessments of skills needs in the health sector. For a detailed review see (Bosworth *et al.* (2007)).

In both sectoral and spatial cases, this work is generally put out to tender and carried out by research organisation in universities or the private sector, although some organisations have developed their own "in-house " capacity. It is also generally recognised that such quantitative model based projections tell only part of the story. They need to be complemented with other approaches including surveys of employers and other more qualitative methods.

Quantitative projections for the SSCs

Historical time series data on employment do not exist for the SSC categories, but the detailed results available from the *Working Futures, 2004-2014* database, enable an initial assessment to be made of both historical trends and future prospects for these categories. This has been produced by combining together the results from the 67 detailed industries which underlie the *Working Futures* results. These have the advantage of being based on a consistent assessment, taking into account the situation across all industries simultaneously, enabling consistent cross SSC and national comparisons to be made.

Despite these refinements, the conversion process remains quite crude, especially at a sub-national level. This is necessary in order to achieve a consistent picture across all the other dimensions of employment considered in *Working Futures, 2004-2014*. The *Working Futures* database is designed to match headline constraints at regional, sectoral, and other levels but cannot replicate every nuance of the Labour Force Survey (LFS). Point estimates based on the LFS for a particular SSC's employment structure therefore inevitably differ from the detailed estimates in *Working Futures*.

The *Working Futures, 2004-2014* projections provide a consistent assessment of prospects of the whole network of SSCs. Underlying these summary results are detailed occupational projections, including replacement needs for each SSC. Full details of methods and results are given in the *Working Futures Sectoral Report* (Dickerson et al., 2006). The results are based on a mapping from detailed SIC categories to the SIC footprints agreed between the SSCs and the SSDA. A set of SIC to SSC converters, which differ for each gender status category, are used based on data from the Annual Business Inquiry (ABI) (for employees) and the LFS (for self-employment). Some SSCs also define their coverage in terms of an occupational footprint. The results in *Working Futures* are based on the "best-fit" SIC-based footprint agreed with the SSDA. This avoids any overlap with other SSCs. These results present a consistent and comprehensive picture across all the SSCs. As noted above, many individual SSCs also produce their own projections (as set out in more detail in Annex B).

In terms of employment coverage, the largest SSCs are ConstructionSkills, Skillsmart Retail, People 1st and Skills for Health, each of which covers over 2 million people. A number of other SSCs represent over 1 million people in employment, including SEMTA, which is the largest SSC covering manufacturing-type industries. Many are however quite small by comparison.

In terms of expected future changes over the period 2006 to 2014, the employment prospects for the SSCs are very different. Many of those which represent industries in the primary and manufacturing sectors, face the problem of sharply declining employment levels, for example, Lantra, Proskills, Skillfast-UK and SEMTA. The problem of falling employment levels is often accompanied (somewhat paradoxically) by problems of skill shortages as older workers leave the sectors concerned and employers find it difficult to recruit new entrants. These issues are also discussed in more detail in the *Working Futures Sectoral Report* (Dickerson et al., 2006).

Other SSCs such as Asset Skills, e-skills UK and Skillset face rather different problems. Here employment levels are projected to rise, in some cases quite rapidly. This is likely to lead to sharp increases in the demand for certain skills, which the SSCs, in collaboration with others, will need to address.

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4.3 Other approaches

The other main approaches to assessing changing skill needs adopted in the UK can be categorised in the same way as set out in Section 2. They include:

- Employer skills surveys;
- Detailed in-depth sectoral studies;
- Other qualitative methods.

In addition to *Working Futures* results the main outputs produced are:

- The *National Employers Skills Surveys* (NESS);
- The *Sector Skills Matrix* (SSM) and related *Sector Skills Almanacs*;
- *Sector Skills Agreements* and related *Skills Needs Assessments* (SSA/SNA);
- *Skills in England* (SIE).

NESS

NESS has been conducted biannually since 1999. It is focussed on England but there are similar survey for Scotland and Wales. The survey is focussed on current skill deficiencies although earlier versions also asked questions about performance. Because of the demand for considerable sectoral and spatial detail the surveys are very large and therefore expensive. More recently they have focussed on SSC footprints. They have also attempted to provide estimates of occupational structure but this is at a broad level only.

SSM

The *Sector Skills Matrix* was established by the SSDA to provide a "one stop shop" for those looking for sectoral LMII on line. It contains data from a wide range of sources including *Working Futures* and *NESS*, all presented in a consistent fashion. The *Sector Skills Almanac* for the UK 2007 is essentially a stand alone document covering the same information. Both are designed as a companion to anyone with an interest in skills and economic performance in the UK and internationally. They bring together comprehensive robust and comparable labour market information and present it by theme and sector. They highlight sectoral differences which is fundamental to the sector focussed approach. *Sector Skills Almanacs* have also been produced for Scotland, Wales and Northern Ireland.

SSAs and SNAs

These are documents and agreements between SSCs and others concerning the skill needs of the sectors the SSCs represent. For further details see Annex B.

SIE

Skills in England is a detailed and extensive review on the state of skills in England produced on an annual basis. It contains range of detailed data on skill demand and supply, including sub regional data. It draws upon *Working Futures* and NESS as well as many other sources.

Qualitative Forecasting Approaches

The mapping of skills needs as part of *Sector Skills Agreements* and consultations conducted by Sector Skills Councils have led to a renewed focus on more qualitative approaches. This can be considered to constitute the main example of the use of a qualitative approach to skills needs assessment in the UK. The approach used by the SSCs involves working with expert, and employers in the sector as well as other specialist institutions. In many cases the emphasis on qualitative as opposed to quantitative methods is a reflection of necessity as the statistical infrastructure to use quantitative modelling based methods does not exist. The qualitative techniques used vary widely from one SSC to another . Many SSCs are still finding their way. In most cases the approaches involve a combination of methods and data sources. Annex B provides a taste.

Most SSCs use the main tools /outputs provided centrally:

- *Working Futures*
- The *National Employers Skills Surveys*
- The *Sector Skills Matrix*
- *Skills in England*

In addition most SSCs have conducted their own surveys, developed their own quantitative models, and used a variety of the qualitative techniques outlined in Section 2. In some cases this is done largely in-house, but in most cases it involves extensive use of external consultants to bring in the relevant knowledge, , skills and expertise.

5. CONCLUSIONS.

Practical Impact of the UK System

Many years of investment by the State in basic data and related systems have established a solid foundation for skill need assessments in the UK. Although there is still considerable room for improvement compared to best practice worldwide, the UK is comparatively well served.

The key elements include:

1. A well established system of national economic accounts (essential for economic/econometric modelling at a detailed sectoral level);
2. Standard systems of classification for both Industries and Occupations that enable measurement of changing structures over time;
3. Reliable estimates of employment by sector based on censuses or large representative surveys of employers (including detailed breakdowns by industry and geographical area);
4. Acceptable estimates of occupational and qualification structures based on Census of Population and regular household surveys (Labour Force Survey);
5. Regular surveys of employers to assess current skill deficiencies and skill gaps;
6. Occasional surveys of employers and employees to consider generic skills within jobs.

Based on this foundation, the State has charged institutions such as the Skills for Business network and the Learning and skills Council to carry out a systematic assessment of changing skill needs, and having done this to deliver the skills the UK needs. To facilitate this, the State has also supported analysis, model building and the production of regular quantitative projections based on such methods. Such support has included general research funding, channelled primarily through Universities (going back many decades) as well as a series of projects and programmes of more applied research, including since 1975 detailed national level employment projections. Substantial prior investment has therefore been made in quantitative modelling, via academic research and competitive tendering, including a substantial and on going research programme focussed on skills;

The main problems and gaps relate to:

- The limitations of 4., (timeliness and limited sample size) compared to best practice such as the regular US surveys of employers which deliver a much finer and more precise estimate of changing occupational structure within sectors;
- Problems with 2., caused by the fact that SSCs have been defined with little regard for existing systems of classification, with the consequence that existing official data often fail to match SSC ”footprints” and are therefore fit for the SSCs purpose;[19]
- A failure to recognise the common nature of many skills issues across both sectoral and geographical dimensions, with the consequence that often too much emphasis has been placed on such detail for it own sake, resulting in the very large and expensive National Employer Skills Survey (NESS) which in many respects has become a “sledgehammer to crack a nut”;
- Too great a focus (especially in NESS) on the issue of current skill shortages, which are often a marginal and ephemeral [phenomena);
- Limited resources compared with some other countries.

[19] This has resulted in some organisations trying to develop their own systems of classification. However these attempts often fail to recognise the complexities of developing such classifications nor the huge amounts of effort that have gone into developing current standards.

Evaluation of UK System Strengths and Weaknesses

Strengths:

- well established statistical infrastructure including a number of quantitative data bases, (the result of many years of investment);
- long established quantitative model based framework with well established track record and reputation for high quality;
- a revised institutional framework with clearly defined responsibilities and management structures;
- co-operation of many institutions, including employers;
- existence of agreements on joint procedures;
- a relatively good accessibility to the outcomes on the internet;
- use of external consultants can help ensure objectivity, independence and neutrality.

Weaknesses:

- the system is very complex;
- lack of stability and continual institutional flux, often linked to political change; devolution; Government Departments;
- many institutions and procedures are still bedding in and many detailed problems remain;
- no single portal for the general public providing information about future skills needs;
- there is the possibility of influencing the government by lobbying on the part of employers' associations. (however this is seen as an objective (ensuring employer engagement) rather than a weakness);
- lack of detail in key areas (notably occupations);
- the role of sectors remains to be fully established compared to some other countries such as Germany where employers have always been involved much more integrally in the process of training (many SSCs have yet to establish themselves);
- the competitive tendering process has disadvantages as well as benefits.

Key Recommendations

General lessons

Based upon the review of best practice worldwide the use of nationwide, multi-sectoral modelling methods, to provide a comprehensive, national overview of the changing demand for skills should be the cornerstone of any systematic a approach to assessing changing skill needs;

- More basic methods should be used for modelling occupational structure within sectors, recognising the limitations of existing data but making recommendations for further improvements in data collection;
- It is important to include an explicit treatment of replacement demands, although recognising the limitations of existing data;
- Some limited analysis of the implications for other aspects of skill such as qualifications might be undertaken;
- A satisfactory treatment of key/generic skills is best left to more qualitative approaches for the foreseeable future.

Other more qualitative approaches are also relevant and useful. They should be regarded as complements rather than substitutes for quantitative methods, adding more detail and subtle insights. The sectoral system developed in the UK relies on both quantitative and qualitative methods, as well as a substantial prior investment in statistical infrastructure. Most SSCs rely on these prior investments and particular products such as *Working Futures* and NESS. The review of the system itself suggests that it has a number of advantages but there have also been many teething and other problems. There are a number of detailed lessons that can be learned about how and how not to set up such a system.

Costs

The experience of other countries suggests that the development of quantitative models and systems for anticipating skill needs at a national level is a major undertaking. Typically, it involves large investments in data, analysis and modelling of many person years of research. By way of an example, the most recent exercise of this kind undertaken in the UK (Wilson *et al.*, 2005) cost over £300K, and this was based to a large extent on existing models and data bases). These models and datasets have taken many years to develop, involving similar costs in previous forecasting rounds stretching back over 25 years. The cost of the programme of forecasting work undertaken by the Bureau of Labour Statistics in the USA is measured in millions of dollars per annum. Other countries also invest similar substantial sums of money in similar kinds of activities.

The overall costs of such work vary enormously depending upon:

- The level of sophistication of the modelling work;
- The level of detail (including the various dimensions of employment covered);
- The extent to which primary data collection is required.

However, it is possible to do something at a more modest level, building upon the lessons and experience of other countries. In particular, costs can be kept down by:

- Making maximum use of existing models and databases;
- By avoiding unnecessary detail (e.g. not necessarily adding a spatial dimension which multiplies the data required by the number of spatial areas to be covered, or including modules to deal with qualifications or key/generic skills as a prime focus of attention);
- Using existing data and not collecting new information specifically for the purpose.

The costs of major surveys of employers such as NESS are also high. This calls into question whether or not the information sought is worth it. Considerable care is needed to design such surveys to ensure that they really add value and produce useful information.

Finally the costs of the SSC network are considerable. The SfB network employs a large number of people. The network also requires considerable budgets for research and other expenditures.

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Annex A: Institutional Changes Following the Leitch Review

Leitch (2006) made various recommendations, including the need for further institutional change. A key focus was on the demand for skills from both employers and individuals. The former relates directly to the demand for skills as recognised in most macro models. The latter is more usually seen as part of the supply picture, being concerned with individual decisions to invest in skills.

The main recommendations made by Leitch that are relevant to the current project included:

- strengthen employer voice, rationalise existing bodies, strengthen the collective voice and better articulate employer views on skills by creating a new ***Commission for Employment and Skills***, reporting to central Government and the devolved administrations. The Commission will manage employer influence on skills, within a national framework of individual rights and responsibilities;
- increase employer engagement and investment in skills. Reform, relicense and empower ***Sector Skills Councils (SSC***s). Deliver more economically valuable skills by only allowing public funding for vocational qualifications where the content has been approved by SSCs. Expand skills brokerage services for both small and large employers;
- improve engagement between employers and universities, increasing co-funded workplace degrees;
- increase people's aspirations and awareness of the value of skills to them and their families. Create high profile, sustained awareness programmes. Rationalise existing fragmented 'information silos' and develop a new universal adult careers service; and
- create a new integrated employment and skills service, based upon existing structures, to increase sustainable employment and progression. Launch a new programme to improve basic skills for those out of work, embedding this support for disadvantaged people and repeat claimants. Develop a network of employer led Employment and Skills Boards, building on current models, to influence delivery.

Creation of DIUS and DCSF

In 2007 government departments were restructured to better achieve the aims set out by Leitch. In particular the Department for Innovation, Universities and Skills (DIUS) was created, bringing together functions from two former departments:

- Science and innovation from the Department of Trade and Industry (DTI); and
- Skills, further and higher education from the Department for Education and Skills (DfES).

At the same time the Department for Children, Schools and Families (DCSF) was created to deal with compulsory education in schools up to the age of 16.

DIUS is expected to work closely with other departments (including the Department for Business, Enterprise and Regulatory Reform (BERR), Department for Children Schools and Families (DCSF), Department for Central and Local Government (CLG) and Department for Culture, Media and Sport (DCMS) and others).

DIUS aims are to:

- Sustain and develop a world-class research base;
- Maximise the exploitation of the research base to support innovation across all sectors of the economy;
- Raise and widen participation in Higher Education;
- Raise participation and attainment by young people and adults in post-16 education and learning;
- Tackle the skills gap amongst adults, particularly equipping people with basic literacy and numeracy;
- Increase the supply of people in science, technology, engineering and mathematics (STEM);
- Accelerate the commercial exploitation of creativity and knowledge, through innovation and research, to create wealth, grow the economy, build successful businesses and improve quality of life;
- Improve the skills of the population throughout their working lives to create a workforce capable of sustaining economic competitiveness, and enable individuals to thrive in the global economy;
- Build social and community cohesion through improved social justice, civic participation and economic opportunity by raising aspirations and broadening participation, progression and achievement in learning and skills;
- Pursue global excellence in research and knowledge, promote the benefits of science in society, and deliver science, technology, engineering and mathematics skills in line with employer demand;
- Strengthen the capacity, quality and reputation of the Further and Higher Education systems and institutions to support national economic and social needs;
- Encourage better use of science in Government, foster public service innovation, and support other Government objectives which depend on the DIUS expertise and remit.

UK Commission for Employment and Skills

In April 2008 a new UK Commission for Employment and Skills (CES) was created by the UK Government and Devolved Administrations in Scotland, Wales and Northern Ireland. It replaces the Sector Skills Development Agency (SSDA). The establishment of the CES was another key recommendation of the Leitch review. It will operate across the UK, palying a central role in raising the UK's skills base, improving productivity and competitiveness, increasing employment and making a contribution to a fairer society. It will play a critical part in securing for the UK the ambitions of achieving a world class profile on skills by 2020 and the aspiration of an 80% employment rate. It will take on many functions of two existing bodies the (SSDA) and the National Employment Panel (NEP).

The SSDA was established in 2002 and was initially responsible for funding, supporting and monitoring the network of 25 Sector Skills Councils (SSCs). Its employer-led board provides additional strategic support and advice. The SSDA is a non-departmental public body with representatives across the UK. http://www.ssda.org.uk

The National Employment Panel is composed of top business executives along with public sector and community leaders. They provide independent advice on welfare reform and labour market issues to Ministers in the Treasury, the Department for Work and Pensions, and the old Department for Education and Skills. http://www.nationalemploymentpanel.gov.uk

For further details about the Commission see www.ukces.org.uk.

The Commission will:

- Advise Ministers on the strategy, targets and policies needed to increase employment and skills rates;
- Assess progress towards the UK's world class ambition in England;
- Monitor the contribution that each part of the employment and skills system makes to sustained employment and career progression, challenging performance and recommending improvements in policy and delivery;

- Ensure that employment and skills services in England are integrated, and are meeting the needs of individuals and employers, and advise Government on whether further institutional change is required;
- Have responsibility for the performance of Sector Skills Councils (SSCs), advising Ministers on re-licensing;
- Research, request evidence, identify emerging issues and promote new approaches that may influence the aspiration of an 80% employment rate and the Leitch targets for skills;
- Rreport to the highest levels of Government and publish an annual report on the state of the UK employment and skills system, at all levels from basic literacy and numeracy skills to the highest level skills delivered in Higher Education;
- Develop strong relationships with employers, Trade Unions, Jobcentre Plus, the skills and Higher Education funding bodies in England, Wales, Scotland and Northern Ireland.

The Skills for Business network of 25 employer-led Sector Skills Councils (SSCs) will have a revised remit. This will focus on raising employer ambition and investment in skills, ensuring the supply of skills and qualifications is driven by employers, and articulating the future skills needs of their sectors. SSCs are expected to be re-licensed by 2009. A new organisation, the Alliance of Sector Skills Councils (ASSC) will take over co-ordination of the Skills for Business network after 1 April 2008.

The Future of the Learning and Skills Council (LSC)

Further reforms to improve the delivery of adult and young people's skills have recently been announced (March 2008). These propose to transfer some £7 billion of expenditure on education and training, currently controlled by the Learning and Skills Council (LSC), to local authority control. The aim is to help colleges and school sixth forms deliver the reforms needed to raise the education and training leaving age to 18, as well a shifting the balance of training in a more vocational direction.

At the same time Government will direct £4 billion a year through a new Skills Funding Agency (SFA) to provide training and skills for adults, transforming the system to be responsive and demand-led. The plans will mean the dissolution of the LSC by 2010 and instead make local authorities responsible for offering all young people in their area a full menu of educational choices - both new vocational Diplomas and Apprenticeships alongside traditional academic GCSEs and A levels.

Local Authorities are already responsible for schools, and for advising young people. They are now being given new duties to ensure that the right range of provision is in place for young people to continue in education and training until 19 across the education and training spectrum.

Local authorities will work together with national agencies and the Regional Development Agencies (RDAs) who will co-chair the regional level, to provide a coherent planning and funding system for FE colleges and providers.

For adult learners the new smaller SFA will replace the LSC to streamline the funding process to colleges and training providers. The aim is to ensure that funding follows the training needs of both employers and learners. The proposed new SFA will ensure that government funding responds to employer's and adults' skills needs and supports excellence in the FE sector. The SFA is intended to build on the success of the LSC and to respond quickly and flexibly to national, regional and local skills needs.

The SFA will route funding swiftly to FE colleges and other providers following the purchasing decisions of adults and employers. It will make sure public funds complement the large private investment which is made in adult skills and training. The SFA will maintain oversight of the coherence and performance of the whole FE service and especially its responsiveness to the strategic skills needs of employers and learners. The SFA will be responsible for the performance management of Further Education Colleges and other providers. It will be the single point of intervention where either pre or post-19 performance does not meet nationally agreed acceptable standards.

The Government is also creating a new national Apprenticeships service (NAS) to take responsibility for the Apprenticeships programme, including ultimate accountability for national delivery of targets (as announced in *World-class Apprenticeships: Unlocking talent, Building Skills for All*). The NAS will be a discrete, coherent service, reporting to the Secretaries of State of DCSF and DIUS, and managed at first within the LSC and then the SFA. The SFA will also manage the National Employer Service (NES). This will be a “one stop” service for employers with 5000+ employees. This will replace the current Employment Service.

Useful links for Government Departments, Agencies and Research Organisations (to be completed)

Non-governmental Agencies

SSDA (now defunct, as from March 31st 2008))

http://www.ssda.org.uk/ssda/default.aspx?page=41

http://www.ssda.org.uk/ssda/pdf/060831%20R%20Research%20Report%2019.pdf

CES

www.ukces.org.uk

SSDA is to be replaced by the CES from April 1st 2008

SSCs (see Annex B)

LSC (Defunct as from 2010)

http://www.lsc.gov.uk/

QCA

Government Departments

Department for Business, Enterprise and Regulatory Reform

http://www.berr.gov.uk/

DIUS

http://www.dius.gov.uk/

DWP

http://www.dwp.gov.uk/

DfES (now defunct)

http://www.dfes.gov.uk/

DCSF

http://www.dcsf.gov.uk

Employment Service

FSS

FSW

DELNI

UK Research Organisations

Cambridge Econometrics
http://www.camecon.com/
Warwick Institute for Employment Research
http://www2.warwick.ac.uk/fac/soc/ier
Policy Research Institute
www.lmu.ac.uk/lbs/pri/
Institute for Employment Studies
www.employment-studies.co.uk
Experian
www.experian.co.uk
Henley centre
http://www.hchlv.com/render.aspx?siteID=1&navIDs=1,224

Annex B: The Role of the Sector Skills Councils[20]

The Role of SSCs and SSAs

The Skills for Business (SfB) network comprises 25 Sector Skills Councils (SSCs) plus the Sector Skills Development Agency (SSDA). The SSCs are independent, employer-led organisations, each covering a specific key sector across the UK. Table B.1 summarises the SCCs and how they relate to SIC categories.

Around 85 per cent of the total workforce in the UK is covered by an SSC. Up until March 31st 2008 the SSDA was responsible for licensing, funding, supporting, and monitoring the SSCs. The SSDA also provided a minimal level of cover for sectors falling outside those sectors covered by the SSCs. From April the 1st 2008 this role will be taken over by the newly formed Commission for Employment and Skills (CES) and the Alliance of Sector Skills Councils (ASSC).

Sector Skills Councils (SSCs) were first set up in 2002. Their aim was to represent the views of employers on the changing need for skills in their sectors. A number of the SSCs were developed from existing organisations which already had well-established track records of anticipating changing skill needs. Others represent a new generation, intent on making a difference for the employers they represent.

The *SSC Standard* sets out the Licensing requirements for the SSCs. The Standard reflects the expectations of the SSDA and stakeholders. According to the SSC Standard, the SSCs should be the "authoritative source of UK-wide data, intelligence and future projections around the skills needs of employers and employees" (p.1). The SSC Standard is used in conjunction with the Skills for Business Performance Monitoring Scorecard results and individual sector specific targets to assess SSC performance.

SSCs are obliged to develop a *Sector Skills Agreement* (SSA) with education and training providers and other stakeholders. In order to do this the SSC has first to produce of a *Skills Needs Assessment* (SNA). These are detailed documents, in many cases based on in-depth, quantitative analysis. This Annex briefly reviews and summarises the SSAs and SNAs produced by each of the SSCs, with details being provided of where to find more information.

The four key goals of the SSCs are:

i. to decrease skills gaps and shortages;
ii. to improve productivity, business and service performance;
iii. to increase opportunities to boost the skills and productivity of everyone in the sector's workforce;
iv. to improve learning supply including apprenticeships, higher education, and National Occupation Standards (NOS).

SSAs involve assessment of skills demands and needs in the SSC's sector and development of deals with the supply side (education and training providers and other interested parties) to fill any gaps and shortages. SSCs must negotiate the actions and solutions in each SSA with regional partners and the devolved administrations in order to bring appropriate funding and support for workforce development to employers. To gain approval, SSCs must demonstrate active employer support for and engagement with the SSA.

There are five stages in the SNA/SSA development process:

- Stage 1 involves an assessment of the prospects in each sector to determine short-term, medium-term and long-term skills needs and mapping out of the key drivers of change;
- Stage 2 requires evaluation of the current training provision in the sector;
- Stage 3 entails analysing the main gaps and weakness in workforce development and setting agreed priorities;
- Stage 4 involves reviewing the scope for collaborative action with partners and assessing in what approaches employers would likely engage;

[20] This Annex draws heavily upon *Skills in England 2007* (Wilson *et al*. (2007)).

Table B.1 Defining the SSCs in terms of Standard Industrial categories

SSC / sub-sector name	*Main sectors covered*	*SIC codes covered by SSC / sub-sector*
SSC - CONSTRUCTION	Construction	45.1, 45.2, 45.32, 45.34, 45.4, 45.5, 74.2
SSC - E-SKILLS	ICT and related	22.33, 64.2, 72,
SSC - SEMTA	Science, engineering and manufacturing technologies	25.11, 25.12, 27-35, 51.52, 51.57, 73.10
SSC - SKILLSACTIVE	Active leisure and learning	55.22, 92.6, 93.04, 92.72
SSC - PEOPLE 1ST	Hospitality, leisure, travel and tourism	55.1, 55.21, 55.23, 55.3-55.5, 63.3, 92.33, 92.71
SSC - SKILLSMART	Retailing	52.1-52.6
SSC - IMPROVE	Food, drink, etc	15, 51.38 (not 15.11/3 or 15.92)
SSC - AUTOMOTIVE	Motor vehicles	50.1-50.4, 71.1
SSC - COGENT	chemicals and pharmaceuticals, nuclear, oil and gas	11, 23-25 (excluding 24.3, 24.64, 24.7, 25.11, 25.12), 50.5
SSC - LOGISTICS	Transport and storage of goods	51 (unless covered by another SSC) 60.24, 63.1, 63.4, 64.1
SSC - SKILLFAST	Clothing and textiles	15.11/3, 17-19, 24.7, 51.16, 51.24, 51.41, 51.42, 52.71, 93.01
SSC - PROSKILLS	Process and manufacturing	10, 12-14, 21.24, 22.2, 24.3, 26.1, 26.26, 26.4, 26.5, 26.6, 26.7, 26.8,
SSC - GOSKILLS	Passenger transport	60.1, 60.21, 60.22, 60.23, 61.1, 61.2, 62.1, 62.2, 63.2, 80.41
SSC - SUMMITSKILLS	Building services engineering	45.31, 45.33, 52.72
SSC - ENERGY AND UTILITY	Utilities	37, 40.1, 40.2, 41, 60.3, 90.01, 90.02
SSC – LANTRA	Environmental and land-based, agriculture	1, 2.01, 2.02, 5.02, 20.1, 51.88, 85.2, 92.53
SSC - FINANCIAL	Financial and business services	65-67
SSC - HEALTH	Health care	85.1
SSC - CARE	Social care	85.3
SSC - JUSTICE	Justice and law enforcement	75.23, 75.24
SSC - SKILLSET	Audio-visual, media	22.32, 24.64, 74.81, 92.1, 92.2
SSC - ASSET SKILLS	Property, housing and facilities management	70, 74.7
SSC - LIFELONG LEARNING	Education and training	80.22, 80.3, 80.42, 92.51
SSC - CULTURE	Culture and arts	22.14, 22.31, 36.22, 36.3, 74.4, 92.31, 92.32, 92.34, 92.4, 92.52
SSC - GOVERNMENT SKILLS	Public sector	75.1, 75.21, 75.22, 75.3

Revised October (2) 2007 for SfB 2007

- Stage 5 is the final stage of the SSA process and involves production of an agreement of how the SSC and employers plan to work with key funding partners to secure the necessary supply of training.

The first two stages are effectively the skills needs assessment (SNA), to determine the demand for skills in the short, medium and long-term. Imbalances in skills need and supply are examined and action plans to overcome deficiencies are outlined. The creation of SSAs is very much employer-centred in assessing the demands in each particular sector.

The SSCs vary in the timing of the beginning of the SSA development process. Four Pathfinder SSCs (ConstructionSkills, e-skills UK, SEMTA and Skillset) began the process before all the other SSCs. Six councils were in Tranche 2 (Cogent, Lantra, Skillfast-UK, SkillsActive, Skills for Health and Skills for Logistics) and began developing their SSAs in February 2005. Six further SSCs (Automotive Skills, Asset Skills, Improve Ltd, GoSkills, People 1st and Skills for Justice) began stage two of the SSA process in January 2006. The remaining nine SSCs (Proskills, Energy & Utility Skills, SummitSkills, Skillsmart Retail, Financial Services Skills Council, Government Skills, Lifelong Learning UK, Skills for Care and Development, and Creative & Cultural Skills) were the last to begin developing their SSAs. An up to date timeline of the SSA development process for all SSCs Is given in Table B.1. For a complete list of SSCs including contact details, click here.

The process of developing SSAs and performing SNAs has resulted in the SSCs becoming very aware of the relationship between skills demand and supply in their respective sectors and ultimately being more responsive to changes in the balance between the two. With employer-centred assessment of skills needs, SSCs are able to anticipate effectively changes in skill demands, and deal with skill gaps and shortages. They can then make appropriate deals with supply-side players to overcome any deficiencies in skills. The SSDA has conducted a umber of reviews of the process.

According to GHK (2008) in the *SSA State of Play Report*, the rationale for SSAs, as set out in the government's Skills Strategy,[21] was that responsibility for and investment in training should be shared between employers, individuals and the State SSAs set out how employers and other stakeholders propose to share the burden in a voluntary fashion without resort to statutory legislation. Public agencies and the government undertake to ensure that public funding for skills development and training reflects SSA priorities. According to the GKN (2007) review, as SSAs have developed they increasingly been seen as a key and tangible output of the system, representing a key element in the employer voice on skills. The SSA can also be regarded as a process followed through by each of the SSCs and other stakeholders, changing perceptions and actions. Initially SSAs were England focused, but they have subsequently been extended across into each of the other nations within the UK and down to the level of individual English regions.

The focus has been on achieving:

- High-quality LMII (to lay the basis for agreement)
- Building a stronger employer voice through research and consultation
- Exercising increased influence over supply side planning and provision
- Agreements with the supply side
- Agreements with employers ('something for something')
- A clear link between LMII and business and action planning.

According to the GHK (2008) report there has been progress on all these elements. The quality of LMII is much improved. SSCs have made significant progress in developing relationships with employers, including engaging with a wider group of employers. However as GHK notes the challenge of marshalling a coherent employer voice is huge, with very large numbers of employers involved in most sectors. In many cases problems with the mechanism to validate the LMII gathered in Stages 1 to 3 has hindered reaching agreements on Stage 5. A key problem is that existing data are rarely tailored to meet employers' perceptions.

SSAs have positioned the SfB network to be better able to influence and respond to major policy developments (e.g. qualification reform; the Leitch review etc), although the changing policy environment and other pressures and constraints on other stakeholders have probably limited the extent of SSA leverage on skills investment priorities to date. According to the GHK (2008) report some

[21] 21st Century Skills: Realising our Potential, July 2003.

funders and providers have acknowledged that SSCs have become increasingly influential and are making a significant contribution to the planning process:

- SSAs have had a significant impact on the way SSCs work;
- However the process is seen by many as over-bureaucratic and burdensome;
- High-quality LMII, is necessary but not sufficient to bring about changes to decisions on funding and planning provision;
- complementary work on lobbying and policy negotiation at the highest levels is fundamental;
- more radical change to other parts of the skills and training infrastructure, particularly the reform of the funding and qualification framework is needed (and is now underway);
- In practice, the logic of the sequential stages from demand/supply analysis; identification of needs and gaps; to vision and planning, has acted as a block on agreements. Many SSAs appear to have become stuck at the first part of that linear process, because the reality of policy making is much more complex.

GHK (2008) argue that arguments over the LMII in Stage 1 and 2 has often been used as an excuse to defer action and decisions. Given the finely grained research and the depth of consultation required it is often impossible to achieve consensus. This has in some cases led to a rather mechanistic approach to the evaluation of SSC evidence in the context of the SSA which has effectively derailed the process and what should be debates about policy decisions end up being debates about LMII quality and interpretation.

GHK (2008) suggest some SSCs have *'been clever'* in terms of working with partners to develop relatively substantial agreements despite struggling with the research phase and conversely there were some cases where excellent research work in Stages 1 and 2 failed to be converted into agreements that stakeholders could commit to. Skills to translate the evidence-base into solutions and then negotiate a deal are fundamental to effective SSAs. This reinforces the message from the earlier The EKOS (2007) report on SSA implementation. This identified examples of best practice amongst pathfinders SSCs such as:

- those able to operate from a position of authority – for example, ConstructionSkills observatory groups, which involve a range of industry and stakeholder representatives developing regular flow of high quality LMII at national and regional level;
- those developing good relationships with key stakeholders - for example eSkills UK's agreements with the LSC that it will only fund certain types of qualifications that it has identified as in short supply.

The "pathfinder" SSCs took the process of developing SSAs as well as SNAs very seriously, with input from senior staff, helping to linking these into the core work of the SSC. The skills, knowledge and experience of these senior staff plus their ability to take decisions on behalf of the SSC, helped to facilitate agreements more easily than appears to be the case for some of the SSC following behind, where there has not been such commitment..

Summary of SSC assessments

The research performed by the SSCs through the various stages of the SSA development process has allowed the Skills for Business network to identify a number of themes common to many or all of the sectors in terms of skills priorities and development needs. A number of common themes arose out of the SSCs' analyses, including management, leadership and employability. Asset Skills has been assigned as the lead SSC to act, on behalf of the network, in the area of employability. The key aim is to embed employability across the Skills for Business network.

Leadership and management were also identified in the Leitch Review as a vital step in gaining acceptance and increasing the value of wider skills development. The evidence emerging from the SSAs supports this view, with a number of SSCs referring to needs regarding management and leadership in their sectors. The evidence from the SSAs has also led to a number of proposed solutions from the Skills for Business network all-sector management and leadership cross-cutting theme. These solutions include: first level management development, management and leadership forums for employers, promotion of the National Occupational Standards, and participation in Action Learning and Solutions4Business programmes.

The Skills for Business network and the SSCs have also developed programmes to examine strategies to deal with employer needs regarding skills for carrying out administrative activities in the sectors, skills for productive exploitation of IT, and language skills.

Recent Experience of Individual SSCs

The remainder of this Annex provides an overview for each of the twenty-five SSCs, along with recent findings related to skills needs and supply for each. The information this section is based on Wilson *et al.* (2007). It is largely derived from the SSCs' respective websites and their SSAs and SNAs (as at mid 2007)). There is not room here to cover all of the work carried out under the auspices of each SSC. Instead a brief overview for each SSC is provided, with links to their websites where interested readers can find further information. There are many common themes, but much of the detail is specific to the particular sectors concerned.

Many draw upon core official data sets and products already identified in Section 4. This includes *Working Futures* projections and *NESS* results on skill deficiencies. Most have carried out their own analyses and assessments, in many cases with the help of external consultants. This includes customised surveys, model building and quantitative projections and a variety of qualitative methods.

B.1 **Lantra** (www.lantra.co.uk) represents the environmental and land-based sector comprising some 17 distinct industries, including agriculture, fishing and forestry and many more. This SSC's footprint consists of approximately 160,000 businesses, of which more than 90 per cent employ fewer than 10 people. Lantra estimates the number of people working in the sector in England (2006) as 720,000. A recent estimate has attributed almost 6 per cent of the UK's GDP to this sector.

The Sector Skills Agreement (SSA) report for Lantra was launched in January 2007. The SSA cites globalisation of production and markets, rapidly changing consumer tastes and growing focus on high-value products as the main drivers of change in the sector. Lantra's sectoral footprint does not fit very neatly with the categories used in official statistics based on the Standard Industrial Classification (SIC). Official data sources and related quantitative models are therefore of only limited value. The disparate nature of the businesses it represents also makes obtaining comprehensive and representative data very difficult . Lantra has therefore adopted an eclectic range of methods to assess changing skill needs and to develop its SNA. This involves in house surveys, in house model building (with the help of external consultants) as well as more qualitative approaches to ensure consultation with key stakeholders as described in Section 2. Use of official data and standard national models and products is limited.

Based on these methods, all 17 industries in this sector report difficulties in recruitment and retention. Current skills gaps have been identified with regard to management and planning, communications, ICT, and technical, literacy and numeracy skills. While much of the workforce in this sector is highly skilled in technical areas, these skills are often unaccredited and currently not recognised. Lantra's SSA outlines the need to recognise these skills and experience, together with qualifications and professional development. According to employers in this sector, new entrants often lack the skills to enter employment. Employers have also expressed concern about the industry relevance of some courses of education and training being offered and the inflexibility of course structure.

B2 **Cogent** (www.cogent-ssc.com) was formed in 2002 and is the trailblazer SSC for chemicals and pharmaceuticals, nuclear, oil and gas extraction, and petroleum and polymers industries. The SSC estimates that its footprint consists of 19,000 employers and 906,000 employees in the UK (based on 2004 figures). Its total gross value-added (GVA) is estimated as £49 billion.

Cogent makes use of the official surveys such as NESS and the *Working Futures* projections, supplemented by its own quantitative and qualitative methods. It has developed customised quantitative models to develop its own scenarios for some sub-sectors.. According to Cogent's SNA which was published in May 2006, overall employment in the sector has been declining in recent years. This is attributed to the combined impact of increasing automation, investment in capital equipment and lower employment costs in response to the need to reduce overhead costs. As industries in this sector are facing static or shrinking workforce volumes, vacancies are mainly down to replacement demand rather than expansion demand. The oil and gas industry is the exception to this as it has recently experienced an expansion of workforce demand stimulated by high oil prices.

The NESS results indicate that where there are vacancies in this sector, approximately 1 in 4 is difficult to fill due to skill shortages. Skill shortages in England are most prevalent among associate and

technical workers (38 per cent of skill shortage vacancies); process plant and machine operatives (18 per cent); and sales and customer service staff (15 per cent). The skills most reported as lacking amongst applicants were technical and practical skills. Deficiencies in problem solving, management, communication, and team-working skills were also reported by 1 in 5 employers with skill shortage vacancies.

One concern expressed across the sector's employers was the skills of graduate engineers and scientists. There is a perception that many new graduates lack the softer and core skills required in employment. These skills include team-working, communication and report writing skills, as well as more specific and technical requirements.

Cogent sector employers report among the highest incidence of skill gaps across all UK sectors. Around 38,000 Cogent sector employees in England are believed to have skill gaps. Around 41 per cent of those with gaps are process, plant and machine operatives. This is disproportionately high when compared to the 32 per cent of the overall workforce who are employed in such roles. Within the Cogent sector, upskilling is vital, not only regarding technical skills but also in terms of core behavioural skills such as communications, customer service, the ability to work in teams, and business improvement.

B.3 **Proskills** (www.proskills.co.uk) is the SSC for the process and manufacturing sector which remains a significant part of the UK economy. According to the SSC, this sector employs over 350,000 in 21,000 companies (based on 2004/2005 LFS data). The sector has a combined turnover of £29 billion. Proskills completed the first stage of development of its SSA in 2007. The Stage 1 report (SNA), highlights that three occupational groups (managers, professionals and technical) are expected to increase in numbers, with a gradual reduction in the numbers of people in other occupational groups. This is expected to level off over the next ten years. This is based on *Working Futures* estimates. Recruitment in the previous 12 months to the Stage 1 report was estimated to be about 5 per cent of the workforce or 6,500 people. Proskills expects the sector to have a net requirement of approximately 80,000 people over the next 10 years. About 30,000 of these will be skilled operatives, 15,000 managers, 15,000 technical staff and the remainder will be in other occupations.

Based on NESS, employers identified "hard to fill vacancies" in the skilled trades and machine operatives. They also cite difficulty with employability skills (attitude to work and learning) when recruiting for all roles. Some skills gaps for existing staff were reported by 17 per cent of employers. This is similar to the proportion reporting such for the whole of the UK. Skills gaps are most prevalent amongst process and plant operatives. The consensus among employers is that they are concerned at the absence of employability skills. For many industries within the Proskills sector, external qualifications are not considered of high importance, although larger companies tend to give more weight to such qualifications and the extractives and mineral processing industry group consider external qualifications to be significant in most cases.

B.4 **Improve Ltd** (www.improveltd.co.uk) is the SSC for food and drink manufacturing. This SSC was licensed in June 2004. The SSC estimates that the industry has an annual turnover of £73 billion (approximately 17 per cent of total UK manufacturing turnover) and employs 500,000 (approximately 14 per cent of the entire manufacturing workforce) (based on 2004 data).

Improve Ltd estimates that approximately 10,000 jobs are being lost annually in the sector, mainly due to automation and off-shoring. A minimum of 56,000 employees are forecast to retire from the sector in the next eight years.

Based on NESS, it appears that employers are facing important skills deficiencies in areas such as supervisors and managers, technical roles, machine operators and craft skills. Estimates from *Working Futures* indicate that the number in managerial and professional occupations in the sector will rise by 50 per cent by 2014, this represents a further 38,000 people being required to fill these roles. The other projected requirements of main concern are machine operators (40,000), and craft skills (16,000). There is little future requirement for elementary level workers as technology improvements reduce the need for this sort of role.

A number of key issues were identified in the Stage 1 report produced by Improve Ltd. These included problems in recruiting food scientists and engineers, accessibility to training, limited training planning, and lack of national prioritisation of the sector. The SSC has recognised the importance of skills development and acquisition and overcoming skills challenges in order to maintain or improve the sector's high productivity ranking in the global market.

B.5 **Skillfast-UK** (www.skillfast-uk.org) is the SSC for apparel, footwear, textiles and related businesses. According to the SSC, in the UK, this sector employs 384,000 people (2003/04 figures) and generates output of almost £10 billion a year. There has been long-term decline of the sector's traditional industries but this is being offset partially by innovative and growing industries such as branded and designer fashion, a variety of craft activities and technical textiles. The sector is continuing to undergo radical change, driven by globalisation of production and markets, rapidly changing consumer tastes, and an increasing focus on high value products and processes.

Based on NESS, the SSC reports a significant incidence of gaps in technical skills among operators but it is recognised that personnel in higher level occupations such as technicians and designers also need to improve their skills. Generic gaps have also been identified regarding management and ICT skills.

The Skillfast-UK workforce has the highest proportion of unqualified workers of any of the SSCs. Many workers are highly skilled in technical areas but these skills are not accredited. Employers in this sector have voiced concern related to the skills held by many fashion design graduates and to the industry relevance of some courses. This echoes the sentiment expressed by a number of other SSCs that external courses and training do not always translate into business improvements for particular sectors.

Skillfast-UK relies on the Working Futures, 2004-2014 projections in terms of the sector's future skills needs to 2014. Total employment in the sector is expected to decrease by 24 per cent with job losses heavily concentrated in operative occupations. More than half of total job losses in the manufacturing part of the sector will impact upon unqualified workers. The largest positive recruitment requirements are expected to arise for managers, associate professional and technical, and sales occupations.

B.6 **SEMTA** (www.semta.org.uk) is the SSC for Science, Engineering and Manufacturing Technologies. It has evolved from the old Engineering Industry Training Board (EITB) first established in the 1960s. It has a long tradition of quantitative modelling and other systematic approaches to skills needs assessment, involving both use of external consultants and the development and nurturing of in house capability. SEMTA makes use of NESS, as well as its own in-house quantitative model (linked to the *Working Futures* projections) together with customised surveys and other qualitative approaches to ascertain employer and other stakeholder views, including the use of sectoral observatories.

According to the SSC, it covers approximately 76,000 companies and 2 million employees (2004 figures) in the UK as a whole. The SSC estimates that this sector contributes about 9 per cent of annual UK GDP and approximately one-third of total UK exports. The SSC was licensed in April 2003 and has completed SSAs for a number of sub-sectors including Aerospace, Automotive and Electronics as well as the Marine industry. SSAs for Bioscience, Metals, Electrical and Mechanical industries were initiated in 2007.

Employment is expected to decrease in the electronics and automotive manufacturing industries. Increases in employment are expected in some areas of the aerospace and marine industries. In response to the employment dynamics in each area, the individual sectors within SEMTA have identified their own specific skills needs.

In the electronics industry, employers have identified the key skill requirements for the future as management and leadership skills, professional level skills and intermediate and technical skills. The automotive manufacturing industry has identified workforce skills development issues related to B-IT (Business-Improvement Techniques) and Lean techniques, team leader training, Level 3, 4 and 5 occupational skills, and top and senior organisational management. Skill requirements outlined by employers in the aerospace industry include: increasing the percentage of graduates from 30 to 50 per cent, increasing higher-level skills, and increasing licensed engineers in maintenance, repair and overhaul. The marine sector anticipates increased demand for skills owing to a series of major orders from the Ministry of Defence, as well as growth in the yacht building sector. Skills needs in the marine sector include: management skills, training in 'Lean' and 'Six Sigma' techniques, and specific skills at Level 3 and above.

B.7 **Energy & Utility Skills** (www.euskills.co.uk) is the SSC responsible for the electricity, gas, waste management and water industries. This SSC was licensed in December 2003 and began development of its SSA in January 2006. It relies on NESS and *Working Futures* results. It has also commissioned customised quantitative projections based on the *Working Futures* model and other sources.

According to the SSC's own research, it covers a workforce of 538,700 people while estimates based strictly on SIC definitions of the sector underestimate the coverage at 374,000 workers. The size of the workforce in the sector has fallen by one-quarter over the last 20 years mainly due to down-sizing following privatisation as well as deregulation. Secretarial, skill-technical and low-skilled jobs have shown the largest declines. Employment in waste management has risen over the same period, largely due to implementation of recycling programmes. This sector, unlike other UK sectors, has greater productivity than its US counterparts.

Based o NESS data, more than one-quarter of employers in the Energy & Utility Skills sector have identified skills gaps. Most gaps are technical and job-specific in nature but the lack of some softer skills such as team-working have also been identified. Based on the *Working Futures* results net new demand for employment in this sector is projected to decrease by 5 per cent between 2004 and 2014. Replacement demand, arising from retirements and individuals leaving the industry, however, greatly outweighs any net new employment in the sector.

B.8 **ConstructionSkills** (www.constructionskills.net) is a partnership between CITB ConstructionSkills, the Construction Industry Council, and CITB Northern Ireland and covers the whole of the construction and building industry (excluding electro-technical), from crafts to professional and technical staff across the whole of the UK. It traces its origins back to the old Construction ITB set up in the 1960s. It is one of the few bodies which still levies a tax from employers to pay for training in their sector. Approximately 2.2 million people work in this sector with about 40 per cent being self-employed (based on 2006 LFS data). The SSC estimates annual sector output of £81 billion (2000 prices) and 8 per cent of UK GDP.

The CITB has had its own quantitative model since the early 1990s (Briscoe and Wilson (1993). This approach has been continuously developed and improved, the current version of the model is serviced by Experian and Reading University[22]. Based on this model ConstructionSkills anticipates that the construction sector will enjoy a period of sustained growth over the medium term All fifteen forecasting organisations referred to by HM Treasury support a continued growth in the economy. The most likely scenario reported by ConstructionSkills is that of an increase in the size of the sector's workforce from 2,224,890 in 2007 to 2,431,240 at the end of 2011. This is under an assumption of 2.6 per cent output growth a year.

It is suggested that there will be increasing requirement in managerial and professional occupations due, almost entirely, to the shift in focus towards a process driven industry requiring increased levels of control. There seems to be no evidence that there is going to be a radical change in either the size or skill mix of the rest of the workforce over the next five years. Employers in the sector recognise that preparation is required to ensure that the required skills will be available to exploit innovations as they become available and to respond to changing client needs and sustainability driven legislation.

In England, it is estimated that the industry will need to recruit around 60,000 qualified new recruits each year (excluding electrical and plumbing trades) for the next five years in order to replace those who retire or leave the industry and to cover growth in the sector. Across the sector there is concern at the limited number of employer placements for apprentices and that Further Education is close to or at full capacity. Furthermore, employers are concerned that there are insufficient graduates with the appropriate knowledge, skills and understanding entering the construction industry. Opportunities to gain the necessary industry experience are at a premium and this is driving innovative and novel site-based training solutions such as the National Skills Academy for Construction and Programme Led Apprenticeships.

B.9 **SummitSkills** (www.summitskills.org.uk) is the SSC for the building services engineering sector. This council was licensed in December 2003. The building services sector represents the electro-technical, heating, ventilating, air conditioning, refrigeration and plumbing industries. SummitSkills estimates that there are 51,000 businesses in this sector and approximately 558,000 workers. The sector contributes approximately 3 per cent of UK GNP each year. The SSC completed its SSA in 2007.

[22] See: http://www.eeph.org.uk/uploads/documents/partnership/Karen%20Pimley%20-%20ConstructionSkills%20network%20and%202020%20vision.pdf

Current skills needs in the sector are centred on craft operatives, practical skills, IT and legislation training. Around 93 per cent of the sector believes Level 3 NVQ/SVQ to be the minimum level for a fully trained craft operative.

B.10 **Automotive Skills** (www.automotiveskills.org.uk) is the SSC responsible for the motor industry, including the sale, maintenance and repair of vehicles in the UK. The SSC estimates that around 580,000 people work in the sector in the UK. There are about 70,000 enterprises in the England footprint and total turnover is about £125 billion per year with a GVA of £22 billion. This sector is dominated by small enterprises involved in distribution and maintenance, with 7 out of 8 businesses in England employing fewer than ten people.

Automotive Skills published its Stage 1 report in July 2006. The SSC estimates that about a quarter of all employees in the sector work as technicians, which represent the largest part of the total one-third employed in skilled occupations. About two-fifths of total workers are sales and administration staff, of which some 10 per cent are owners or senior managers. Around 10 – 15 per cent in the sector are employed in professional and elementary occupations.

B.11 **Skillsmart Retail** (www.skillsmartretail.com) covers the retail sector. This SSC was licensed in September 2004. It commenced development of its SSA in May 2006 and undertook Stage 3 in 2007. Stage 1 and 2 reports are available from the SSC's website. Annual spending through this sector is about £250 billion. According to Skillsmart Retail, in the UK over three million people work in this sector (2004/05 data) and there are currently 279,000 retail enterprises. 233,100 of these businesses are in England. Around 85 per cent of retail enterprises in the UK employ fewer than 10 people.

Based on *Working Futures* the SSC predicts that an extra 250,000 new jobs will be created in the UK retail sector from 2004 to 2014. According to the SNA for Skillsmart Retail, on average, 7 per cent of retailers in the UK report having at least one hard to fill vacancy. One fifth of retailers report skill gaps. Around 13 per cent of managers and 17 per cent of sales and customer service staff hold no formal qualifications. Data from the NESS2005 suggest that 57 per cent of retail establishments funded or arranged training in the 12 months prior to interview, which is significantly lower than the average for England (65 per cent).

In its SNA, Skillsmart Retail identified key areas of concern requiring concerted effort by the retail sector in order to offer a world class level of products and services. These key areas of concern include:

- failure of the retail sector to train its older workers;
- poor comparison with other sectors on qualifications held and the amount of training undertaken;
- disparities in the level of qualifications held by managers in the sector and access to training;
- demographic pressures on the sector intensifying due to one in three of the workforce being under 24, while one in eight are over 55 years of age.

B.12 **People 1st** (www.people1st.co.uk) covers hospitality, leisure, travel and tourism. This SSC was licensed in April 2004. People 1st represents 14 industries which together generate turnover of more than £135 billion a year. The SSC estimates that in the UK the sector employs approximately 1.9 million people in over 180,000 establishments (2004/05 LFS data).

In the first stage of the SSA development process, based on their own surveys, People 1st found that staff turnover across the sector is 30 per cent. This imposes considerable costs on employers.

Some of the SSC's main findings from the Stage 1 research are:

- based on NESS over 60 per cent of management vacancies are considered hard-to-fill;
- more than 20 per cent of applicants for chef roles are lacking required skills and experience;
- customer service skills were the top of the list of skills required by employers.

B.12 **GoSkills** (www.goskills.org) is the SSC for passenger transport. This council was licensed in November 2004. The SSC estimates that in England, this sector employs 555,000 people with an additional 10,000 transport planners and 9,500 people involved in the mostly voluntary community transport. Bus and coach and hackney and private hire are the sub-sectors with the highest number of workers in the sector. The taxi industry, driver training industry and coach industry all have high proportions of sole traders. About 54 per cent of employees in this sector in the UK have NVQ Level 2 or above but many of these may not be relevant to the sector. This figure is greatest in the aviation industry (72 per cent) and lowest in taxi and private hire (38 per cent).

NESS shows both large and micro-businesses citing driving skills (practical skills) as those most needed in their current workforce. Customer service skills are also key to the development of the sector. NESS indicates that within the English passenger transport sector, the occupations with the most significant skills gaps tended to be engineering/maintenance occupations and drivers which represent the majority of jobs in the sector. This survey also showed that skill gaps in numeracy and literacy are higher in the passenger transport sector than for all sectors.

In terms of future skills requirements, driving skills are viewed as most significant, with 14 per cent of large companies and 8 per cent of micro-businesses reporting that they believe this will become increasingly important in the future. Customer skills and communication are also viewed as emerging needs for the future. Developments in technology, culture and legislation result in constantly changing skills needs in this sector. The introduction of EU legislation, the Driver CPC, for instance, will have a significant impact on the training requirements in the bus and coach industries. It is imperative to address these future skills needs before company performance is adversely affected.

B.13 **Skills for Logistics** (www.skillsforlogisitics.org) represents the freight logistics industry, covering moving, handling, and storing of goods. This sector contributes £55 billion to the UK economy. Skills for Logistics estimates that approximately 1.7 million people in about 65,000 companies are working in this sector (2003/04 LFS data). Skills for Logistics has recently taken responsibility for most of Wholesaling (SIC 51) but this is not reflected in these figures.

The SSC has identified a current major shortage of LGV Drivers. This has been exacerbated by the industry's failure to attract women and workers from various ethnic minority communities.

The SSA developed by Skills for Logistics has identified six key skills issues which are fundamental to the success of the industry.

- management skills gap;
- basic skills gap;
- industry image;
- unrepresentative labour force profile;
- limitations of current external training provision;
- lack of understanding of the business case for training.

B.14 **The Financial Services Skills Council** (FSSC) (www.fssc.org.uk) is the SSC covering the UK financial services industry. The FSSC was licensed in April 2004 and began its SSA process in February 2006. The SSC estimates that this sector accounts for 4 per cent of employment and 8 per cent of total output in the UK. There are more than 34,000 financial service firms in the UK employing over 1.2 million individuals. Self-employment accounts for 5.6 per cent of the sector's workforce. Approximately 98 per cent of firms are SMEs but a handful of large organisations, mostly retail banks, dominate employment.

About 20 per cent of the financial services workforce is set to retire over the next five years. The industry is expected to generate 10,500 new jobs a year, up to 2011, representing a rise of 1 per cent a year. Nearly half of these jobs will be in banking. Administrative roles will fall to 41 per cent of the workforce by 2014, but technical and managerial roles will increase their share of employment.

B.15 **Asset Skills** (www.assetskills.org) represents the UK property, housing, cleaning and facilities management industries. This SSC was licensed in September 2004. Asset Skills estimates that it covers about 628,000 people in the UK (based on Annual Population Survey (APS) 2004). Approximately 56 per cent of employment is in property services and housing, 38 per cent in industrial cleaning, and the rest in facilities management. This SSC has completed the first three stages of their SSA and will publish and launch the SSA in September 2007.

Asset Skills estimates that 20 per cent of the workforce it represents has no qualifications, while nearly one-third have achieved NVQ Level 1 or 2 qualifications. This compares to the average for all sectors in the UK of 12 per cent with no qualifications. The cleaning industry is the least qualified, with 84 per cent of individuals having Level 2 qualifications or below. The SSC has strongly suggested that upskilling initially focus on workers in the cleaning industry.

Based on NESS about 17 per cent of all businesses in this sector within England have unfilled vacancies. Skill shortage vacancies are reported by 4 per cent of employers in the Asset Skills sector, and hard-to-fill vacancies are reported by about 6 per cent. The SSC concludes that non-skill factors (such as conditions, pay, and image of the sector) are factors contributing to hard-to-fill vacancies.

Using two different economic forecasts, (*Working Futures* and its own customised projections) Asset Skills anticipate total employment to increase by between 40,000 and 250,000 from 2004 and 2014, depending on the precise projection method. There is a high degree of uncertainty as to the extent of overall employment growth of the combined industries in this sector.

B.16 **e-skills UK** (www.e-skills.com) is the SSC for IT and Telecoms and lead body for Contact Centres. Licensed in April 2003, e-skills UK estimates that 1.2 million people work in IT in the UK and a further 250,000 in Telecoms. The SSC has completed all stages of the SSA process and launched the SSA for IT in July 2005, with an update on milestones and achievements published in October 2006.

e-skills UK own research, based on analysis of secondary data, own surveys and detailed consultation with key stake holders indicates that employment in the UK's IT industry is growing at 5 to 8 times the national rate and around 150,000 entrants to the IT workforce are required each year. At the same time:

- uptake of A-levels in Computing is declining (from 10,913 in 2001 to 6,233 in 2006 – a drop of 43 per cent);
- uptake of IT-related degrees is declining (from 27,000 in 2001 to 14,700 in 2006 – a drop of 46 per cent);
- women are under-represented, making up 19 per cent of the workforce, 17 per cent of those accepted for IT-related degrees, and 8 per cent of Computer Science A-level students;
- only 28 per cent of the UK's IT graduates enter IT occupations;
- one in five employers report skills gaps for IT users, and skills gaps for IT professionals are at their highest level since 2004.

B.17 **Government Skills** (www.government-skills.gov.uk) is the SSC for central Government which became licensed in December 2005. It represents the work of all Government Departments and the Northern Ireland Civil Service, Executive Agencies, Non-Departmental Public Bodies and the Armed Forces. According to the SSC, Government Skills covers a workforce of approximately 800,000 people in the UK. In April 2007, 14 major Government departments signed the pledge to help every eligible employee gain basic skills and a Level 2 qualification. This commitment covers 19 departments and some 475,000 workers. Work on expanding the coverage of the pledge continues and has since resulted in two more major departments signing. Initial estimates based on the Spring 2006 LFS indicate that (excluding the Armed Forces) about 63,000 staff in the footprint were not qualified to Level 2 or above, but this will be revised in light of new research (see below).

Government Skills was the last of the twenty-five SSCs to begin developing its SSA, for which it started building an evidence base in June 2006. A recent refocusing exercise has meant that Government Skills now intends to use this and other evidence to produce a Skills Strategy for the central Government sector, which it intends to deliver in late 2007, in lieu of an SSA. This involves a mixture of methods and the use of external consultants. The research programme includes an online employee survey of qualifications and skills needs, a telephone survey of employers to identify skills needs and gaps (current and future), a scenario planning exercise and an assessment of training provision. The findings from this research were due to be published in late 2007.

B.18 **Skills for Justice** (www.skillsforjustice.com) is the SSC representing the justice sector, including community justice, court services, custodial care, forensic science, policing and enforcement, and prosecution services. This SSC became licensed in April 2004. It covers an estimated 447,000 to 560,000 workers, half of which are employed in the Policing and Law Enforcement strand. It is estimated that there are about 4,000 employing establishments in this sector as well as 10,400 other establishments operating in the community justice strand but for which Justice is not their primary or core business. In addition, a conservative estimate of the number of voluntary organisations in the justice sector is around 12,500. These estimates are based on 2004 UK data.

Those employed in the Skills for Justice sector are:

- located in two main occupational groups: associate professional and technical (53 per cent) and administrative and secretarial (21 per cent);
- more highly qualified than the UK average (31 per cent are qualified to Level 4 or more);
- most likely to be employees – the self-employed make up less than 1 per cent of employment in this sector.

Forecasts based on *Working Futures* estimate that employment levels in the justice sector will show a slight decrease of about 16,000 jobs by 2014. Although the overall level of employment may drop, there

will still be a need to recruit people into the sector. Over this period, approximately 125,000 workers will retire and require replacing, leading to a total net requirement of 109,000. There will be increases in the numbers of managers and senior officials which will partly offset an expected decrease in the number of employees in administrative and secretarial roles.

Over the past five years, there has been an increase in the proportion of people employed in the sector holding degree level qualifications and a decrease in those with lower level qualifications. This trend is expected to continue to 2014.

B.20 **Lifelong Learning UK** (www.lifelonglearning.co.uk) (LLUK) represents libraries, archives and information services (LAIS), work-based learning (WBL), higher education (HE), further education (FE)and community learning and development (CLD). This SSC was licensed in January 2005, since which time it has absorbed the work of three former training organisations, FENTO, PAULO and isNTO along with the NTO responsibilities of HESDA. LLUK estimates total employment in the UK in the sector to be in the region of 1 to 1.2 million (2005). More than 60 per cent of all sector employees in the UK have Level 4 and above qualifications. Total spending by institutions in this sector is estimated at about £25 billion per year.

LLUK began developing its SSA in January 2006 and has recently started Stage 3. The reports from Stages 1 and 2 are available on the SSC's website. LLUK will undertake an 'Impact Review' as a sixth stage in the SSA process, involving a review of all other sectors' SSAs, assessing their effects and the demands that they will place on skills needs in the lifelong learning sector, both currently and in the future. The full SSA for this SSC is expected to be completed in October 2007.

Based on NESS it is estimated that 29 per cent of establishments in the lifelong learning sector were facing vacancies at the time of the survey, 24 per cent of establishments reported hard-to-fill vacancies (as a percentage of all vacancies), and 15 per cent were facing a skill shortage vacancy (as a percentage of all vacancies).

B.21 **Skills for Health** (SFH) (www.skillsforhealth.org.uk) is responsible for the UK health sector. Approximately 2 million people are employed across the NHS, voluntary and independent sectors (2004 LFS data). There are also a large number of volunteers working in the health sector.

The UK health sector is characterised by a highly qualified workforce. About 24 per cent hold degree level qualifications or equivalent as highest qualifications. This reflects a high proportion of health professionals, but qualifications are concentrated at the top and bottom ends of the qualifications distribution.

This sector has experienced rapid employment growth relative to the whole economy. Between 1999 and 2004, employment in the SFH sector increased by 13 per cent compared to only 4 per cent in the UK as a whole. Increases in this sector vary across health authorities and are subject to political and financial dynamics each year.

Employment growth in the sector from 1999 to 2004 was accompanied by an increasing skills base. There was a 35 per cent increase in those employed with degrees as their highest qualification. This growth rate was 22 per cent for the whole economy.

The results of the SFH's SNA shows that the major area of skills gaps in England were reported in communications skills, customer handling and problem solving skills. According to the SNA report, over the next five to 10 years, employers and other stakeholders in the health sector expect that future skills requirements are going to be driven by growth in the demand for vocational qualifications. There is also likely to be increased demand for generic and basic skills as well as specialist skills.

SFH's research also points towards increasing demand for a more flexible workforce in health care. The health sector currently employs an older workforce (compared to other sectors), which combined with other factors is likely to increase replacement demand, increase skill shortages as well as gaps, and enhance the emphasis on flexibility in career and professional development pathways.

The health sector in the UK is dominated by the NHS which conducts its own programme of research to assess changing skill needs and to plan the workforce. This is very complex with different arrangements in the constituent countries of the UK. The methods involved are mixed but include various quantitative model based techniques. Bosworth *et al*. (2007) provide a review of much of this work.

B.22 **Skills for Care & Development** (www.skillsforcareanddevelopment.org.uk) is the SSC which represents social care, children, early years and young people's services in the UK. This SSC is made up of five existing organisations, including Skills for Care (formerly Topss England), dealing with adult

social care in England, and the Children's Workforce Development Council (CWDC), also working in England. This SSC was licensed in April 2005. Within this sector, there are an estimated 60,000 employers and 1.6 million workers across the UK.

According to Skills for Care (England), social care spending in England is estimated at more than £1.5 billion a year. This care is delivered by over 920,000 staff. A further 500,000 staff are employed in early years and childcare, children and family social care, as well as in advisory and education support roles, under CWDC's footprint.

B.23 **Skillset** (www.skillset.org) is the SSC covering the audio-visual industries, which comprise broadcast, film, video, interactive media and photo-imaging. This SSC was licensed in January 2004. Combining results from its own 2006 Skillset Employment Census and information from other Skillset research suggests an employment estimate of up to 500,000 people in the sector in the UK. Particular care has to be exercised when interpreting data based on SIC codes for the Skillset footprint. Photo-imaging is spread across a range of SIC codes, and it is not possible to isolate the retail element. Interactive media, the largest sector within Skillset, is not exclusively coded and is included within the core of e-skills UK, therefore it is excluded from data for this SSC in *Working Futures* and NESS.. Additionally, self-employed people without employees make up large proportions of employment in this sector, especially in film production and Skillset's own research has sought to address some of these challenges, but the difficulties in estimating the footprint highlight the problem of the lack of data for official sources that is "fit for purpose" for many SSCs to fulfil their lgal obligations to produce a robust SNA.

The workforce in this sector is highly qualified relative to the UK workforce as a whole. More than two-thirds of media professionals are graduates. Skillset conducted its own survey of almost 7,000 people working in the media which highlighted that, despite the existing high levels of qualification among the sector's workforce, there still exists the need for significant training in order to meet the skills demands of the industry. Two-thirds of respondents reported a training need - mainly to stay up to date with or improve current work and to develop new technical skills. Of those seeking training, a number of barriers were encountered.

Current skills shortages in a number of areas of the media sector have been identified by Skillset. Alongside these, there are a number of emerging needs, including:

- web-based and database programming skills (Interactive Media);
- knowledge of IT networking among some engineers (Radio);
- financial skills (Radio);
- various business skills (for example, commercial awareness of sales/marketing staff, strategic business planning, project management) (Television);
- electrical engineering (Television);
- competencies associated with the use of voice recognition from subtitling (Television);
- gallery production assistants (Television).

B.24 **Creative & Cultural Skills** (www.ccskills.org.uk) covers advertising, crafts, cultural heritage, design, music, performing, literary and visual arts. It was licensed in June 2005. This sector accounts for 3.7 per cent of the total UK GVA. The SSC estimates that work in this sector counts as the main job for over half a million individuals (APS 2004). The ratio of employees to the self-employed for this sector is 60 to 40, which is much greater than the UK-wide figure. The largest sub-sector is visual, performing and literary arts. The smallest sub-sector is advertising, which comprises 62,000 businesses. Creative & Cultural Skills began the development process for its SSA in March 2006.

The SSC's own research has indicated that the sector lacks management and leadership capacity and that 17 per cent of business suffer skills shortages. One of the strategic goals of Creative & Cultural Skills for 2005 to 2010 is to influence the demand for and supply of skills by ensuring that qualifications, apprenticeships and competency frameworks are relevant to employers' wants and needs.

B.25 **SkillsActive** (www.skillsactive.com) is the SSC for active leisure and learning. According to this SSC, the total size of the paid workforce in this sector in England is 479,900 workers. There are 30,000 business establishments in this sector in England. The majority of these establishments (73 per cent) have 1 to 10 employees.

SkillsActive launched its SSA in December 2006. The SSC forecasts 3.8 per cent average annual growth in output and 2.2 per cent annual growth in employment in their sector from 2004 to 2009. They also estimate an average of 70,000 jobs becoming available each year between 2004 and 2009.

In terms of future demand for skills in the SkillsActive sector, there is a significant recruitment challenge. The SSA estimates using *Working Futures* estimates that overall levels of employment in England for this sector in 2014 will be 581,000 and the sector will also have to recruit 70,000 workers each year to cope with replacement demand. Although forecasts do not predict significant changes to the profile of the sector's workforce, it is possible that some employers will seek to improve the level of management, communication and customer handling skills of their workforces in order to develop a competitive advantage.

The SSA outlines that the existing workforce needs upskilling. This includes the introduction of more fitness instructors qualified to Level 3, improvement of the take-up of specific qualifications, and improvement of the take-up of vocational qualifications by volunteers. In addition, a number of other skills including management and leadership, fundraising, marketing, project management, and finance skills are required to fulfil future employer demand. Generic skills including communication, teamwork, technical, customer handling and problem-solving skills are also considered important for improvement.