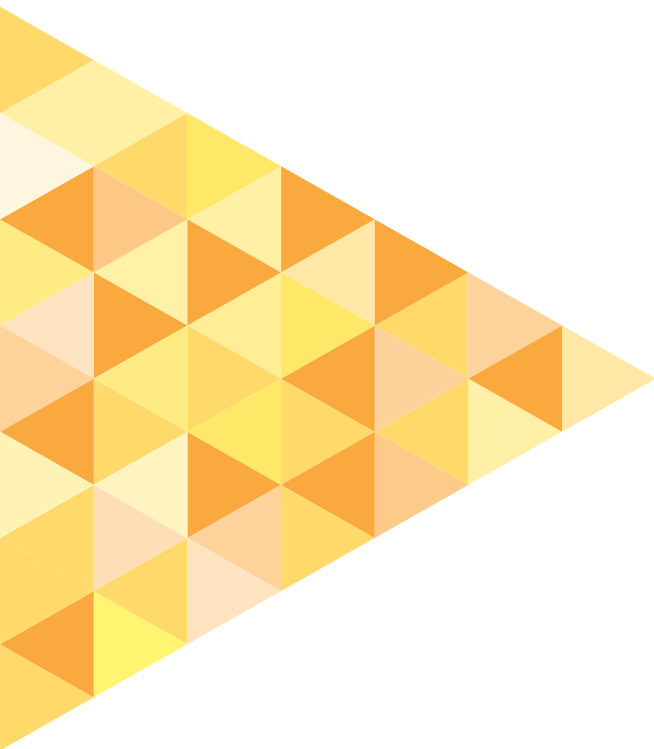


Timo Schnepf

User Research Report

Summary for the development of the Data Portal “BIBB Occupations and Skills Radar”



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User Research Report : Summary for the development of the Data Portal “BIBB Occupations and Skills Radar”

Timo Schnepf*

Abstract:

This user research report serves as preliminary work for the development of the new data portal “BIBB Occupations and Skills Radar” (“BIBB Berufe- und Kompetenzradar”, or short BKR) funded by the BMBF (Federal Ministry of Education and Research, duration 2022-2026). The report uses various sources to identify target group-specific user requirements. It is based on a quantitative survey of users of bibb.de (on-site survey), a survey of young adults, qualitative interviews with decision-makers and stakeholders from politics and vocational training practice, a literature review, an online traffic analysis of the BIBB publication directory (“Fachpublicationen”), an analysis of the BIBB database on request management (“Anfragenmanagement”), a market analysis, and internal discussions with managers. User requirements were derived from these sources and divided into “cross-user” and “user-specific” requirements in this report. The results show a heterogeneous picture of the BIBB's target groups, describe which statistics are of particular interest, and which challenges need to be taken into account when developing a new portal.

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Glossary

(Single) Occupation

The definition of a (single) occupation (“Einzelberuf”) refers to the German classification of occupations KldB 2010 by the Federal Employment Agency (BA). The anchor point is the so-called 5-digit code for occupations and 8-digit code for vocational training occupations (according to DAZUBI, not BA). These identification features allow comprehensive data from various sources to be combined at the occupation level.

Higher occupational aggregates

“Higher occupational aggregates” refers to groupings of individual occupations based on various criteria:

- a. According to summary classification schemes (e.g., the so-called “3-digit codes” of KldB 2010, “occupational groups”)
- b. By topic (“STEM” occupations, “green occupations,” “railway occupations,” etc.)
- c. By other groupings (e.g., by areas of institutional responsibility IH/HW/ÖD)

Qualitative Information

In addition to data and statistics, the BIBB provides qualitative information such as procedures relating to exam reforms (curricula) or framework curricula (“Rahmenlehrpläne”). This information has no direct connection to statistics and research data and play a minor role for the BKR. Portals such as the BIBB's “Berufesuche” already exist for this purpose.

Standalone /cross-tabulated indicators

Standalone indicators are statistics providing information on their own (e.g., newly concluded apprenticeship contracts). Cross-tabulated indicators are needed to differentiate indicators according to another characteristic (e.g., new contracts by gender or general education qualification).

Introduction

The BIBB has, among other tasks, the responsibility to research the vocational education and vocational training system in Germany and make the results available to the public ([BBiG §90 Absatz 2](#)). The focus is on informing stakeholders in politics and practice, but other parts of the public are also considered. This goal is reflected in the [mission statement of the BIBB](#), where point 7 says that “work results are made available in a manner appropriate to the target audience through suitable media and communication channels.” The motivation for developing a new, unified statistical data portal stems, on the one hand, from changing possibilities in IT technology and the politically desired expansion of linked and open data ([Second Open Data Act](#)), based on the [FAIR principle](#). On the other hand, continuous changes in the labor market (COVID-19 and digitalization, energy crisis and green jobs, artificial intelligence and changes in job roles) as well as the workforce (demographic and educational structural changes) require scientifically sound information. They form the basis for individual, institutional, and political discussion and support decision-making processes that go beyond anecdotal evidence.

This report aims to provide insight into potential user groups and their requirements for a modern data portal. It seeks to answer the following questions:

1. Why do users utilize data? What are their desires and needs? What challenges do they face in their daily professional lives?
2. How can the planned data portal help meet these requirements and simplify the users' workflows?

This report provides answers to questions such as which target groups are generally interested in the data, what the data is, and how it should ideally be made available. However, the report does not address which user requirements should be prioritized in the development of the website. Nevertheless, the report is intended to serve as a guide for deriving user stories. The following research methods were used to compile the report:

- 5 qualitative interviews,
- 3 quantitative surveys,
- analysis of previous user research by the BIBB,
- an analysis of the online traffic of the publication directory,
- an analysis of the database of the inquiry management system,
- as well as internal discussions with managers and other colleagues in direct contact with users.

The report is structured as follows. First, in section „*Current Use of the BIBB Data Offering*“, the “status quo” is described, showing how BIBB-research and the statistics offering fit into the broader context of vocational education research, policy, and practice, which groups of people make use of the offering, and why they do so. The section “*Cross-user requirements*” describes the key findings of the six research methods across all user groups. The section “*Requirements by user group*” describes the five identified user groups and their relationships to each other in detail. These are:

1. Professional associations („Berufsverbände“)
2. Ministries, committees, and local authorities
3. Research and consulting
4. Educational institutions and companies
5. Interested citizens and others

Current use of the BIBB data offering

Bibb.de is primarily used in a targeted, occasion-driven manner by so-called “heavy users”. These include representatives from chambers and associations, as well as universities and research institutions (i.e., user groups 1 and 3). “Casual users” are more likely to be young people and trainers in VET (user groups 4 and 5). The data is used by very heterogeneous groups from society. All of them have different interests in different data. For example, the statistics from the BIBB/BAuA [employee surveys](#) tend to be used for research and consulting, while the statistics from [QuBe](#) are used by practitioners (e.g., large companies). An internal user survey conducted in 2017 revealed the following reasons for visiting bibb.de (multiple responses possible):

- 45% of all respondents are interested in information on vocational training and continuing education,
- 28% of all respondents are interested in statistics,
- 27% of all respondents are interested in publications,
- 23% of all respondents are interested in programs and research projects.

When requests come from politicians, 80% of them are requests for statistics. For practitioners, the proportion of requests relating to statistics is more like 15-20% (BIBB Anfragenmanagement). In 2017, around 10% of page visits to www.bibb.de came from the user group “Interested citizens and others” (internal report xCom 2017: 8).

Abonnentenstruktur der BWP (in Prozent)

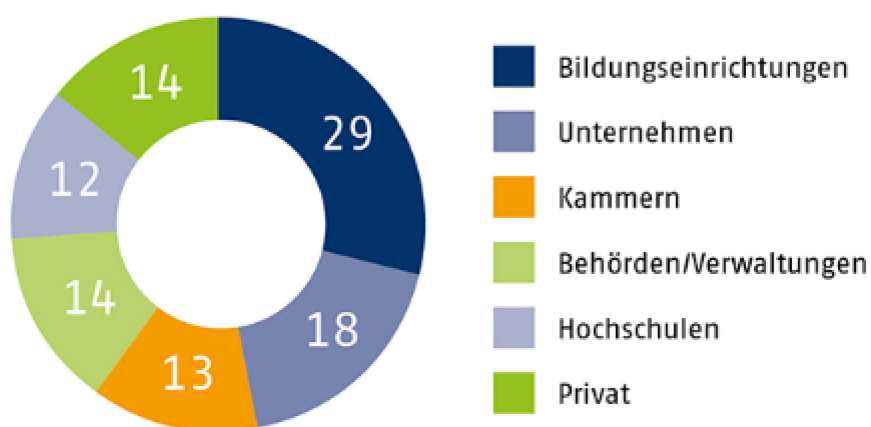


Figure 2: BWP website “About Us”

Figure 2: The BWP website “About Us” shows the distribution of subscriptions according to specific user groups of the BWP Journal.

A 2017 analysis (xCom 2017: 66) of the most frequent external links to the BIBB's online offering revealed:

- 45 % direct entries (e.g., via bookmarks)
- 38 % via search engines
- 17 % via other website links, of which
 - 19,9% IHK / HWK pages, 14.3% ministries / initiatives, 13.4% other BIBB portals, 8.6% Wikipedia, 6.2% media

The 45 percent of direct entries indicate the importance of the “heavy user” community.

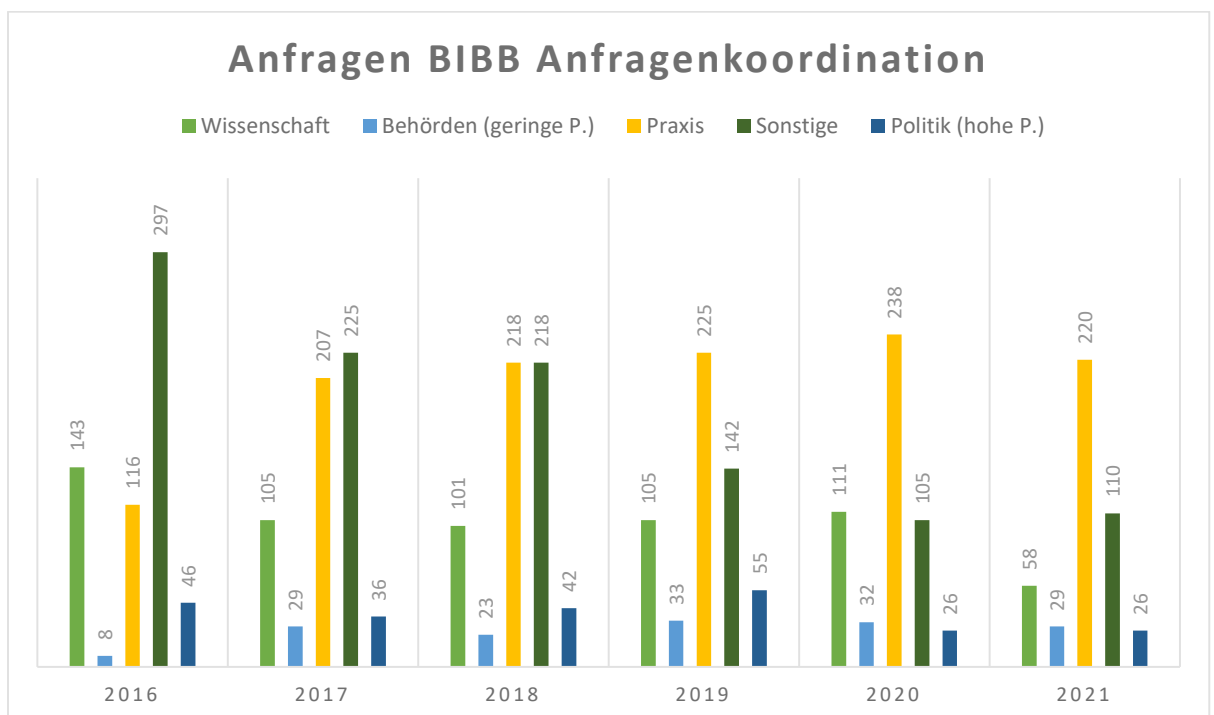


Abbildung 1: Anfragenkoordination Nutzer, eigene Darstellung

Figure 3: User request coordination shows the number of requests made to BIBB request coordination for the years 2016 to 2021, broken down by user group.¹ The user group “Practice” dominates the inquiries to the inquiry coordination department. However, it is not statistics that are primarily

¹ This includes all requests, not just those with high priority that are documented in the request coordination database.

requested here, but rather qualitative information. In second place are “Other” inquiries, which are not further defined. Third are “Science” and then “Authorities” with low priority. Thirdly come “science” and then “authorities” with low priority. These include, for example party-affiliated foundations, offices, and administrations. The fewest but most important inquiries come from the “politics” user group, which includes authorities with high priority (e.g., state and federal authorities).

Cross-user requirements

Relevance

The project vision of the BKR has been very well received by all user groups. Against the backdrop of constant structural changes in the labor market, user groups in associations, politics, research, and practice need to be able to access scientifically sound information on occupations and skills online. Reference is made to the two challenges of a common basis for discussion and informed decision-making, which the data portal can support: “This would enrich many debates on vocational training policy” (interview with the DAA Foundation). The integration and harmonization of various datasets is seen as a positive development, as this currently mostly has to be done manually. For the user group “interested citizens”, the data portal also offers potential added value, as “prejudices about occupations [...] are still widespread” (interview with BIZ).

Regarding the selection of indicators

Across all analyses, it is clear that there are not just a handful of relevant indicators. Interest is broad, but tends to vary by user groups.² In general, there is high demand for **socially relevant indicators**. This is evident, among other things, in the topics requested by the inquiry coordination team and in the VÖ VZ download figures. For example, interest in the integration of young people with a migrant/refugee background was a major topic around 2015, while in 2020/2021, COVID-19 was the most frequently requested topic. Current trends could include artificial intelligence or the economy’s transformation to renewable energies.

Users from research and associations emphasize the desire for a skills analysis tool based on job advertisements: „ If there was a [Lightcast dashboard](#) for the German labor market, we would buy it” (WFBB interview). There is an expectation that **job advertisement analyses** will enable two things. First, a “daily” understanding of the skills demanded by employers, thereby enabling formal education and qualification certificates to be optimally adapted to the labor market needs for occupations: „What skills will be required in the automotive industry as electromobility increases?”.³ Secondly, to identify occupations through competency searches that require sought-after skills: „Which alternative occupations require competencies in precision mechanics, given the shortage of precision

² This can also be seen in the high variance in download figures for the BIBB's publication directory. Of the approximately 500,000 downloads of the BWP publication series in 2018, the most downloaded article has around 9,000 downloads.

³ In the context of demographic and structural changes, the early identification of training needs is a politically relevant issue, see, for example, <https://www.tagesschau.de/multimedia/sendung/tagesschau/video-1187922.html>.

mechanics?”. Related to this question is the demand for indicators on occupational transitions from a life-course perspective: „If workers have completed vocational training in occupation X, which careers do they then pursue? How do they continue their education?” These competency analyses are primarily of interest to stakeholders from research, associations, and politics. However, a competency search would also be relevant for “interested citizens” to align their personal interests with occupations, e.g., „In which occupations can I pursue my passion for image editing software?”.

Besides competencies, user groups are interested in „macro-indicators” such as skilled labor development, apprenticeship contract signings, and shortage indicators. User groups that require indicators more relevant to the individual situation of trainees/employees, for example, have a high interest in income indicators. This was revealed by the analyses regarding the „interested citizens” user group, as well as the search engine analyses of the search function on bibb.de⁴. Other relevant individual indicators relate to the „attractiveness of occupations,” such as working hours, working conditions, and job satisfaction.

Regarding the standalone indicators for cross-tabulations, the following characteristics have been frequently mentioned: First and foremost, temporal analyses for trend developments are essential. Spatial analysis capabilities are also desired; however, for users from associations, politics, and research, the federal state level is usually sufficient. Other key independent indicators included company size and demographic characteristics of the trainees/employees (gender, age, migration background).

Regarding individual occupations and „occupational aggregates”

With regard to the question of whether individual occupations (according to KldB 2010 5- or 8-digit codes) or aggregated occupational groups are more relevant, different conclusions can be reached depending on the analysis method used. The inquiry coordination team, when responding to requests from politicians, has primarily dealt with inquiries about occupational aggregates (e.g., STEM/commercial/social/sustainable/etc. occupations). In various discussions with BIBB colleagues, it was reported fairly consistently that around one third of all inquiries relate to such group differentiation, i.e., “which occupations are particularly affected by the energy transition/digitalization/etc.?” The expert interviews from research, consulting, and associations show a clear preference for individual occupations, which can then be aggregated into groups (e.g. “craft occupations”). Since analysis requests often do not follow a clear classification or defined grouping

⁴ The search term “apprenticeship pay” was by far the most frequently searched term on bibb.de in 2017 among search terms related to statistics.

(“occupations in the railway sector”), it is recommended to select at the most disaggregated level possible.

Regarding which specific occupations are of interest, the following can be noted. On the one hand, there is demand for “major” Apprenticeships, i.e., those with many trainees/employees (see internal report xCom 2017 and VÖ VZ). Additionally, demand is particularly high around new training years⁵, as well as when occupations are reorganized or when they attract social interest (“systemically important” occupations during the coronavirus pandemic). Occupations related to specific topics (nursing occupations due to reorganization and the coronavirus pandemic) have also been in high demand in recent years (inquiry coordination and VÖ VZ).

Along with the importance of analyzing trends, the ability to compare different groups is an important analytical tool. This means that there is a desire to relate statistics to other comparison groups (e.g., apprenticeship contract signings in the skilled trades compared to all other dual vocational training occupations).

Requirements

The goal of integrating various datasets based on common classification systems (KldB 2010, ISCO, ESCO, O*Net, etc.) and making them publicly available is received very positively. For user groups from research and consulting, the availability of data in tabular form is central, although the possibility of data exploration through visual tools is welcomed. Data visualization also offers other user groups, such as “association end users,” educational institutions, companies, as well as individuals in politics and administration, the opportunity to read and interpret descriptive statistics about the labor and training market. The BIBB User Research Report from 2017 also concludes that a “stronger use of infographics” (xCom 2017) promotes user-friendliness.

The interviews point out that statistics can be easily misinterpreted. Numbers can suggest an objectivity that, for various reasons, is not actually present.⁶ Classic misinterpretations arise, among other things, from:

1. By not considering the population from which conclusions are drawn (sampling bias). For example, data from job advertisements could be mistakenly interpreted as “representative” of occupation X, even though some occupations may rarely be advertised through job postings and are instead filled through other recruitment methods (e.g., “headhunters” in high-paying professions).

⁵ For example, “orthopedic shoemaker” was in high demand in the download area of “Ausbildung gestalten” when the apprenticeship was re-ordered in 2020.

⁶ For an overview, see Krämer, „So lügt man mit Statistik“ (2009).

2. Through overinterpretation of the measurement method. That is, the measurement of a phenomenon does not (only) correspond to the phenomenon of interest. For example, statistics on the decline in apprenticeship numbers are equated with the attractiveness of vocational training, or the “contract termination rate” in apprenticeship statistics is interpreted as “apprenticeship dropouts”. Other causes (demographic development) and heterogeneous effects, which are “swallowed” by the average (e.g., the increase in school-based versus the decline in dual education), are not taken into account.
3. By confusing correlation and causality.

For this reason, barrier-free documentation of the data and its limitations is necessary in the data portal: “How do I read this?” (WFBB interview). In view of the fact that a lack of documentation will lead to queries that will have to be dealt with by BIBB colleagues at great expense in terms of personnel, easily accessible documentation is recommended. Overinterpretation in the presentation can be further reduced by offering direct comparisons between points in time and (occupational) groups: “Satisfaction in occupation X increased by 10 percentage points between 2012 and 2018” is less meaningful than contextualizing it with a comparison group: “Satisfaction in occupation X is 10 percentage points higher than in all other occupations “. ⁷

A powerful search function is desirable for providing an overview of the many occupations, skills, and indicators. On the one hand, a search based on entered job titles should suggest relevant occupations, but indicators and skills should also have keywords. Closely related to this is the link to common classification schemes/taxonomies: Which sub-terms are assigned to a corresponding element of a taxonomy?

It is desired that tables and high-resolution dashboard graphics can be exported. Politicians have stated that the portal should allow A4-compatible export, so that it can be transported and tracked independently of electronic devices.

Since the definitions of “occupations” and “skills” as well as the compilation of indicators are subject to many individual decisions, it is important to document the data completely. However, this is primarily provided by the Radar Database Group. Nevertheless, implementation of the documentation must be taken into account for the data portal.

⁷ The contextualization of statistics is not exhaustively covered here and requires further research. Other classic examples include not specifying the comparison group: “20% are employed part-time” – 20 percent of what? Data visualization aspects must also be taken into account, such as labeling the axes or truncating the ordinate to dramatize trends.

Integration into the BIBB portal landscape

A sensibly linked integration of the Radar data portal into the BIBB portal landscape is desirable. There are six portals with data references in the portal landscape:

1. [Qualifications and Careers in the Future](#) (QuBe)
2. [Trainee Data System](#) (DAZUBI)
3. [BIBB survey “Newly concluded apprenticeships contracts as of September 30”](#)
4. [Collectively agreed apprenticeship pays](#)
5. [Career search portal](#)
6. [Integrated apprenticeship reporting](#) (iABE)

Other data-related offerings include the [Research Data Center](#) (“Forschungsdatenzentrum”), the [Data Report](#), and the [BIBB topic pages](#). As already noted in the internal xCom report from 2017, user guidance is (still) not centrally designed around the user experience and the *customer journey*: “Overall, references to data appear in three places under topics. Direct access, e.g., via a statistics portal or data archive, would be helpful” xCom (2017: 47). It should therefore be considered that another portal, in terms of the customer journey, should be harmoniously integrated into the overall BIBB offering. The many data offerings of the institution are not intuitively accessible to external users, as the current BIBB website is geared more toward the internal organizational structure than the user perspective. This may be less relevant for the 'heavy users' group, as they can, for example, directly access their data via bookmarks. However, it might discourage potential new users from exploring the wide range of offerings provided by BIBB. The open data approach of the BKR would offer users the opportunity to explore the institute's data offerings in an exploratory manner. Given that the Data Portal only makes extracts from the Radar database publicly available, optimizing links to other offerings from the institute is an important requirement: For example, a user looking for information on newly concluded apprenticeship contracts for bricklayer apprentices in the Data Portal Radar could directly link to the DAZUBI Data Portal to analyze the statistics further based on additional characteristics. A similar integrative approach is followed by the [Occupation Search Portal](#), although it does not link to the full data offering of the institute⁸.

Along with the aspect of the customer journey, the state of the back-end infrastructure of the BIBB data should also be mentioned in this context. A central requirement for the data presented in the BKR is consistency with the outputs from the other portals of the institute:

⁸ Although the job search function includes a direct link to the relevant occupation in the DAZUBI data portal, such links do not exist for other portals such as the QuBe portal or the collective apprenticeship pays.

If the Data Portal reports 10,330 newly concluded apprenticeship contracts for bricklayers in 2020, the DAZUBI Data Portal must also display 10,330 contracts. If this changes due to data harmonization or weighting, it must be documented (as mentioned above). Data that exists in multiple versions and is based on different technologies or even script languages (without common standards) carries the risk that personnel resources are “sunk” into manual maintenance and updates, where automated solutions would be available. Another risk is that data maintenance heavily depends on individual persons/service providers. If they are no longer available, this could pose a threat to the success of the overall project. IT infrastructure has a short half-life, and the effort required for updates and re-factoring increases significantly if common documentary and technological standards are not considered.

The team of the Radar Database addresses these aspects by creating a sustainable IT infrastructure and documenting it for third parties. The goal should be to establish the joint data maintenance of the institute in the sense of a sustainable IT infrastructure.

Requirements by user group

Figure 1: User group Map shows the five identified user groups and their relationships to each other.

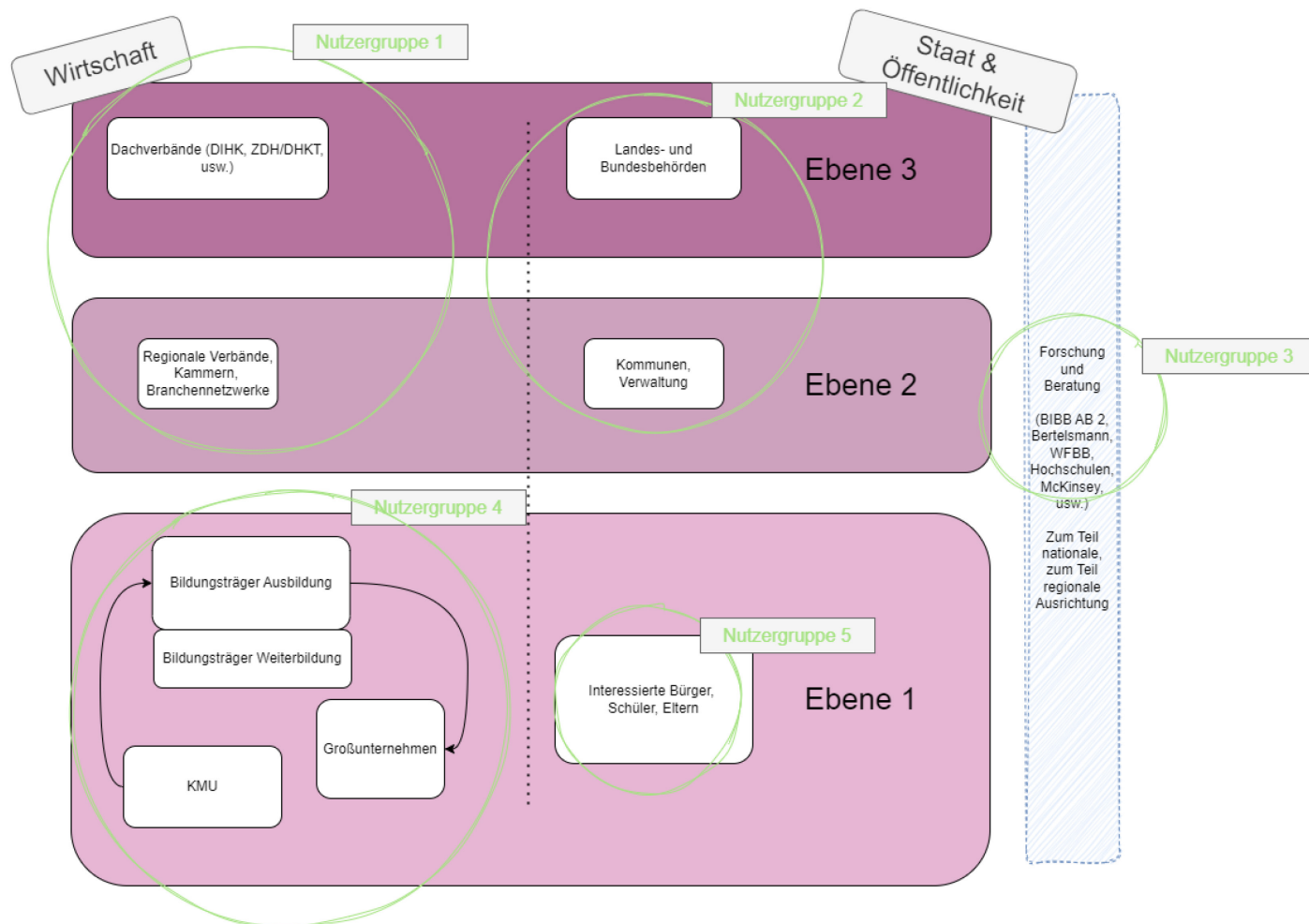


Figure 2: User groups Map, own depiction.

The user taxonomy is divided into two dimensions: The vertical dimension describes a certain hierarchical structure. The horizontal dimension describes user groups from the business sector and those that can be assigned to the state and the public sector. On the far right is “Research and Consulting,” which includes not only for-profit (e.g., consulting firms) but also non-profit consulting institutions (e.g., Bertelsmann Foundation, OECD). Universities and data analysis teams within other user groups (e.g., in umbrella organizations) also belong to this group.

Level 3 describes umbrella organizations (e.g., DIHK, ZDH), state and federal authorities (e.g., the German Bundestag). These need statistics to make decisions. This is similar for Level 2. Furthermore,

Level 3 often acts as 'networkers' for the lower levels. This means that they are responsible for the exchange of information and the joint alignment of their subordinate institutions.

Level 1 requires statistics for decision-making. This means that companies and educational institutions, for example, are interested in new trends in “their” professions in order to derive new qualification modules (skills) or teaching capacities (trend toward new contracts). Interested citizens can use the information about professions to obtain data-driven information about the labor market, for example, in the context of career orientation.

User group 1: (T)VET professional associations

Who?

National trade unions, employer associations, umbrella organizations, and chambers of industry and commerce (DIHK, HWK, DZH). There are professional associations (“Berufsverbände”) for almost every profession (e.g., speech therapists, tax consultants, medical specialists, sociologists, etc.). The user base of the associations is larger than that of the user groups from politics (user group 2) and research (user group 3). Associations and social partners belong to the inherent target group of the BIBB, alongside politics and practitioners.

Why is the data portal interesting?

Inquiries from (umbrella) organizations are more specific or general depending on whether they come from Level 2 or Level 3. Umbrella organizations at Level 3 tend to have an Germany-wide focus, while professional associations at Level 2 are generally more regionally oriented. They use statistics to set or justify political agendas within vocational education networks. This can be reflected in press releases as well as in official speeches and announcements from the associations. They also serve as a communication tool to provide a common basis for discussion with subordinate institutions. The Data Portal would it for instance make possible to quickly determine whether there is a clear trend in “English language skills” in profession X in region Y, even across different data sources, such as job advertisements and surveys. Another example would be to use job advertisement analyses to identify whether certain topics from public discourse (currently artificial intelligence and ChatGPT use in knowledge professions) are relevant to specific professions.

Level 2 associations often have few analytical resources of their own and obtain their information from the “research and consulting” group, as well as from contributions from umbrella organizations (level 3).

What requirements does the user group have for the radar data portal?

General requirements

For the user group of professional associations, the data portal would offer the opportunity to gain an overview of trends in professions. To this end, the statistics should be accessible with as little data literacy as possible. Interpretation aids, such as how to read statistics, contextualization of the figures, and clear documentation are also desirable. Mobile display could help to quickly research the most important numbers and topics, for example at network meetings or trade fairs. This would simplify joint communication and also enable level 2 associations to use statistics relevant to them without high access barriers.

Indicators

Current indicators on skilled labor development (new apprenticeship contracts), the number of trainees in occupation X, and the development of skilled labor demand, labor shortage, and matching problems are highly relevant.

Qualification development plays an important role for associations, i.e., analyses of the skills demanded by companies: Where are occupations changing? How strong is the influence of external shocks (coronavirus, energy crisis, migration movements) and new technologies? Where are the skills in demand on the labor market, and which occupations include them?⁹ These can be analyses of job advertisements, but also analyses of flexibility matrices and/or employment histories.

Aggregate level

Associations require the selection of occupations at least at the KldB 2010 5-digit level in order to select “their” occupations. In absence of a clear definition of what constitutes a “craft occupation,” selection at the smallest level would be helpful.¹⁰ The ability to create custom occupational aggregates using user profiles was frequently requested.

⁹ For example, a professional association inquired about similar occupations to energy consultants (in terms of tasks and competencies) due to a shortage of skilled workers, in order to target recruitment campaigns for similar workers (internal discussions). A very similar example occurred in the context of a large turbine manufacturing company, which began recruiting dental technicians after discovering that they shared a key competency with turbine builders.

¹⁰ For example, for every analysis, it must be clarified whether “craft occupations” also include “occupations in the craft sector”: Does the office clerk in a carpentry business belong to craft occupations? (Interview ZDH)

User group 2: Ministries, committees, and local authorities

Who?

Bundestag committees, members of parliament, committees in state and federal ministries, although constituting the smallest user group in terms of numbers, their inquiries are given particularly high priority by the BIBB as the central advisory body for vocational education and continuing education. The BIBB has the specific duty providing the federal and state governments with expertise in the field of vocational training research. Requests from this user group are therefore particularly relevant and are given high priority by the BIBB.

Why is the data portal interesting?

The BIBB's inquiry database shows that ministries, committees, and local authorities submit a wide range of inquiries, around 80% of which relate to statistics and overview reports on specific topics.

What requirements does the user group have for the Radar data portal?

General requirements

Requests from politicians often relate to current events.¹¹ Therefore, the timeliness of the data is highly relevant for this user group. With regard to further use, the desire was expressed to make the statistics available digitally in such a way that they “can be printed out legibly in DIN A4 format” (inquiry coordination).

Indicators

Indicators related to skilled labor development (new apprenticeship contracts), the number of apprentices in occupation X, as well as the development of skilled labor demand, shortages, and mismatch issues are of high relevance. Behind this area of interest lies a focus on the “attractiveness of vocational occupations,” with indicators such as apprenticeship remuneration, working conditions, retention rates, and career progression. Data on the “cost-benefit” ratio (BIBB Cost-Benefit Survey 2017/2018) has also been increasingly requested. Regarding independent indicators, time and spatial analyses (regions, federal states, cities) are the most important. The indicators for company type and size are also of high relevance.

Aggregate

Requests from politicians asking for clarification of the “occupational aggregates” (“railway occupations,” “cultural occupations,” or “occupations in the agricultural sector”) were often returned

¹¹ For example, Mr. Esser (President of BIBB) recently spoke at the federal government's “Alliance for Transformation” about the contribution of the dual vocational training system to ecological transformation.

to the sender, or colleagues from the inquiry coordination team made suggestions for occupational groupings. The possibility for the community to create occupational groups would solve this problem.

User group 3: Research and consulting

Who?

Universities and other research institutions, such as:

1. BIBB in-house consulting, e.g., regulatory department A 2
2. Research departments of other government institutions
3. Universities and technical colleges
4. Foundations such as Bertelsmann, Hans Böckler, etc.
5. For-profit and non-profit consulting, e.g., OECD, WFBB
6. Statista

They are the smallest user group, but have expert knowledge in the field of statistical data analysis and exploration and are therefore likely to be of particular interest. They form the group of so-called “heavy users” in the current use of the BIBB data offering (see section *Current use of the BIBB data offering*).

Why is the data portal interesting

Users from research and consulting take on a mediator role between the raw data and its communication to other user groups. This user group needs “a data offering that [they] can access flexibly and then share with others” (Interview WFBB). The focus here is primarily on the simple provision of tables/graphics and the selection of cross-tabulable features, similar to the [GENESIS portal by the Federal Statistical Office](#). This user group processes the data and summarizes it in an overview (“punchlines”), because “no one in this country reads more anyway” (Interview WFBB).

What requirements does the user group have for the Radar data portal?

General requirements

The data portal could significantly reduce work processes, as it offers a major advantage over existing services¹² in terms of its “one-stop shop” approach to data. Analysts usually have to “copy-paste” their

¹² Besides this User Research report, we conducted a steady market analysis with 60 nationally and internationally comparable data portals.

information from various sources (BIBB, BA, DeStatis, etc.). The data portal would provide homogeneous linkage and harmonization of the data.

Descriptive, robust statistics on vocational training activities are in demand. It should be possible to explore the data, i.e., “we need to get our hands on the data to weigh up which aggregates and sources are of interest” (WFBB interview). The use of established classification systems (KldB 2010, ESCO, VerBis, AMS) is necessary.

The **most up-to-date data** is often required, for example, to monitor worsening shortages in certain occupations at an early stage. This is also reflected in the high demand for “new apprenticeship contracts as of 30.9,” which are more up-to-date than the DAZUBI data.

Indicators

Users from research and consulting express a high level of interest in extracting skills from **job advertisement** data.¹³ One request, for example, is to be able to quickly view the skills mentioned in job analyses over the last X years. What are the top 10 skills in profession X according to various categories (transversal/technical/IT/etc. skills), and which skills are the “newcomers”?

Besides experimental data from job advertisements, the most important indicators are those related to the supply-demand ratio of vocational training (participation in training, new contracts, unfilled apprenticeship positions, unplaced applicants, contract termination rate). The topic of “attractiveness of vocational training” is relevant, especially regarding apprenticeship remuneration. Regarding cross-tabulations, it was mentioned that company size is an important comparative factor.

Concerning other data offerings on the internet, various sources have pointed out the need for data on higher vocational education, TVET (according to KldB 2010, requirement level 3). Such statistics are scarcely available online.

Aggregate

A connection to the KldB 2010 is necessary, at least at the 3-digit + 5-digit levels. The industry level (“Branchen”) was not classified as primary by the respondents in this survey. However, the desire for a flexible compilation of occupational aggregates was expressed multiple times, independently of each other. A user-friendly GUI for compiling occupations/indicators would significantly “relieve” this user group (Conversation with inquiry coordination)

¹³ In view of the new, process generated data (“big data”) and its experimental status in the social sciences, there is a differentiated picture on how job advertisements can be used for vocational training research. Respondents were aware of restrictions, such as the fact that job advertisements are not synonymous to open positions. However, there is hope that new and up-to-date insights into skills demand can be gained by means of skills taxonomies that are as disaggregated as possible.

User group 4: Educational institutions and companies (Practitioners)

Who?

The practitioners consist of training and continuing education providers (e.g., TÜV Rheinland, DAA) and vocational schools, as well as (small, medium, and large) companies. These can be companies such as Deutsche Bahn or insurance companies that need statistics for personnel planning (internal discussions). Training personnel are a fairly large user group of bibb.de (xCom 2017, pp. 9, 30), which, however, mainly uses the BIBB's services for conceptual, planning, and consulting activities, i.e., it also requests a lot of qualitative information (on-site survey). They form the largest immediate user group in terms of quantity, apart from the non-priority user group 5.

Why is the data portal interesting?

Vocational schools, continuing education providers, and companies (level 1) have a specific degree of freedom in designing their curricula and qualification modules, which are ideally coordinated with the relevant associations (levels 2 and 3) (see Figure 1: User group map). Education and vocational training play an increasingly important role in the context of lifelong learning.¹⁴ There is a high demand for reliable information about changes in occupations: How relevant are externalities (coronavirus crisis, energy crisis, migration movements, etc.) and new trends (digitalization, artificial intelligence) for “our occupations”? Education stakeholders in the respective occupations are usually well informed about new trends through informal channels. However, they are “not in a position to strategically evaluate their qualification modules and see whether they are still in line with market requirements” (WFBB interview). This is mainly due to a lack of human resources and expertise in data acquisition and evaluation, especially among continuing education providers. Ideally, qualification modules are developed jointly by experts in practice, education, and research. A multidimensional development is usually only possible for large educational institutions and companies with extensive resources. The data portal could serve as an interface by providing a platform that makes statistics publicly available and allows them to be customized for individual needs.

What requirements does the user group have for the Radar data portal?

General requirements

Due to the potential for misinterpretation of, it is necessary to provide relatively accessible documentation of the data and its limitations. For example, it should be possible to integrate text

¹⁴ See <https://www.tagesschau.de/multimedia/sendung/tagesschau/video-1187922.html>.

modules into the dashboard or highlight specific aspects of graphics (e.g., by using different colors or arrows).

Indicators

Competence analyses are important for educational institutions in terms of developing training programs. Regional school associations and continuing education providers do not have the resources to conduct systematic analyses of labor market demand. Their vocational training programs are often based on anecdotal evidence. A portal could help here by making current developments on the labor market visible to those responsible for curricula. A follow-up question would be how to break down skills from **job advertisements** in such a way that they can be transferred into curricula. In other words, what specifically should be learned when, for example, “IT skills” are in demand? There is a need to analyze skills in a disaggregated manner. Making these analyses available to SME would be new. Skills analyses would not only serve qualification development, but also the recruitment of skilled workers, by answering the question for employers which occupations provide the sought-after skill X.

Alongside competencies, other topics such as skilled labor development and the attractiveness of occupations play an important role for practitioners. Large companies, for example, require forecasts on how the skilled labor situation will develop in the future due to demographic changes and aspects of attractiveness.

Career trajectories, transitions from school to vocational training, from two-year to three-year apprenticeships, from training to employment or higher education (further education/university), are politically relevant and will gain importance in the future.

Aggregate

It was pointed out that the focus should be on occupations, not on (T)VET institutional responsibilities. This means that even school-based occupations (e.g., educators, physiotherapists) should be included in the portal, as the distinction between school-based/dual training is rather research oriented and less from the perspective of those participating in education and training.

The BIBB newsletter survey revealed that both, individual occupations and higher aggregated topics, were of similar interest.

User group 5: Interested citizens and others

Who?

Young people, parents, and teachers, as well as individuals from journalism and press departments. They are not the primary target group of the BIBB, but inquiries occasionally reach the institute due to the sheer size of the target group. In the strategic orientation of the data portal, this group was assigned the lowest priority in collaboration with the BMBF.

Why is the data portal interesting?

There is a high level of interest in careers and labor market conditions among the general public. There is a need for understandable, data-driven insights into the labor market, because “prejudices about careers are still widespread” (see IDH survey and BIZ interview). The internet is a key source for finding information. However, statistics are often off-putting for the “general population” (BIZ interview). A 2017 survey showed that about 10% of visits to bibb.de came from this target group (com.X 2017, p. 8).

What requirements does the user group have for the Radar data portal?

General requirements

Barrier-free documentation and interpretation aids for the data and its limitations are necessary for this user group. It is important to note that these statistics should not be used for career guidance purposes. A general distinction is made between career information (e.g., continuing education opportunities for occupations, [BerufeNet](#)) and career guidance (e.g., suggesting occupations that match skills, [Check-U](#)). Statistics from the data portal should serve the former, because it is “not a good idea, for example, to place labor shortage data in the context of career guidance, which should be based on aptitude and interests, not market demand” (internal discussions).

Journalism and the press occasionally require BIBB statistics. These should be clearly assignable and quotable with a link. Graphics are sometimes taken directly and incorporated into other publications. Therefore, the option of exporting graphics in high resolution is desirable.

Indicators

The qualitative (BIZ interview) and quantitative (IDH survey) result suggest the following prioritization of indicators. In the context of career information, teenagers and young adults are interested in wages and the future viability of occupations. These can be indicators related to the projected demand for skilled workers on the one hand, but also indicators related to “change in occupations” on the other. Since career decisions have long-term consequences, statistics relating to the “replacement potential” by machines as well as general statistics on job security are of interest. The question of further training and a life-course perspective on career paths in occupation X are also relevant. With regard to skills (and activities), a search function for occupations is interesting: “Which occupations offer me the

opportunity to work with Photoshop?”, “Which occupations involve working with people?” Also relevant are the question of social recognition, that is the prestige of an occupation, “how cool is occupation X” (BIZ interview), as well as questions regarding working conditions (working hours, autonomy, incentives).

Aggregate

There tends to be greater interest in overview statistics on occupations, e.g., “Which occupations are “green” occupations?” in direct comparison to individual occupations.