



International comparison of occupational profiles in the eEconomy

A methodological assessment and guidelines for profiling occupations

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Introduction

On the basis of the report on occupational profiles from various countries and the experiences with the profiling method applied to the occupations of web development and customer technical support (Bollen & Ramioul, 2004), it is possible to engage in an assessment of the profiling methodology for ICT-related occupations. The assessment provided in this report contains three parts.

Chapter 2: *International comparison between the profiles*. The different national partners used common guidelines and formats to collect and report information on two occupations in the eEconomy. On the basis of this information it is possible to compare the content of the various profiles. This comparison should reveal the most important differences between the national profiles. Although it is out of the scope of this project to explain differences between the national occupational profiles, such comparison will allow to assess to what extent differences may be related to 'real' differences in the content and the socio-economic context of the occupation or may rather be related to different applications of the profiling methodology itself. Problems of methodological bias will serve as the basis for the second part of this assessment report.

Chapter 3: *Inventory of methodological problems*. On the basis of the experiences of the different national partners in establishing occupational profiles as well as the international comparison between the content of the national profiles, it is possible to identify methodological problems in the application of the profiling method for occupations in the eEconomy. This includes problems related to the application of common guidelines and frameworks to collect and report information on the occupations and therefore problems of comparability between the national profiles; to the broad organisational diversity and therefore problems of demarcation of the occupations concerned; to the turbulence in the environment of the occupations and therefore problems of accuracy and stability of the profiles established. This inventory of the main methodological problems in the profiling of occupations in the eEconomy serves as the basis for the third part of this assessment report.

Chapter 4: *Proposals to solve methodological problems*. Based on the inventory of methodological problems, a number of recommendations will be made to adjust the occupational profiling methodology and improve its user-friendliness. The application of these recommendations should lead to a more standardised approach to the guidelines and frameworks to collect and report information on profiles for occupations in the eEconomy. As such this will enhance the (international) comparability of profiles as well as the ease of future updates.

This assessment will be used as the basis for a revised occupational profile for web development and customer technical support that will be established in the next deliverable (D7.3 - STILE workpackage 7).

International comparison of occupational profiles

Increasingly the unitary market is driven by policy initiatives at the supranational level. In addition there are increasing opportunities for international labour market mobility. To deal with the challenge of the Europeanisation of the labour market and support a European labour market policy, there is a need for international comparable data on occupations and their competence requirements. The development of different national profiles in this project (Bollen & Ramioul, 2004) offers the opportunity for an international comparison between the member states participating in the research.

In this paragraph, the international comparison focuses on the content of the ‘task lists’ that are at the core of the occupational profiles. In order to present a clear comparison between the five national occupational profiles that have been made for web development as well as technical customer support, a comparative grid has been established that compresses the information in one single table. Table 2.1 and 2.2 provide such a concise comparative grid of the national occupational profiles on web development and customer technical support respectively. The following explanations should be kept in mind in interpreting these comparative tables:

- The task lists in the national occupational profiles contain different levels of detail in the tear-down analysis of the tasks. First of all, there are the main subcategories listed in the first column of the comparative table. If the main subcategory is applied in a national profile, this is indicated by a *grey area* in the second level subcategories of the tasks. Inevitably, some divergent ways of describing this main subcategory may be used in the respective national profiles. But when the description is broadly comparable, it is indicated in the comparative table as a grey area. As an example: the main subcategory ‘plan work’ in the occupational profile for web development was not as such indicated separately in the Italian profile and therefore this section of the comparative table is not covered by a grey area.
- However, if such a main subcategory of the task list is not indicated separately in a national profile, this does not necessarily imply that no second-level tasks related to this main subcategory are indicated. It may well be that a similar second-level task is presented in the national profile but categorised under another main subcategory. This refers to problems of tearing-down the main task categories of the profile into more detailed second-level tasks in a coherent way. To enhance the comparability between the national profiles, such second-level tasks were shifted in the comparative table between the main subcategories. To indicate such a shift, the tasks concerned are indicated in *italic letters* in the comparative table. As an example: ‘plan schedule of tasks’ is indicated in the Italian report, but originally categorised under another main subcategory. Therefore the task concerned is indicated in ‘italic’.
- With regard to the comparison of the second-level tasks in tasks list, again different words may be used to describe tasks that are broadly similar. Such broadly comparable tasks are placed within the *same row* of the comparative table. This makes it possible to see at first glance to what extent comparable second-level tasks have been indicated between the

national reports. Or, conversely, which tasks are mentioned in only a few or one national report. In this last case, such a task stands alone in a given row.

- In addition the task categories in the different national task lists are regrouped in the comparative tables within four main categories referring to four differences in the nature of tasks that occur in any occupation (Malfait & Sels, 1996, p. 42-43). These four different categories in the nature of tasks are:
 - *executive tasks*: these tasks form the core of an occupation. Without executive tasks the occupation would not exist. Usually the title or the description of the occupation itself refers to such an executive tasks. As an example: executive tasks for a web developer are making a web site, making a final version of the web site and maintaining the web site;
 - *preparatory tasks*: these are tasks that must be done in preparation of the executive tasks. The most important preparatory tasks usually concern the planning of work sequence, the preparation of working material, the determination of working method, etc. 'Preparatory' must always be interpreted as a preparation of one's own executive tasks, not as a preparation of the task of someone else. As an example: preparatory tasks in web development are defining the demand of the customer or planning the work that must be done;
 - *supportive tasks*: these are tasks that allow to perform the executive tasks in a good and undisturbed way. The most important supportive tasks usually concern maintenance, administration, quality control, etc. Again, 'supportive' must be understood as related to one's own executive task, not as support to the task of someone else. E.g. maintaining a machine is a supportive task for a machine operator as his main task is to operate the machine. But it is an executive task for a mechanic as his main task is to maintain machines. In the case of web development, supportive tasks are quality control and keeping up competences;
 - finally there are *organisational tasks*: these are tasks that refer to the organisation of work in as much as this supersedes one's own workplace. Organisational tasks are performed when the executive tasks require contacts with other people in the organisation, be it through functional contacts, consultation, participation in work groups etc. In the case of web development, the co-ordination of one's own work with the work of others in the organisation is such an organisational task.

The regrouping of the tasks in the task lists of the respective national occupational profiles according to these four task categories supports a more coherent grouping and presentation of the tasks and thereby improves the (international) comparability of the task lists. In addition, it supports a more analytical perspective in the tear-down of the tasks in the occupation concerned. Finally, the introduction of these four categories in the nature of tasks allows to assess the learning opportunities that are present in a given occupation. Indeed, the level in which an occupation - or more specifically a given job - contains tasks from these four different natures, is a major source for learning opportunities in the occupation - or job - concerned (WEBA, 1990).

As an example, suppose a web developer would not be involved in the design of the web site (preparatory task), maintenance of the web site (supportive task) or consultation with others to establish the web site (organisational task), but would merely be restricted to making the web site on the basis of a blue-print provided by others, this would undoubtedly limit his opportunities to think about alternatives, experiment with different approaches, get ideas from others, ... and thereby severely limit his opportunity to learn from and during his work.

In the context of profiling of occupations in the eEconomy, this perspective of learning opportunities in work is an important consideration. All national reports of the research partners repeatedly stress the importance of learning on the job for both occupations. In addition, such learning on the job is a major way to deal with gaps between required and available competencies to perform a job. As it is one of the main aims of making occupational profiles to improve the match between demand and supply on the labour market, the regrouping of the task lists in these four different categories in the nature of tasks, not merely improves the coherency of an international comparison, but also increases the relevance of the occupational profile itself.

Table 2.1 Comparison of five national task lists on web development

	Belgium	Hungary	Italy	Netherlands	USA
Preparatory tasks					
Analyse need / purpose	Define customer needs	Analyse needs	Analyse customer requirements		Define client needs
	Inform customer				Make recommendations
			Plan graphic interface		
				Discuss with superior	
				Place web site in value chain of organisation	
					Schedule client meeting
					Collect background information
					Check end-customer usage
Plan work	Make time planning		<i>Plan schedule of tasks</i>		Plan time schedule
	Make technical planning				Plan technical aspects
	Make financial planning			<i>Make assessment of costs</i>	Draft budget
	<i>Make inventory of order</i>				
		Make contract			
Executive tasks					
Develop draft	Prepare content	Edit content		Gather information	Draft content and sources
	Develop site structure	Take care of structure	Design database structure	Design structure	Develop site structure
	Develop navigation paths				Develop navigation paths
	Develop functionalities			<i>Preselect functionalities</i>	Work out functionalities
		Take care of graphic design			
Produce web site	Design graphics		Develop graphic interface		Complete graphic design
	Produce web pages		Insert contents		Produce web pages
	Integrate databases				Integrate databases
	Attach functionalities				Work out functionalities
		Modify test version			
			Insert information in databases		
			Develop search engine		
			Check connection speed		
Implement web site	Put web site on-line	Upload web site		Transfer web site documents	Put web site on-line
					Obtain clients approval

Table 2.1 Comparison of five national task lists on web development. Continued

	Belgium	Hungary	Italy	Netherlands	USA
Maintain web site	Make inventory of updates				
	Update/change web site	Assuring automatic/ re- requested update	Update site with new offers	Adjust site, content, design, functionalities	Update web site, change content
				Troubleshoot	
	<i>Train customer</i>			<i>Deliver input to users</i>	<i>Train client</i>
		Setting up maintenance agreement			
			Maintain site and server		
					Make functional changes
Keep up customer relations			Reply and sort customer mails		
			Sort offers to customer profiles		
			Search information to reply customers		
			Interact with tour operators and agencies		
<i>Supportive tasks</i>					
Quality control	Submit to assessment	Present first version			
	Test iteratively	Test new web pages		Test web site for links, func- tionalities, content, design	<i>Test work iteratively</i>
Learn continuously	Undertake learning initiatives	Follow technical innovations		Create and use time for self- development	Take pro-active learning ini- tiatives
	Search for solutions			Search for information	Search for solutions
		Specialise			
		<i>Perform administration</i>		<i>Stick to budget</i>	
	<i>Promote web site</i>				<i>Promote web site</i>
<i>Organisational tasks</i>					
Co-ordinate with others		<i>Co-ordinate in teamwork</i>	Discuss communication strat- egy	Ask for continuous input	

Table 2.2 Comparison of five national task lists on customer technical support

	Belgium	Hungary	Italy	Netherlands	USA
Preparatory tasks					
Receive customer question	Answer customer	Receive customer call	Answer calls	Answer telephone	Accept cases via telephone
	Make first inventory			Analyse problem	Qualify the problem
	Filter administrative problems				
	Conclude preliminary				
				Read e-mail	Accept cases via web site
				Judge problem source	
				Judge problem complexity	
Executive tasks					
Troubleshoot problem	Make advanced inventory	Analyse problem			Diagnose problem
	Filter complex problems				
	Follow up troubleshooting	Organise problem solving	<i>Ensure customer receives technical assistance</i>		
	Conclude intervention	Manage problem solving process (final stage)		<i>Check client satisfaction</i>	
		Solve problem		Solve problem	Solve problem
					Accept cases from computer log
Code writing			Analyse specifications		
			Devise and conduct code tests		
Code testing			Carry out repeated tests		
Update the system			Install soft- & hardware		
			Update systems		
Keep up customer relations			Reply and sort customer mails		

Table 2.2 Comparison of five national task lists on customer technical support. Continued

	Belgium	Hungary	Italy	Netherlands	USA
Supportive tasks					
Document solutions	Keep up administration	Perform administration on intervention	<i>Write documents on advancement of projects</i>	Administer incident	Record resolution of problem
Contribute to adjustments	Communicate systematically on problems	Collect, analyse and share problems/solutions		<i>Discuss problems with colleagues</i>	
	Experiment with technologies & services				
	Translate experiences into adjustments	Participate in development knowledge base		Provide input for procedures/solutions	<i>Continually add to database</i>
				Write documentation	
				Detect often occurring problems	
				Test new products / services	
Learn continuously	Search information to improve service	Learn continuously	Search for useful documentation	Search for information	
	Search information to improve technical knowledge				
	Internalise and operationalise information				
			<i>Study and exchange experiences with colleagues</i>		
				Read internal information	
				Study offered information	
				Follow courses	Attend training
					Provide training
Organisational tasks					
Organisation of activities			Manage own work		
				Attend help desk meetings	Review common problems

The comparison between the different national profiles could be extended to include the further tear-down analysis of the tasks into third-level tasks. However, it would then be impossible to integrate all tasks into one single comparative table and would therefore be an obstacle to catch similarities and differences between the national profiles in one view. Furthermore, not all partners have pursued a tear-down analysis until these third level tasks and therefore such a detailed comparison would inevitably remain incomplete. For these reasons, the comparison of the task lists is restricted here to the second-level tasks (Table 2.1 and 2.2).

In order to compare the different task lists, the Belgian task list will be used as a reference point. The following specific differences can be identified between the different national task lists and the Belgian task list with regard to web development:

- *Hungarian task list*: emphasis on lack of familiarity of Hungarian customers with the Internet and the possibilities, obstacles and consequences of a web site. Therefore more emphasis in the task list is put on the task of the web developer to inform the customer and guide the customer in formulating a precise demand;
- *Italian task list*: emphasis on relationship with end-user by receiving and dealing with end-user information (e.g. replying to mails or dispatching them) as well as analysing end-user information and approaching them (e.g. setting up end-user profiles and sending personalised offers);
- *Dutch task list*: emphasis on organisational task to co-operate with others, e.g. in motivating content suppliers and technical experts to provide the necessary support and organising this support;
- *American task list*: emphasis on collecting information on customer and acquiring insight in the organisation of the customer. Also emphasis on tasks to inform and educate the customer in formulating a precise demand that allows the web site to serve its business purposes.

The following specific differences can be identified between the different national task lists and the Belgian task list with regard to customer technical support:

- *Hungarian task list*: input of technical customer support not merely in using the questions and problems of customers to adjust or improve existing procedures in order to solve these problems (knowledge management system), but also in using this knowledge about the questions and problems reported by clients to deliver an input in changing the services offered by the organisation or in creating new services (involvement in product development);
- *Italian task list*: no distinction is made between software development itself and the provision of support. By consequence a lot of tasks with regard to software writing, installing hardware and software and updating these are included in the task list;
- *Dutch task list*: emphasis on tasks to solve incoming problems by customer technical support itself, rather than filtering out these problems and dispatching non-routine problems to the appropriate specialist. In other words, less division between first and second level customer support;
- *American task list*: employees involved in technical customer support not merely have to learn in their work and from others, but are also involved in giving courses to others.

The causes for these differences may well refer to differences 'in substance', in other words to differences in the tasks of the occupation concerned in the respective countries. But it is also possible that these differences are due to methodological bias, in other words differences in the application of the profiling method by the different partners.

It is out of scope of this project to explain the differences between the national task lists in view of the complexity and dynamic character of the socio-economic context in the various countries. In general, however, the following causes may contribute to differences in the content of the occupation between countries:

- the presence and content of programmes in the *formal education* system of the country focused on the occupation concerned;
- the presence and content of specific *training programmes* set up by vocational training organisations in the country for the occupation concerned;

- the presence of *specific initiatives within organisations* in the country to embed the occupation concerned strategically within the organisation, such as formal training initiatives in the organisation based on profiles and possible career paths, recognition of experiences developed within work, ...;
- the presence of a system of *recognition of acquired experiences* on the job in the country;
- the presence of representative unions or other *interest organisations* in the country concerned with the needs and interest of the occupations;
- the level of development of the *product market* in the country. As an example for web development in the tourist sector, the development of a tourist market and the extent to which tourist organisations occupy this tourist market;
- the level of *technological development* in the country. As an example for web development, the extent to which there is penetration of complex web sites that allow for interaction and transaction;
- the *labour market situation* in the country. The extent to which there is a quantitative or qualitative mismatch between supply and demand on the labour market. As an example for web development, the lack of software programmers may force web developers to include software programming within their task list, while otherwise it may be divided between occupations;
- *legal framework*. Differences with regard to legislation, e.g. on Spam, the monitoring of clients, computer transactions, eBusiness, etc.

However, methodological problems in the establishment of the task lists are another possible cause for differences between the national task lists. The difficulties experienced by the research partners in the application of the profiling methodology are reported in the following paragraph.

Inventory of methodological problems in occupational profiling

On the basis of the experiences of the different national partners in establishing occupational profiles as well as the international comparison between the content of the national profiles (Chapter 2), it is possible to identify methodological problems in the application of the profiling method for occupations in the eEconomy. The following six main problems can be drawn from the results:

- 1) A lot of new activities within the 'New Economy' are not yet fully institutionalised. The process of consolidation is confronted with *rapid changes* on the market and the technologies used. As a result there are no clear demarcations between 'clusters of activities' and organisations are still trying to find the best way to give the activities a specific shape. This turbulence contributes to a fast outdatedness of the profile made. In its turn this may lead to less willingness from potential users of the profile to co-operate in the establishment of the profile (e.g. through a validation conference). In addition the turbulence challenges the demarcation and description of an occupation on which there is general agreement. With regard to the information gathering stage, it is not obvious which respondents are most appropriate. With regard to the reporting stage, it is difficult to develop a specific list of tasks and related competence requirements. This makes (international) comparisons more problematic.
- 2) Related to the above-mentioned problem, is the broad *organisational diversity* that can be found with regard to the specific shape of the occupation concerned. Different kinds of work organisation are implemented in organisations where the occupation is present. Examples of integration of tasks within the occupation as well as extensive specialisation in the occupation can be found simultaneously. This makes it difficult to find a balance between generality and organisational specificity. Again this contributes to a lack of agreement with regard to the demarcation of the occupation, making (international) comparisons more problematic.
- 3) There are marked differences in the way second- and third-level tasks are *categorised under the main subcategories* in the different national task lists. With regard to second-level tasks, this can be seen in the comparative tables 2.1 and 2.2, where tasks in 'italic' refer to similar second-level tasks that are placed under different main subcategories by the partners. The task list is therefore not coherently broken down into subcategories. In addition the task lists sometimes lack elements mentioned in the accompanying text. This lack of a coherent and exhaustive tear-down analysis of the tasks makes (international) comparisons more difficult.
- 4) The national reports on the occupational profiles contain an *extensive amount of explanatory text* dealing with a multitude of aspects as work organisation, human resource management, adjoining occupations, etc. that are sometimes not coherently grouped into the respective paragraphs. Varying kinds of information tend to be placed under the same paragraph heading. In general there is too little attention on the task list itself and too much on subsequent explanations. The large amount of accompanying 'literature', instead of concise tables, makes the profiles less user-friendly and increases the difficulties for (in-

ternational) comparisons as well as their future update. Finally, in view of the fast changing nature and context of occupations in the eEconomy, the expected future trends for the occupation should be given special attention.

- 5) The relationship in the profile between the *tasks on the one hand and the required competencies on the other hand* is not clear as both are not directly linked to each other. Moreover there are differences in the way 'knowledge', 'abilities' and 'attitudes' are interpreted and reported, making (international) comparisons more difficult.
- 6) The national reports contain a paragraph on competence requirements put forward in recruitment and selection. There is an additional paragraph on the competence requirements derived from the task list itself. However, there is no separate paragraph that specifically *confronts both competence requirements*, looks for gaps between both and offers possible solutions to bridge such possible gaps. The inclusion of such a separate paragraph would increase the relevance of the profiles as it would then directly contribute to one of the main aim of occupational profiles by improving the match between demand and supply on the labour market.

In the next chapter, proposals will be made to remedy each of these six problems in the establishment of a profile for occupations in the eEconomy.

Solutions to methodological problems in occupational profiling

Based on the inventory of methodological problems (Chapter 3), a number of recommendations need to be made in order to adjust the occupational profiling methodology applied in the national reports. These recommendations must lead to greater relevance of the profiles; to increases user-friendliness of the methodology for the profiler as well as the end-user of the profile; to a more standardised approach in the profiling of occupations resulting in improved (international) comparison and a greater ease to update the profile. While such aims are worthwhile for any occupational profile, these aims are especially relevant for occupations in the eEconomy as the problems of demarcation and fast outdateness are more important.

The following six recommendations that deal respectively with the six methodological problems mentioned in Chapter 3, should help to achieve these aims.

- 1) *Demarcation of the profiled occupation within an occupational cluster.* The profile should start with a presentation of related occupations and the location of the profiled occupation within this cluster of activities in order to make the relationship with such 'adjacent' occupations clear. Currently a wide variety of occupations is mentioned in the national reports that co-operate and interact with the profiled occupation. As an example the web developer is said to interact with a project manager, co-ordinator, sales (wo)man, product developer, marketeer, graphical designer, animator, HTML-editor, script writer, software specialist, system-analyst, text-writer, database-builder, information architect, user interface technologist, web master, ... Although some of these titles may cover similar occupations, locating the profiled occupation within a network of relationships makes clearer to the user what cluster of activities is covered by the profiled occupation and which activities are considered as belonging to other neighbouring occupations.
This could be taken a step further by locating the profiled occupation within the whole range of ICT-related occupations. This allows to link the occupational profiles to existing classifications of ICT competencies. Connecting to such more generally accepted standards and tools for IT skill measurement and development enhances the relevance of the occupational profiles as the research is thereby aligned to already existing attempts to achieve (internationally) comparable measurement of ICT-competencies (e.g. Career-Space, the Skills Framework for the Information Age, eSkills UK, APO/IT-Berüfe and frameworks emerging from recent CEDEFOP work). The occupational profiles in this project can be seen as a zoom on a particular occupation within the overall skills framework offering a much more extensive and detailed task and competence requirements list.
- 2) *Reporting of organisational diversity.* Related to the demarcation of the profiled occupation is the problem of differences in the division of labour within organisations that affect the shape of the occupation and thereby also its task and competence requirements list. In order to enhance the comparability between the national profiles, the information on this issue within the national reports should be condensed and structured within the task list itself. Although it is the aim of a profile to establish a common denominator for the occupation, it is not an obligation to restrict oneself to that common denominator. On the basis of

the interviews and the validation process during the information gathering stage, the conclusion may emerge that a number of additional tasks are integrated in the occupation in an important number of organisations. In that case, it is certainly worthwhile to report this organisational diversity in the task list.

As an example, the national reports on web development suggest three main organisational variants for the occupation. Web developers can work in small organisations that specialise in web development ('web organisations'). Web developers can also be found in organisations that have their core activity in another domain. These organisations use the Internet intensively and employ web developers themselves. Tourist organisations are an example of companies that use a web site as the most important communications channel with their clients and provide possibilities for transactions through the Internet ('tourist organisations'). Finally there are self-employed web developers who work on their own or co-operate with other freelancers ('self-employed'). These different organisational settings result in a somewhat different profile. These differences can be reported in a structured way by putting a cross in the respective organisational settings where the task concerned is integrated, as shown in Table 4.1. This example shows that the graphics design is usually integrated in the tasks of the web developer working as a self-employed and working in 'tourist organisations', but not for those working in 'web organisations'.

Table 4.1 Reporting organisational diversity within the task list

Executive tasks		Web organisations	Tourist organisations	Self-employed
Produce web site	Design graphics		X	X

- 3) *Distinguishing between different kinds of tasks.* As indicated in Chapter 2, it is useful to categorise tasks according to four main blocks related to the nature of tasks (executive, preparatory, supportive and organisational tasks). This distinction supports an analytical approach in the tear-down of the main subcategories into lower level elementary tasks and grouping them together coherently. It also supports the exhaustivity of the task list as the profiler is forced to consider tasks within these different categories, thereby reducing the risk of omission of important tasks. In addition, the distinction leads to a better focus on certain areas of disagreement, e.g. during the validation stages of the profile. Often a consensus will more easily be reached with regard to the executive tasks of the occupation, that form the core of the occupation, while discussions are likely to center more on the additional tasks that support or prepare these core tasks.
- 4) *Integrating future prospects into the task list.* The national reports provide extensive information on possible future developments for the profiled occupations. However, as with the information on required competencies, this information could be provided in a more structured way by means of an integration within the task list itself. Through such integration, the task list acquires more perspective. Not all tasks are equally important. Some are more important than others. By indicating some tasks - and related competence requirements - in bold (table 4.2), the tasks that will become really important in the future catch the eye. In this way attention is drawn to such tasks, e.g. from vocational training organisations, ensuring that such competencies will be included in training programmes that prepare students for future jobs. As an example, in the case of web development, web sites will increasingly be used to support B2B and B2C. Such web sites require continuous updating and therefore co-operation with other occupations in marketing, product development, sales, ... are likely to be more important in the future.

Table 4.2 Integrating future prospects in the task list of web development

Produce web site	Design graphics
	Produce web pages
	Integrate databases
	Attach functionalities
Implement web site	Put web site on-line
Maintain web site	Make inventory of updates
	Update / change web site

- 5) *Linking competence requirements to the tasks.* Based on the information of the national reports, a comparative table can be established with regard to the different task lists. However, a similar attempt with regard to the competence requirements is not feasible due to the wide variety in which these are reported. This is unfortunate, as potential end-users of such occupational profiles will primarily be interested in the competence requirements list (e.g. in order to establish training programs or selection criteria) rather than the task list itself.

Therefore the abilities and knowledge domains should be directly linked to the tasks themselves by which they must be described. In this way, the required competencies will be reported in a more structured and detailed manner. As an example some abilities and knowledge domains are linked to a task for the web developer in Table 4.3.

Attitudes, on the other hand, refer to more general characteristics that are not directly linked to specific tasks. Therefore they must not directly be linked to these tasks. With regard to attitudes, an existing standardised list of attitudes can be applied with extensive information on how each of the attitudes should be understood. Using such a standardised list in which the most important attitudes for the occupation profiled are indicated, enhances the (international) comparability between the profiles.

Table 4.3 Integrating abilities and knowledge domains into the task list

Preparatory tasks	
TASKS	ABILITY & KNOWLEDGE DOMAINS
Inform customer	Knowledge of possible functionalities in a web site
	Knowledge of technical possibilities and limitations of web applications
	Knowledge of customer organisation and possible added value of web site
	Knowledge of kinds of customers and their behaviour
	Knowledge of costs related to customer choices
	Ability to make technical possibilities and limitations clear to a customer with limited technical background
	Ability to make customer aware of added value of a web site

- 6) *Analysing the match between demand and supply of competencies.* As one of the aims of occupational profiles is to improve the match between demand and supply on the labour market, the relevance of the profiles could be enhanced by adding a separate paragraph analysing the gap between demand and supply. More specifically, distinction should be made between:

- the set of competencies required to perform a job. This refers to ‘what a person does’ and the competencies that are effectively used in the job;
- the set of competencies required by the employer. This refers to ‘what a person is required to be able to do’ and the competencies demanded by an employer in recruitment and selection;

- the set of competencies possessed by an person. This refers to ‘what a person can do’ and the set of competencies the worker has.

Between these three sets of competencies mismatches can occur (Figure 4.1).

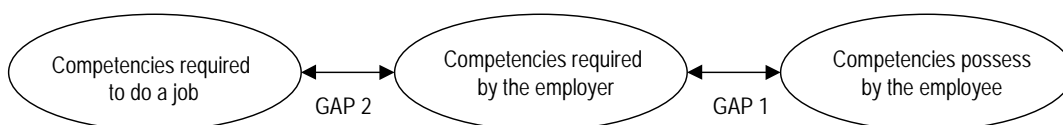


Figure 4.1 Mismatches between demand and supply on the internal and external labour market

Policy initiatives are usually concentrated on ‘gap 1’ by working on the quantity and quality of competencies on the supply side of the external labour market. In view of the recent emergence, fast changing nature and organisational specificity of the tasks of many occupations in the eEconomy however, the required competencies demanded by employers are often not readily available on the external labour market. This means that organisations themselves have a great responsibility to match demand and supply of competencies within their own organisation.

Although all national reports emphasise the importance of learning on the job, a separate analysis of the specific measures taken by organisations to enhance such learning on the job will heighten the relevance of the occupational profile. In general two – related - kinds of measures can be mentioned by which organisations can enhance learning on the job.

On the one hand HRM measures can be taken to enhance learning on the job, e.g. by creating a strong internal labour market in which employees enter at lower levels in the organisation and are encouraged to expand their qualifications through appropriate training policies; by offering contractual stability; by offering appropriate pay systems and promotion opportunities recognising acquired competencies, etc.

On the other hand also measures with regard to the design of the jobs themselves can be taken to enhance learning opportunities. Indeed, jobs can be designed in such a way that learning opportunities are enhanced. Design criteria to create learning opportunities are (De Sitter, 2000, p. 358-362):

- jobs containing a broad range of tasks. Broader jobs offer more possibilities to adapt tasks to changing circumstances and problems in the execution of the job and thereby to learn from such adaptations;
- jobs containing a coherent whole of tasks. Jobs with fragmented and unrelated tasks are hard to learn as an employee can only rely on the limited capabilities of his short-term memory. People can only master a limited number of unrelated tasks in a additive way. However, jobs designed in such a way that they form a logical coherent whole within the labour process, allow the employee to make use of the capacity of his long-term memory. The possibility to put tasks in a meaningful way within a coherent whole, enables the employee to master broad and complex tasks and to acquire relevant occupational competencies. Indeed, it is only under this condition that the above-mentioned criterion of broad jobs makes sense;
- jobs requiring co-operation with others. Through mutual co-ordination with others, the employee is able to put his tasks in a broader context and is able to acquire a deeper knowledge about his work. In addition, through mutual co-ordination the employee is able to call upon others to solve problems in his own work and thereby learn from others. This prevents work from being isolated and alienating and enhances the social, communicative and organisational qualifications of the employee. However, this requires that work in the organisation is divided in such a way that jobs are related to one another and require mutual co-ordination;
- jobs containing tasks of different natures. As explained in Chapter 2, learning opportunities in the job are greatly enhanced if a combination of executive, preparatory, supportive and organisational tasks are included;
- jobs containing sufficient autonomy. Fully standardised jobs offer no opportunity to change work method, sequence or rhythm in order to adapt work to changing circum-

stances. Jobs with sufficient autonomy, however, allow the employee to adapt work to changing circumstances, engage in alternatives and learn from these.

These design criteria make clear that organisations themselves can design jobs in such a way that learning opportunities are enhanced. Thereby organisations can contribute to solve the gap between required and available competencies. In view of the importance of learning on the job emphasised in the national reports for both occupational profiles, it is important to pay attention in the profile of occupations, especially in the eEconomy, to measures in human resource policy and work organisation taken by organisations that support learning.

The application of these six recommendations with regard to the methodology of occupational profiling, will lead to a better user-friendliness of the profile, a better (international) comparability and a greater ease to update.

- *User friendliness*
 - The compression of as much information as possible within the task list of the occupational profile, enhances the ability of the user to achieve an overview of the profile.
 - Linking the competence requirements directly to the task list will increase the interest of users as they will primarily be interested in a structured competence required list, rather than a task list as such.
- *International comparability*
 - A well structured and user-friendly profile facilitates (international) comparisons. Extensive written texts in the profile burdens comparisons. Condensed tables, on the other hand, that include the information on tasks, competence requirements, future prospects and organisational diversity are more easy to compare.
 - The inclusion of organisational diversity in the task lists brings differences between countries better to the front (e.g. more specialisation in mature markets).
 - The inclusion of competence requirements in the task list allows for better international comparisons of abilities and knowledge of the occupational profile. These are more relevant than comparisons of task lists as such, as they allow to connect the occupational profile to educational profiles. Indeed with regard to educational profiles, important work on international harmonisation has already been undertaken.
- *Ease of update*

As occupations in the eEconomy are part of a highly turbulent environment, it is difficult for an occupational profile to remain up-to-date. Especially as developing an occupational profile is time-consuming. Improving the ease of update is therefore essential.

 - The recommendation to embed the profile in an occupational cluster allows to better monitor shifting tasks between occupations, thereby easing the need to establish new profiles from scratch.
 - Better structured and condensed profiles also contribute to the ease of update, while extensive written texts are hard to update.
 - The distinction between executive, preparatory, supportive and organisational tasks allow to focus updates on specific parts of the occupational profile.
 - The attention to organisational diversity and its impact on the occupational profile also contributes to its ease of update. The distinction between basic core tasks and specific extensions according to work organisation makes future updates easier as differences in work organisation are often aligned to different levels of technological development, maturity and institutionalisation of the occupation and therefore with different stages on a time scale.
 - The inclusion of future prospects in the task list and its derived abilities and knowledge domains, draws attention to those tasks that are expected to be more important in the future. This makes it more easy to target necessary changes in the profile for future updates.

In the next deliverable (D7.3 - STILE workpackage 7), these recommendations will be used as the basis for a revised occupational profile for web development and customer technical support. These revised profiles will offer a standard for the establishment of occupational profiles for the many other occupations in the eEconomy.

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