

Regional Labour Market Forecasting

AMS-Skills Barometer – Austria’s Target Group oriented Labour Market information System

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The “AMS-Skills Barometer” was developed to provide a broad group of users with valid, comprehensible and well structured information on current and short term qualification needs as an internet information platform. Information that was already available is exploited and merged in a synoptical way. Information on regional labour market trends is not the main focus of the AMS-Skills Barometer. But since studies used contain regional forecasts and the compilation of information on occupational fields also uses regional labour market data, a regional focus of information on basis of the nine Austrian regions (“Bundesländer”) can be found in the AMS-Skills Barometer. Although there is an attempt to attract more notice to skills and competencies, it is still occupational and vocational information which guides the structure and composition of the information system. Regional information sometimes merges into the AMS-Skills Barometer through the regional distribution of different occupations, and therefore regional labour market trend information is sometimes also part of the edited occupational information (like in specific occupational fields such as service tourism, automotive industries, or the creative industries).

1. Background Information

1.1 History of the AMS-Skills Barometer

The interaction between economic trends (globalisation, service orientation), technological trends (diffusion of information and communication technologies) and labour organisational trends (growing need for flexibility, restructuring of labour processes) brings about rapid changes in the occupational environment and especially in the field of qualifications¹ needed for economic success. The growing need for information in this respect – especially on labour market trends at national and regional level – lead to considerations

¹ In analogy to the German “Qualifikation” we use the English term “qualification” in the sense of “vocational competence” or “skills and competencies” within the whole context of the AMS-Skills Barometer, thus including knowledge and physical abilities as well as social skills, language competencies or even certain personal features related to vocational specifications. In this article we use “competence” and “skill” alternatively, but meaning the same.

about the necessity of a new information system for continuous monitoring of changes in qualification demand at micro-level.

In the late 1990s the Austrian Labour Market Service (Arbeitsmarktservice, “AMS”) started to reshape their labour market information system, which was originally designed especially for young people needing to gain information about job descriptions (job profiles, educational background for each job), and job opportunities. At that time job guidance and counselling was hindered by highly differing information sources, on the one hand, and a restricted focus on only very specific occupations on the other. At the same time the concept of occupations as a stable bundle of requirements (education, tasks to be carried out, experiences, attitudes, skills and competences) was already breaking up, and job seekers were forced to be more flexible than ever before. It was felt that focussing more on competencies, rather than on segregated vocations, would be a far better approach in vocational guidance and counselling.

For these reasons the “AMS” – as the main provider of job information at that time – decided to develop an online information tool for job and career guidance and counselling, including meta-information from different sources about the whole job-market: The “AMS-Skills Barometer” (“AMS-Qualifikations-Barometer” in the German language original), which was designed and developed by 3s Unternehmensberatung (3s) and the Institute für Bildungsforschung der Wirtschaft (ibw), two main players in the field of labour market and qualification forecasting.²

1.2 Objectives and Target Groups

Main objective of the AMS-Skills Barometer is to provide a broad group of users with valid, comprehensible and well structured information on current and short term qualification needs. Right from the beginning it was evident that information that was already available should be exploited and merged in a synoptical way. Additionally, methods like expert interviews and processing of statistical data should be allowed. The AMS-Skills Barometer therefore is first and foremost an instrument for representation and only secondary one for data analysis.

Not only young people looking for information on current occupational job profiles and qualification needs are meant to benefit from this information tool. Further target groups of the AMS-Skills Barometer can be described as follows:

- Decision makers and public services staff at different political levels
- Education and career development guides and labour market counsellors in different institutions and organisations
- Journalists

² www.ams.at/qualifikationen

- Decision makers and their staff in educational and research institutions
- Decision makers in enterprises
- Employees, job-seekers and people interested in further education and qualification
- Staff members of the “AMS” at all levels and in all organisational units.

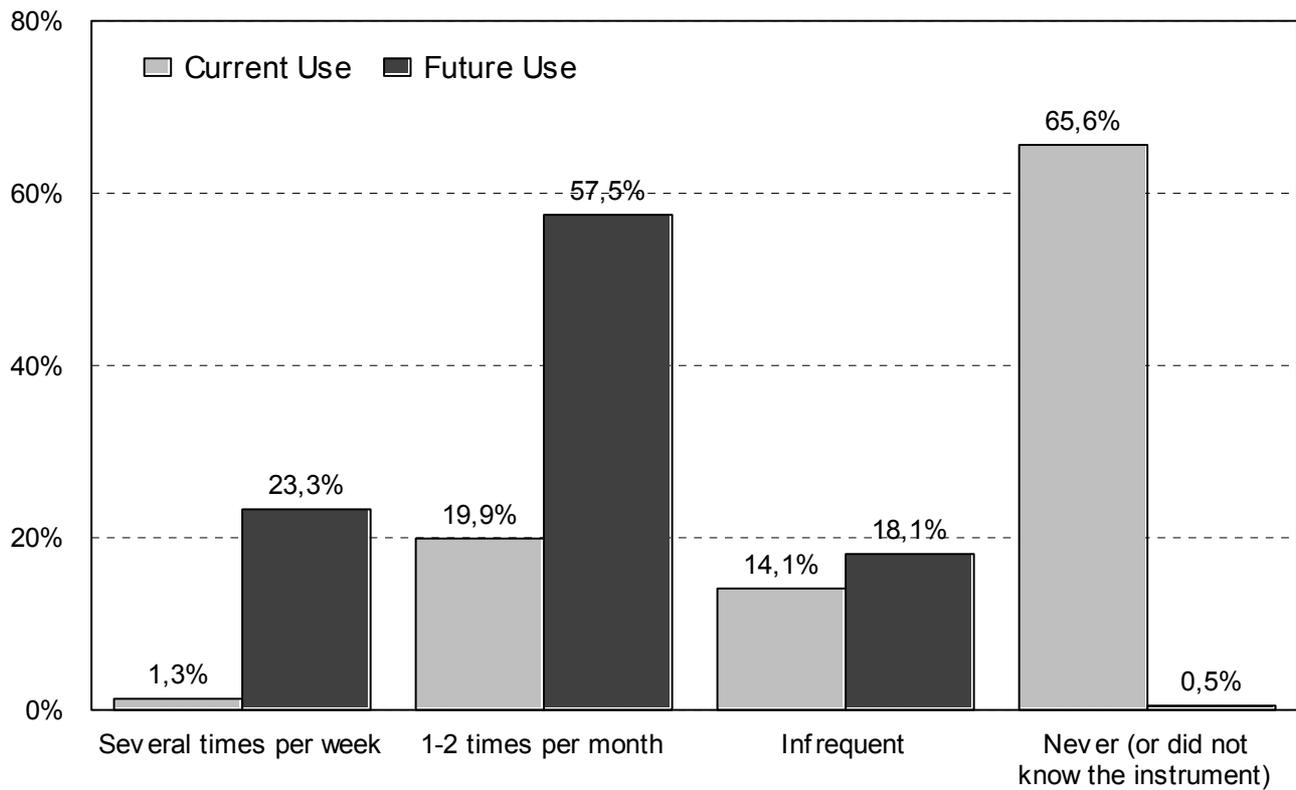
1.3 Usability Problems – Heterogenous User Groups

The AMS-Skills Barometer was realized as a web-based information tool accessible to a broad range of users. Most of these are not expected to have any previous experience with socioeconomic research or taxonomies. The attempt to provide this group with technical information that is at the same time comprehensive, concise and easy to understand, turned out to be a real challenge at all levels of representation: wording, phrasing and text length; user guidance; technical usability of the website (the range of search and select functions etc.). On the other hand, the AMS-Skills Barometer also wants to adress experts. Compromises needed to be made to meet the needs of such a broad range of users.

In an evaluation undertaken in 2004 about 200 decision-makers in the field of labour market, education and qualifications (such as representatives from social partner organisations, ministries, vocational counsellors and researchers) were asked to use the AMS-Skills Barometer and report about their experience in telephone interviews. More than half of these people had never used the instrument before. Those having done so, used it once or twice per month at the most.

When asked if they would use the AMS-Skills Barometer in the future, their answers were encouraging: more than half planned to use the instrument once or twice per month, and almost none could imagine not using it at all in the future. When asked ‘will you further recommend the AMS-Skills Barometer (e.g. to colleagues, clients, etc.)’, 98% declared that they would recommend the instrument to others.

Figure 1: Evaluation of the AMS-Skills Barometer 2004: Expected future use



Source: 3s

As a reaction to the results of the evaluation, the site was relaunched. Graphic design, menu navigation and search functions were re-engineered to provide even better usability in the future.

2 Methodology and Basic Structure

2.1 Methodological Background

The methodological approach applied in the process of establishing and updating the AMS-Skills Barometer principally was and still is one of editing already existing information. This is done by a process of searching sources, collecting and evaluating information critically, joining these together and finally editing them along the given structures of the AMS-Skills Barometer. The result, both textual and graphic, can be looked upon as a synopsis of compiled information.

Editing is done by a team of experienced authors. They follow a common framework of “working rules” that guarantee that all texts within the AMS-Skills Barometer are homogenous with regard to content and style. Additional quantitative data is extracted from different sources like articles on labour market needs and qualification trends, analysis of job advertisements and job openings recorded at the AMS. The editing process is based on the critical use of all these different sources. To summarize, the main sources of information are:

- Quantitative data (labour market statistics from data providers like Statistik Austria, Hauptverband der Sozialversicherungsträger, etc.)
- Research, analyses and forecasts on skill demand for the Austrian labour market (at regional and national level)
- Specific analyses on job advertisements, commissioned by the “AMS”
- Relevant texts from a broad range of sources ranging from general publications (even articles from mass media) to specific branch journals
- Relevant PhD- and Master-Theses
- Explorative interviews with labour market experts in specific occupational fields (HR management members in leading enterprises, directors of educational institutions, representatives of professional bodies, etc.)

Closeness to relevant practical occupational environments is provided especially by the interviewed experts, who can call attention to trends, which otherwise would only be detected in relevant statistical analyses much later.

The editing work is based on constant desktop and literature research and source analysis throughout the year. A general update of the online tool AMS-Skills Barometer takes place every March and October.

As mentioned before, the AMS-Skills Barometer was designed as a representation tool for labour market trends, based on a critical evaluation of already existing information. This implies that the sources used have not been compiled to be exploited by the AMS-Skills Barometer, and therefore cannot be expected to apply comparable structures, like classifications of skills and occupations. Furthermore, the quality of representation can only be as good as the information sources used – therefore a critical evaluation of these sources is one of the most prominent tasks of the editing process. With respect to the sources it is based upon, the compilation of the AMS-Skills Barometer faces the following conditions and problems:

Level of differentiation: One of AMS-Skill Barometer's main goals is to provide highly detailed information on trends down to the detailed level of individual occupations, e.g. "tour guide". Unfortunately, most trend forecasts refer to a much more general level, such as to "trends in tourism" (which sometimes might even include economic information, instead of being restricted to labour market trends alone). In the majority of cases also research analysing and/or forecasting skill needs does so only in a very global way, such as assessing a growing need for "key qualifications", "soft skills", or "technical qualification". In the AMS-Skills Barometer, however, specific knowledge, abilities and competencies are named and evaluated at a highly differentiated level, like "basic IT skills" or "knowledge of accounting software".

Restriction of research scales: Many skill forecasts restrict their result statements to specific random chosen occupations, economic branches or regions, whereas the AMS-Skills Barometer always applies a comprehensive approach, with respect both to regions and occupational sectors. Primarily the focus is on the national level; then specific statements for regional differentiations are made (if available). Surveys restricting themselves to a certain region or industrial sector therefore can only be of limited significance for the AMS-Skills Barometer.

Differing reference frames: As mentioned above, almost no research is commissioned specifically for integration into the AMS-Skills Barometer. Diverging classifications and occupational structures have to be "integrated" by an editing process. Because of this trend statements from very detailed analyses – if available at all - often cannot be used in the AMS-Skills Barometer directly. Editing in this sense includes e.g. identifying occupations from a certain occupational sector which can be easily transferred to the classification used in the AMS-Skills Barometer, reducing statistical labour market data by those occupations, which cannot be transferred to the same sector, but can maybe be subsumed under a different sector, and so on. In some case the differences between the classifications applied are so large, that the prognosis can either not be used at all, or only serve as background information, at a very general level.

Different time periods: All trend forecasts of the AMS-Skills Barometer have a time horizon of four years. It is self-evident that all information on skill trends that is found in the sources must be adjusted to this time scale. The quality of the forecasts is improved by exploiting several analyses for the same occupational field, and supplementing them by additional

sources like expert interviews and articles both from branch specific journals and mass media.

2.2 Methodological Developments

Skill forecasts designed and accomplished specifically for the AMS-Skills Barometer would significantly alleviate the editing process. But unfortunately up to now this is only done in two cases: Every year an analysis of job advertisements is carried out that has the objective to extract information on jobs, occupational fields and skills from Austrian print media. Only this study - together with statistical data on job vacancies reported to the "AMS" - is 100% compatible to the classifications used in the AMS-Skills Barometer.

But even this kind of survey shows specific limitations:

The demand for jobs (and skills) in job advertisements does not reflect the "real" demand of the labour market, because:

- Many job vacancies are filled without publishing a job advertisement, e.g. via direct job application (which is of growing importance in tight labour markets), via personal contacts between future employee and employer, and via direct recruiting after graduating from certain vocational schooling ("hidden labour market", e.g. in nursing occupations).
- In occupational fields with a high fluctuation of employees the quantity of job advertisements is higher than in others. Taking this into account, the analysis shows a "higher demand" in such occupational fields, but the chances for long term job occupations are low. The demand appears to be higher than it actually is, if you compare the number of vacancies and the number of actual job openings. This is the case e.g. in the tourism sector, where the same job might be advertised twice a year (for the summer and the winter season).

Furthermore, an analysis of job advertisements can only give a quantitative picture of the past. The editing work, in contrast, is focused on recent and future developments. This is why the presentation of quantitative data and textual information in the same occupational field sometimes seems contradictory.

Whether the need for further surveys specifically designed to serve the AMS-Skills Barometer can be met, remains to be seen. However, some other steps have been taken to broaden the information basis of this web tool:

Gender specific information

has been implemented for each occupational area. It is summarized on one web page per occupational area and accessible through a button ("Mehr Informationen" – "more information"). It contains basic information on gender segregation (employment figures

according to gender), differences in educational level, income and others for the respective branch or sector.

The “gender“ pages are clearly marked by the use of a different colour (orange), as the information, due to the lack of sources using comparable classifications, could not be implemented into the pages of the relevant occupational areas. Thus, a clear separation from the main information was preferred.

Enterprise survey as a new source: A broad survey on occupational developments in enterprises with more than 20 employees is carried out every two years by the “AMS”. The original focus was on contacting Human Resource Managers to gain information about labour force demand, and thereby also enhancing the contact between the regional offices of the “AMS” and their customers. Recently the focus changed: Now, more attention is given to collecting information on occupational and skill trends. The survey’s questionnaire has been adapted accordingly, e.g. it now includes more detailed questions, such as:

‘Name three occupations that your company highly demanded in the last two years’;
‘Please specify the demand trend for these occupations within the next 12 months’; or:
‘Which skills and competencies will be needed specifically for these occupations?’

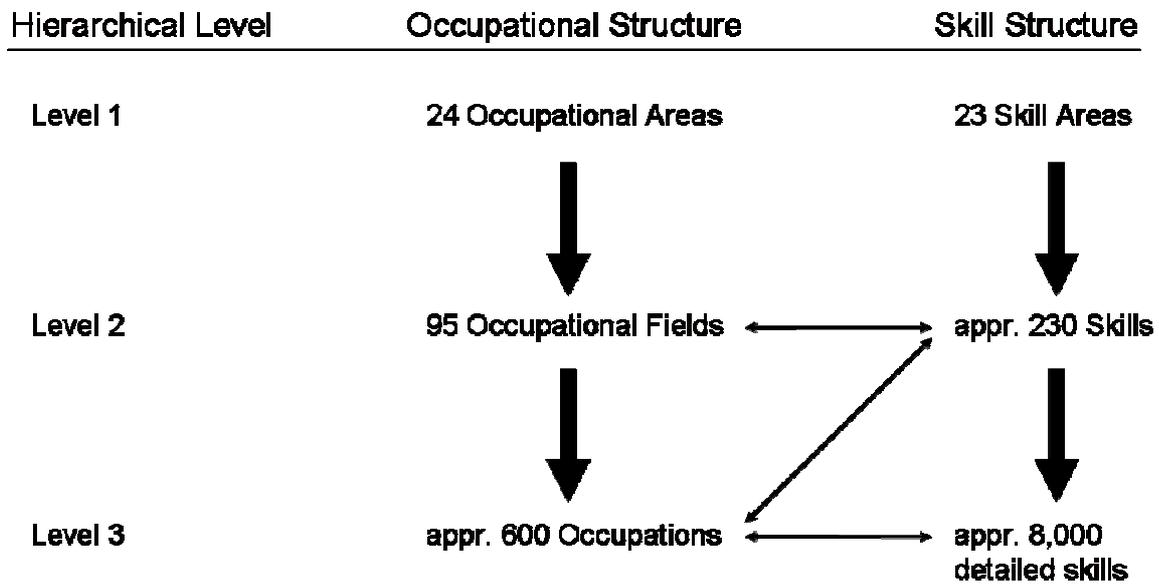
As a result, specific trend information on “occupations most demanded”, “skills most demanded”, and “most dynamic occupations” (increase or decrease of occupational demand) can be displayed via “charts” for occupations and skills. The results can also be edited according to the nine Austrian “Bundesländer” (regions), which will give us a quantitative database for regional occupation and skill trends.

In the survey, more than 7,000 enterprises provided detailed information. The response is representative for the Austrian enterprise structure with more than 20 employees.

2.3 Basic Structure of the AMS-Skills Barometer – Occupational Information

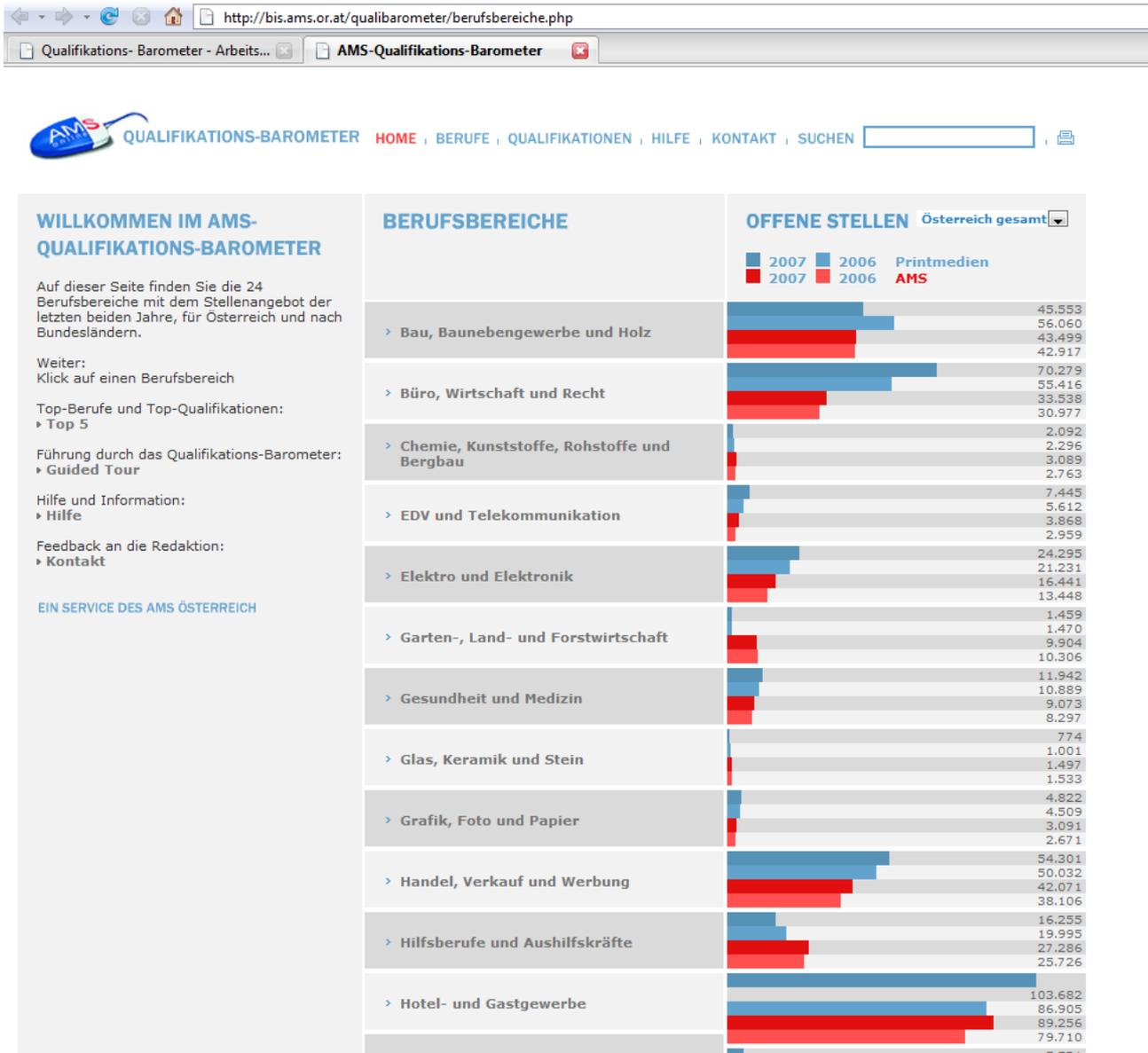
All information given by the AMS-Skills Barometer follows a hierarchical structure, outlined along a concept of the labour market, which distinguishes what we call (bigger) “occupational areas” (“Berufsbereiche”) and (smaller) “occupational fields” (“Berufsfelder”): Thus, the whole labour market is divided into 24 main occupational areas (which can be overseen on the first page view of the AMS-Skills Barometer, compare figure 3), further broken down into smaller occupational fields (total: 95 occupational fields, compare figure 4). Each occupational field contains several job titles. These are linked to another online information system of the “AMS”, the Vocational Information System (“AMS-Berufsinformationssystem, see <http://www.ams.at/bis/>, containing appr. 600 occupational profiles).

Figure 2: Basic information structure on occupations and skills in the AMS-Skills Barometer



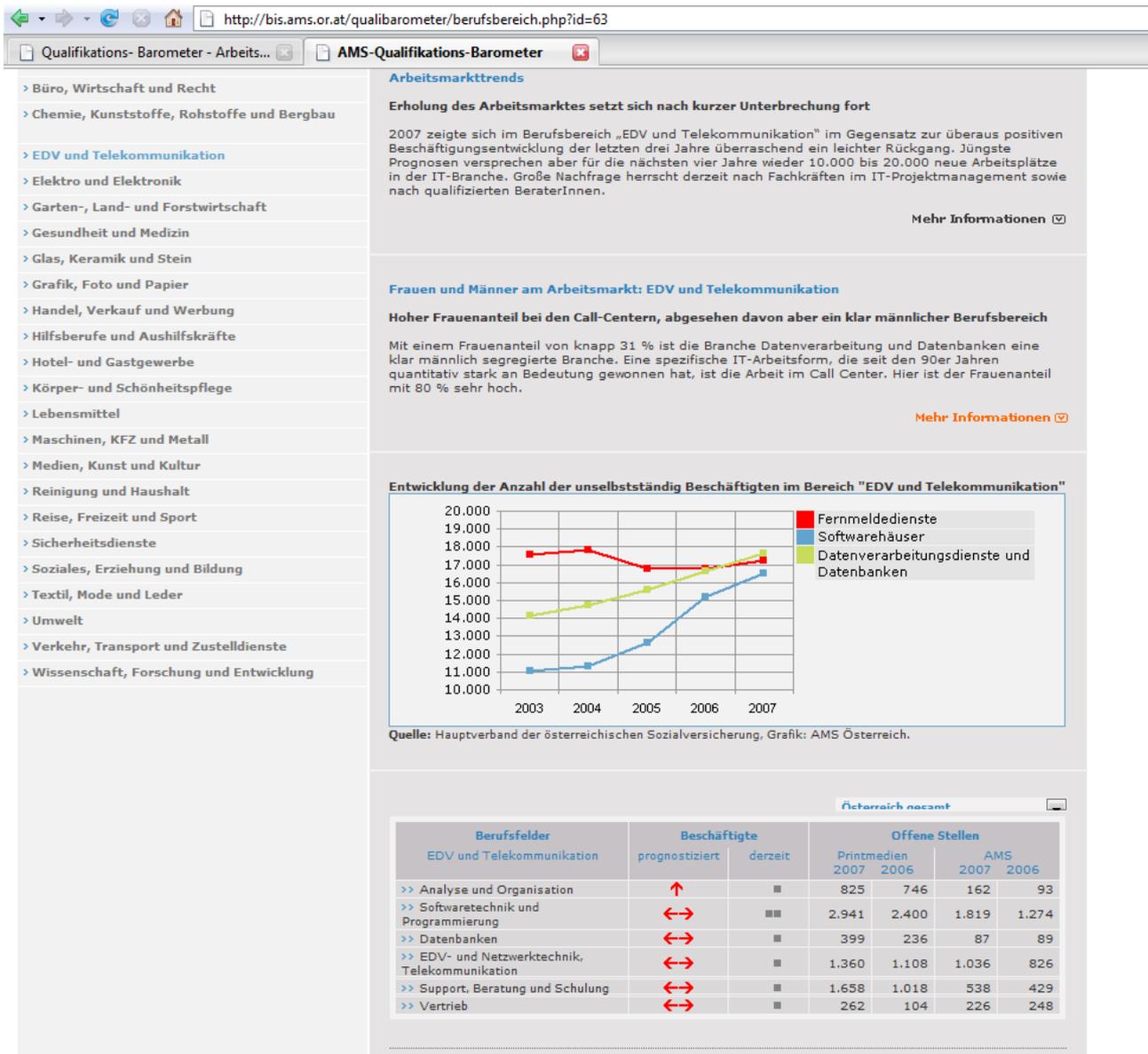
Source: 3s

Figure 3: First page view of the AMS-Skills Barometer:



Source: www.ams.at/qualifikationen

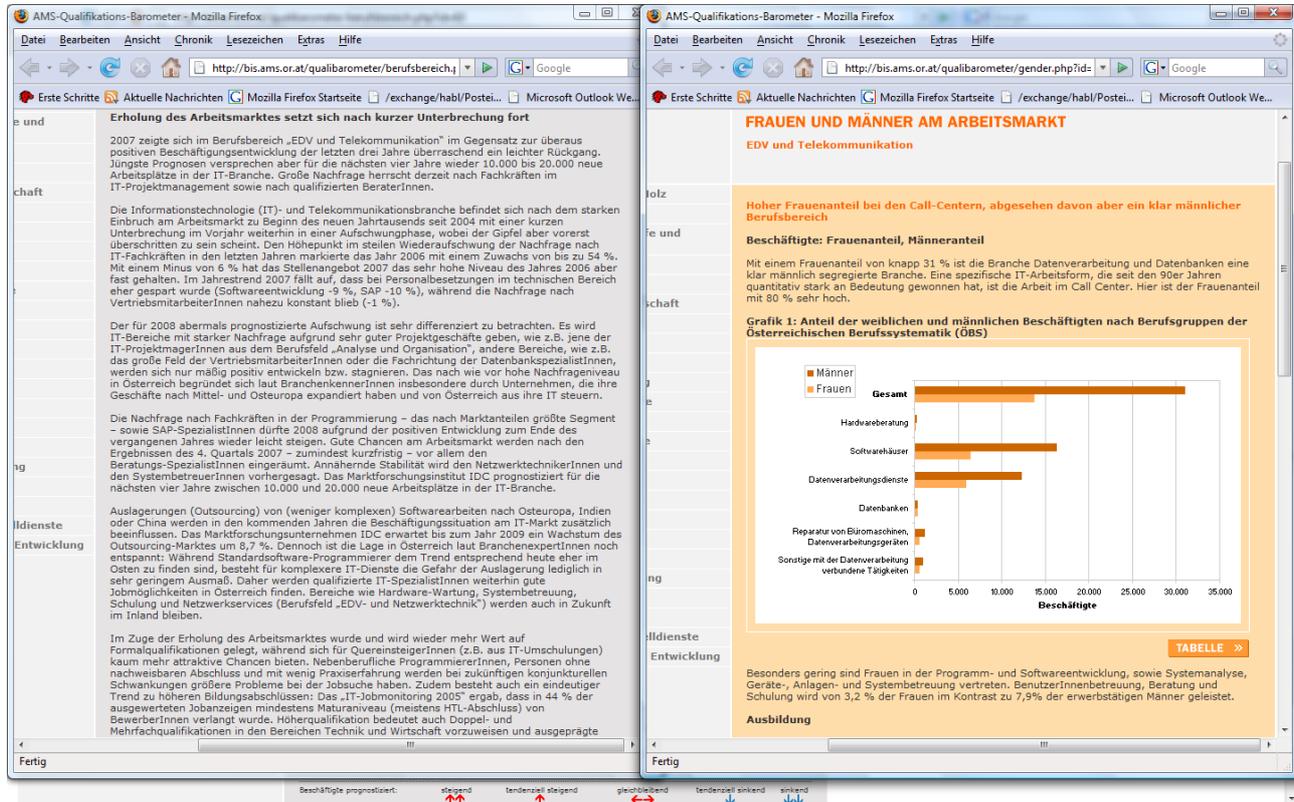
Figure 4: Occupational area “IT and Telecommunication” in the AMS-Skills Barometer



Source: www.ams.at/qualifikationen

The link “Mehr Informationen” (blue) at the end of the first text section expands the short introduction to a more comprehensive text (see left half of the following figure). Another link “Mehr Informationen” (orange) at the end of the second text section provides more information on gender specifics for the respective occupational area (see right half of the following figure).

Figure 5: Particular text information on labour market trends (left) and gender related labour market situation (right) in the occupational area of “IT and Telecommunication”



Source: www.ams.at/qualifikationen

Trend information captured in tables for vocations and vocational fields is visualised by arrows and dots. The assessment is based on the evaluation of the editors and rely on the trend information provided by quantitative and qualitative analyses as well as on expert interviews.

2.4 Basic Structure of the Skills Barometer – Qualification Information

Following recent trends in vocational research the AMS-Skills Barometer also undertakes the attempt to pay more detailed attention to skills and competencies than usual in more traditional labour market information systems. Thus, a second ontology, a comprehensive classification of skills and competencies (summarized as “Qualifikationen/qualifications”; compare figure 2) has been designed and implemented:

Tables for every occupational field display relevant qualifications taken from this ontology and rate their present (“Bedeutung am Arbeitsplatz”/importance at the workplace) and future significance (“Prognose”/prognosis) This trend rating is also represented by means of graphic symbols (compare figure 6).

Figure 6: Qualification information in the occupational field of “Software Technology and Programming”

The screenshot displays the AMS-Qualifikations-Barometer interface. At the top, there are navigation tabs for 'ausführlich: BEOLINGUS: Wörterbu...' and 'AMS-Qualifikations-Barometer'. The main content area is divided into several sections:

- Diese Berufe finden Sie (auch) ...**: A list of professions including InformatikerIn (Lehrberuf), MedieninformatikerIn, SystemanalytikerIn, SystembetreuerIn, and User-Interface DesignerIn.
- ... in diesen Berufsfeldern**: A list of occupational fields including EDV- und Netzwerktechnik, Telekommunikation, Rundfunk, Film und Fernsehen, Analyse und Organisation, and Printmedien und Neue Medien.
- Qualifikationstrends**: A section titled 'Zusatzqualifikationen und Soft Skills werden wichtiger' with a paragraph explaining that professions focusing on pure programming are under pressure, and additional knowledge and soft skills are becoming more important.
- Fachliche Qualifikationen**: A table showing the prognosis and importance of various technical skills.
- Überfachliche Qualifikationen**: A table showing the prognosis and importance of various cross-functional skills.
- Prognose**: A legend for the prognosis symbols: 'steigend' (upward arrow), 'tendenziell steigend' (upward arrow), 'gleichbleibend' (double-headed arrow), 'tendenziell sinkend' (downward arrow), and 'sinkend' (downward arrow).
- Bedeutung am Arbeitsmarkt**: A legend for the importance symbols: 'hoch' (four squares), 'mittel' (three squares), and 'niedrig' (two squares).

At the bottom left, it says '© AMS Österreich März 2008'. At the bottom right, there are links for 'Quellen zum Berufsbereich' and 'Quellen zum Berufsfeld'.

Source: www.ams.at/qualifikationen

“Qualifications” are, as mentioned before, seen in a comprehensive way and represent knowledge, skills and abilities. The AMS-Skills Barometer does not only inform about domain specific skills for every occupational field, but also about personal skills, the need for particular professional experiences, or additional skills in demand (like specific IT-skills as a chance for quicker job integration).

3 Regional Forecasts in the AMS-Skills Barometer

3.1 The AMS-Skills Barometer and Regional Forecasting

Information on regional labour market trends is not the main focus of the AMS-Skills Barometer. But since also studies containing regional forecasts are evaluated when compiling the information on occupational fields, regional disparities in skill trends are being referred to in the texts, if needed. Furthermore, the quantitative data displayed in the AMS-Skills Barometer – data on job vacancies – is represented with a regional focus: job vacancies for the last year (and the year before) can be looked upon either at national level, or at the level of one of the nine Austrian federal states (“Bundesländer”, like Upper Austria, Burgenland, Vienna, the Tyrol ...).

A few words have to be said about Austria’s regional structure: Austria is a country with little more than 8 million inhabitants, divided into 9 different federal states. The Austrian Labour Market service is responsible for the whole country, no specific difference being made in the service within the different regions.

On the other hand, regional differences do exist and constantly influence the development of the labour market. Usually these regional labour market differences do not strictly follow the borders of the nine federal states, but align themselves to other regional demarcations, such as rural / urban environments, tourism regions, industrial service areas, etc. Basic statistical data is usually represented according to the 9 federal states, and therefore provides only insufficient trend information at the level of the many different regions.

At the same time, one could argue that Austria’s labour market information is relating to a small regional basis anyway, due to the small scaled division of the country. After all, some German regions have more inhabitants than Austria as a whole.

3.2 Examples for regional forecasts within the AMS-Skills Barometer

As we said before, providing information at a regional level is only seen as one of the tasks of the AMS-Skills Barometer. Despite the attempt to attract more notice to skills and competencies, it is still occupations and vocational information which guides the structure and composition of the information system. Regional information has always been – and still is – one of the aspects that have constantly been kept in mind, right from the beginning.

Apart from data on job vacancies, which can be displayed at the level of Austria’s nine federal states, information on regional specifics is provided in the texts on occupational fields, sometimes even in occupational areas, throughout the AMS-Skills Barometer. Due to the limits of the evaluated sources (see above, 2.1), this cannot be done as

systematically as with the data on job vacancies. A few examples might deliver a deeper insight.

Service tourism: In Eastern border regions of Austria a specific phenomenon has occurred for several years that is usually referred to as “personal service tourism”. Quite a few Austrians living close to the border prefer to travel to the Czech Republic, to Hungary, or Slovakia, to get dental services, to have their hair done, and such. This applies to (parts of) the federal states Upper and Lower Austria, Styria and Burgenland. The effects on the labour market are described in the texts of the respective vocational fields with phrases like: “growing cross-border competition”, “declining prices for services”, and “decreasing chances for job seekers in Austria”.

Regional differences in tourism: According to geographic conditions, different characteristics of tourism are concentrated in different regions. Thus, winter sport tourism plays an important role in Western Austria (within the federal states of Tyrol, Vorarlberg, Salzburg), in the South (within the federal state of Carinthia), and is less important (but partially still important) as a job market in federal states like Upper Austria or Styria. On the other hand, tourism has become more important in parts of Eastern Austria over the last years, following the “wellness boom” and the development of spas and hot springs. Information like this can be found in texts on the occupational area of tourism.

Similar descriptions are presented for topics like *automotive industries*, which are concentrated in specific industrial areas in the federal states of Upper Austria and Styria. Creative industries, media development, printing industry and professions in art and culture will find better conditions in the central region of Vienna (a federal state itself) and its surroundings (the surrounding regions of the federal state of Lower Austria), where the related sectors are concentrated.

With respect to the need for *medical doctors* and *teachers*, there are differences in demand between rural areas and bigger cities, or in other words cities with universities and cities without: In rural areas, *medical doctors* and *teachers* might still find good employment opportunities, whereas in bigger cities chances have decreased.

There exists yet another type of forecast with a regional reference, but with a different angle: In certain fields and occupational sectors, a shift from regional structures towards international, European, or global markets can be observed. This is especially the case e.g. for the printing and paper industry, where companies more and more face an international competition.

In a different way internationalization plays an increasing role on national labour markets: E.g. Austrian banks and insurance companies were expanding to the CEE-countries for several years. This also had an impact on skill demand and job chances: for instance more and more future employees are expected to accept placements for a certain period of time; on the other hand, people from neighbouring countries improved their chances on the Austrian labour market, as they bring along native speaker competencies for languages in demand, thus intensifying competition between national and international job seekers.

All of this kind of information is integrated following the main basic structure of the AMS-Skills Barometer, which does not have its main focus on regional information, but offers it, whenever regional differences are reshaping the development of occupational fields.

The AMS-Skills Barometer could, of course, also follow Austria's federal structure to provide information on labour market needs focussing strongly on regional differences, and delivering information on trends and development in sectors which shape the respective region. But this is not done so far.

Leaving the AMS-Skills Barometer as an online tool behind, we would like to point out a printed information tool, which we consider as the most important example for regional information in this context.

The *regional "Qualification Structure Reports"*³ ("*AMS-Qualifikationsstrukturberichte*") are a set of reports, which consist of textual trend descriptions at national level, and in addition, of detailed data on job vacancies for each federal state (Bundesland). So each regional report has the same texts for all of the occupational areas and fields, but differs in the figures and tables provided. The quantitative data shown in these figures and tables are based on the analysis of job advertisements in print media and the job vacancies announced at the "AMS", and are displayed for the respective federal states, such as vacancies for the Tyrol.

The regional "Qualification Structure Reports" are intensely used by the regional offices of the "AMS" for further analysis of regional labour markets, supporting them in such decisions as financing vocational training in selected occupational fields.

4 Further Developments concerning the AMS-Skills Barometer

Structured feedback from users (within evaluation projects, but also from an expected online user's survey which will take place in 2008), discussions with relevant user groups, and the discussion with information providers (like experts of labour market analysis, statistical institutions, etc.) influence the ongoing work on the AMS-Skills Barometer insofar as they serve as an impulse for further development leading to new challenges for the AMS-Skills Barometer.

For instance, the overall design as a "basic information instrument", serving all different user groups at once, is in question. Maybe more detailed information for experts, and basic information for a first insight, should be separated, in one way or the other. Also, the presentation of "(seemingly) contradictory results" from labour market forecasts for expert use is discussed, needing complementing references to different sources, different structures and different methods in use for forecasting and further comparison.

³ Arbeitsmarktservice Österreich, ABI / Abteilung Arbeitsmarktforschung und Berufsinformation: Qualifikationsstrukturbericht des AMS Österreich für das Jahr 2007. Wien, Juni 2008.

Supplementary information of this kind might not be made accessible for a broad public, in order to avoid misunderstandings and misleading information.

These and more ideas and considerations are still in discussion; which of them will ultimately be implemented, depends not only on the expected effects, but also on the available resources.

Following the overall trend that the “concept of occupations” decreases in importance, while the “concept of job related tasks” becomes more prominent, AMS-Skills Barometer’s focus on information will shift: Sooner or later the structure and description of workplace related skills will replace constructions that use occupations.

The AMS-Skills Barometer allows for this trend by reserving more and more space to the information system’s own skills ontology. Through a nationwide survey done by the “AMS” (see 2.2), quantitative data on skill demand will be integrated into the AMS-Skills Barometer. This kind of quantification of skills demand (not comparable to “qualifications” as levels of education) is a new concept for broad labour market information services in Austria. On the basis of the respective survey, quantified skill demand will be visualised at regional level for the first time.

On the other hand, the skills ontology used in the AMS-Skills Barometer already cut across Austrian borders to form the basis of a European skills ontology developed within the budget of a recent Leonardo da Vinci project (“DISCO – Dictionary on Skills and Competencies”), funded by the European Commission (more information can be found at <http://www.disco-tools.eu>). Also the development of the European Qualification Framework (EQF) and the National Qualification Frameworks (NQF’s) could be seen as a sign for the growing importance of comparable competence structures, based on comparable descriptions of competences and skills. The skills ontology used in the AMS-Skills Barometer is one basic tool in action for providing occupation and skills trend information.