

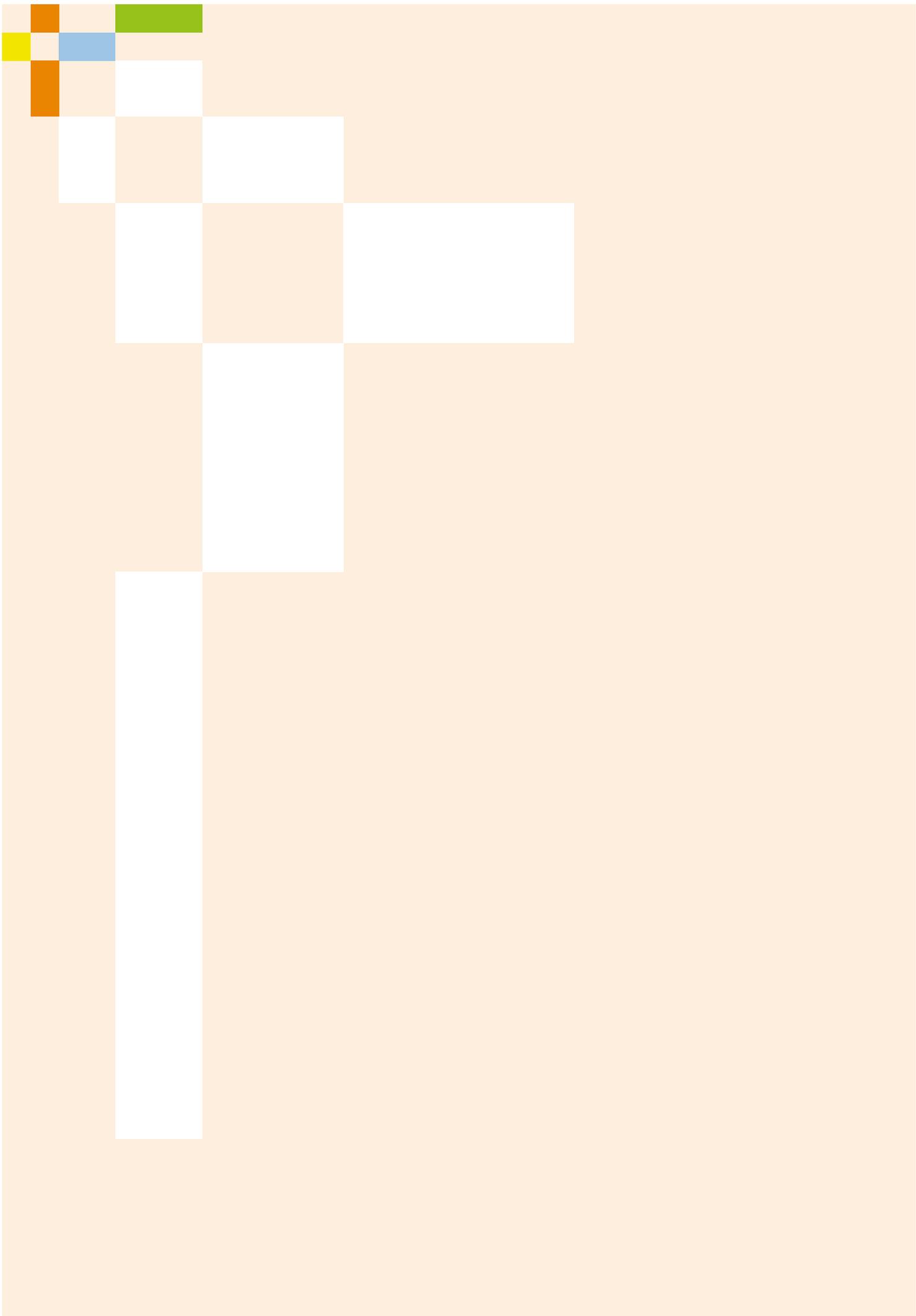


acatech DISCUSSION

Dynamic Skills Management: Identifying Skills Requirements Early, Devising Tailored Solutions

Practical Guidance from acatech's
Human Resources Working Group

J. C. Jacobs, H. Kagermann,
H. Roehl, D. Spath (Eds.)



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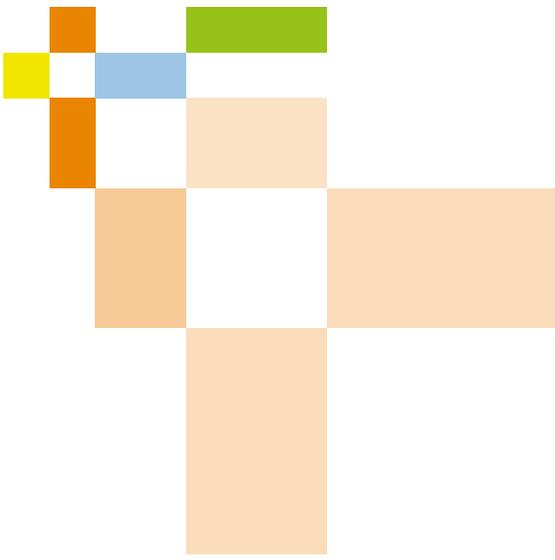
The acatech DISCUSSION series

This series comprises papers on engineering and technology policy issues. It documents the interdisciplinary discussions at acatech events and in the Academy's projects and working groups. Responsibility for the contents of these papers lies with their authors.

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Foreword

In February 2020, acatech's Human Resources Working Group (HR Working Group) presented the acatech DISCUSSION „Promoting Lifelong Learning – Good Examples from Practice. A Good Practice Report from acatech's Human Resources Working Group. Lessons Learned, Academic Analyses and Options for Action“. In that paper, we use examples from the workplace to show how companies are working together with their employees and their social and business partners to develop innovative approaches to lifelong learning.

To design purposeful continuing education programmes that are aligned with their corporate strategy, companies must analyse and define their skills requirements. In many businesses, skills management needs are changing rapidly. Which target groups do we want to address? What exactly do we want to empower the workforce to do? What specific content do we want to convey? Meaningful answers to these questions can only be given if companies bring their human resources planning and development into line with their own corporate and HR strategy objectives, as well as with expected technological developments and changes in their environment. Employees also have a high level of responsibility for their individual learning biography, but they need guidance on the direction they should take to acquire the knowledge and skills appropriate for them personally.

In the context of the digital transformation and rapidly changing business models, it is certainly not possible to provide a rigid, universal classification and definition of skills required that would apply across all companies or even business sectors. Companies are facing the challenge of designing sustainable skills management plans and devising tailored, future-oriented measures to meet their operational skills requirements. Changes in the working world, some of which are disruptive, and the associated transformation in demands placed on the workforce require a flexible approach to human resources and skills management,

as well as continuous monitoring to ensure that the measures adopted are up to date and a good fit. In this way, current and future skills requirements can be anticipated and addressed in the training, professional development and reskilling programmes run by companies, as well as in recruitment.

This acatech DISCUSSION enlarges upon this challenge of developing a future-oriented skills requirements analysis. The publication is based primarily on the results of a working party within the HR Working Group on this topic. In the period from February 2019 to September 2020, we discussed specific demands being placed on business practice and devised an approach to skills requirements analysis. We developed this business practice guidance following several workshops and review loops with HR directors from the member companies of the HR Working Group and after successful field testing in those companies. We see the guidance as a proposal to the various stakeholders in the digital transformation to facilitate future-oriented human resources management, to maintain employability, and to promote innovation and good working practice in Germany.

The approach we describe and the insights into business practice and the academic perspectives we provide are addressed primarily to economic, social, scientific and management experts. However, by presenting options for action, we want to contribute to the public political and social discourse about the future of work that is not dependent on the policy approaches of political parties, professional associations or trade unions.

Joh. Christian Jacobs

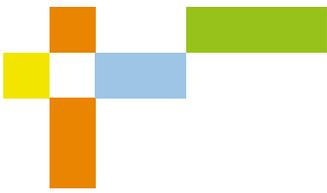
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Executive Summary

The **digital transformation** is fundamentally changing working and organisational processes in companies, requiring the constant updating and continual development of skills. **Lifelong learning** is vital so that new needs are addressed promptly and digital transformation opportunities can be translated into increased productivity and a rapid rate of innovation. Companies and their staff are **jointly responsible** for ensuring employees' working capacity and employability. Government and society provide back-up for future-oriented continuing education.

Transparency is essential when considering skills from the company's perspective and also individual skills (whether current or required in the future), so that the company adopts and encourages a targeted approach to human resources planning and development. Until now, there has not been a dynamic and holistic approach that adequately reflects the changes taking place in the working world and the resulting need to **record skills requirements and professional skills requirements** in a systematic manner. Current approaches still follow too closely the logic of linearity and path dependency.

Against this backdrop, acatech's Human Resources Working Group (HR Working Group) has developed a **conceptual framework** that will enable organisations, irrespective of the sector in which they operate, to adopt a systematic approach to determining current and future skills requirements and then implementing the appropriate processes. This method aimed to ensure that continual iterations and ongoing modifications could be made to the process. To design a **practical, pragmatic yet scientifically-based approach**, the academic and economic experts opted for a multi-stage procedure. The first step of this procedure comprised the analysis of a broad range of contributions from skills research (**desk research**). Existing models and approaches were recorded and critically examined. In several workshops and **review phases**, the members of the working group compared the current

state of research with needs and strategies in business practice and devised an approach to the skills requirements analysis. To test acceptance of the approach and its economic and technical feasibility, it was trialled (**piloted**) in various business units in the companies in the HR Working Group over a three-month period. The lessons learned were fed back into the design. In summary, this approach to the skills requirements analysis is based on a **holistic perspective**; company-specific and sector-specific aspects were incorporated, thus ensuring universal applicability across different sectors.

The process devised for the skills requirements analysis consists of five steps. To provide a better understanding of the approach and make it simpler to use, each of the five steps of the process is underpinned by optional **practical hints and tips** (canvas), with details not only of the key activities and key issues, but also of the tools and decision-makers relevant for that particular phase. The practical hints and tips give guidance and may be used selectively or in full, depending on the specific requirements of the company. **Real-world examples from companies** provide further insight into implementation in practice.

This **multi-channel 360° approach** makes it possible to establish a basic conceptual framework for human resources planning and development within a company. This can then be used to develop a skills model that matches the company's needs. This skills model underpins both the recording of targets and the target-actual comparison of skills at corporate and individual level and forms the basis for devising human resources measures. **Continuous review loops** of the skills model and its application process in terms of practicability, effectiveness and agility improve their fit and ensure they remain up to date.

The aim of this business practice guidance is not to set out the structure and content of a skills model. Nor do the implementation and evaluation of human resources measures (such as recruitment and upskilling/reskilling) form any part of the subject of this approach.

Project

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Support

acatech thanks Dr. Joh. Christian Jacobs and the companies of the members of the HR Working Group for their support.

1 Starting position

The **digital transformation** is the structural change of our era. Evidence of this can be seen in the implementation of the visions of Industry 4.0 and the Smart Service World and in the way in which artificial intelligence and learning systems are becoming part of daily life. The digital transformation coincides with a fundamental transformation of our working world. We are seeing radical changes in work processes and management and organisational processes within companies.

Globalisation, the digitally networked economy and the move towards a platform economy have **already had a massive impact on many traditional value chains**. The boundaries between production and the provision of services are becoming increasingly blurred. Companies need to react more and more quickly to ever more radical technical upheavals, triggered not least by the progress being made in artificial intelligence. Established business models and companies which have been successful to date are being challenged by start-ups and companies from other sectors, especially large American and Chinese IT companies. New data-driven business models are shattering established value chains, sometimes within an extremely short period of time.

From a **macroeconomic** perspective, Germany will also require a huge **leap in productivity** to remain globally competitive as a business location, to deal with the consequences of the coronavirus pandemic and, given the demographic challenges, to ensure the sustainability of its social security systems in the long term. Digitalisation will be crucial here.

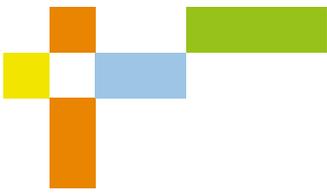
If employees and companies are to benefit in equal measure from this change, they must **shape the transformation together**. Employees' skills will play a decisive role. On the one hand, employees and employers will need to adapt and keep learning new

things. On the other hand, digitalisation will demand completely new skills. In general, this will lead to a significant **skills shift**. Job descriptions are changing, while new (and sometimes much more challenging) job opportunities are emerging. Very few jobs or professions will be unaffected by digitalisation.

In the past, there have been changes, sometimes significant, to job descriptions and profiles. What is new nowadays is the **speed, dynamism and complexity** of those changes. The way in which digitalisation is accelerating technical, economic and social developments is also fundamentally changing the way in which employees learn. In the future, it will be less and less possible for employees to acquire knowledge and skills in advance. Existing human resources planning and development tools are no longer sufficient to anticipate today what will be needed tomorrow. Therefore, we need to focus on the issue of how **human resources and skills management** in companies will be able to address such dynamic and complex changes.

Both employees and companies need a framework that provides **guidance on future job profiles**. Knowledge of current and future skills requirements is important, so that recruitment and human resources development can remain appropriate and geared towards the future. This ensures that employees retain their working capacity and employability in the long term and enables companies to stay productive and continue to innovate at speed.

Despite a large number of studies and publications about current and future skills requirements (e.g. OECD, World Economic Forum, McKinsey Global Institute, Ashoka Foundation), there has not yet been a dynamic and holistic approach of this type to a systematic survey of the skills and professional skills requirements of German companies. Current approaches still follow very closely the logic of the linearity and path dependency of individual steps in the process. For small and medium-sized companies in particular, such guidance would be especially useful.



2 Academic perspective

What issues and aspects of skills management and the skills requirements analysis are currently being discussed by academics? What skills will become even more important in the future? Why do we need new thinking patterns when developing and using new skills models and how can these be applied in business? The following chapter gives selected responses to these questions.

What will be important tomorrow – A plea for a new analysis of skills requirements

Heiko Roehl (University of Freiburg / Managing Partner of Kessel & Kessel GmbH)

A changing world

An unrelenting chain of events (the pandemic, digitalisation, migration, and the financial and economic crisis) has turned our world upside down. Everything seems to be in flux. Societal insecurity was at its height during the lockdown at the beginning of 2021, when even walking to the baker's shop seemed like an adventure.

An important dictum of organisational theory has become a bitter reality. For decades, the VUCA era has been proclaimed, an era that would be characterised by an exponential increase in volatility, uncertainty, complexity and ambivalence¹. Back in 1999, the organisational psychologist Karl Weick published his idea of continuous change, which people and organisations needed adequately to address. The key ideas here were the ability to change, improvisation and a general scepticism towards conventional approaches to planning and management in organisations².

If we go back another two decades, it was Henry Mintzberg³ who, at the beginning of the 1990s, invoked the great crisis of strategic planning. In his view, the focus of strategy departments and their tools was too linear, too unprepared for surprises. He demonstrated how strategic planning was repeatedly overtaken by reality and eaten for breakfast by corporate culture.

Moving away from linear thinking

Behind the increasing planning scepticism of organisational theory in the past decades lies the question as to what, in times of disruptive change, can still be ascertained about the future. Organisations need guidance. They depend on having meaningful objectives that direct the actions of their members. Research on corporate foresight provides answers here⁴. To remain open to surprises in the corporate environment (markets, technologies, social values etc.), there is a need for "thinking in alternatives". This approach takes account of potential future developments and regularly incorporates signals from the organisational environment that are relevant to planning or might be so in the future. It is becoming increasingly important to pause on a regular basis, to take a step away from day-to-day business, and to make a comparison with the slice of reality that is relevant to that planning issue. In this approach to learning, planning moves away from precise long-term targets towards discursively negotiated target corridors, which can frequently give rise to collective learning processes. Georg Schreyögg described this move away from the linear planning paradigm back in 1998 as a shift towards collective organisational learning processes⁵.

Since then, the organisation of collective learning processes has been at the heart of modern planning and management approaches that are designed to make people think and act in a manner that is gradual, iterative and involves feedback loops⁶. In conclusion, it can be shown that it depends on three key aspects:

1. Exploration: Openness to disruptive events and signals that are beyond their own search fields
2. Dialogue: Discursive application of as great a variety of perspectives as possible to the relevant issues within the organisation
3. Permission to criticise: Establishment of appropriate governance for constant scrutiny of the underlying assumptions in the process.

The main features of non-linear planning practice such as this are the high level of complexity involved in the process and its ability to continue to connect in a responsive (agile) manner with its surroundings.

1 | See e.g. Kozica/Kaiser 2017, p. 245.

2 | See Weick/Quinn 1999, p. 362ff.

3 | See Mintzberg 1994.

4 | See Bergheim 2020, p. 69ff.

5 | See Schreyögg 1998, p. 35f.

6 | See Senge et al. 1996, p. 133ff; Minx/von Mutius 2013, p. 59f.

The analysis of future skills requirements

The issue of an organisation's future skills requirements takes us back to the dilemma described at the outset. Increasing uncertainty in the social and economic environment of the organisation makes linear planning processes (and simple forecasting models) obsolete. However, if one applies the three aspects described above to the issue of the analysis of the organisation's skills requirements, interesting prospects arise.

First, it should be noted that the skills requirements of an organisation should ideally derive from its overall strategy. The problem in practice is just that a) the strategies of many organisations assume unlimited availability of qualified personnel and managers and that b) strategy work nowadays does not often proceed on the basis of resources (i.e. seldom proceeds to the market on the basis of organisational skills and knowledge) but instead generally considers the provision of services the other way round (as market-driven). The fact that this situation was once different was demonstrated by Prahalad und Hamel⁷. On closer examination, it is also clear that, for organisations, the issue of future and future-proof skills is a distinct and extremely turbulent segment of the corporate environment.

What we can say today with certainty is that organisations of the future will probably need different skills to those required today. Machine learning, artificial intelligence, the replacement of cognitive functions by computers, as well as new forms of work and organisation, lead to only one conclusion, which is that the working world in 20 years' time will be fundamentally different from the one we see today. There are trends that are clear threads running through this prediction. These certainly include machines taking over transactional services and a focus on higher-value cognitive skills such as complex problem-solving. The debate about skills of the future has also led to discussions about which skills are beyond machines and genuinely human, such as creativity, intuition and empathy.

Moving to agile analytics

By applying the three key aspects of modern strategy mentioned above, a skills requirements analysis involving a circular learning process is produced. The basis of this analysis is no longer the derivation of simple strategic assumptions about skills and the implementation of those assumptions in a linear planning process. Rather, it is an iterative process of comparison between changes in the corporate environment, the strategic direction of the organisation and the assessment of future skills requirements.

The skills model arising from this process is designed so that it can be revised: i.e. continually adapted to changing environments. This increases the responsiveness of the model, its sensitivity to context and its ability to deal with surprises. At the heart of this agile analysis of skills is a dialogue between heterogeneous interest groups. Applying different perspectives to the skills issue in the organisation avoids the creation of the short-sighted and one-dimensional models that would be the inevitable outcome of prognoses made by single interest groups.

Finally, a prerequisite for the success of a new approach to skills analysis is having permission to adopt a critical approach to the issue of skills that is embedded in corporate policy and corporate culture. This is not least because analysis of the future skills requirements of an organisation is always a policy issue that requires functioning corporate governance.

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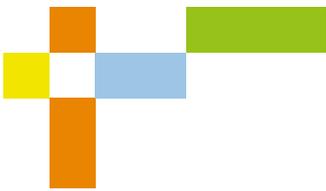
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7 | See Prahalad/Hamel 1990, p. 71ff.



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The working world of the future – what skills will the workforce need?

A discussion between Isabell M. Welpé (holder of the Strategy and Organization Professorship at the Technical University of Munich) and Esther Ostmeier (Senior Researcher at the Bavarian State Institute for Higher Education Research and Planning – IHF)

In the context of macrosocial developments and trends, we are currently seeing major changes in markets for goods and services and therefore also in professional activities and skills requirements. What skills will become even more important in the future?

An important driver of these changes is the progress that has been made in the development of artificial intelligence and in automation processes and the necessary hardware. On the one hand, current studies⁸ suggest that by far the greatest increase in demand is for technological skills. These include IT skills, as well as skills relating to data analysis, engineering and research. On the other hand, cognitive skills such as complex problem solving, creativity and critical thinking are becoming increasingly important. These include excellent reading and writing skills, the ability to process complex information, problem solving, creativity, and skills in handling statistics and quantitative methods, such as those required by doctors, authors, publishers, accountants and research analysts. In contrast, there will probably be less demand for more basic cognitive skills (such as monitoring and checking) and for skills relating to physical and manual activities that smart

sensors and robots can also perform (or will be able to do so in the future). Such skills are very often to be found in jobs in manufacturing and production engineering, in transport and logistics, and in business-related services.

In the same way, it is anticipated that excellent socio-emotional skills, such as those required by business developers, consultants, programmers and emergency responders, will come more to the fore. These include excellent communication and negotiating skills, leadership skills, adaptability, empathy, ethical and cultural awareness, and lifelong learning. Many of these human "soft skills" will not be acquired by machines in the foreseeable future.

We often read and hear that digital skills are relevant for the future. Does that mean that all of us should know about or learn about programming, machine learning and data science?

We believe that most of the workforce would benefit from having a basic understanding of IT infrastructure, programming and how artificial intelligence works. This would enable them to identify opportunities for efficiency improvements in their professional environment (which may or will be necessary for competitive reasons) and to communicate with those who design software to exploit those opportunities. This is also one of the reasons we would welcome it if an interdisciplinary approach to teaching computer and IT skills in schools and universities were adopted in future. Unfortunately, Germany has a lot of catching up to do in this area, as we have been able to see for years

8 | See Dengler/Matthes 2018, p. 5ff.; Frey/Osborne 2017, p. 265ff.; Sousa/Rocha 2019, p. 259ff.; van Laar et al. 2017, p. 582ff.; World Economic Forum 2020, p. 35ff.

from international comparative studies of school pupils such as PISA⁹.

The umbrella term “digital skills” should include all those skills that enable us to operate in and contribute to a working world that is making increasing use of digital technologies and digitally transmitted information. In this environment, the skills required include the ability to assess the quality of information and data and to extract the relevant information from the large volumes available, to have some understanding of data protection, and to use virtual platforms and spaces oneself. As a result of COVID-19, most employees are probably learning a great deal about this aspect of work at the moment. We are discovering which situations require face-to-face contact and which situations can benefit from digital forms of collaboration. So, for many people, “remote collaboration skills and leadership skills” will probably be relevant for the future.

In which areas are the skills relevant to the future still changing?

One area which affects everyone, and which we would therefore like to mention here, is career management and development. Researchers in the field of careers expect that employees today and in the future will need to take on greater responsibility for their own professional careers, that they will be less able to rely on internal company career paths, and that they will increasingly become entrepreneurs on their own account¹⁰. This is because the technical, social and political developments that influence the product and work markets have become and will become less predictable. In the past few years, we have seen how disruptively innovative start-ups have changed whole sectors of the economy (e.g. hotels, taxis). Even our own “sector” – academic study, research and teaching – will change significantly, due among other things to the boom in education technologies and online courses. Such unpredictability and uncertainty mean that a successful future for workers will depend on self-directed career management that is based on personal initiative and foresight, resilience and, as I have already mentioned, lifelong learning.

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9 | An overview of PISA publications can be found at: <https://www.pisa.tum.de/pisa-publikationen/>

10 | See e.g. Hirschi et al. 2020.



3 Approach to skills requirements analysis

A concept for **identifying current and future competence requirements** (within companies) which takes the **rapidity** and **complexity** of changes into account - how might that look? How can companies devise human resources measures from this for successful skills management? Finally, how is it possible to ensure the suitability and practicability of the skills model, not only now but in the long term?

The following approach to skills requirements analysis provides guidance in response to these questions. Thus, companies can **take a more strategic and dynamic approach to their skills management**, ensuring their innovative capacity and competitiveness. In addition to the key points relating to the implementation of the approach, we present practical examples that provide specific insights and hints about critical success factors, as well as documenting the experience companies have gained and the lessons they have learned. From analysis, through design and validation, to the development of skills, the approach sets out all the process steps required in a skills requirements analysis.

Using this business practice guidance will enable companies to

- analyse and define the skills they require now or will require in the future,
- develop a skills model,
- determine the extent to which skills need to be acquired or skills levels raised,
- derive human resources measures,
- review the skills model and the application process, and
- implement various steps in the process using the canvas described.

Conversely, the presentation of structural and content-related aspects of the skills model and analysis of successful implementation of human resources measures (such as recruitment and human resources development) do *not* form part of this approach. The guidance which follows provides support for existing activities in companies and hints and tips for in-house reviews and is primarily directed at larger companies.

The process for a skills requirements analysis consists of a total of five steps:

Step 1 – Analyse the corporate environment

Identify key trends and analyse the impact on skills requirements and skills availability in the company. Then conduct the first plausibility check.

Step 2 – Design the skills model

Develop a preliminary skills model. This involves devising the structure and rules of the skills model, preparing a skills catalogue that lists individual skills, and establishing roles and/or job titles with corresponding skills profiles.

Step 3 – Validate the skills model

Pilot the preliminary skills model in a representative pilot group. Also perform a target/actual comparison to determine the specific development and upskilling/reskilling requirements of the pilot group. On this basis, evaluate the organisational suitability and practicality of the skills model in the pilot environment, fine-tuning it if necessary.

Step 4 – Apply the skills model

Roll out the skills model, with the standardised application of the model to all proposed target groups. Determine the company's upskilling/reskilling requirements based on the target/actual comparison, then devise human resources measures based on the skills model.

Step 5 – Review the skills model

Conduct a critical evaluation of the skills model and its appropriateness, for quality assurance purposes. If necessary, adjust the skills model and identify any strategic issues.

The sequence of the various steps should not be seen as linear. Instead, this approach sets out a **dynamic and flexible process** with fluid transitions. Iterative loops enable steps to be repeated multiple times and/or a return to specific activities as well as continuous adjustment during the process ("adjustment loops"). As a result of **reviews** in the development and application phases of the skills model, changes in the internal and external corporate environment can be taken into consideration, while lessons learned from the application and implementation of the model can be developed into follow-up activities. The **decision tree** (Figure 8) can be used to help adjust and fine-tune the skills model. This offers guidance by asking six key questions about

possible changes that might need to be made to the model. The *first time the skills requirements analysis process is implemented* is a special case, when it is recommended that the five phases are worked through in chronological order.

It is particularly important, given the speed and pace of change in the digital transformation, that there is **continuous critical evaluation** of the skills model and its appropriateness. A re-evaluation of the skills model and of the human resources measures based upon it (providing the opportunity to make any necessary adjustments) would seem reasonable after a period of 12 to 24 months (“the review period/review cycle”).

Requirements for implementing the approach

What **are the prerequisites within a company** for the successful application of the approach? What fundamental assumptions are necessary?

- **Securing a future-oriented learning culture:** An important prerequisite for future-oriented skills management is a corporate and leadership culture that promotes self-directed, work-integrated continuous learning and creates the space and flexibility needed for that type of learning. This requires greater levels of autonomy and individual responsibility on the part of employees. Openness and a positive attitude to digital learning formats within the organisation are of key importance here. This assumes a move away from face-to-face learning towards learning that is focused on results and based on trust. Other elements of this learning culture are a capacity for self-reflection and a constructive approach to dealing with mistakes.
- **Ensuring widespread acceptance and support:** Active involvement and support from (top) management up to Board level increases the relevance of the skills management process and encourages widespread acceptance in the company. Fundamental here is governance that prioritises human resources planning and development and gives those responsible the appropriate mandate to implement the process (ownership).
- **Promoting involvement and cooperation in the process:** The early involvement of all relevant stakeholders and decision-makers in the process of the skills requirements analysis and skills development increases the speed at which the company moves from the requirements analysis to implementation mode. At the same time, it enables concerns to be addressed constructively and differing needs to be considered.

Ongoing dialogue and working together (co-creation) ensure the organisational fit and practicality of the skills model.

- **Adopting a holistic mindset:** Additional synergies can be achieved if silos are broken down and colleagues work together across different departments. It is of key importance here to link existing activities in the company with the skills requirements analysis and skills development and to connect specific steps in the process to the company’s operating business. From the very beginning, a holistic approach should be adopted and embedded in the company and constantly contribute to the company’s success. Integration with the leadership culture, human resources strategy, corporate policy and organisational development of the company and with the values and principles of corporate governance is essential for the success and acceptance of the approach. Market trends should be constantly borne in mind, while external stakeholders in the ecosystem, such as customers and suppliers, should be involved as necessary.
- **Paving the way for a dynamic iterative process:** An iterative process is required to ensure the success of an appropriate needs-based skills requirements analysis. By repeating the same or similar actions (steps 1 to 5) multiple times, it is possible to come closer to a tried and tested, highly effective skills model. A company’s skills requirements analysis should therefore be seen as an ongoing process with no fixed endpoint. For companies, the commitment of all those involved to a dynamic, adaptive approach to the development and application of the model plays a key role in this regard.
- **Focusing on technical application and implementation:** The use of digital tools means that the response speed required for agile and flexible skills management can be achieved. Transparency about the individual and corporate skills available and required can make it easier for companies to identify human resources measures and enable them to standardise employee appraisals and personal development interviews to the extent that is required in some areas.

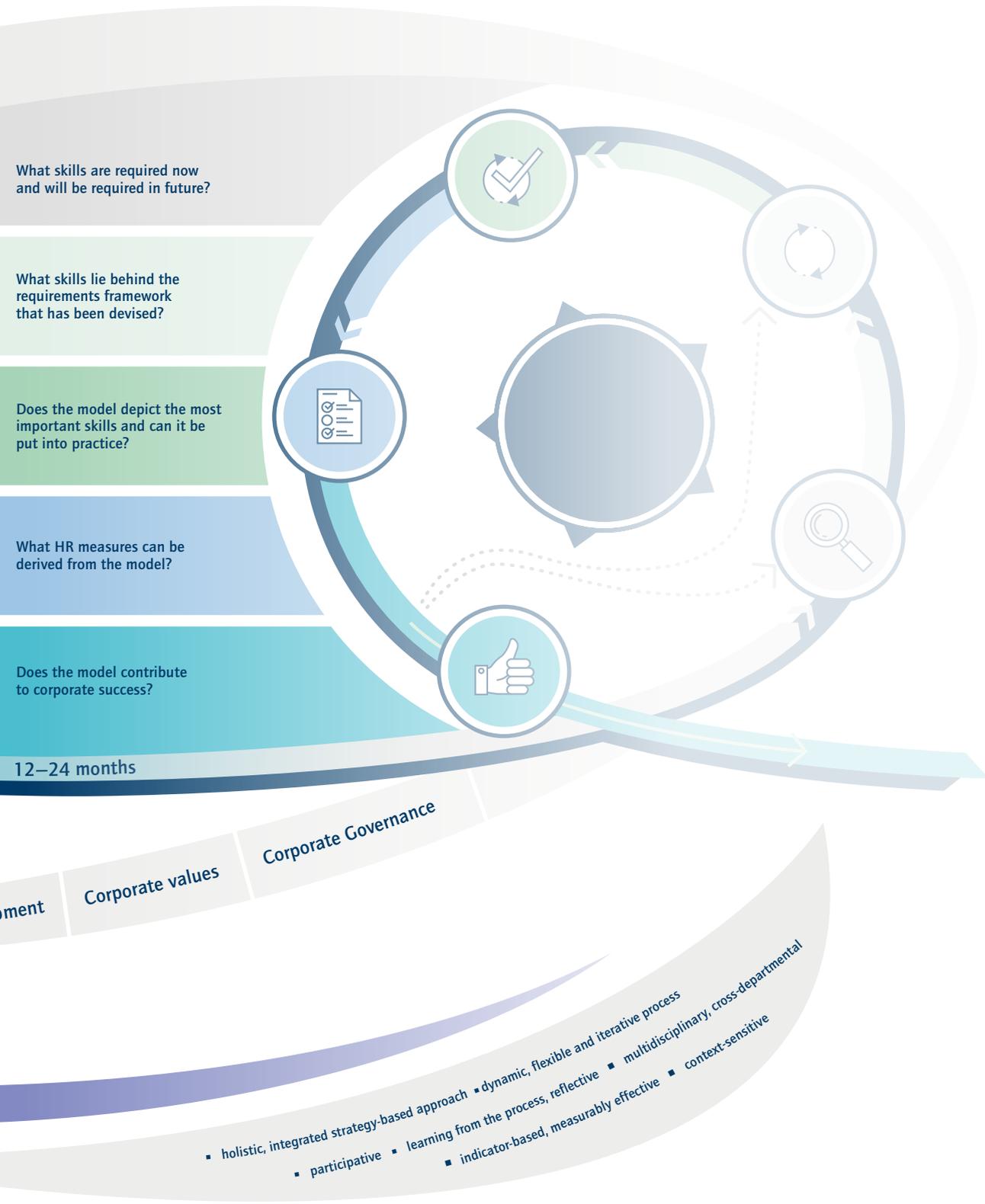
Responsibilities for implementing the approach

Who initiates and continues to support the process of the skills requirements analysis? Who ensures the successful application and implementation of the skills model?

Generally, the approach should be seen as a **multi-stakeholder process** and be embedded in the whole company. Systematic support of the approach to skills management analysis should



Figure 1: Approach to the skills requirements analysis (source: own presentation)



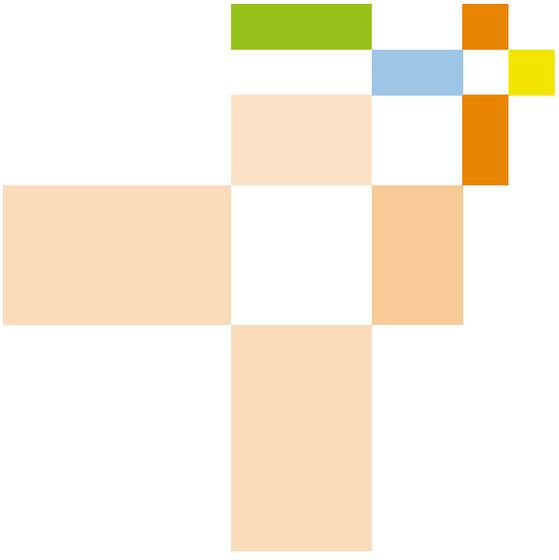


be sought at all levels of management, starting with the Board. A critical success factor is cooperation between human resources management and other departments, from the very beginning, on the joint development and application of the approach. The concept of “shared ownership” requires **cross-functional collaboration** between departments. Rather than applying individual solutions, it is important to adopt a comprehensive, integrated approach. Process drivers include strategic HR development and planning. If available, a project team responsible for this process acts as an interface with Board members. The individual

departments are usually responsible for the operational implementation of the approach.

Application of the approach

Each of the five steps in the process is underpinned by practical hints and tips (canvas). To improve understanding and clarity, Figure 2 provides an example of a canvas, (based on Step 1 – Analyse the corporate environment), explaining its structure and how to interpret it:



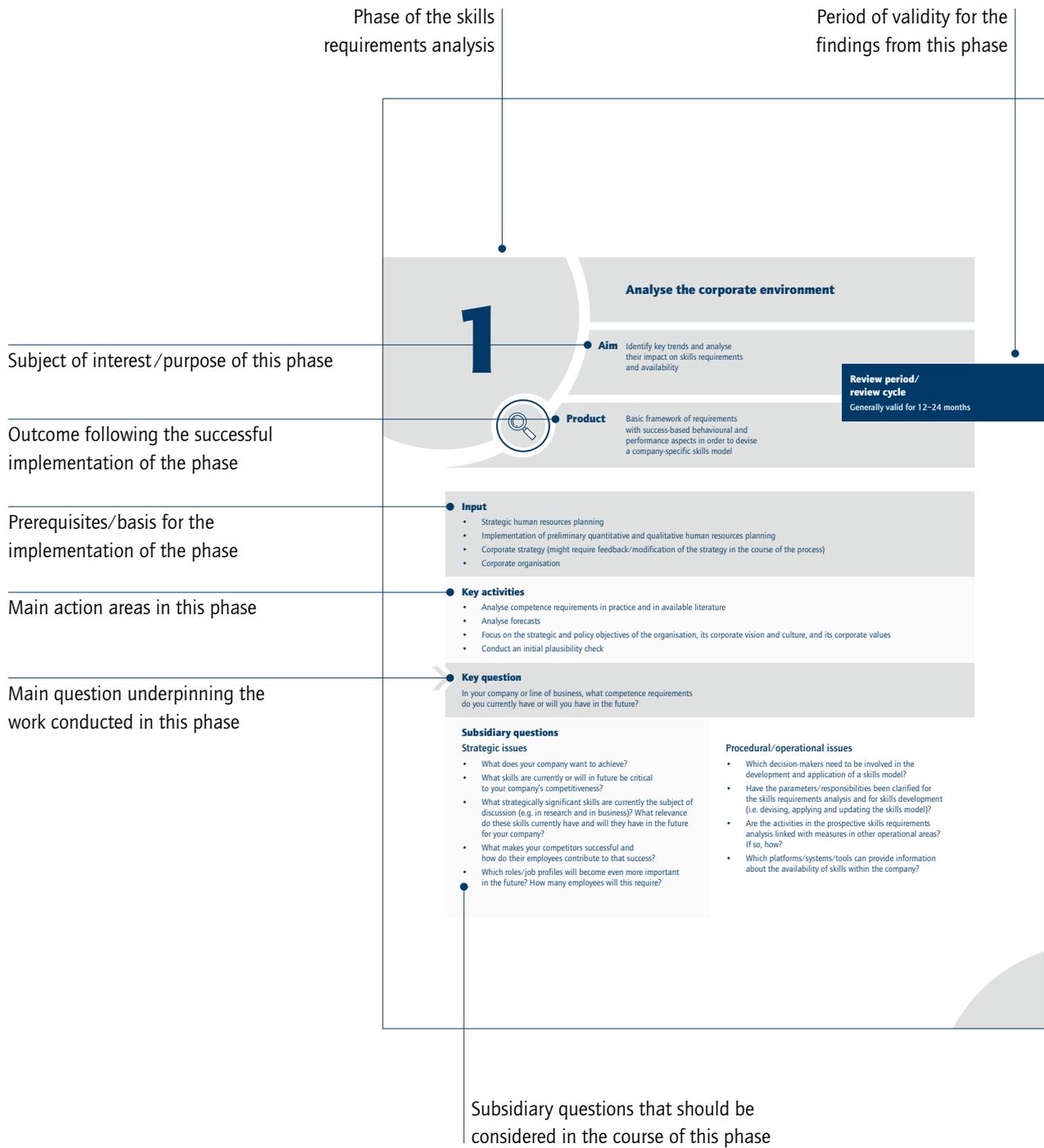
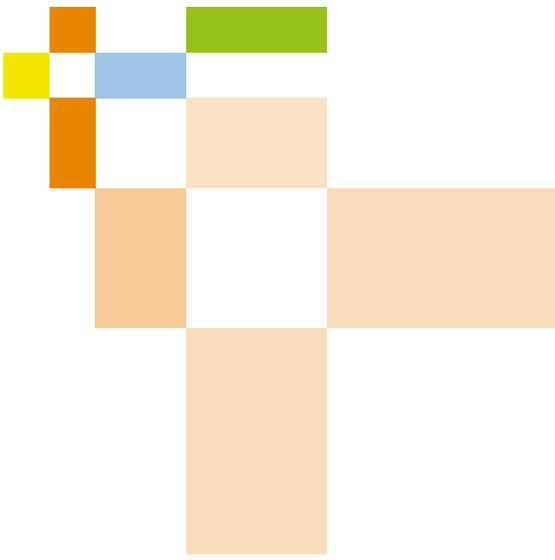


Figure 2: Application of the approach (source: own presentation)



Tools to help answer the key question

Parties that should be involved in this phase of the skills requirements analysis



3.1 Analyse the corporate environment

To establish a basic framework of requirements with success-based behavioural and performance aspects in order to devise a company-specific skills model, it is necessary to **identify key trends** and to **analyse their impact on skills requirements and availability**. The starting point is the question about current and future competence requirements.

To answer this key question, existing **skills models** relating to companies within and outside the specific industry sector can be used and analyses conducted of **requirements in business practice**. By screening political developments and externally monitoring new technology fields, companies can ensure that they always incorporate **economic policy developments** in their skills requirements analysis. The analysis of the corporate environment should also consider the results from **skills research**. What job profiles and fields of work will become even more important in the future? What (key) skills are academics discussing in this context? How relevant are they to the company now and how relevant will they be in the future? These questions can only be answered in a meaningful way if companies bring their own strategy and human resources development into line with expected technological trends and changes in their environment.

The prerequisite and **basis for a targeted analysis of the corporate environment** ("Input for Phase 1") is strategic human resources planning. In addition to (preliminary) planning relating to quantitative and qualitative employee capacity within the framework of the company's strategic plan, there should be clarity within the company about its strategic direction. It should be posing itself the question as to which business segments are set to grow in the future, which will remain the same size as they are now, and which are likely to be reduced in size or relinquished. As corporate strategy is closely linked with business skills management, it is possible that modifications might need to be made to the corporate strategy as a result of conducting the skills requirements analysis. Moreover, during this first phase, consideration should also be given to corporate organisation, the way in which the company is structured in the medium to long term and the responsibilities associated with this.

The analysis of the corporate environment concludes with an **initial preliminary plausibility check** by the stakeholders

responsible, such as operational and strategic HR management, organisational development, specialist departments, and executive management. In this way, the findings from this phase are reviewed to ascertain whether they seem plausible for the company. However, obvious inconsistencies can be identified. It is also possible to have initial thoughts about prospective human resources measures. The aim of the plausibility check is to take a critical look at the skills requirements identified and, if necessary, to modify the starting position (i.e. the basic framework of requirements with success-based behavioural and performance aspects).

Generally, a number of factors within the company have an impact on which **human and financial resources** are required in each step of the process:

- Existing database: Does the company already monitor current and future skills on a regular basis?
- Maturity of the organisation: Is there a standardised strategy process? To what extent has the market environment been considered to date? What experience does the company have with the process of skills requirements analysis and human resources planning?
- Stakeholder situation: Which decision-makers need to be involved in the development and application of a skills model? Are the responsibilities for the skills requirements analysis and for skills development clear?
- Complexity of the organisation: What coordination loops must be included in the various processes? Who needs to be involved in the discussions and decisions?
- Level of digitalisation of HR: What information and communication technologies and related forms of collaborative working are used? How much understanding is there within the company of roles and leadership behaviour?
- Infrastructure in the company: Which platforms/systems/tools can be used for the process? Does the existing digital infrastructure in the company support interdepartmental cooperation and create transparency about individual skills available as well as potential development needs?

The findings from this phase are generally valid for a period of 12 to 24 months. The **review period/review cycle** depends on the size and resource situation of the organisation, its past experience of such processes, the intensity of the implementation and application of specific activities, and the commitment shown by management.



1



Analyse the corporate environment

Aim Identify key trends and analyse their impact on skills requirements and availability

Product Basic framework of requirements with success-based behavioural and performance aspects in order to devise a company-specific skills model

Review period/ review cycle

Generally valid for 12–24 months

Input

- Strategic human resources planning
- Implementation of preliminary quantitative and qualitative human resources planning
- Corporate strategy (might require feedback/modification of the strategy in the course of the process)
- Corporate organisation

Key activities

- Analyse competence requirements in practice and in available literature
- Analyse forecasts
- Focus on the strategic and policy objectives of the organisation, its corporate vision and culture, and its corporate values
- Conduct an initial plausibility check

Key question

In your company or line of business, what competence requirements do you currently have or will you have in the future?

Subsidiary questions

Strategic issues

- What does your company want to achieve?
- What skills are currently or will in future be critical to your company's competitiveness?
- What strategically significant skills are currently the subject of discussion (e.g. in research and in business)? What relevance do these skills currently have and will they have in the future for your company?
- What makes your competitors successful and how do their employees contribute to that success?
- Which roles/job profiles will become even more important in the future? How many employees will this require?

Procedural/operational issues

- Which decision-makers need to be involved in the development and application of a skills model?
- Have the parameters/responsibilities been clarified for the skills requirements analysis and for skills development (i.e. devising, applying and updating the skills model)?
- Are the activities in the prospective skills requirements analysis linked with measures in other operational areas? If so, how?
- Which platforms/systems/tools can provide information about the availability of skills within the company?

Figure 3: Phase 1 of the skills requirements analysis (source: own presentation)

Initial plausibility check:

Are the skills required considered to be so essential to your corporate success that they need to be available within the company itself, with temporary solutions (such as temporary employment) not appearing to be expedient?

Which of the skills required are available in the labour market or in your company?
Are workers available in the required numbers in the labour market or in your company?

Can the skills that are needed be acquired through upskilling/reskilling and/or recruitment?
Are financial resources available for this?

Are there trends in the labour market that need to be considered?

Tools/Procedures**external**

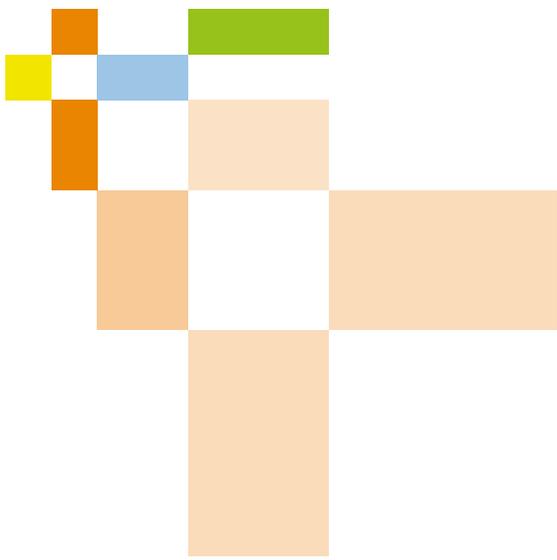
- ▶ Analysis of existing skills models/Review of literature
- ▶ Conferences
- ▶ External networks of experts/Interviews with experts
- ▶ Screening of political developments
- ▶ External monitoring of new technology fields
- ▶ Benchmarks/best practice
- ▶ Screening of CVs
- ▶ Analysis of job adverts/work procedures
- ▶ Analysis of process descriptions

internal

- ▶ Internal/external networks of experts/Interviews with experts
- ▶ Benchmarks/best practice
- ▶ Screening of CVs
- ▶ Analysis of job adverts/work procedures
- ▶ Analysis of process descriptions
- ▶ Analysis of the learning analytics of in-house learning platforms
- ▶ Scenario development/simulation methods for review

Potential stakeholders/decision-makers

- Management Board/Executive Board
- Operational and strategic HR management
- Organisational development
- Specialist departments
- Training personnel
- Senior managers
- Business and social partners
- Equal opportunities officers
- Innovation management



3.2 Design the skills model

To develop a skills model, the question that needs to be answered is what **skills** lie behind the basic framework of requirements defined earlier. What precisely do the findings from Phase 1 mean for the particular company? What skills will continue to be required in the future? For which skills will there be less demand or no demand at all (target skills)? Depending on the target group that the model is to address in the future and on any specific regional circumstances, the next stage is the development of a **structure and a set of rules for the skills model**.

This intuitive and primarily experiential approach is very much based on business practice. It is not external factors that determine the structure of the skills model. Instead, the company makes its own decisions about the design and complexity of the model. Such decisions include the number of skills to be considered, the level of detail required and the weighting of the individual skills. Designing an appropriate skills model has **no generic, universally applicable, one-size-fits-all solution**.

Initially, the behavioural and performance aspects that have been determined need to be reduced, condensed, combined into logical groups and then **translated into skills**. In private meetings, human resources experts and experts from specialist departments come together with other decision-makers to establish those skills that underpin the various specifications of requirements. Similar skills profiles are amalgamated, while redundant ones are deleted. The skills identified are described and summarised as target skills in a **skills catalogue**. This catalogue provides the company with common terminology that can be used, for example, in employee selection, human resources development and succession planning.

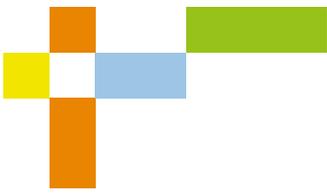
The next step is the **formulation of behaviour anchors** for individual skills that are specific to the various target groups and levels. Thus the skills model can be used in business practice and can provide a basis for other human resources measures. Various behaviour anchors can be used to give descriptions of the behaviours that are relevant and a critical success factor for that

particular skill. Team skills, for example, can be operationalised using the following three behaviour anchors: "Integrates easily into a group", "Can work together with people with different attitudes and different ways of working" and "Is confident and unassuming, is able to step back". The descriptions given should always consider the areas of responsibility involved and the specific hierarchical and functional level. This is the only way skills can be recorded accurately and evolve.

The prerequisites and **basis of an effective design for a skills model** ("Input for Phase 2") are transparency and clarity about the organisation's leadership culture and its corporate values. Only if the skills model is based on the values and attitudes within the company will it be appropriate for specific individual and business requirements. In addition, operational and strategic human resources managers should review any skills model already being used in the company as regards its structure and the requirements identified in Phase 1. As the literature distinguishes between various types of skills model and the structure and format of these skills models can sometimes vary widely, the design of the skills model requires prior agreement among decision-makers about a framework that is suitable for the company. Moreover, in order to arrive at definitions of roles and job titles with corresponding skills profiles, there is a need for clarity about the system currently in place in the company for the allocation and organisation of roles.

Collaboration between human resources personnel and other stakeholders such as organisational development as well as social and business partners is imperative for devising the skills model, so that all the various business requirements can be adequately represented in the model. In addition, personnel from specialist departments and senior managers should be involved, as they have insight into business practice and will be working with the skills model on an ongoing basis. This is also a way to ensure a common understanding of the importance of specific skills.

The findings from this phase are generally valid for a period of 12 to 24 months..



2



Design the skills model

Aim Develop a preliminary skills model

Product Preliminary skills model

**Review period/
review cycle**

Generally valid for 12–24 months

Input

- Corporate values
- Clear understanding of leadership
- Review of the current skills model with regard to its structure (specialist/transferable skills)
- Transparency about the current allocation/organisation of roles in the company

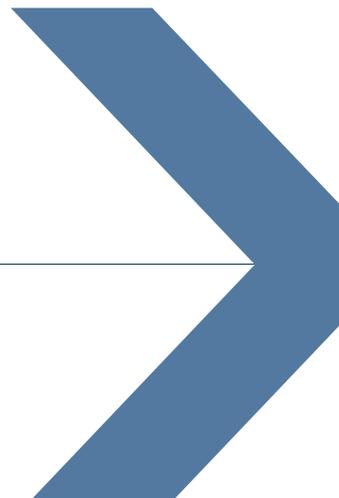
Key activities

- Devise the structure of the skills model and the set of rules that applies to it
- Establish a skills catalogue which sets out individual skills, with descriptions of those skills
- Create roles/job titles with corresponding skills profiles

Key question

What skills lie behind the defined basic framework of requirements?

Figure 4: Phase 2 of the skills requirements analysis (source: own presentation)



Subsidiary questions

Strategic issues

- Which target groups should the skills model address in the future? Which target groups have the greatest need for action? Do specific regional circumstances apply?
- What exactly do the conclusions from Phase 1 mean for your company? What skills will continue to be required in the future? For which skills will there be less demand or no demand at all? (Target skills)
- When is it necessary/appropriate, from the company's perspective, to inform other decision-makers about the change processes that are planned?

Tools/Procedures

internal

- ▶ Private meetings to discuss skills
- ▶ Translation of the descriptions of the requirements into skills
- ▶ User stories to describe skills from the employees' perspective
- ▶ Amalgamation of similar skills profiles and deletion of redundant ones
- ▶ Condensing of skills into skills profiles (clusters)
- ▶ Definition of behaviour anchors and skills levels
- ▶ Selective, clear-cut definition and operationalisation of skills

Procedural/operational issues

- How should the skills model generally be designed? What does a workable/pragmatic framework look like? How can the skills requirements identified be formulated so that they are specific to the company? Is there a need for differentiation specific to particular target groups?
- What number of skills is required? How much detail is required? What weighting should be given to individual skills?
- Are there skills that are similar and can be aggregated?
- What behaviour anchors can be used to operationalise the skills? What behaviours are critical to the company's success?
- How can the skills requirements identified be allocated to (existing) roles and/or job profiles?
- How will it be possible to update/modify the skills requirements for roles/job profiles?

Potential stakeholders/decision-makers

- Operational and strategic HR management
- Organisational development/Change management
- Specialist departments
- Senior managers
- Business and social partners



3.3 Validate the skills model

The aims of the third phase are a validated skills model in the context of a pilot group and the establishment of defined processes and responsibilities for its application. For this purpose, the preliminary skills model is reviewed for its organisational fit and for its **practicality in the company**. It must also be ensured that **customised human resources measures can be derived** from using the model.

In terms of human and technical resources in the company, and especially in terms of financial resources, there should always be critical scrutiny of whether the cost of developing individual skills is in proportion to the foreseeable results. Thought should be given to whether the company's future skills requirements can be met by its existing workforce. This would have consequences for recruitment and human resources development. A feasible option might also be the use of temporary employees to cover short periods.

In the spirit of an iterative and flexible approach, an assessment of the issues described above initially takes place in a **pilot environment** within the company. Based on the findings, the model can be **fine-tuned** (including a target/actual comparison).

As the **pilot** also serves as a test run for the use of the skills model throughout the company, the composition of the pilot group is particularly important. The participants should be as representative a cross-section of the company as possible and should be able to identify potential weaknesses and/or necessary modifications of the skills model. Generally, the pilot area selected should neither be too small nor too large to ensure the workability and agility of the study. The ideal scenario would be a **heterogeneous organisational unit**, some of whose members had already been involved in the steps taken so far. This serves to enhance both the strategic and operational validation of the model. The review process can be divided into two stages. From the **company perspective**, the model is reviewed for its validity to ensure that it is a precise, coherent, workable and useful description of the relevant skills. The **user level**, on the other hand, applies critical internal dialogue to the preliminary skills model to focus on the applicability of the target-setting process and on the situation analysis of previously identified skills. Thus it can be ensured that the skills model not only meets the needs of practice but is also suitable for use in practice.

First, all the participants in the pilot study need to be trained in using the model. This should not merely consist of a purely procedural operation but should include detailed communication of the assessment criteria and key questions. The pilot process is supported by an overview and the definition of validation criteria from the point of view of all key stakeholders.

Based on the roles/skills profiles assigned to employees, the **pilot study** is conducted of the **target-setting process**. This demonstrates the extent to which the individual skills aspects and descriptions are appropriate, representative and relevant for the performance of a specific activity and/or occupation. At the same time, it enables the identification of any items or dimensions missing that are characteristic of individual skills. In qualitative terms, the skills descriptions should fully reflect the skills defined.

Another key activity is the **pilot study of the process of the situation analysis**. Based on self-assessment and external assessment of the recording of skills in the pilot group, an overview is obtained of the skills present in the current workforce (in the pilot environment). By recording the actual situation and comparing it with the level of skills required (the target profile), conclusions can be drawn about the practicability and feasibility of the process. The findings from the target/actual comparison also enable **individual development needs and upskilling/reskilling needs to be determined** in the pilot group. They support the review and, where appropriate, the modification of existing HR development and recruitment strategies, including the related HR tools.

A **culture of trust in the company** is crucial to ensure open, factual self-assessment and external assessment of the workforce. Close and frank dialogue and various forms of communication between senior managers, organisational development and the pilot group can contribute to strengthening this culture of trust. The results of employee surveys can also be used to enhance the corporate culture.

Existing works agreements should be reviewed in this context and, where appropriate, modified, based on the findings of the pilot scheme. The **constant involvement of social partners** is also necessary in this phase. Joint dialogue enables the necessary modifications to be made with participation from those involved. At the same time, it is desirable to clarify how the process will be monitored, how success will be measured and how the efficacy of the skills model will be recorded.

Following on from this, plans can be made for the implementation and standardised use of the skills model for other target groups. As the skills model is closely linked with the processes of human resources management, existing IT systems should be reviewed to ensure their suitability. **Appropriate IT solutions** need to be found and in some cases new systems will be required. Close involvement with the IT department is desirable.

The findings from this phase, the validated skills model within the framework of the pilot group, and the defined processes and responsibilities for its application are generally valid for a period of 12 to 24 months.



3



Validate the skills model

Aim Evaluate the organisational fit and practicality of the skills model in the pilot environment and make fine-tuning adjustments (including a target/actual comparison)

Product Validated skills model within the framework of a pilot group and defined processes and responsibilities for the application of the model

Review period/ review cycle

Generally valid for 12–24 months

Input

- Preliminary skills model
- Overview/definition of validation criteria from the point of view of all key stakeholders
- Selection of a suitable pilot group

Key activities

- Pilot study of the preliminary skills model for a representative pilot group (target-setting, target/actual comparison, derivation of human resources measures)
- Enabling the relevant process partners to use the model
- Reviewing the model for its validity to ensure that it is a precise, coherent, workable and useful description of the relevant skills
- Assessing the extent to which the skills aspects and descriptions are representative/relevant
- Critical internal dialogue applied to the preliminary skills model
- Modification/improvement of the skills model
- Description/pilot study of the target-setting process
- Description/pilot study of the situation analysis process (e.g. self-assessment and external assessment of the recording of skills in the pilot group)
- Target/actual comparison to determine individual development needs and upskilling/reskilling needs within the pilot group
- Reviewing and, if appropriate, modifying HR development and recruitment strategies, including the related HR tools
- Planning the rollout to other target groups, including planning any IT solutions that will be required

Key questions

- Is the model practical and does it reflect the skills that will be critical to future success?
- Can HR measures be derived from the application of the model?

Figure 5: Phase 3 of the skills requirements analysis (source: own presentation)

Subsidiary questions

Strategic issues

- How do experts, decision-makers and members of the pilot group evaluate the organisational fit and practicality of the preliminary skills model?
- What were the findings of the pilot study? Does the skills model require optimisation or radical modification? Is there a need to make any changes to the company's HR development or recruitment strategies?
- To what extent are the individual skills aspects and descriptions representative and relevant for the performance of a specific activity and/or occupation? Are any items or dimensions missing that are characteristic of specific skills?
- In qualitative terms, to what extent do the skills descriptions fully reflect the skills defined?
- How can you create the necessary culture of trust in your company to enable open/factual (self-) assessment of the workforce?
- How will the process be monitored and how will success be measured? How will the efficacy of the use of the skills model be recorded?

Procedural/operational issues

- What procedures should your company adopt for recording skills?
- How are roles / skills profiles allocated to employees?
- How is the target/actual comparison of roles made? How can employees / senior managers become actively involved in the process?
- How are the workability, acceptance and usefulness of the model assessed?
- Is there a need for any adjustments to the model?
- How should the process of adapting the content for new job profiles or updating the corresponding skills profiles be designed?
- Where appropriate, what changes need to be made to HR development and recruitment processes and tools when the model is used in practice?
- Do any changes need to be made to existing works agreements?
- How can the use of the model be implemented pragmatically? How will the continuing rollout of the model proceed in the company?

Tools/Procedures to evaluate the model

internal

- ▶ Training on the application of the model
- ▶ Conversations/workshops with focus groups
- ▶ Think tanks
- ▶ Conversations with experts/Interviews with employees
- ▶ Inclusion of results from employee surveys
- ▶ Development of future scenarios and personae
- ▶ Rating procedures
- ▶ Observations of practice
- ▶ Use of the model in its application context (pilot study)

Potential stakeholders

- Operational and strategic HR management
- Specialist departments
- IT department
- Senior managers
- Employees
- Business and social partners
- Organisational development
- Training department (L&D)

Tools/procedures for the target/actual comparison of skills

internal

- ▶ Skills diagnostics
- ▶ 180-degree and, where appropriate, 360-degree feedback
- ▶ Skills analysis questionnaires
- ▶ HR analytics tools/databases
- ▶ (Online) assessment
- ▶ Conversations with employees/interviews
- ▶ Competence mapping/skills matrix



3.4 Apply the skills model

The rollout and **standardised use of the skills model** for all the planned target groups creates transparency about current and future skills requirements at both the company level and the individual level. Human resources measures can then be derived from the model.

To apply the model, **all process partners require training** in its use. They need to be able to make purposeful use of the skills management instruments, processes and tools. Those involved in the pilot phase (e.g. senior managers, operational human resources management, business and social partners) can act here as in-house disseminators of knowledge. For the successful application of the skills model, a crucial factor is a **common understanding** among all the process participants of the aim and the application of the skills model. This is important not only for the actual use of the model, but also primarily to make it clear that the aim of the model is to secure the skills that are critical to the success of the organisational unit under consideration and each individual. Crucial for the acceptance and efficacy of the model are not only management **support**, but also cross-functional **collaboration** between different areas. A clear definition of processes, rights and responsibilities is critical for success.

In addition to this, the **aims** of the new process should be communicated throughout the company, together with an explanation of the need for and usefulness of this approach and how exactly it works. Devising and implementing the skills model is a process of change that requires time. **Commitment** should be obtained from both senior managers and employees, while fears and misgivings need to be assuaged. A corporate culture based on openness and trust provides the necessary framework. Constant communication about changes in the company's skills management and HR management, as well as transparency about the lessons learned from the pilot phase, will create acceptance and trust in the new model. Involvement on the part of the employer and employees at an early stage in the information and consultation process and in the planning and development of future-oriented recruitment and HR development strategies makes it possible to handle concerns constructively and to take different needs into consideration.

Top management (and other managers) and the specialist departments need to make it clear that every employee will be supported so that they understand the skills they currently have and make the best choices about their personal professional development. This ensures the individual's capacity to work and employability

over the long term, also across company boundaries. It must be clear that the model is not designed to reveal weaknesses or a lack of knowledge, but to promote the personal development of the employee and the implementation of the company's strategy, thereby helping to define clear aims. In this way, **tailored human resources measures** can be devised and implemented.

Using the skills model, the skills required for a role (the target job profile) can be compared with the skills available (the actual job profile) and potential discrepancies between the two can be identified. Then, in the discussion between the manager and the employee, a development plan can be produced that is specific to the employee. Employees also have personal responsibility for their professional development both within and outside the company. They can and should be active designers and curators of their own learning biography. Managers are required to provide **support and guidance for their employees' learning**.

The target/actual comparison should also be assessed with regard to anticipated future variations, such as those relating to foreseeable employee retirements and forecast employee turnover. This means that shortages of qualifications that are key to the implementation of the company's strategy can be anticipated at an early stage and opportunities can be identified so that the expertise and skills required can be built up and modified accordingly.

The development of an **indicator system** for the efficacy and application of HR instruments provides a basis for continuous critical scrutiny and potential reorganisation of current practice within the company (instruments/processes/tools). Strategic and operational HR development planning should be undertaken in conjunction with potential modifications to job profiles and profiles of requirements as well as apprenticeships and their content.

Modifications to human resources management may relate not only to HR diagnostics but also to the focus and selection of the form and content of training. Collaboration with external education providers is also possible here. Likewise, accessible external services such as microdegrees and nanodegrees can be used. The skills required can thus be built up in a sustainable manner, so that the application of the model in the target groups proceeds smoothly.

The findings from this phase are generally valid for a period of 12 to 24 months.



4



Apply the skills model

Aim Implement the skills model

Product Transparent skills requirements and human resources measures

**Review period/
review cycle**

Generally valid for 12–24 months

Input

- Validated skills model
- Human resources development planning
- Instruments/processes/tools to apply the model

Key activities

- Rollout and standardised use of the skills model for all proposed target groups
- Training for all process partners (including senior managers and employees) in the application of the model
- Target/actual comparison to determine business training requirements
- Deriving human resources measures on the basis of the skills model; critical scrutiny and, where appropriate, reorganisation of current practice within the company (instruments/processes/tools) on the basis of the skills model
- Company-wide communication

Key question

What human resources measures can be derived for the target groups from the implementation and application of the model?

Figure 6: Phase 4 of the skills requirements analysis (source: own presentation)

Subsidiary questions

Strategic issues

- Is there a divergence between the target picture and the actual picture for the target groups? What future divergences can be expected: e.g. as a result of foreseeable employee retirement, employee turnover or similar (target/actual comparison)?
- Where are there shortages in terms of key qualifications? Which skills are not available or insufficiently available for the implementation of the strategy?
- How is the action required evaluated?

Procedural/operational issues

- When the model is applied, might there be a need for adjustments to the job profiles and/or skills profiles already defined in the model?
- What opportunities are there for you to build up and modify expertise and skills accordingly? What are the consequences of the skills model for recruitment and HR development?
- Is the cost of developing individual skills in proportion to the foreseeable results?
- Can the company's future skills requirements can be met by its existing workforce?
- What HR measures are particularly important from the point of view of the works council? Which modifications to the measures are subject to co-determination?
- What is the best way to communicate information about the skills model openly across the company?
- What training content needs to be developed in what form, so that the application of the model in the target groups proceeds smoothly in the long term?

Tools/Procedures

internal

- ▶ Reorganisation of qualitative HR planning
- ▶ Devising employee-specific development plans (building up and modifying skills)
- ▶ Where appropriate, adjusting job profiles and profiles of requirements
- ▶ Where appropriate, modifying apprenticeships and their content
- ▶ Devising an indicator system for the efficacy and application of HR instruments
- ▶ Adjusting HR diagnostics
- ▶ Linking with HR development planning (strategic and operational)
- ▶ Communicative disclosure and raising of awareness by management
- ▶ Developing training

Potential stakeholders

- Operational and strategic HR management
- Organisational development
- Specialist departments
- Senior managers
- Employees
- Business and social partners
- Internal communications
- External education partners
- Training department (L&D)



3.5 Review the skills model

Once the skills model has been introduced, the processes and the model itself must be evaluated on an ongoing basis and modified if necessary. It is only under constant critical scrutiny that a **qualitatively effective skills model that has been field-tested** can be established. Is the skills model suitable in terms of content and processes for business practice? Does it reflect the current internal and external corporate environment? What lessons have been learned from its implementation?

A key activity during this phase is **quality assurance** and, alongside, taking time to **reflect on the practicability, current relevance and usefulness** of the model. A valuable contribution can be made here by tools used for the systematic **evaluation of processes and results**: i.e. the review of processes for the purposes of process monitoring (process evaluation) and reflecting on the results and effects of the introduction of the model (evaluation of results). Critical dialogue about the skills model that has been field-tested, employee feedback and a lessons learned workshop with all those involved in the process enable the challenges arising from the application and implementation of the model to be identified and experience to be gained. **Lessons learned** from the implementation of the skills model can be recorded. This also offers the possibility of jointly establishing any specific action required and any additional requirements relating to the model and its implementation. Last but not least, listening to and incorporating the user perspective encourages acceptance of the model.

In the course of the evaluation of results, it is always important to consider the existing corporate strategy, data collected within the company (including the results of employee surveys

and monitoring of continuing education), and feedback from the process partners involved. A **cost-benefit analysis** helps with the decision as to whether the cost of developing particular skills is in proportion to the anticipated results. There is a need to evaluate not only how to build up and modify skills through training, but also the cost-effectiveness and efficiency of recruitment measures. Continuous monitoring of professional development can give an insight into whether and to what extent the required skills and qualifications could be built up. It can also help to ascertain to what extent the desired transparency about skills requirements has been achieved and appropriate human resources measures identified as a result (**before-and-after analysis of objectives**).

External factors such as the market environment (including sales markets, the economic, socio-political and legal environment, and technical developments) have a significant influence on the process of the skills requirements analysis. The medium-term and long-term development of these factors and also their direct and indirect impact on the company and its skills management should be investigated and, if necessary, modifications should be made to the design and application of the model. The analysis can be conducted in a similar way to the analysis of future forecasts described in Step 1.

At the same time, the process of the skills requirements analysis is linked to corporate strategy issues. The findings from the application of the skills model can therefore also have an impact on overall strategic corporate goals and strategic human resources planning.

The findings from this phase are generally valid for a period of 12 to 24 months.



5



Review the skills model

Aim Critical assessment of the skills model and of its practicability

Product Qualitatively effective skills model that has been field-tested

Review period/ review cycle

Generally valid for 12–24 months

Input

- Corporate strategy
- Data collected in the company (including the results of employee surveys, monitoring of continuing education)
- Feedback from the process partners involved

Key activities

- Quality assurance
- Reflecting on the practicability, current relevance and usefulness of the model
- Establishing the lessons learned from the application/implementation of the model
- Modifying/fine-tuning the skills model where appropriate
(► Use the decision tree to optimise the model)
- Deriving/modifying corporate strategy issues where appropriate

Key question

Is the skills model suitable in terms of content and processes for business practice and does it reflect the current internal and external corporate environment?

Figure 7: Phase 5 of the skills requirements analysis (source: own presentation)

Subsidiary questions

Strategic issues

- Have there been any internal and/or external changes that require radical modification of the skills model?
 - ▶ What internal/external factors have a significant influence on the process of the skills requirements analysis?
 - ▶ How might these factors develop in the medium and long term? What would that mean for the skills model and its application?
- What lessons have been learned from the implementation of the model?
- How relevant is the information gained from the application of the model? Is it possible to derive appropriate HR measures from that information?
- What are the positive/negative effects of the application of the skills model on those concerned? How do employees and senior managers rate the model and its implementation?
- What were the challenges arising from the application/implementation of the model?
- Have the findings had an impact on overall strategic corporate goals? Is there a need to derive/modify any corporate strategy issues?
- Is there a need to modify strategic human resources planning?

Tools/Procedures

internal

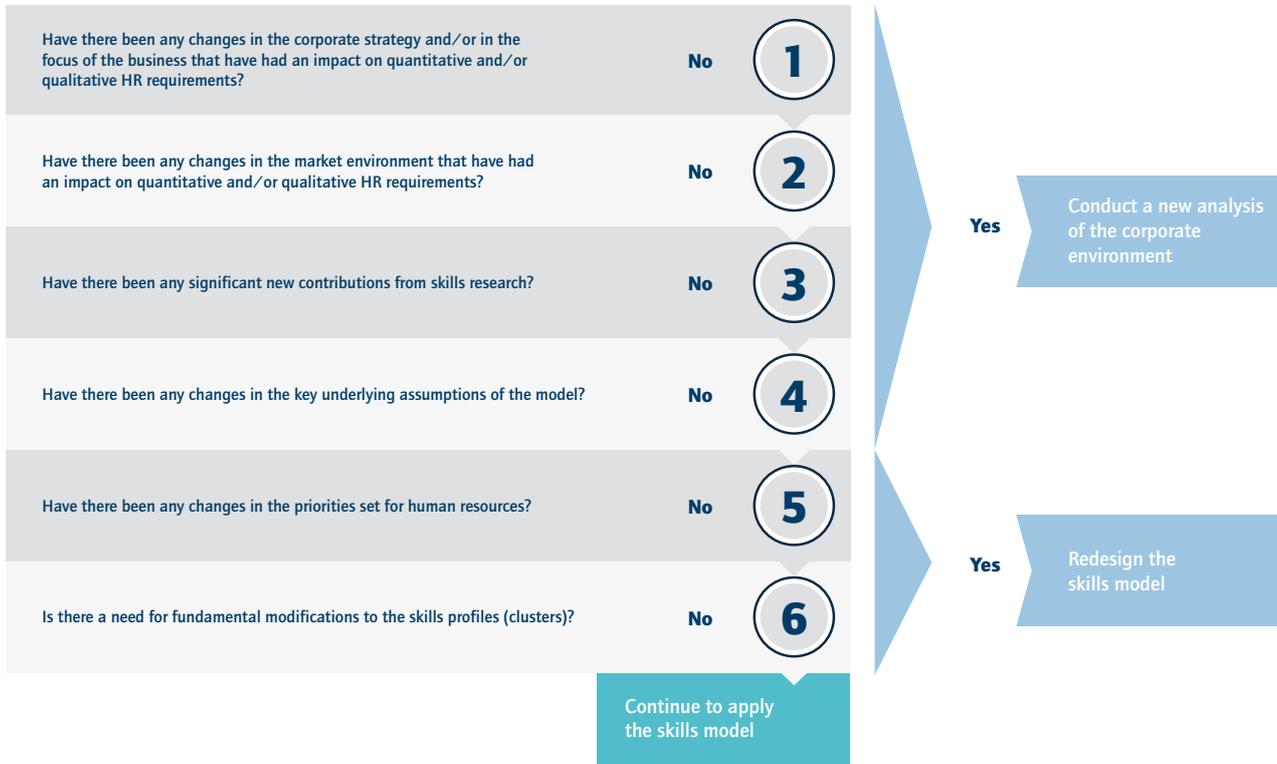
- ▶ Critical dialogue about the field-tested skills model
- ▶ Employee feedback
- ▶ Lessons learned workshop with all those involved in the process
- ▶ Systematic evaluation of processes and results
- ▶ Analysis of the results of employee surveys
- ▶ Before-and-after analysis of objectives
- ▶ Monitoring of continuing education
- ▶ Cost-benefit analysis

Procedural/operational issues

- How well is the application of the model working?
- Could the expertise required or skills levels (based on the model) be raised? Could the skills be acquired through personal development programmes in the company?
- Was it possible to acquire the professional skills that were not present in the existing workforce or could not be obtained by additional training of the existing workforce by recruiting new employees?
- Could the requirements of operational HR management be implemented?
- Are the stakeholders (still) in favour of the whole process of the skills requirements analysis?
- Might the monitoring and measurement of success of the model need to be modified? If so, how? Was it possible to achieve the desired transparency about skills requirements? Can HR measures be devised accordingly?

Potential stakeholders

- Management Board/Executive Board
- Operational and strategic HR management
- Organisational development
- Specialist departments
- Senior managers
- Employees
- Business and social partners



* Assistance for the adjustment loops in the model

Figure 8: Decision tree for adjusting and fine-tuning the skills model (source: own presentation)

3.6 Insights from practice

Examples from business practice demonstrate that companies are starting to focus their skills management even more on the changes in requirements arising from the digital transformation.

We present below six insights from companies in the HR Working Group regarding the implementation of the dynamic approach to skills requirements analysis. Each of these insights focuses on one of the five phases of the approach described above:

Insight into business practice: Phase 1 – Analyse the corporate environment

This practice-based contribution describes the analysis of the corporate environment to determine skills requirements with regard to professional skills. The illustrations relate to the approach to skills development in one of the 13 functional academies of the company.

The company described here has the following structure for its skills development:

- Within the HR department, global strategic HR development focuses on the identification, definition and development of non-specialist transferable skills. These include leadership skills, a capacity for innovation and emotional intelligence. For most of the workforce, these skills are mandatory to varying degrees.
- However, it is the company's autonomous functional training academies that are responsible for identifying and defining specialist skills and for devising and implementing appropriate professional development measures. They ensure that the different sections of the company have appropriately qualified personnel. These sections

are allocated to particular specialist departments (e.g. Finance, Research & Development, Sales & Marketing).

The faculty of one of the academies defined skills management as a major driver of the company's business strategy. Based on this, the directors of the academy launched a project entitled "Functional skills management", sponsored by the relevant management committees.

Guidance is provided by four project development dimensions::

1. Focus

Before the beginning of a new financial year, the management committee of the specialist department defines the strategic focus for that department for the following year. This is based on the corporate strategy that the Board and regional and divisional managers work together to develop and/or modify. The aims of the functional academy also derive from this. In our example, a project was set up that defines current and future competence requirements, enabling the company to design a sustainable upskilling/reskilling strategy and to act early to build up skills that will be critical in future.

2. Setting the framework

First of all, the project participants agreed on a number of guiding principles for the project:

- a) Defining terms: skills management and (functional) skills
 - Skills management is a systematic approach to the identification of skills areas and skills needs to enhance relevant operational and strategic measures in accordance with the company's goals, with the aim of building up the right skills and maximising individual and organisational performance.
 - The term "functional skills" describes the functional expertise required to do a specific job.
- b) Clarifying the aim of the project and defining opportunities for the organisation and for management and the employees
 - The aim of the project is derived from the definition of skills management.
 - The project provides benefits for

- the organisation, such as creating greater transparency and ensuring competitiveness,
- management, in the form of improved focus for deployment planning and succession planning,
- the employees, as regards transparent management of expectations about the requirements relating to particular activities and jobs.

- c) Specifying and defining project roles for the academy, HR and senior managers
 - Within the academy, the role of Competency Owner has proved effective in making final decisions about the definitions of skills.
 - A Governance Manager ensures that the formal principles defined in the skills requirements analysis are applied. An HR Business Partner assumes this role.
 - The function of Job Family Owner is assumed by the department head, who determines the Subjob Family Owners in the organisation (generally senior managers), who are responsible for defining and approving Subjob Families – similar jobs grouped together in job clusters – and for the identification of the skills required within these Subjob Families.
- d) Planning the project deliverables: process descriptions, guidelines, interfaces, design principles and the preparation of a works agreement including a timeline
 - To measure the success of the project, a project plan was drawn up, comprising individual task packages, deliverables and milestones.
 - In addition, topics were identified that were not included in the definition of the project objectives, such as the modification of the grading system already established – an appraisal system designed to systematise and evaluate individual jobs in the context of the company as a whole.
- e) Defining a cycle which critically examines the current relevance of the skills developed
 - Regular reviews were set up to make the skills management process more dynamic, moving away from rigid one-off approaches towards an iterative process. Here, the project deliverables are examined in the light of prevailing conditions (i.e. new changing external trends, internal changes in the organisation's objectives, changes in strategic focus) and adjusted where appropriate.



3. Skills requirements analysis

In this phase, a new process describes the way to determine skills requirements within the specialist area. The Subjob Family Owners conduct structured interviews with job incumbents using a standardised interview guide. The clearly defined tasks for each job that emerge from these interviews provide the basis on which the Subjob Family Owners can identify skills and record and document them according to defined design principles.

4. Process Sign-Off

In the next step, commitment to the skills defined was obtained from those responsible. Transparency about previous key activities supports the objective of the next stage, which is move together with relevant stakeholders towards the implementation of the process.

The scope of the project includes the development of a functional skills management system within the specialist department. Key here is the definition of transferable/digital skills. These guide the actions of all the company's employees. The Head of Academy is in charge of the project, while the specialist department's management committee commissions the project. Included in the project at an early stage are also all senior managers in the relevant specialist department, HR business partners, employees from Compensation & Benefits with expert knowledge of existing grading, personnel with employment law expertise and works council representatives.

The key element in the skills requirements analysis is the employee interviews conducted by the Subjob Family Owner. The identification of the tasks included in each job and the derivation of skills requirements are based on previously defined design principles:

- a) Keep it simple: Skills should be described at the Subjob Family level and not at the workplace level. Each Subjob Family comprises ten to twelve functional skills – this avoids complexity.
- b) Use existing knowledge: All the participants were given unlimited access to the skills definitions. This provides guidance and avoids unnecessary extra work.
- c) Standardisation: Around the world, only one skills profile was produced for each job. The description

of the skills is always based on a three-part standard: the name of the skill, its definition and a description of behaviour anchors.

- d) Think pragmatic: A brief description (one-pager) of each skill was prepared for the subsequent rollout. In addition to the standardised description of the skill, there is also space reserved for the jobholder to add personal notes and specific remarks about their own position.

In line with these principles, the first comparison was made. What skills do we have available to us in the company (based on the evaluations which form part of the recording of activities)? Which skills need to be developed and which can be externally sourced?

Success factors for the key activities

1. Skills management is a task performed by the company's executives. The concept of skills management is developed according to the roles defined, but its implementation is the responsibility of the executive concerned. This includes determining the degree of proficiency required for each job, carrying out evaluations and identifying appropriate development measures as a result. A campaign to improve employees' professional skills conducted by senior management is therefore critical for success.
2. Using the project framework to provide focus. The project framework encompasses stakeholder management, risk analysis, and a communication and project plan. By also setting up an advisory body of experts (a sounding board), the results of this framework can come under critical scrutiny from different angles.
3. Ensuring skills are comparable. With regard to the skills requirements analysis, it had already been agreed at the start that sufficient comparable functions were required (at least fifty).

Generally, it seems that although standard descriptions from literature or from external partners may provide a helpful starting point, definitions and responsibilities ("roles") should be compiled and/or modified so that they are specific to the company, to avoid ambiguity and "watering down". Moreover, the regular exchange of information, especially among Subjob Family Owners, allows for the development of best practice.

The main way in which the success of the whole skills management process within the department is measured is via reports. These reports record participation in training, changes in the assessment of skills and any change in the success of

human resources decisions (especially regarding succession planning, recruitment and professional development). In addition, the skills defined should be compared every one to two years with the prevailing corporate environment at that time.

Insight into business practice: Phase 2 – Design the skills model

The practical example describes the following key activities in the skills requirements analysis:

- Developing the structure and rules of the skills model
- Preparing a skills catalogue that lists individual skills, with descriptions of those skills

The definition of professional skills is a key part of the skills model. These are based on the job families in the Global Job Catalogue. The structure and rules of the new skills model were devised in collaboration with a consulting firm. A pilot study of the model to examine its feasibility and practicability was initially conducted with a representative group of employees. The main result of this test phase was the decision to structure the skills model at job family level.

For each job family, skills clusters comprising around ten skills/functions were created. The descriptions of the skills are deliberately kept general.

The skills catalogue consists of around 170 skills. These were drawn up in a series of workshops involving business representatives such as business unit managers with global responsibilities, as well as experts from various functions, divisions and regions. The skills model focuses on the key skills required by employees to perform their duties and achieve their targets. Care is taken to ensure that the model is practice-oriented and depicts the skills that will be necessary and relevant in the future.

In the course of a pilot scheme in sales, the process steps in the design of the skills model were tested and then optimised on the basis of the lessons learned. A global project launched subsequently focused on the implementation of the process in all other job families. Around 170 business delegates with

global and regional responsibilities, some at Board level, helped to compile the list of skills.

For each job family, the skills were defined along the value chain.

Internal and external data analyses form the basis for the preparation of a draft skills cluster with around ten skills per job family. The first step was to analyse internal data sources (such as evaluations from the current professional skills catalogue, job adverts, training landscapes and strategy documents) and to group them in clusters. The second step was to consult external data sources such as web searches or collections of best practice. Particular attention was paid to the key skills applicable to the respective functions. Twelve experts then examined the content of each draft skills cluster that had been created, refining it where appropriate. Three workshops lasting for around five hours in total took place within a month. The series of workshops started with an introduction to the skills model to create a common understanding. Then the participants revised the draft skills cluster based on the following key questions:

- Are there current skills and skills that will be strategically important in the future which are missing?
- Are there skills that are obsolete?
- Are the skills appropriate for all the jobs in the job family?
- Are the titles and descriptions of the skills accurate?

Overall, the skills model should be flexible so that it can be used both in recruitment and in performance management. Standard MS Office programs and the Mentimeter survey tool were used to compile the skills catalogue.

Success factors for the key activities

One success factor is the mandatory participation of representative knowledge carriers in the process. These include



experts from different management levels representing various functions, divisions and regions. The early involvement and sensitisation of the participants paves the way for constructive handling of concerns and speeds up the transition from the design of the skills model to its application. In addition, deadlines agreed should be communicated in a timely manner. Only this will ensure that all the relevant stakeholders will be able to participate in the whole series of workshops and that all participants will have the same level of knowledge. Deputisation rules or selective participation in the process, on the other hand, lead to delays caused by the resulting need for repetition or discussions that may be at cross purposes. Documents and reports of results should be made available to all participants. This is material that is essential to the process, so that the participants can perform the tasks required such as preparing for meetings and gathering additional feedback. Understanding of the model is promoted by including responses from people who were not actively involved in the development of the skills model, such as the participants' direct employees or colleagues. A flexible approach can be taken to the selection of the feedback group. Other perspectives can thus be considered with little additional cost.

In the case of more complex job families, enough time should be scheduled for arriving at the definitions and the skills

model should be presented via a system demonstration to illustrate its application.

An annual review process ensures that the design and application of the skills model are embedded in the company for the long term. The contacts for the control process are selected business representatives who have already been involved in the development of the model. Content can thereby be tested for its current validity and relevance, ensuring it continues to suit business needs.

Applying HR processes

- Applies HR know-how and acts as an expert in the subject
- Uses appropriate methods for operational HR processes, ensuring they are of high quality and delivered in a timely manner
- Assumes responsibility for own tasks
- Finds suitable solutions for tasks beyond the standard processes

Figure 9: Example of a skill from the HR job family (source: own presentation)

Insight into business practice: Phase 3 – Validate the skills model

When designing the skills model, essential information can be obtained from the company's existing corporate identity. Its corporate philosophy, corporate vision, mission statement and code of conduct can help determine the skills it will require in future. The values and attitudes inherent in these statements absolutely must be reflected in the skills model since performance-related feedback on the various skills reinforces the corporate culture.

In addition to its corporate identity, another source of information about the company is its strategic action areas. Skills management and cultural aspects influence each other. A new and/or modified skills model always has an impact on

corporate identity. Depending on the maturity of the company, modifications to the company's self-image will be the result. The skills model addresses not only more stable and long-term corporate values, but also new demands being made on employees that are critical for the company's success. In addition to subject-specific and sector-specific skills, the model also includes skills that should be present in the entire workforce. These include digital skills and digital literacy, which are critically important for all employees at every level of development. To ensure a pragmatic approach, this process was not conducted at a great level of detail for the job profiles. The rapid rate of change in the company's spheres of activity would have meant huge recurring costs.

There is a distinction to be made between "Trainees and apprentices" (Group 1), "Employees covered by collective

pay agreements" (Group 2) and "Employees not covered by collective pay agreements" (Group 3):

- Trainees and apprentices have their own skills model, developed jointly by the works council, the youth and trainee council, instructors and training managers. The focus is on developing key skills in newcomers to the profession. These include motivation, initiative, commitment, a willingness to learn, and verbal and written communication skills.
- In Groups 2 and 3, there are some overlaps and some differences in the skills identified. This ensures consistency in performance-related professional development throughout the company. Details are given below, with examples of skills that overlap and differ for the two groups.

Business skills (Group 3)	Occupational skills (Group 2)
<ul style="list-style-type: none"> – Strategic approach to action – Commercial approach to action – Customer focus 	<ul style="list-style-type: none"> – Self-reliance – Quality of work – Organisational skills
Social skills (Groups 2 and 3)	
<ul style="list-style-type: none"> – Effective communication skills – Teamwork – Conflict management 	

Behaviour anchor: Strategic approach to action (Examples)	Behaviour anchor: Self-reliance (Examples)
<ul style="list-style-type: none"> – Sets priorities – Clearly pursues short-term, medium-term and long-term goals – Manages on the basis of transparent KPIs 	<ul style="list-style-type: none"> – Completes work on own initiative – Is also capable of acting in complex situations – Takes the opportunity to play an active role where appropriate

In practice, workshops involving the Board and senior managers have proved effective. Representatives from a wide variety of the company's specialist departments should work together here to identify the skills that will be critical to the success and the future of the company. One tool or agile development methodology that can be used is a skills canvas for different occupations. The first step is for each of the managers to indicate those skills that will be required in the future within their sphere of responsibility (such as for employees in Procurement, Project Management, or Sales & Marketing). Then, the skills listed are rationalised to eliminate duplication, confirmed by the Board and combined into a

shortlist. Appropriate professional development and upskilling/reskilling programmes can be devised as a result.

The descriptions of the behaviour anchors in the skills areas are an important result of this process. These provide not only senior managers but also employees with a focus for performance-related feedback on their individual skills and are formulated by HR development on the basis of results from workshops. In the course of annual performance appraisals, managers respecify the employee's individual requirements for the year and define the required behaviour indicators. The employee's individual experience is considered in the course of the assessment as well as the relevant pay grade.

Success factors for the key activities

So that there is a common understanding of skills and their importance for the company, participation by the Board and senior managers is essential. In the course of annual performance appraisals, all first and second tier managers exchange views on the skills model and the level of skills requirements. In addition to the regular adjustment cycle of one to two years, this means that the skills model can be supplemented and enhanced to reflect current developments within and outside the company.

Additional 360-degree management feedback completes the skills model. Connections can be identified as a result, which ensures that professional development is consistent and ties in with leadership ambitions. This development tool is mandatory for first and second tier managers and voluntary for third tier managers. It is recommended that it is repeated every three years. The first occasion when management feedback is mandatory is after the manager has had at least one year of management responsibility. This process is complemented by a company works agreement.

Looking forward, the next modification cycle will focus on an international cross-border skills model. Essential to this will be the participation of all regions and ensuring the usability of the model. At the same time, aspects relating to each country and its pay rates or culture should be modifiable in a way that is specific to the company.

To ensure the continuity of the skills model, the aim should be to refine the existing model on an ongoing basis. This



means that cultural and normative aspects of the company enshrined in the model can continue and new requirements

made of the organisation can be incorporated in a flexible manner.

Insight into business practice: Phase 4 – Apply the skills model

The development of new technological skills in cloud computing, data and artificial intelligence is a vital element of human resources measures in a global media, services and education company. Continuing education initiatives that are strategically focused are derived from this.

Digitalisation and related technological developments mean that employees at all levels need to acquire new skills. In addition to recruiting new people who already have these skills, the company's human resources strategy relies above all on the continuing professional development of those it already employs. It has two key objectives here. First, it needs to promote the technological skills required for the transformation of the company. Secondly, raising skills levels ensures employability in the long term and the personal development of each individual employee. When designing continuing education programmes, the company therefore focused on creating an offer directed at all employees, regardless of their current level of technological skills.

In collaboration with the specialist departments, role-specific skills models were initially defined and then, based on these, curricula were developed, which were available throughout the group. These curricula consist of many different role-specific learning paths: from the technical expert with in-depth knowledge to the generalist who needs instead to have broad knowledge and maintain an overview. To develop and curate these curricula, the product ranges of world-leading online technology training providers were analysed. The course content was tested by a pilot group from the specialist departments as well as by the central department for continuing education.

One criterion when selecting the providers was that the course content should be continuously updated to ensure that it is always relevant to the current situation. In addition to the specific content, the analysis and testing also paid

particular attention to the methodology and didactics of the curricula, enabling customised individualised learning. To support the development of skills in an even more targeted and needs-oriented manner, the specialist departments and training providers worked together on modifying the course content to meet company-specific requirements. This also increases the methodological diversity of the curricula. They range from online training that is entirely self-directed, where qualifications and certificates can be obtained from well-known educational institutions, through to virtually moderated live sessions in role-specific learning groups.

An extensive communication campaign for disseminators (such as HR departments) and for the employees ensures the optimal introduction of the curricula for the individual roles. The campaign illustrates the different learning paths available as well as their learning content, and promotes their suitability for particular learning needs.

In addition to this continuing education initiative, which is purely internal, the company has since 2018 run extensive digital scholarship programmes with a world-leading online training provider. These are open not only to the company's own workforce, but also to external interested parties who want to improve their technological skills. In innovative, practice-based, career-specific online study programmes lasting three to six months, the participants can obtain market-recognised certification in the relevant technological field.

The content of these study programmes is constantly being modified and developed in conjunction with leading experts from the technology sector to meet the changing requirements of the market. This ensures the courses are relevant and up to date and provides learners with the opportunity to acquire practical knowledge within a relatively short period of time.

When this initiative was set up, at its heart was the announcement of 15,000 data science scholarships. Building on the success of the scholarship programme, a further global

education initiative was launched. Over a three-year period, the company is funding a total of 50,000 tech scholarships, focusing on three areas: data, artificial intelligence and cloud computing.

At the beginning of each year in which the scholarships are awarded, employees and external interested parties can apply for a place on what are known as “Challenge Courses”. The three-month introductory self-study courses provide basic knowledge for the subsequent scholarships that relate to actual certificate courses. These are awarded to around the top 10 percent of those who complete the introductory courses. For both the “Challenge Courses” and the certificate courses, experienced mentors and community managers accompany the scholarship holders in their learning process. They support the exchange of views in digital learning communities and thus promote participative social learning. Intensive collegial exchange also increases learning success and learners’ motivation. Extensive targeted communication has an important role to play in the success of the initiative.

Success factors for the key activities

The key element of all professional development and human resources measures is a strict focus on the company’s skills requirements. The measures that deliver continuing education are based on the corporate and human resources strategy. The focus here is on the strategic objective of implementing

the company’s vision with regard to technology skills by applying systematic professional development measures throughout the group.

Another of the critical success factors is close collaboration between the central HR department and the relevant specialist departments. Thus it was possible to ensure targeted development and curation of the curricula in terms of content and the appropriate range of teaching methods.

As a result of the broad relevance of the topic, it is essential to persuade the widest possible range of employees to participate in the training, from subject experts to generalists.

A regular comparison of target and actual, based on the roles defined and the corresponding skills profiles, ensures the success of the human resources measures described. The relevant HR departments, working together with the operational business units, make the target/actual comparison, thus ensuring that the skills requirements depicted take market dynamics into account, rather than being seen as separate from the market. Regular meetings between the group’s executive board and the various divisional boards ensure the implementation of the appropriate divisional strategies. In the course of these reviews, the target/actual comparison of the skills requirements for the roles defined is also presented and the human resources measures adopted for this purpose are illustrated by means of a rating system.

Insight into business practice: Phase 5 – Review the skills model

A skills model was developed in the course of the “Enabling Digital Transformation” (EDT) initiative launched in 2017/2018. The model describes 13 skills that are divided into two areas (IT skills and cross-functional skills). An online self-assessment tool offers employees the opportunity to evaluate their skills and experience in terms of topics relating to the digital transformation. The users of the tool can rate their skills in a particular area such as machine learning or business models, using a 4-point system (1 = I have never heard the term, 4 = I have a thorough understanding of the topic and can explain it using practical examples). The aim

of this self-assessment is to make employees aware of these skills and determine their personal position. In addition to a summary of the results of their self-assessment, each employee receives personalised recommendations with proposals that will enable them to continue to develop the skills they already have. The tool is subject to continuous review and, if modifications are made to the skills model, it is revised accordingly.

To continue to improve and build on the upskilling measures in the area of IT, this part of the skills model is currently being evaluated. The central department for continuing education is working together with in-house specialists to review the practicability of the model. This will highlight, for example,



whether newly emerging professional development measures or job profiles can be described using the model.

The main target group of the first EDT skills model was employees who needed to be made aware of skills that would be relevant for the digital transformation and to be pointed towards appropriate ways of raising their skills levels. The continuing development of IT skills in the model creates an even broader application base for in-house subject experts, subject owners and training providers; new upskilling measures can be planned and job/skill/position profiles can be compiled.

Success factors for the key activities

Broad consultation about the model in the company encourages its acceptance and ensures its practicability and

feasibility. As competence requirements within and outside the company evolve rapidly, the speed of the process is a critical success factor. Evaluation loops and coordination loops should be expedited at a similarly fast rate, to the extent that the size of the company permits it. The Plan-Do-Check-Act approach, a quality management method for continuous quality improvement and project management, provides guidance here. A skills model must be sufficiently coordinated and sound enough for its application. However, it should not and cannot last forever. Subsequent iterations need to be planned and the model constantly refined. A review and validation of the skills model takes place on a regular basis, approximately every twelve months.

Insight into business practice: Phase 5 – Review the skills model

The example for the review phase comes from a company with international operations, with around 120,000 employees in development, production, logistics, sales & marketing, and administration.

Every year, the company prepares a quantitative and qualitative strategic human resources plan derived from its corporate strategy. This is designed for the long-term management of business segments that are expanding, contracting or being reorganised and relates to strategically relevant skills areas. Strategic human resources manages the process in close cooperation with HR management, the specialist departments and talent management. Strategic human resources planning forms the basis for all subsequent HR processes (training needs analysis, upskilling/reskilling, next generation programmes and training, succession management, recruitment).

Competence requirements at employee level are recorded as part of a training needs analysis that is conducted annually. This analysis is based on manager/employee conversations and is supported by specially designed IT tools. Individual professional development and training measures are derived from this training needs analysis. The organisational unit for continuing

education advises and supports the specialist departments here. The process owner of the training needs analysis is talent management, while responsibility for implementation lies with senior managers.

Review:

At the company level and at the individual level, there are established quarterly and/or annual review processes. At regular meetings of strategic human resources with HR management and talent management, a review is conducted of the results of strategic human resources planning, from which HR measures are derived. To ensure continuous improvement, a review of the strategic human resources planning process is also conducted and optimisation approaches are identified.

At the employee level, there is an annual comparison between the employee's target and actual skills profile. Training and continuing professional development measures are derived from this if required. In a conversation with the employee, the manager assesses the effectiveness of training measures in the learning management system.

Against the background of the digital transformation and rapid technological change, checks are performed, in addition to the established review processes, to ensure even

more effective monitoring of the enhancement, reduction or modification of skills.

The following approaches were identified:

1. The recording of skills at company level should be more closely coordinated with subsequent HR processes. This requires the use of consistent terminology for as many human resources processes as possible: i.e. a "common language" within the company for all HR topics. This was done very successfully by creating a skills-based job architecture.
2. Based on the findings of the review, the goal for strategic human resources planning is a better differentiated description of the skills areas being considered. Not only greater differentiation of the skills areas, but also the use of additional skills profiles should optimise the usefulness of the terminology in the subsequent HR processes.
3. Workshops with the specialist departments are able to focus on redesigning the job architecture. The participation of these departments then ensures a higher level of acceptance when it comes to the application of the approach.

Success factors for the key activities

- The successful development and validation of all elements of the skills model requires close cooperation between strategy departments, HR and specialist departments.
- The level of detail in the skills descriptions has a direct impact on the workability of the skills model. The more detailed the descriptions of the skills, the more the model will need to be updated and, where appropriate, modified. Here, the cost incurred needs to be commensurate with the additional information generated as a result. To achieve the right level of detail requires concerted coordination with the specialist departments, strategy departments and HR process owners, accompanied by regular tests and iteration loops. Agile instruments and tools, which can be used on a voluntary basis by employees to input their skills, facilitate the management of detail.
- In summary, an agile approach is recommended for the development of the skills model: i.e. the development and application of small sections, making regular iteration loops possible.
- The information about skills and their definitions must be available in the IT system worldwide and for all specialist departments. A consistent IT solution for human resources processes supersedes previous island solutions.



4 The most urgent action areas and policy options

Lifelong learning is one of the most important keys to ensuring sustainable working capacity and employability and to translating the opportunities presented by the digital transformation in an effective manner into increased productivity and the capacity to innovate at speed.

Companies and employees have a joint responsibility here. Companies need to create working conditions conducive to learning, support individual learning processes according to need and promote employees' fitness to learn. Employees in turn make their contribution by, insofar as they are able, learning in a more self-sufficient and autonomous way. Government and society provide additional support for future-oriented continuing education.

Creating favourable conditions

Public and private educational institutions, companies and society need to anticipate future skills requirements at an early stage and address them in their range of educational, professional development and reskilling programmes. **Ongoing monitoring of key skills** is essential in order to focus on the preparation and promotion of lifelong learning. It will become increasingly important to switch even **more rapidly from the requirements analysis into continuing professional development mode**.

Challenges in practice

Despite a large number of studies and publications about current and future skills requirements (e.g. OECD, World Economic Forum, McKinsey Global Institute, Ashoka Foundation), there has until now been no continuous systematic monitoring in Germany of the changes in skills requirements. Both employees and companies need a framework that provides **guidance on future profiles** and

thereby on training and continuing education. Knowing where we, as a location for innovation, want to go and where we really stand in relation to continuing education is crucial for needs-based **just-in-time continuing education**, since know-how about future technologies cannot be acquired in advance.

Solution approach

Establishing a permanent skills monitoring system in Germany: A national skills monitoring system could help identify and describe skills requirements even more rapidly, from the company perspective as well as from the cross-sectoral perspective¹¹. As a location for innovation, what skills does Germany need in order to achieve breakthroughs in relevant (technology-driven) areas that will be important in the future? How well-prepared are we for these issues of the future, in terms of training and continuing education, research and development, production, business models and marketing, in comparison with other countries?

Acatech, BDI (The Federation of German Industries) and the Hans Böckler Foundation, with the support of the German Federal Ministry of Education and Research (BMBWF), have developed and tested a concept for such a monitoring system. The Federal Government is expected to pursue the initiative and make it permanent as another tool of its innovation policy.

Expanding financing and funding models

In some areas, it appears to make sense to use monetary incentives and financial support to promote lifelong learning (e.g. to **promote small and medium-sized companies** and people who have until now been underrepresented in continuing education such as **low-skilled workers**). Funding and incentive structures that rely on the "sprinkler approach" satisfy neither the requirements of companies nor the needs of employees. This means, for example, that policymakers should focus their support instruments and models on the conditions prevailing in companies.

11 | Recommendations for action have also been developed by the Strategic Personnel Planning and Development focus group of Working Group 4 of the National Platform Future of Mobility (NPM) on how we can address the challenges of the transformation together, taking the mobility sector as an example. In addition to a proposed toolbox for companies which contains employment forecasts and enables companies to implement strategic human resources planning, regional skills hubs in particular could increase the participation of SMEs in continuing education and strengthen regional business and innovation networks. The German Federal Government took these proposals on board (see National Platform Future of Mobility Working Group 4 – "Securing Germany as a place for mobility, production, battery cell production, primary materials and recycling, training and qualification", Strategic Personnel Planning and Development focus group: 1st Interim Report on Strategic Human Resources Planning and Development in the Mobility Sector, Berlin 2020).

Challenges in practice

Previous financing and funding models have been too heavily based on traditional formats for continuing education. Eligibility conditions for the funding of training programmes, such as a minimum number of hours or the frequency of sessions, need to be **more focused on business practice** and also **consider** less face-to-face teaching and more **innovative, technology-enhanced teaching and learning solutions**. In addition, application procedures for funding usually involve a high bureaucratic burden.

In the context of the digital transformation, the current artificial distinction between upskilling/reskilling measures in private and corporate interests is no longer appropriate in the modern world and should be removed. This is because employees may suffer tax disadvantages if their employer finances or part-finances upskilling/reskilling measures for them. Self-initiated learning becomes significantly less attractive as a result. A **tax exemption** might increase the employee's willingness to participate in continuing (professional) education. Moreover, the State should make it clear that **lifelong learning is, as a matter of principle, held in high esteem**.

Solution approach

Selecting pragmatic and practical approaches: Streamlined processes, simpler regulations and clearer forms can minimise inhibitions and barriers to application. Existing approaches to removing bureaucratic obstacles set out in the German Work of Tomorrow Act 2020 need to be expanded. Support should also be provided for training formats of a shorter duration than the minimum duration that has been eligible for funding to date.

Continuing to set up BAföG models (providing financial assistance for training in Germany): As future demand for skilled and highly-qualified workers will primarily be at the expense of the mid-range skills levels, support for upgrading training and reskilling will play an important role. There should also be an increased focus on support for older employees. In this context, the "Aufstiegs-BAföG" (financial assistance for upgrading training) should continue to be expanded. It is conceivable that there could be an additional focus in the form of an "Alters-BAföG" (financial assistance for older age-groups) that would, for example, consider the upskilling/reskilling of those approaching retirement

age, enabling them to continue working. If this is implemented successfully, the objective should be to link it with a combined industry-wide consultation.

Offering tax incentives /tax relief: Investment by companies in training and continuing education can currently be claimed as operating expenses. As an incentive to spend more in this area, direct tax cuts or exemptions should be discussed. A review should be carried out to establish whether models such as those relating to short-time work or in connection with the German Social Security Code (e.g. education vouchers) could be copied for use in training and continuing education. The proposed extension of the short-time allowance in connection with continuing education programmes is to be welcomed.

Making certification systems more flexible

In the course of the digital transformation, the certification of continuing education activities is also changing. On the one hand, certificates need to be **more flexible** and much more **personalised**, while on the other hand they need to be **comparable** and **quality-assured**. This tension cannot be completely resolved.

Challenges in practice

Traditional educational qualifications are becoming increasingly irrelevant and no longer paint a full picture of an individual's professional development history. Mini-degrees such as Udacity's nanodegrees, which are **intermediate and can be combined and extended**, encourage just-in-time continuing education and provide low-threshold opportunities for training and continuing education, moving away from comprehensive yet rigid curricula towards **flexible, practical qualifications**. It is thus possible to acquire new skills more rapidly in substantially shorter cycles.

However, many of the well-established programmes available in the market are not recognised by the German government and as a result they do not currently qualify for funding. For small and medium-sized companies in particular, this makes the financing and use of such programmes difficult.



Solution approach

Adapting certification: New forms of certification and less formalised continuing education programmes should be recognised by the German government. A particularly important role here is played by the validation, recognition and certification of skills

acquired informally. However, the objective here is not to formalise completely the existing processes for informal learning nor to instrumentalise certificates for commercial purposes. Instead, the main emphasis should be on the flexible and structured enhancement of skills.

5 Outlook

This DISCUSSION sets out an approach to a future-oriented analysis of business skills requirements, provides insights into its implementation in a company, and presents academic perspectives on the topics of skills, skills requirements analysis and skills development. Together, we have devised and tested guidance for business practice that is focused on operational requirements and enables future-oriented human resources management.

In other activities, the HR Working Group will continue to focus on the opportunity-based evolution of the digital transformation

and the future world of work. We are also taking the impact of the coronavirus crisis into account. In follow-up projects and dialogue formats, we are focusing inter alia on the following key areas and questions about digital change:

- Lifelong learning: How can lifelong learning become embedded in corporate culture in practice? How can we create a working environment that supports learning and motivation?
- Post-Covid world of work: What medium to long-term influence will the Covid crisis have on work processes and organisational processes in particular? How do we create new forms of work organisation and culture?



Glossary

360-degree feedback

360-degree feedback is a tool for holistic, objective evaluation of employee performance. It can help in the decision-making about the employee's salary, promotion prospects, or training or development needs. The results are based on the assessments of various groups consulted, such as senior managers, colleagues and customers, who come into contact with the employee whose performance is being evaluated. In addition, this process includes self-assessment by the employee. 360-degree feedback is an extension of 180-degree feedback, which only includes self-assessment and an evaluation of the employee's performance by the relevant manager.

Behaviour anchors

Behaviour anchors are indicators used to express a requirement criterion or construct that cannot be directly measured. They are documented as directly observable behaviour that is evaluated in relation to a defined requirement criterion. If a person demonstrates the behaviour defined in the behaviour anchor, this is interpreted as a strong expression of the requirement criterion. The requirement criteria may involve skills, but also knowledge or motivational qualities that go beyond specialist expertise.

Competence requirements

Competence requirements are the qualities or abilities that are necessary to combine knowledge and expertise in order to deal with operational requirements.

Cost-benefit analysis

Cost-benefit analysis is a tool that helps determine whether the result (the benefit) of an action justifies its expense (the cost).

Human resources diagnostics

Human resources diagnostics provides principles, methods and measurement tools for diagnostic tasks in HR: e.g. for personnel selection, employee placement, personnel and organisational development. It draws on scientific methods and research results from academic psychology. HR diagnostics is concerned with identifying differences between people (such as employees or job

applicants), interpreting them appropriately and, finally, making a well-founded personnel decision based on that information.

Human resources planning

Human resources planning includes all the measures necessary so that the company has the employees available that it requires in order to reach its goals, both in quantitative and qualitative terms (i.e. the right number of employees with the right professional skills).

Job families

Job families denote job clusters that are established based on the principle of similarity. This means that "related" jobs are grouped together: i.e. jobs involving the same or similar tasks or task profiles.

Job profiles

Job profiles are non-personal descriptions and/or a detailed summary of the tasks, activities and skills involved in a particular job.

Learning analytics

Learning analytics involves the collection, aggregation, analysis and evaluation of data about learners and their learning context. It enables learning progress to be measured, future performance to be predicted, potential problem areas to be detected, and learning and the learning environment to be optimised.

Lessons learned

In the context of project management, lessons learned can be described as knowledge gained from the project execution process. Traditionally, the lessons learned from a project were formally presented on or just before the completion of a project, but here lessons learned can be identified and documented at any stage in the project lifecycle. The purpose of documenting the findings is to share the knowledge gained from experience and to use it to repeat desirable results and/or to prevent the recurrence of undesirable results.

Monitoring

Monitoring is the supervision of operations to determine whether a procedure or process being observed is on the right course and

whether specific thresholds are being met. If this is not the case, an intervention can be made to control the situation.

Persona

Persona is a term used to describe a representative of an archetypal target group. Information such as name, behaviour, career history and preferences is provided for each persona. Personas can be of help in the development of user-friendly processes/products.

Pilot group

A pilot group is a small heterogeneous or homogeneous group of employees, brought together for a short period of time, which helps an organisation learn how and whether a new approach or a new project is feasible in practice.

Professional skills

Professional skills are a combination of subject expertise, social skills and key skills that indicate a person's aptitude for a particular occupation.

Skills

Skills are what people know and what they are able to do. The skills needed for a job can be presented in different categories: e.g. social skills, methodological skills and specialist skills. Taken together, they can be seen as professional skills.

Skills catalogue

A skills catalogue is a summary of all the skills required and/or available in a company. It ensures the use of consistent terminology: e.g. for recruitment and evaluation of employees, human resources development and succession planning.

Skills diagnostics / skills analysis

Skills diagnostics / skills analysis describes methods or tools that help to measure or evaluate skills. This can take place at an individual level, or at an institutional or systemic level (e.g. to compare systems for education and training).

Skills levels

Skills levels are used to denote the different levels or qualities of a person's operational knowledge and expertise within one of the skills described.

Skills model

A skills model is a skills management tool. It describes the skills available and required in a company.

Skills profile

A skills profile is the detailed description of the work-related skills of managers, employees or people in general. A person's skills profile not only describes selected skills, but also how those skills are manifested or the person's areas of expertise.

Skills requirements

Skills requirements comprise the necessary or desired skills that a company requires in order to achieve its corporate goals. This requires a qualitative and quantitative approach.

Strategic human resources planning process

The strategic human resources planning process ensures that the right employees with the right skills are available, at the right time and the right cost, to implement the company's strategic goals. To do so, strategic HR planning deduces the implications for qualitative and quantitative personnel requirements on the basis of the company's business objectives, external drivers and the existing personnel structure.

Target group

A target group is a group of employees/people/customers that the company is seeking to reach with a specific measure or product.

Temporary work

Temporary work involves working for a limited period of time. A worker (contract worker) enters into a contract with a hiring agency. The hiring agency deploys the worker for specified periods of time at one or more customers. For this reason, temporary work is also known as personnel leasing.



Think tanks

Think tanks are a special form of organisation that consider topics relating to the future. They include project groups or business units in which interdisciplinary teams of employees and/or external partners (e.g. experts, cooperation partners and customers) address future-related issues.

User stories

User stories are designed to record requirements and are constantly being refined ("What does the user want to achieve?"). This is a technique to describe requirements from a user's point of view using everyday language (and no specialist terminology).



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acatech advises policymakers and the general public, supports policy measures to drive innovation, and represents the interests of the technological sciences internationally. In accordance with its mandate from Germany's federal government and states, the Academy provides independent science-based advice that is in the public interest. acatech explains the opportunities and risks of technological developments and helps to ensure that ideas become innovations – innovations that lead to greater prosperity, welfare, and quality of life. acatech brings science and industry together. The Academy's Members are prominent scientists from the fields of engineering, the natural sciences and medicine, as well as the humanities and social sciences. The Senate is made up of leading figures from major science organisations and from technology companies and associations. In addition to its headquarters at the acatech FORUM in Munich, the Academy also has offices in Berlin and Brussels.

Further information is available at www.acatech.de.



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Series editor:

acatech – National Academy of Science and Engineering, 2022

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Recommended citation:

Jacobs, J. C./Kagermann, H./Roehl, H./Spath, D. (Eds.): *Dynamic Skills Management: Identifying Skills Requirements Early, Devising Tailored Solutions Practical Guidance from acatech's Human Resources Working Group* (acatech DISCUSSION), Munich 2022.

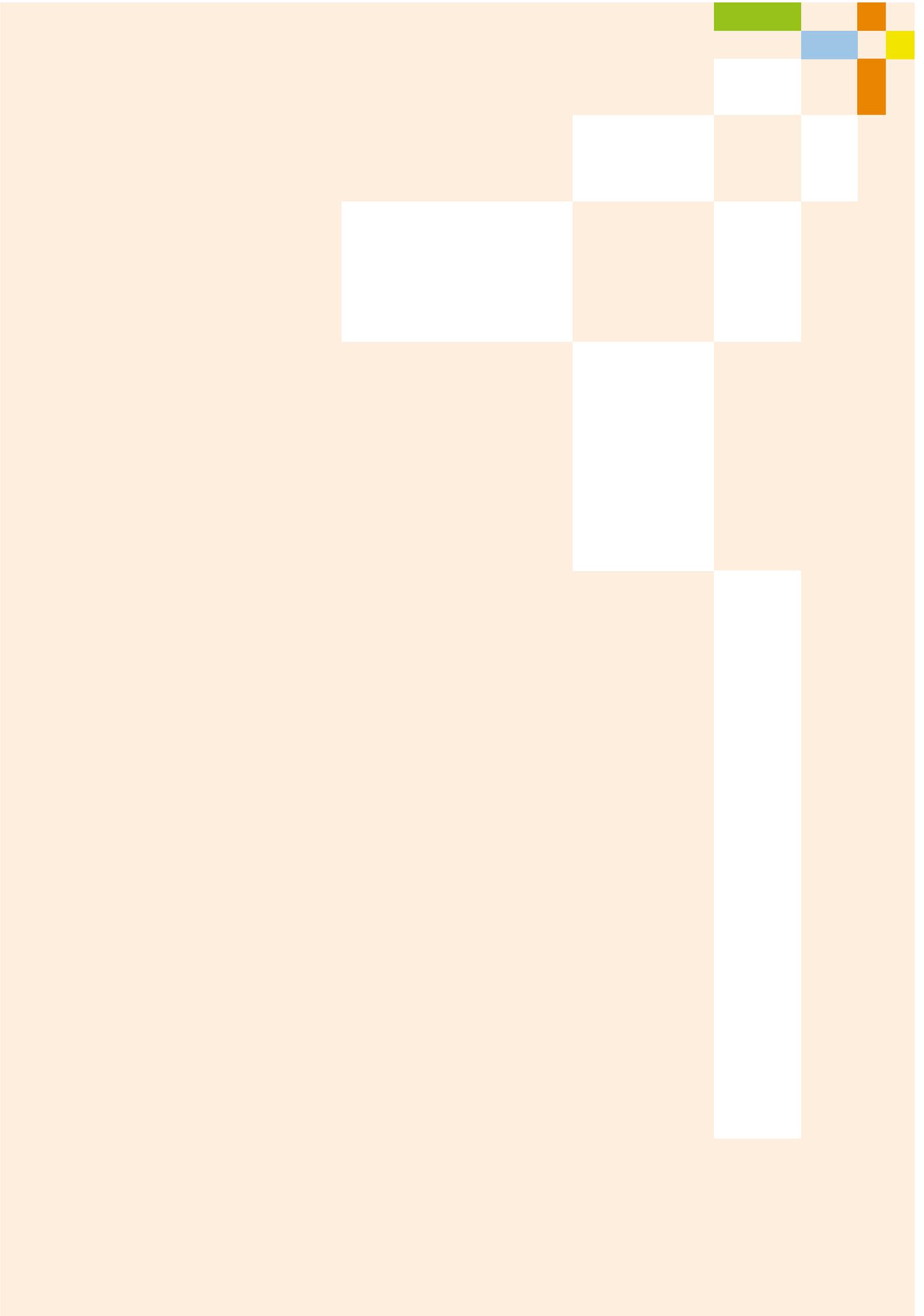
Bibliographical information published by the Deutsche Nationalbibliothek.
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographical data is available online at <http://dnb.d-nb.de>.

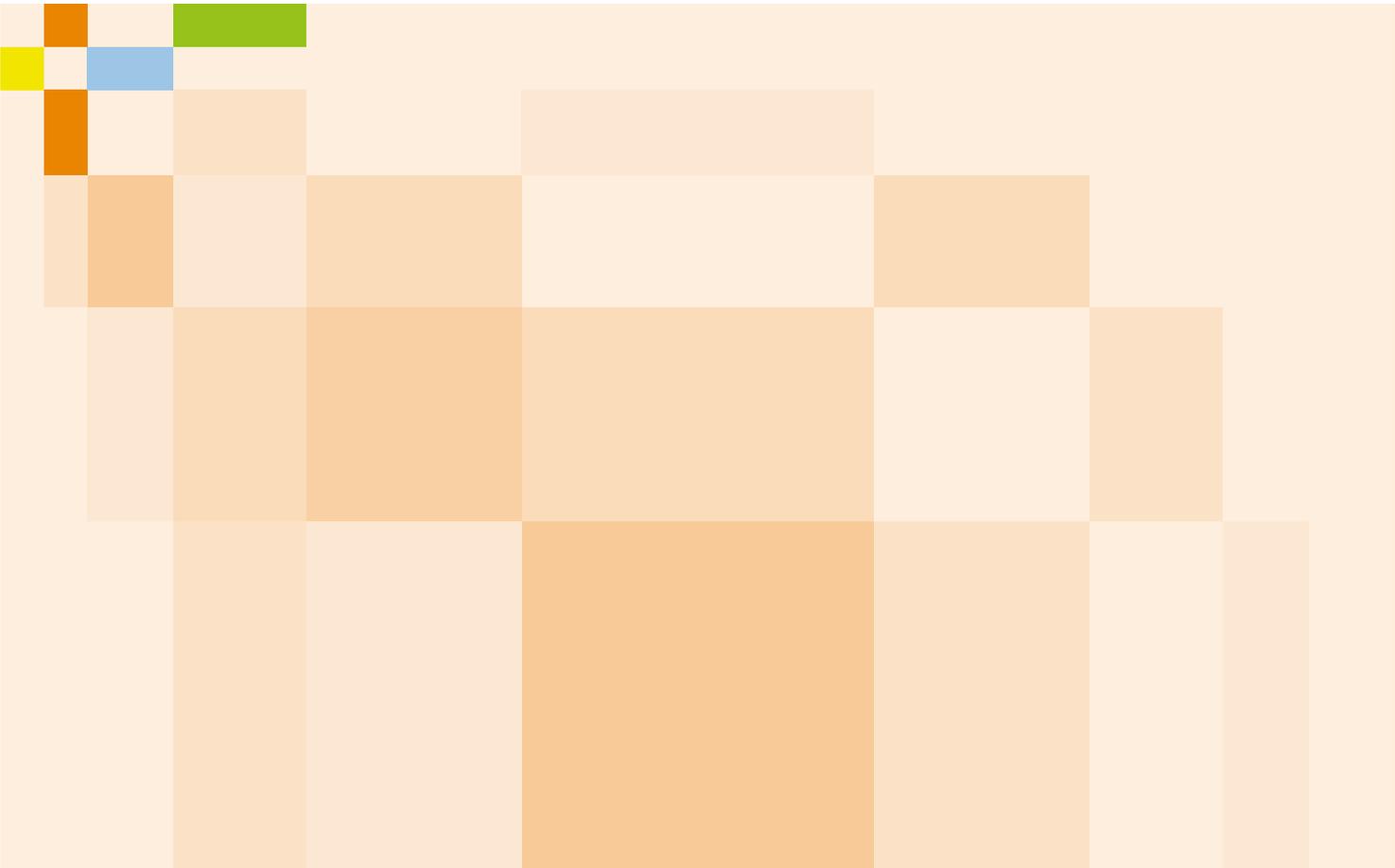
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Project management and editing: Luise Ortloff, Katharina Winkler
Translation: Jeannette Jennings
Layout concept: Groothuis, Hamburg
Conversion and typesetting: Heilmeyer&Sernau Gestaltung, Berlin
Title: shutterstock/elenabl and acatech – National Academy of Science and Engineering
Illustrations: Britta Stammeier

The original version of this publication is available at www.acatech.de





Adopting a sustainable approach to skills management and deriving tailored future-oriented measures to meet their business needs – this is the challenge facing many companies. For some time now, job profiles and descriptions have been changing, in some cases to a significant extent, but what is new is the speed, dynamism and complexity of the changes occurring as a result of the digital transformation. Digitalisation is accelerating technical, economic and social developments in a way that is also fundamentally changing learning. It will be less and less possible to have a ready supply of the knowledge and skills that will be required in the future. Continuing education that is targeted and aligned with the specific corporate strategy of the company therefore requires an operational analysis and the definition of skills requirements.

This acatech DISCUSSION presents a dynamic approach to the analysis of skills that are currently required and will be required in the future, facilitating a reflective and iterative process. The publication is based primarily on discussions held by the HR Working Group on this topic. We see this practical guidance as a proposal to the various stakeholders in the digital transformation. It should pave the way for future-oriented human resources management, maintain employability, and promote innovation and good working practice in Germany.