BEYOND4.0 - Understanding Future Skills

(Excerpt from Deliverable 6.1)

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Within BEYOND 4.0, a first report has been elaborated presenting current results of research activities in the first months of the topic "Understanding Future Skills". It is about different aspects of changes in skills requirements due to digitalization in organizations. Two updates will follow when additional data have been collected and processed at company, regional and EU level. This text includes a summary of the above mentioned report providing information on the state of the art related to the skills topics that are in the scope of BEYOND 4.0. This report essentially comprises the state of play of the skills debate, a general skills framework and its building blocks "Conceptualisation" (classification of skills) and "Calculation" (measuring influence factors on skills). It represents the state of play and some limitations that should be mitigated by the progress of the BEYOND 4.0 project to enrich the skills debate.

Enriching the skills debate means to emphasise skills needs that enable inclusiveness. The current debate about the impact of digitalisation on jobs and skills often revolves around the number of occupations and jobs that are susceptible to automation as initiated by Frey and Osborne (2013). In contrast, Atkinson and Wu (2017) use the occupational churn approach that forms a balance of the numbers of threatened jobs and jobs that will be emerging due to digitalisation. However, it has to be stressed that the skills requirements of the emerging jobs will in most cases be quite different from the disappearing jobs. So, there will be a need for closing the emerging skills gap by education and training and there also might be a need for other ways of inclusion for the people who worked in jobs that have been destroyed.

To prevent certain groups of employees from becoming losers of the digitalisation and thereby to ensure inclusiveness, the training of additional skills is needed. Enriching the skills debate means to identify the gap and the numbers of affected workers to prepare the EU, member states (VET systems) and companies for those changes.

Another important issue is to enrich the skills debate on polarisation and upgrading. Many studies revolve around developments in different EU states and in different decades. But, it is hard to predict what trends can be expected for the future. But still, such estimates are important in order to identify threatened groups of employees (and unemployed people) and to prepare them for the digital transformation by up-skilling, re-skilling etc. So, further data from companies and regional ecosystems have to be considered to approximate such estimations. Furthermore, additional trends such as crowd working have to be considered to analyse potential impact on skill needs.

In particular, the distinction between routine and non-routine activities must be defined more clearly. In the current debate, circular arguments often have been used: routine activities are defined as such that can be automated. Afterwards, it is stated that routine tasks are susceptible to automation. This problem of circular reasoning is exacerbated even further by the technology of artificial intelligence. Frey and Osborne (2013) state that this technology can even automate non-routine tasks. However, facing the argument that an activity that can be

automated is defined as a routine task, the statement of Frey/Osborne would be impossible. That shows that there is an urgent need for a clear distinction of routine tasks and non-routine tasks which will also enrich the skills debate in the further course of the project.

The so-called bottlenecks of automation show that also routine tasks are not susceptible to automation if they require special dexterity. It must therefore be redefined what is considered to be automatable and what is not. Again, the distinction between routine and non-routine tasks is not sufficient. This argument has been confirmed by studies (Pfeiffer et al., 2016; Pfeiffer, 2016; Pfeiffer & Suphan, 2015c) which show that activities that are apparently routine tasks require experience-based skills.

So, enrichment of the skills debate will include a more careful examination of which types of skills are needed in the digital future and which not. The distinction between routine tasks and non-routine tasks is no more sufficient.

This deliverable describes a general framework that has been developed to integrate all the skills related issues that have to be dealt with in the project BEYOND 4.0. Not only employers´ requirements are integrated but also those of individuals. In the changing labour market structures, it is not only the responsibility of the state and the companies to care for the provision of skills that are needed for the digital transformation.

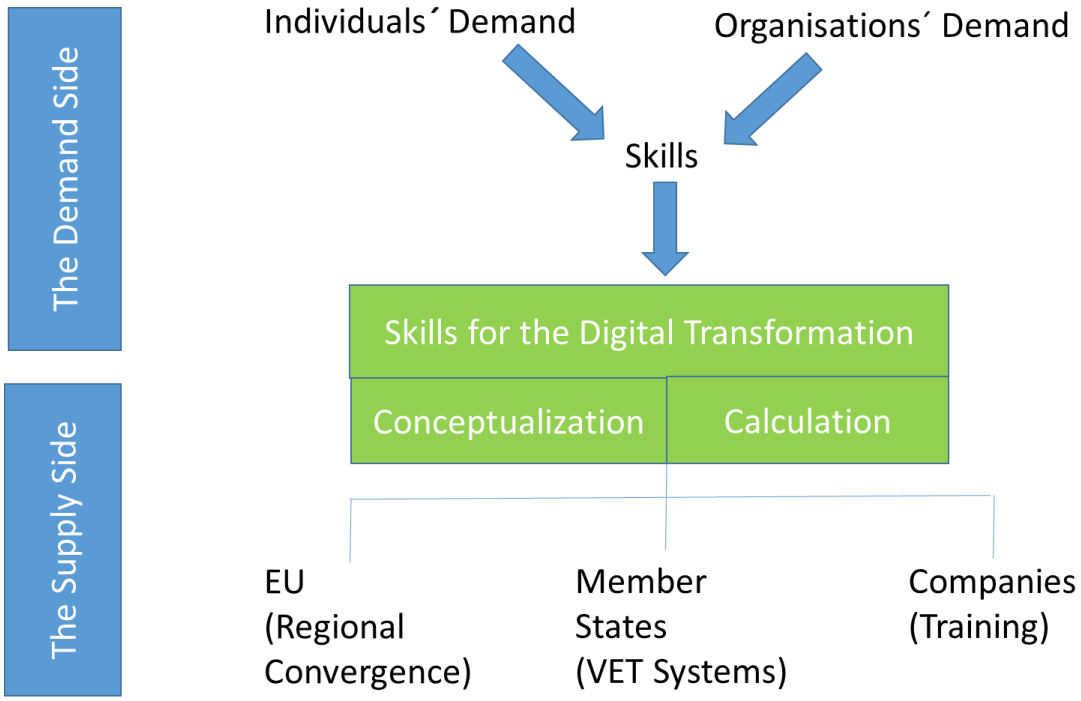
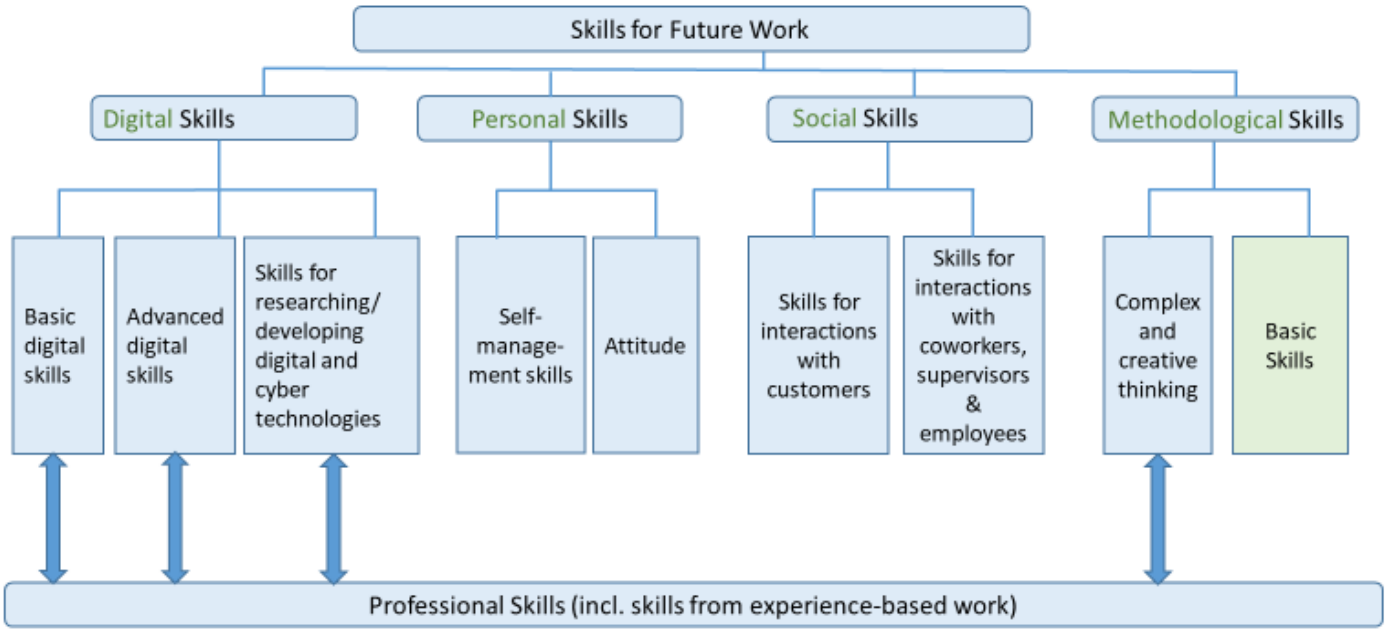


Figure 1: The General Skills Framework

Also, individuals are in charge to acquire the right skills in order to remain employable in a changing work environment. This is especially important for the platform economy, where people are and increasingly will be self-responsible to have the right skills to meet demands of customers. The further research within the project BEYOND 4.0 should include the investigation of the question which skills are needed by people working in the platform economy and how they can acquire those skills.

Conceptualisation as one building block of the general framework has been done by developing a preliminary classification of new or increasingly important skills for the digital transformation.

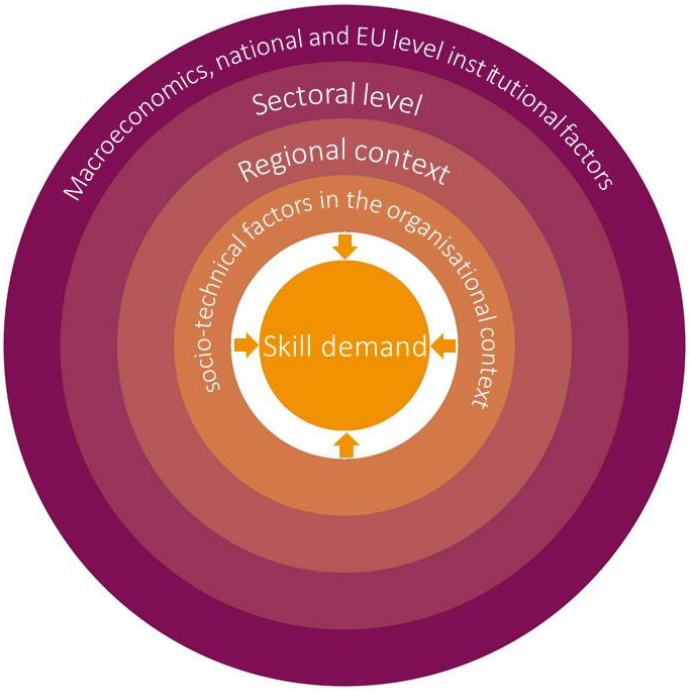
Figure 2: Classification 2.0 of skills for future work



It has to be agreed on a common understanding of skills categories with the other work packages. Additional data from these work packages will be integrated to validate the classification. Further developments of current frameworks (e.g. Agoria digital skills model or 21st century skills classification) could be considered. Above all, the further development of the skills classification of ESCO must continue to be observed. It seems to consider most of the skills categories we found in literature. But we have to wait and see if the operationalisation of transversal skills is done in a way that is suitable for BEYOND 4.0. Particularly, ESCO´s understanding of digital skills (in a strictly technical sense) must be critically reviewed. So, there remains scope for adaptation of the preliminary classification of future skills.

The elaboration of the building block calculation of the general framework is based on the analysis of the current skills debate and further literature which examines and theorises how and why skills demand changes. There have been identified four levels of influence factors: the organisational level, the regional level, the sectoral context, and the institutional configurations and macroeconomic influences. In this approach, the underlying assumption is that the organisational level, including the specific uptake of new technologies, has the most direct influence on changes of skills demand, the regional context has the second most direct influence and sectoral and institutional influences on the national or international level have rather mediated or indirect influence on the skills demand. The macroeconomic influences have both, direct and indirect influences on skills demands.

Figure 3: Different levels of influencing factors on skill demand



In order to use this approach for empirical studies, several European surveys and databases are available. There are surveys conducted on the individual employees' level which include variables measuring skills with workplace and socio-demographic characteristics. Most of them do not measure organisational characteristics as they are portrayed to be important in the theories discussed. But there are employers' surveys which include organisational variables, and technological uptake. The difficulty is bringing these datasets together. For this, more links between these datasets would be needed. The same holds true for connecting these datasets with information about institutional configurations or macroeconomic statistics. During the project period, we will further look into European data that deal with skills and the identified influence factors and will also integrate findings of other work packages in order to provide a comprehensive overview and critical evaluation of the available data.

For a skills debate that includes the discussion of reasons for labour market polarisation (and to a lesser extent upgrading and downgrading), in our point of view, a task-based approach will improve the understanding of the impacts of the digital transformation and facilitate more appropriate expectations of future changes of work and skills demand. This task-based approach includes the organisational level influence factors and also examines the actual technologies and use of technologies within organisations and industries. In our next updates of the deliverable the aim is to further elaborate in what way such an approach needs to be designed and conceptualised. Furthermore, the work and results of the other work packages in Beyond 4.0 are to be integrated to find the most adequate framework to analyse and predict the changes in skill demand caused by the digital transformation.

References

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