



Feasibility study for a (self-) assessment tool on skills management practices in SME's

Kantar, Visionary Analytics and Rand Europe

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Contact: Alison Crabb

E-mail: EMPL-B2-UNIT@ec.europa.eu

European Commission

B-1049 Brussels

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Written by

Visionary Analytics: Simonas GAUSAS, Aleksandr CHRISTENKO

KANTAR: Marius MOSOREANU, Maxime HAYET, Daniela ULICNA

RAND Europe: Joanna HOFMAN, Madeline NIGHTINGALE

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Introduction

This document represents the report highlighting the results of the feasibility assessment stage of the study “A study for feasibility assessment and piloting of a (self) assessment tool on skills management practices in SME’s”.

While a standalone document itself, it constitutes an distinct, complementary part of the final report in which the points exposed here have been summarised and synthesized with the insights stemming from validation workshops, interviews and the development of the tool.

The main goals of this document is to provide:

- A summary of the findings regarding the skill management in SMEs, as emerging from our desk research (including analysis of academic literature, reports, statistical data), case studies, and interviews with SMEs, experts, and intermediaries.
- An overview of the existing skills management solutions / tools that are available on the market and which SMEs could use, which also includes case studies of selected tools.
- A description on how the (self-)assessment tool could be developed, which includes, but is not limited to, a description of the possible target groups, aims, content, operation and usability, deployment, and sustainability strategies the tool could take.
- An overview of the state of play of stakeholder consultation and relevant methodology updates for the remaining tasks of the study.

These goals are achieved by providing a systematic and schematic summary of the findings detailed extensively in the study’s first interim report. To limit the scope of the report, we predominantly focused on summarising the main findings, while a more in-depth discussion on most of the topics can be found in the Annexes.

This report is organised into two main parts, mapping the role on outcomes of the Tasks 1-3 of the assignment, with the following role and characteristics:

1. The first part of the study – *Desk Research* – refers to task 1 of the assignment and is structured as follows:

- (a) Business needs and skills management challenges in SMEs – what SMEs need to solve / change in order to meet their goals, such as improved productivity, growth, implementation of new strategies, etc.? Though we explore different types of business needs, the main focus is on those that can be solved through more effective / efficient skills management. We focus on business needs first rather than skills management (SM) practices as the latter are often solutions to particular problems that SMEs face. And hence, if we are able to pinpoint the problems that SMEs have, we can more easily identify solutions that are the most useful and relevant.
- (b) Good skills management practices – what skills management practices could SMEs adopt to meet their business needs? This includes an overview of new practices that SMEs could implement as well as how they could improve existing ones. The SM practices are separated into four groups, including skills assessment, skills development, skills

utilisation, and complex (i.e. include several skills management practices) solutions. In addition to SM practices, among other things, the subsection also provides links and references to different sources explaining how the good SM practices could be implemented in SMEs.

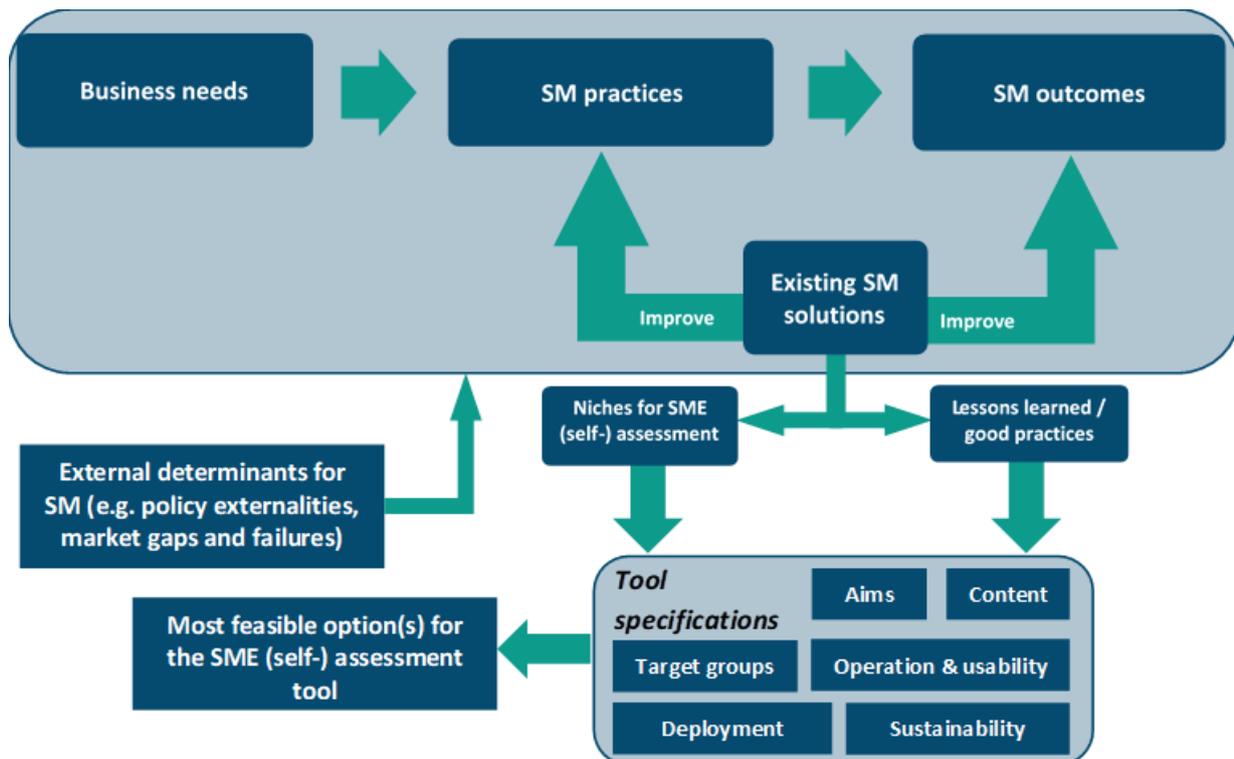
- (c) Outcomes of good skills management practices – what are the outcomes of good skills management practices and which of them have academically proven causal relationships? Outcomes here refer to outcomes to individuals (e.g., improved competences), companies (e.g., higher productivity, growth), and society (e.g., greener companies). In addition to the outcomes, this subsection also discusses causal chains between business needs, good practices, and outcomes that can be found in the academic literature.
- (d) Overview of skills management solutions / tools – what is the broad situation in the market of SM solutions and what niches our tool could fill? This subsection includes both a general overview of the market and an overview of venture capital investments into the HR market. It also provides an overview of the mapped tools and external (market) determinants that can hinder SMEs from implementing the most effective / efficient SM solutions. Finally, to better identify the niches that the new solution / tool could fill, subsection also overviews what niche are not filled by other tools.
- (e) Cross-case analysis of selected tools – how selected skills management tools differ, what are their main selling points, what lessons we can learn from them? Answers to these questions will facilitate us to learn from the best when developing the new tool.

2. The second part – *Analysis of possibilities to develop a (self-) assessment tool* – refers to task 2 of the assignment and is comprised from the following three subsections:

- (a) Business needs and skills management challenges in SMEs – what SMEs need to solve / change in order to meet their goals, such as improved productivity, growth, implementation of new strategies, etc.? Though we explore different types of business needs, the main focus is on those that can be solved through more effective / efficient skills management. We focus on business needs first rather than skills management (SM) practices as the latter are often solutions to particular problems that SMEs face. And hence, if we are able to pinpoint the problems that SMEs have, we
- (b) Rationale for the tool – what are the justifications for creating a new (self-)assessment tool? This also includes a summary of niches that the tool could fill.
- (c) Tool specifications – who and what the tool could target, how it should operate, be deployed, sustained, etc.? Namely, this subsection includes an overview of the target group, aims, content, operation and usability, deployment, and sustainability strategies of the tool.

- (d) Options – what are the different combinations of dimensions the tool could have, who it could target, etc.? While the tool specifications subsection provides a general overview of possible features, target groups, deployment strategies, etc., this subsection provides a refined summary of the best combinations of the aforementioned dimensions.
- (e) The figure below also provides a general conceptual model of how the different elements of the study relate to each other.

Figure 1. Conceptual model of the study (tasks 1 and 2)



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Source: Consortium

Our main conclusion was that a tool is feasible, and that there is even a special niche for it. Further research, validation workshops and IT development, as presented in the draft final report (DFR) have rendered what such a tool could look like:

- Open to everyone but focused on advising on transformational issues
- Sector- and country agnostic in its recommendations, but taking both into account in the comparison/benchmark
- Using a questionnaire to answer questions about skills practices and business. Then analysing answers to identify best performers
- Using the answers to the questionnaire to report best practices for a group of similar SMEs. The list of which is derived from the literature review presented in this document and should in term be supplemented by SMEs' own recommendations.

Such a tool is thus feasible and had even been tested. The results drawn in the draft final report however have fine-tuned this approach by confronting the prototype to its users to come up with practical recommendations.

Summarised below are all the insights gathered through the report regarding the feasibility of the tool currently assessed:

Table 1. Lessons learned - summary

Aspect assessed	Lessons learned
Issues faced by SMEs	<ul style="list-style-type: none"> • While the term ‘SMEs’ refers to a very large number of diverse enterprises, most of them face similar challenges in terms of increasing productivity, profitability and faster growth. Micro SMEs also face particularly high death rates. • To ensure sustainable growth and profitability SMEs, just like large enterprises, need to develop new or improve existing products, processes, business models, etc. However, propensity to innovate is strongly related with size: the share of innovative large enterprises is significantly higher than the share of innovative SMEs, irrespective of type of innovation activities. • Lack of qualified employees within an enterprise is a very important barrier to innovative activities. Although a higher share of SMEs (in comparison to large enterprises) claim that this factor hinders innovation, a smaller share of SMEs provide training.
Needs and mitigation strategies	<ul style="list-style-type: none"> • Though many government policies and other positive external determinants can boost SMEs interest in investing in skills, they are often overshadowed by negative externalities. • Many market gaps are interconnected with each other and present complex challenges for SMEs (e.g., supply constraints and lack of funds; lack of time and lack of human resources). • When looking for SM tools that could effectively solve their business needs, SMEs tend to face the issue of supply gaps. Supply gaps present two problems for SMEs. First, they often cannot find tools that could address their needs. Second, if they find those, most of the tools mostly target bigger companies and not SMEs. • Market failures are particularly problematic for SMEs there are few solutions on the market that could satisfy SMEs both in terms of tailored content and, especially, in terms of price. Therefore, SMEs do not use expensive, but innovative SM tools that could help them to satisfy their business needs. • SMEs also suffer both from a lack of internal resources and time; the lack of financial resources prevents them from buying innovative, well marketed, SM solutions, while the lack of time and human resources prevents them from searching for free/open access SM tools or planning any SM activities internally. • The developed tool, therefore, should be tailored to the SMEs financial needs – it should be provided free of charge, be easily accessible, and require minimum time commitment from SMEs. • SMEs also suffer from the information deficiency problem – many of them do not see the actual benefits of effective and efficient SM. This unawareness, in turn, discourages SMEs from creating or updating their SM strategy. • Therefore, when developing the tool, particular attention should be paid to its dissemination strategy. The tool must be easily findable, while the advantages of its deployment should be clearly formulated. It is crucial to ensure a broad user span during the first wave of distribution, since SMEs tend to follow competitors in adopting good practices.

<p>Cross case analysis of the tools</p>	<ul style="list-style-type: none"> • Target groups: • Size is the key differentiating factor, both across the tools (e.g., some target SMEs while some medium-sized and large companies) and within the tools (different packages depending on the organisation size). Thus, the tool could include variations in content (thematic modules) and depth (complexity of the tool) to address varying needs of SMEs of different sizes. • The tool could focus explicitly on SMEs with 25-250 employees as they are seen as a group most in the need of such solution. If targeted at all SMEs, the tool would have to carefully consider the very different needs of very small companies (e.g., incorporating a HR administration module to help with day-to-day HR management). • Availability of languages seems a crucial feature to ensure international coverage, especially in the European context. <p>Aims:</p> <ul style="list-style-type: none"> • To ensure take-up, the tool needs to present concrete benefits for business owners, i.e., contribute to improvement of business outcomes (e.g., increased productivity) or people-related outcomes (e.g., ability to attract and retain talent). • The tool should focus on smaller, more tangible, aims rather than on broad all-inclusive goals (e.g., improve productivity, growth, etc.). To achieve the broad goals infinite amount of solutions could be proposed, while achieving the former provides structure, is easier to implement, as well as it helps to achieve the broad goals. <p>Content:</p> <ul style="list-style-type: none"> • Almost all analysed tools highlight the importance of gathering employee feedback and measuring employee and include employee surveys. Such feature should be seriously considered. • Diagnostic targeted at company owners/ managers should focus on broad issues across (and possibly beyond) all SM stages, incl. practices used in recruitment, training, work organisation as well as issues related to business and people strategy, succession planning, and other aspects affecting long-term standing of a company. Diagnostic (or its part) focused on employees (e.g., employee surveys) should instead focus on: i) perceived employee engagement and satisfaction (which is a proxy to higher productivity), and ii) assessment of company's organisational culture, incl. knowledge sharing, communication, job design, etc. • Some level of content customisation seems necessary, from a relatively fixed structure with only some personalisation options (adding questions to surveys, etc.) to full flexibility in module selection, survey creation, etc. • The tool needs to accumulate a critical mass of users, before benchmarking will be possible, which in itself can be challenging. <p>Operations and usability:</p> <ul style="list-style-type: none"> • At least two reporting options seem necessary – more detailed for business owner/ managers/ HR and a summary for wider dissemination (among employees and/ or for financial and other intermediaries)
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- Depositories of resources and online communities are highly valued by customers and are largely self-sustainable features.
 - Non-human support mechanisms are most cost-effective and feasible given the EU reach of the tool – this can include detailed walk-through guides and manuals in attractive formats. Live chat could be considered.
 - The tool needs to incorporate intuitive visual solutions not to scare off users with its perceived complexity and maximise user experience.
- Deployment:
- Delivery of the tool through an online platform seems most feasible – additional mobile app is not a must as it needs significant amount of backend support and seems to provide little added value for users.
 - A demo / taster version is often the key promotional material. It could focus on a single narrow issue (ideally, a common or ‘hot’ problem) or provide overview across many SM aspects.
 - Dissemination of the tool through existing institutions, e.g., one-stop-shops for SMEs, chambers of commerce, local / national development agencies should be considered, especially during the roll-out phase.
 - Flexibility and user-friendliness are the functional areas most valued by users and thus, are often advertised by the providers. First, given the heterogeneity of needs (e.g., depending on size) among SMEs, they need to be able to adapt the solution for their specific purposes. Second, given often little or no HR expertise in SMEs as well as limited resources, incl. time, the tool needs to be easy and intuitive to use, not to ‘scare off’ users.
- Sustainability:
- Collecting user fees should be considered (e.g., for ‘extra’ tool features) as it seems to be the only viable long-term sustainability strategy.
 - Costs can be cut to minimum by employing largely self-sustainable elements such as online communities and repositories or detailed manuals and walk-through guides instead of human support.

Desk research: SMEs needs and Skills management solutions market

This subsection reports the results of the in-depth desk research exercise that has been conducted in order to inform the design of the tool and the feasibility study. It draws on different methods of research and analysis that can be grouped under the desk research umbrella, including:

- Data gathering (from Eurostat SBS and Orbis)
- Literature review; especially on the needs of SMEs regarding skills management practices
- Market research of the SM solutions field, which itself includes:
 - A mapping of solutions available
 - An in-depth comparison of selected tools

This allows us to explore the problems SMEs are facing, how they cope with it, what are potential best practices and their impacts, and what solutions the market offers. This is summarised in the below table.

Table 2. Questions tackled in the desk research

Main question answered	Adapted to the topic	Relevant section
The problem	What issues do SMEs face when it comes to skills?	Section 1
The solutions	How could they address them with good skills management practices?	Section 2
The market offer	What are the solutions the SMEs have at their disposal to help them improve their skills management practices?	Section 3

Source: Consortium

Understanding the problems SMEs are facing, the solutions and the current market offer allows us to calibrate what the different options for the development of the tool could be. This is tackled in section B- “Axes of development for the creation of a self-assessment tool on skills management practices”, where the findings of the desk research are also confronted to the conclusions stemming from SME engagement.

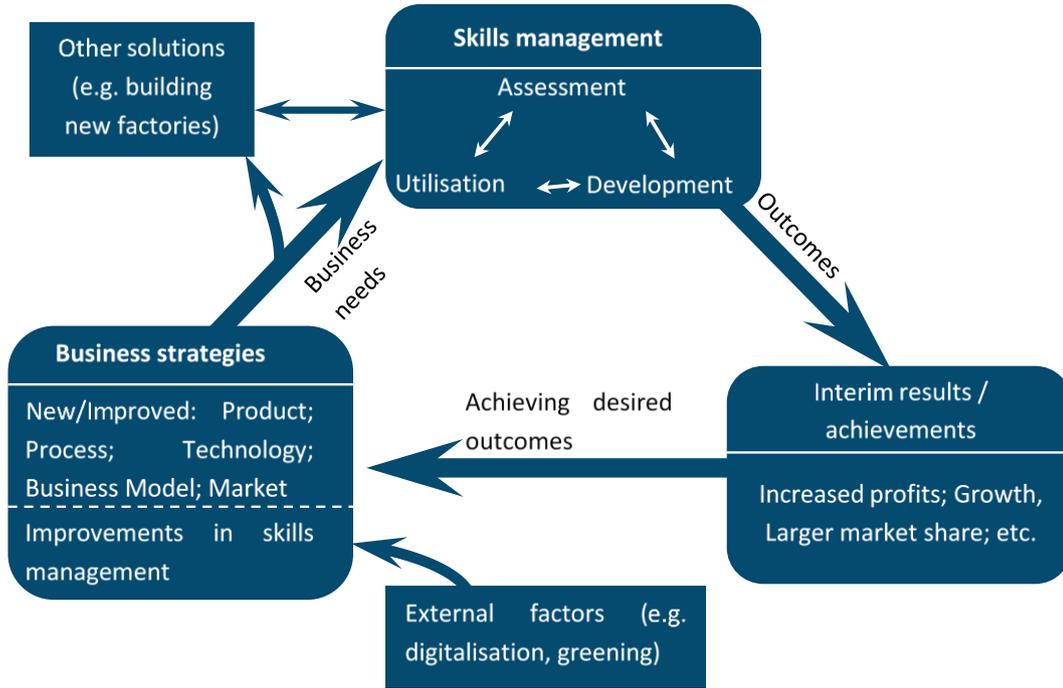
1. Business needs and skills management challenges in SMEs

As for all businesses, the main objective of an SME is to turn out a profit. While there is a link between good skills management and business output (evidenced in further sections), it is important to understand current practice to see how a tool could change things. The core idea is that the business needs for companies emerge from business strategies, aimed at improving products, processes, technologies, skills management, etc. The pressures to adopt specific strategies arise:

- as a response to external pressures / opportunities (e.g., digitisation, greening of business) or
- with the goal of improving company profitability, growth, stability, etc.

Figure 2 illustrates the overall conceptual framework for the analysis of business needs. It outlines how interconnected the business needs are with the skills strategy. Keeping this model in mind, the remainder of the subsection reviews the most important/relevant issues SMEs face. We start the discussion by analysing how SMEs fare in terms of overall firm objectives (i.e. profitability, growth, productivity, etc.) and what broad challenges they face in regard to them. After that, we dive into concrete business needs SMEs face as well as indicate, in passing, which skills management practices can help to mitigate them.

Figure 2. Business needs: conceptual model



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Source: Consortium.

1.1 General issues SMEs face and mitigation strategies

While the term ‘SMEs’ may refer to a large number of diverse enterprises, most of them face the same broad challenges. This includes, challenges related to (i) productivity, (ii) profitability, and (iii) stability. These challenges are not SME-specific, as large corporations also face them. However, for SMEs these challenges are more pressing.

SMEs are on average less **productive** than large enterprises. In 2014 micro-enterprises in the services sector were only 68% as productive as large companies, while the productivity of small and medium-sized SMEs reached 91% and 111% respectively (Marchese, et al., 2019). More recent data, from the structural business statistics, tell a similar story (see Figure 3). As the size of the company grows, in majority of cases, the labour productivity also increases. This is true for majority of economic sectors, with the manufacturing sector standing out with a very large jump in productivity for large companies (i.e. 250+ employees). The only exception is the wholesale and retail trade sector, where medium-sized SMEs (50-249 employees) had a higher labour productivity than companies belonging to other size classes.

Figure 3. Average apparent labour productivity (gross value added per persons employed) in thousands of euros by size and sector (2017) in EU27 (2020)*



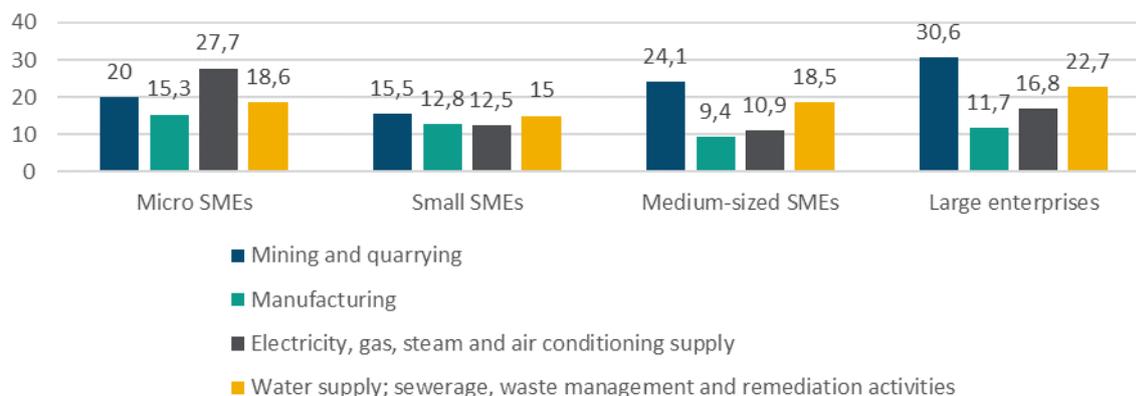
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Source: Consortium, based on Eurostat, Structural Business Statistics (SBS) 2020.

* Malta and Luxembourg were excluded from the analysis due to missing data, while EU27 (2020) refers to the European Union excluding United Kingdom.

Similarly, the level of **profitability** of companies significantly varies between sectors, countries, and size. In some sectors, such as mining and quarrying as well as water supply, sewage <...>, large companies were significantly more profitable than SMEs (see Figure 4). However, in manufacturing sector SMEs were more profitable than large companies. We can also detect a decline in profit rates with the increase in SME size – similar trends were also identified in the analysis of historical data (PwC et. al. 2019, p. 50.).

Figure 4. Average gross operating rate % (profitability) in 2017 by size class in selected sectors in the EU-27 (2020)



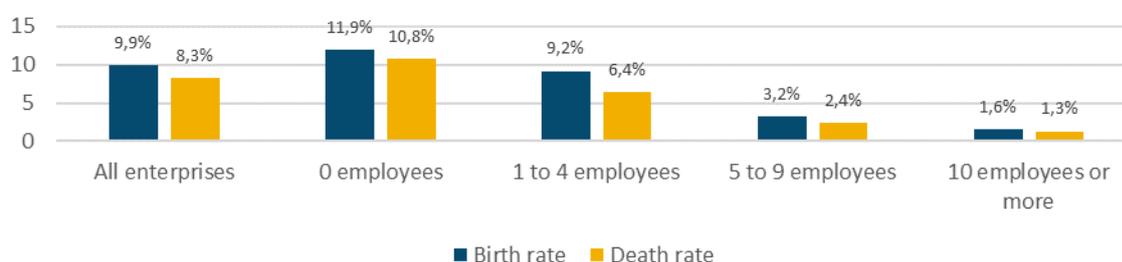
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Source: Eurostat (2020)

Note: Gross operating rate is an indicator of profitability that is calculated by dividing gross operating surplus by turnover. The gross operating surplus is the surplus generated by operating activities after the labour factor input has been recompensed. It can be calculated from the value-added at factor cost less the personnel costs.

Furthermore, **stability**, in terms of survival, in smaller enterprises is also smaller compared to large ones. As Figure 5 demonstrates, micro-SMEs have the highest birth as well as death rates¹. As the enterprises grow in size, their death rates significantly decline. In 2013 – 2016 the largest number of new enterprises was established in the following sectors: administrative and support services, information and communication as well as professional, scientific and technical activities (PwC et. al. 2019, p. 74). These three sectors also demonstrated the largest difference in birth and death rates, i.e. more companies were established than ceased operation (Ibid.).

Figure 5. Average birth and death rates of enterprises in EU-28 in 2013 – 2016 by size class



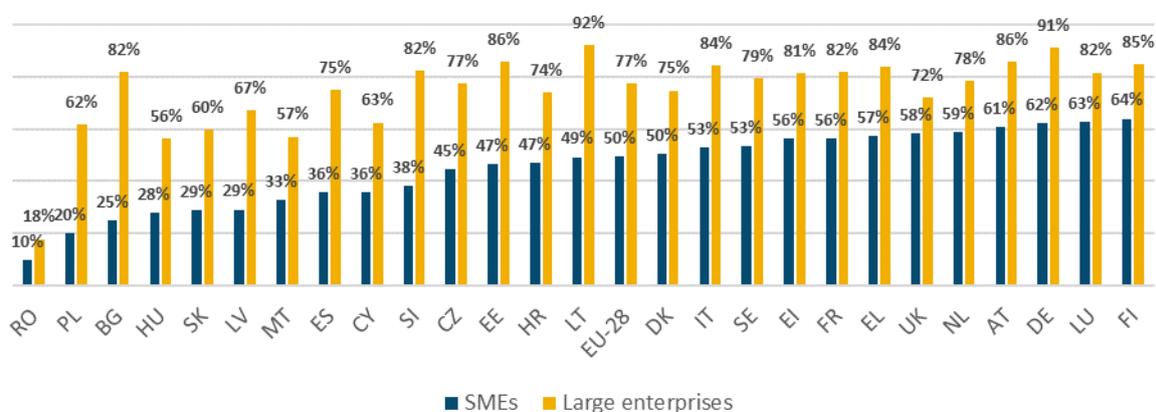
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Source: [PwC et. al.](#) (2019), p. 73.

¹ Birth rates equal to the number of new enterprises divided by the number of enterprises in the same size class in year t-1. Death rates are equal to the number of enterprises that disappeared in year t, divided by the total no. of enterprises in year t-1.

To address the challenges of survival as well as increased productivity and profitability, SMEs, like large enterprises, need to improve their products, processes (including adoption of new technologies), business models, gain access to new markets, etc. These improvements are, to an extent, captured by Eurostat Community Innovation Survey.² The survey defines innovative firm as the one which has developed product, process, marketing and organizational innovations that are significantly different from what a company did before. The most recent results suggest that the share of innovative large enterprises is significantly bigger than the share of SMEs (see Figure 6). The differences between large enterprises (250+ employees) and SMEs (249 and less employees) are particularly pronounced in the Member States that joined the EU in 2004 and later.

Figure 6. Share of innovative enterprises in EU28 in 2014-2016



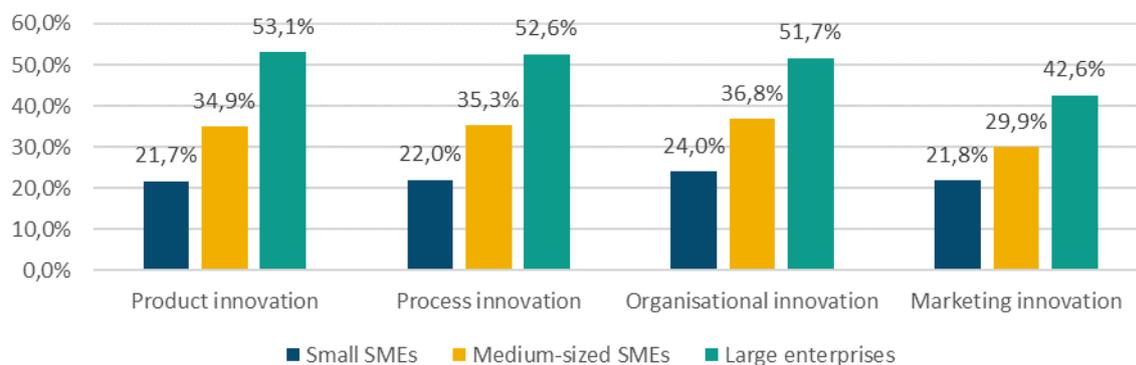
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Source: Eurostat, Community Innovation Survey, 2016.

Closer inspection by size class (see Figure 7) suggests that the share of innovative large enterprises is significantly higher than the share of SMEs irrespective of type of innovation activities. Furthermore, the share of innovative micro-SMEs (10-49 employees) is also significantly smaller than respective share of medium-sized SMEs (50-249 employees). This clearly shows the propensity to significantly improve products, processes, etc. is strongly positively related to the size of an enterprise.

² The survey does not cover micro SMEs. Furthermore, it defines innovations as significant changes, which could arguably lead to omission of incremental improvements. Data available at: <https://ec.europa.eu/eurostat/web/microdata/community-innovation-survey>

Figure 7. Share of innovative enterprises by type of innovation in EU27 (2020) in 2014-2016 by size class



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Source: Eurostat, Community Innovation Survey, 2016.

Lack of qualified employees is among top three factors that hamper innovation activities (others include lack of internal finance and high costs; PwC, 2019, p. 139). The scale of this challenge differs by company size: 16.38% of SMEs claimed that this factor hampers innovation, as compared to 11.8% of innovative large enterprises (ibid). Non-innovative SMEs also more frequently than large enterprises claim that lack of qualified employees within an enterprise is a very important barrier to innovative activities.

Although a larger share of SMEs face lack of qualified employees in comparison to large enterprises, a smaller share of SMEs provide training. As Figure 8 demonstrates, **propensity to train** is closely associated with size: while nearly all large enterprises provide training, less than two thirds of small SMEs do so. Training provision can be viewed as one of the outcomes of effective skills management. The other elements, such as identification of skills needs, facilitation of learning-by-doing or utilization of existing talent within an enterprise, are not systematically captured by EU-wide data. However, it is highly likely that non-training firms also have not invested in other skills management aspects. This demonstrates the needs for more effective and efficient skills management in SMEs.

Figure 8. Share of companies providing training in EU by size class



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Source: Consortium, based on Eurostat (2020)

Text box 1. Main takeaways from General issues SMEs face and mitigation strategies section

- While the term ‘SMEs’ refers to a very large number of diverse enterprises, most of them face challenges in terms of increasing productivity, profitability and faster growth. Micro SMEs also face particularly high death rates.
- To ensure sustainable growth and profitability SMEs, just like large enterprises, need to develop new or improve existing products, processes, business models, etc. However, propensity to innovate is strongly related with size: the share of innovative large enterprises is significantly higher than the share of innovative SMEs, irrespective of type of innovation activities.
- Lack of qualified employees within an enterprise is a very important barrier to innovative activities. Although a higher share of SMEs (in comparison to large enterprises) claim that this factor hinders innovation, a smaller share of SMEs provide training.

1.2 Business needs of SMEs

Though the discussed broad challenges are relevant for all companies, they are too broad to pinpoint concrete good skills management practices that SMEs could implement. Hence, instead of focusing on the broad challenges and company goals, we focus on business needs that arise when they try to improve old, or implementing new, products, processes, business models, etc. The following overview includes an explanation of the needs, why they are important, and why some SMEs might have difficulties meeting them. This subsection is divided according to two types of needs, general and specific. The former refers to needs that are relevant to majority of SMEs. In their basic form, they can be related to taking a step back

to think strategically about the skillset. The specific needs refer to needs related to digitalisation and greening. The needs in both of these subsections are arranged from the needs that are most relevant to micro and small enterprises to those that are more important to bigger SMEs.

In this study variety of different business needs are explored, also including those that are not directly related to skills. However, to tailor the business needs to the main objectives of the study, the focus is given to needs that can be solved, to at least a large extent, with more effective / efficient skills management practices. Thus, conceptually, though we focus on a variety of business needs, they are structured around three skills management principles that are described in the table below.

Table 3. Skills management principles and examples of practices

Principles	Objectives	Examples of practices
Analysis and planning	This is an overarching process that underlies and determines the application of the practices for development and deployment of the workforce. It aims to identify the skills that employees currently have and skills that are most needed considering short-, medium-, and long-term business strategy.	<ul style="list-style-type: none"> • Definition of business strategy • Analysis of internal and external environment • Workforce analysis • Identification of skills gaps • Development of gap-closing strategies
Skills development	It aims at increasing the levels of skills within company. Although it is most commonly associated with training, companies use a wide range of upskilling practices, such as mentoring, learning-by-doing, etc.	<ul style="list-style-type: none"> • On-the-job coaching / mentoring • In house / external education and training • Facilitation of learning-by-doing
Skills utilisation	It aims to put the existing skills into the best use, maximising the potential of each employee and the enterprise as a whole.	<ul style="list-style-type: none"> • Job redesign • Job rotation / re-assignments of employees • Co-creation of job requirements and contents with employees

Source: Consortium, based on Berger and Berger (2004); OECD (2017); Schweyer 2010, Cotton (2007) and Robinson and Hirsh (2008).

1.2.1 General needs

During literature review and interviews we identified eleven most pressing and relevant general business needs for SMEs that can be solved with better skills management. These include the following: (i) **better managerial capabilities**, (ii) **dedicated HR personnel**, (iii) **better utilisation of existing skills**, (iv) **effective monitoring of needs for up- and reskilling**, (v) satisfying basic retraining needs of the employees, (vi) **better understanding of the employees and the labour market**, (vii) **monitoring of competition**, (viii) finding a low cost (monetary and time) skills management solution, (ix) **external assistance to improve skills management**, (x) **external funding to improve skills management**, (xi)

training needs arising from the deployment of new equipment / techniques (non-ICT).

The remainder of the subsection goes into depth on all of them.

Better managerial capabilities refer to the need of manager-owners of companies to improve their HR skills. This is an especially major issue in micro and small enterprises. This need arises as in many SMEs owners-managers also often perform the role of HR managers, even when they rarely have any formal training (OECD and ILO, 2017; Peng, Mole and Roper, 2019). Because of that, they frequently lack the know-how on how to implement more effective SM practices and have an issue balancing their managerial and HR related functions (OECD, 2012; OECD and ILO, 2017; Peng, Mole and Roper, 2019). This lack of know-how might also leads to other ramifications, such as inability of owners-managers to design a fair pay / benefits scheme (Dundon and Wilkinson, 2018; EC, 2018; Cardona and Stevens, 2004).

However, even though this issue is well documented in the literature, many SME managers are reluctant to undergo training as they believe it will not enhance their capabilities or they fear that such training will expose their knowledge deficiencies (OECD, 2012). And even if SME owners-managers want to undergo training, they often cannot due to time and financial constraints, especially in micro and small enterprises.

The aforementioned need is also heavily connected to the **dedicated HR personnel need**. This is because, as was mentioned, in small SMEs the role of HR personnel is often relegated to owner-managers of the company. Because of this owner-managers often have to split their time between HR and other managerial tasks. This, in turn, leads the company to concentrate on administrative tasks and not on skills management or employee motivation (Stone, 2010; OECD, 2013; EMPL, forthcoming; Festing et al., 2017; Kauffeld and Frerich, 2018). Though this issue could be easily solved with dedicated HR personnel, for some SMEs it might be a luxury due to financial constraints.

In addition, as many SMEs, especially smaller ones, cannot spend resources on training, they often have a need to **better utilise the existing skills of employees**. This need also stems from the fact that the smaller enterprises are often much less productive than the larger ones (see subsections 1.1.1. General issues SMEs face and mitigation strategies for more details). And this need is especially crucial for micro and small SMEs as they tend to operate under severe financial constraints (Bootz et al., 2011; Ndjambou and Sassine, 2014; Bernier et al., 2017). Although SMEs try to meet this need with some creative and relatively cheap solutions, such as informal job rotation, manual progress-tracking, etc., other, more advanced, practices remain relatively unpopular. For example, linking individual skills with enterprise objectives can be difficult for SME managers, given the lack of understanding on how one reinforces the other without 360-degree feedback from the employees (Charles-Pauvers, 2004; Sonntag, 2011; Charles-Pauvers and Schieb-Bienfait, 2010).

Those that are able to invest in training, also have an additional need to improve their **monitoring of needs for up- and reskilling**. By meeting this need, SMEs could improve the skills level of their employees, which in turn could lead to more effective and efficient work. It would also allow them to more precisely communicate to third parties what are their needs when applying for external assistance, be it consultative or financial (EMPL, *forthcoming*).

However, as some of them might lack the capabilities to accurately assess what needs each employee has the monitoring business need frequently remains unmet. Namely, SME owners-

managers are not aware of the training needs of their employees (OECD, 2013), or even do not recognise any need for training at all (Forth and Bryson, 2018; EMPL, *forthcoming*). This issue is even more severe, when they wish to evaluate what skills the company lacks as a whole and which of them, if learned, would have the largest benefits (EMPL, *forthcoming*). Some SMEs try to mitigate this issue by searching for external solutions. Though, this rarely bares fruit, as according to the interviews, due to a huge amount of SM solutions on the market and the limited time of SME managers, they have difficulties finding a solution that suits their needs.

Even if SMEs manage to create an accurate monitoring system, they may have difficulties with **satisfying retraining needs of employees**. Because of limited resources SMEs often have to focus more on how to utilise existing resources better rather than on training needs of employees (OECD, 2013; Festing et al., 2017). This is an especially large issue when it comes to soft skills, such as communication or critical thinking. This is because though SMEs are able to find professionals with relevant qualifications, they often lack relevant soft skills (EC, 2010; Cedefop, 2013; P2C, 2019). This, in turn, leads many SMEs to opt-out from finding such employees in the labour market and simply hire people with less developed soft-skills and then invest resources in their training (Cedefop, 2013; P2C, 2019). Though, as mentioned before, some SMEs are unable to meet this need due to financial and time constraints.

Going wider, some SMEs have a more general need of **better understanding their employees and the market**. When it comes to employees, this includes information on the skills, but also the general condition of employees, such as their motivation level, how empowered they feel, what they dislike about their job, etc. When it comes to the market, it is predominately focused on the skills potential employees possess. The SMEs that fail to meet this need might not be aware of how efficient their existing skills and talent management practices are (ILO, 2017), or how to attract talent (Parlier, 2005; Abraham et al., 2011; Sonntag, 2011). The second issue is especially pressing for SMEs as they often offer lower salaries and more limited career perspectives than in larger enterprises, which further limits their ability to attract talent (Parlier, 2005; Abraham et al., 2011; Sonntag, 2011). Even though these issues could be fixed by focusing more on training, which would improve future carrier perspectives of potential employees, due to limited resources (Bootz et al., 2011; Ndjambou and Sassine, 2014; Bernier et al., 2017) only few SMEs are able to do so.

Those SMEs that are able to get a better understanding of their employees and the market increasingly face the need to effectively **monitor competition**. Due to the impacts of digitalisation and globalisation, SMEs no longer compete with local businesses only but also with major national and global brands (QuickSprout, 2019). In order to stay on the market and turn a profit, SMEs have to be aware of what their competitor's business and SM strategies are (Croll and Power, 2009). This is confirmed by the interviews conducted both with the SME representatives and intermediary organisations. The interviews suggest that SMEs (particularly micro-SMEs and small SMEs) are very interested in the best practices that other companies in their industry use. SME representatives noted that in order to monitor competitors effectively, they need effective benchlearning as well as analysis and planning tools.

According to the literature review and interviews some SMEs are actively trying to solve issues with external solutions. However, literature review and interviews have shown that this can create a different need – **finding a low cost (monetary and time) skills management**

solution. First, SMEs have rather limited financial resources and, therefore, can only choose from affordable SM tools and practices (Flake et al., 2019). Second, SMEs often require tools that are easily adjustable. As both the literature review and interviews with the SME representatives demonstrate, SMEs are flexible and fast, which allows them to respond quickly to market demand (Parlier, 2005; Beron et al., 2006; Bernier et al., 2017). That is why they are unwilling to introduce overly formalised management procedures or standardised strategic planning, which are prevalent amongst large enterprises and among the existing tools (Sonntag, 2011; Paradas, 2007). Hence, because they cannot find such tools, skills assessment in SMEs tend to be performed manually by CEOs while skills development is limited to mentorships or organising ad hoc workshops (Bernier et al., 2017; Beron et al., 2006; Parlier, 2005).

Alternatively, some SMEs could try to use other types of **external assistants**, such as from governments or other SMEs, to help them with their SM needs. During the interviews we have seen that some respondents express interest in knowledge exchange of good skills management practices with successful business. However, they also mentioned that they did not know who to consult and described a manual Internet search as very time-consuming and, usually, fruitless.

Similarly, other SMEs could try to secure **external funds** to improve their SM strategy. They require such funding due to the lack of resources; they often prefer to focus on investing into production and “getting the job done”, rather than training (OECD, 2013; Festing et al., 2017). And even if they have funds to invest in SM, as mentioned prior, many existing SM solutions are not tailored to them or come with a high price (Paradas, 2007; Voyer, 2011; Abraham et al., 2011). This leads many SMEs to searching for funds outside of the company, such as in financial institutions or intermediaries for assistance (e.g., public programmes, incubators). However, some of them might fail to secure funding as financial institutions often do not sufficiently trust SMEs due to small turnovers and volatile business conditions (Paradas, 2007; Voyer, 2011; Abraham et al., 2011).

Finally, the most advanced SMEs also have an issue of meeting their **training needs arising from deployment of new equipment / technology (non-ICT)**. This is a huge issue in healthcare and manufacturing sectors as both of them frequently have to learn how to operate new equipment or how to perform new treatment methods (Cedefop, 2013). However, due to resource, knowledge, and other limitations, SMEs often do not pay the necessary attention to the questions of SM (Festing et al., 2017; OECD, 2013).

1.2.2 Specific needs

The specific needs are divided in to two types – digital and greening needs. This grouping was selected as they are prominently featured in the literature as well as EU SME strategy (EC, 2020). Digital needs refers to the need of companies to digitalise themselves and their processes due to the digitalisation of every aspect of our life. Greening needs refers to needs of becoming more environmentally friendly due to regulations, financial incentives, altruism, or other reasons.

Digitalisation-related needs

Digitalisation is affecting businesses all over the world and it presents many opportunities for companies, including SMEs, to speed up business processes, cut down on administrative and paper-based costs, and improve productivity (BWMi, 2016). This is achieved, among other things, by introducing new tools to the workplace, such as HR software, digital communication services, spreadsheets, etc. However, at the same time, it creates many new business needs, some of which could be solved with more effective and efficient skills management.

During the literature review we have identified four digital business needs that are the most pressing for SMEs and that can be solved with better skills management: (i) **help with implementing new (digital / ICT) technologies**, (ii) **developing e-commerce**, (iii) **developing online presence**, and (iv) **safe cybersecurity environment for businesses**. The remainder of the subsection goes into depth in each of them.

The most general digital need that SMEs have is to help them **with the implementation of new ICT technologies**. In relation to skills management, this means that many SMEs struggle to implement a new ICT technology due to lack of knowledge (CEFRIO, 2016; Zizzo, 2019). This struggle is exacerbated as company managers might be discouraged by short-term expenses related to the adjustments of business processes due to digitalisation. Hence, SMEs often need assistance with knowledge as well as to ensure that the digital transformation is successful.

In addition, some SMEs, especially in the retail sector, have a need to **develop e-commerce**. This is because developing an online shop is no longer seen as a domain of large business, with many SMEs prioritising it in their business strategy (City of London, 2018; OECD, 2019). At the same time, smaller businesses are still not as active in e-commerce when compared to big conglomerates as the OECD statistics demonstrates. In 2017, approximately 45% of larger businesses (250+ employees) and only approximately 22% of SMEs (less than 250 employees) received their orders via computer networks in the OECD region (OECD, 2019). Hence, there is still some room for improvement.

SMEs in the retail sector, as well as others, are also starting to see the value of developing their **online presence**. This way they can become more visible to the consumers and further increase their outreach (OECD, 2010). In other words, online presence is considered by SMEs as a marketing tool, which uses social media, personal websites, promotional videos, etc. to put themselves in front of potential clients (OECD, 2010, OECD, 2019). Compared to more traditional marketing approaches, many opt-in for digital ones as they can easily monitor the reach of the campaign through a variety of tools, such as Google Analytics. However, in order to create effective online marketing strategies, SMEs need employees that have adequate digital skills (OECD, 2010; City of London, 2018). Since many SMEs do not have such know-how, this creates a potential skill gap.

Finally, with the increased thread of cyberattacks many SMEs have a need to create a **safe cybersecurity environment for business**. According to Hiscox (2019), the average cost of cyberattacks for businesses have been increasing with dramatic speed in the last two years – from approximately €212,000 to €342,000 per business annually (an increase of 61%). In addition, according to the same report (Hiscox, 2019) small firms (with fewer than 50 employees) reported an increase in the frequency of cyberattacks. In 2019, 47% of the respondents reported at least one cyberattack, compared to only 33% in 2018. Medium-sized

firms (employing 50 – 249 people) also reported a sharp increase from 36% to 63% (Hiscox, 2019). These rising digital challenges incentivise companies to educate their employees on how to protect their computer systems and networks from cyberattacks (Gaycken and Hughen, 2015). However, due to the lack of know-how and many SMEs not seeing cybersecurity as a priority, only a selected number of companies have adequate cyber protection.

Greening and sustainable development needs

Similarly to digitalisation, greening and sustainable development is at the forefront of the discussion in the EU (EC, 2011; Lesinger, 2015; Commission, 2020). Because of this, companies in the EU are incentivised, through monetary means or social responsibility, to become greener and more sustainable. However, just like digitalisation, this also creates additional needs for SMEs. From the literature and interviews we have identified three of such needs that can be solved with more effective and efficient skills management: (i) **building green business strategy**, (ii) **skills management solutions for implementing environmental standards**, and (iii) **cutting down administrative and paper-based costs**.

One of the main business needs that appeared from the sustainability trend is **developing green business strategies**. SMEs have a motivation to do so as it could not only reduce their negative impact on the environment, but also make them eligible for participation in various sustainability support programmes (e.g., European Green Deal). Furthermore, a green business strategy could help SMEs to increase their market share by appealing to the more ecologically conscious consumers (OECD, 2018). However, to develop such a strategy, SMEs need knowledge in areas such as sustainable energy use, awareness of relevant environmental standards, and good understanding of environmentally friendly technologies, among others (Cedefop, 2012). As SMEs might have difficulties acquiring this knowledge, as was discussed in previous subsections, being greener is a luxury to a majority of them.

Though those that try to become more conscious about the environment, also have a need of finding **skills management solutions that follow environmental standards**. This need includes knowledge about how such solutions could be implemented, but also general knowledge about regulations and green standards (Cedefop, 2012). Additionally, the aforementioned European Green Deal also gives an additional boost to SMEs to focus more on green skills management (EC, 2020a). In that respect, companies can benefit from SM solutions that analyse the company's utility data and provide recommendations on how a business can save money while reducing its environmental impact (e.g., energy management software). This need is particularly relevant for manufacturing SMEs since their production processes have bigger impact on the environment (Cedefop, 2012). However, SMEs often lack knowledge on how exactly to implement such solutions, as well as lack resources.

Finally, under the influence of both trends discussed previously – digitalisation and greening of the global economy – SMEs are looking for ways to **cut down administrative and paper-based costs** (DataScope, 2019). This can be achieved by introducing digital, more environmentally friendly, SM solutions in the company. For example, using an e-Learning platform instead of classical paper-based courses (BWMi, 2016). Other solutions like technology-based assessments help to save time on recruitment or monitoring employees' development (BmBF, 2015; Flake et al., 2019). Unfortunately, quite a number of SMEs do not possess the adequate knowledge on how to use such technologies or on what their benefits

are (Cerchione and Esposito, 2017). Apart from that, in certain cases, SMEs cannot afford these tools because of their limited financial resources (Cerchione and Esposito, 2017).

1.3 External determinants for skills management

External determinants are factors not directly in control by the company that prevent or enhance the company's want and ability to invest in skills. Positive factors include market forces and government interventions that increase incentives for businesses to invest in skills. On the negative side, we have a variety of market gaps and failures that do the opposite. This subsection provides an overview of both types of externalities, starting with the positives and concluding with the negative ones.

Positive externalities

First, the overall **economic situation** can impact SMEs' SM-related behaviour. During economic expansions, firms are more likely to use HRM practices such as training and increasing employee autonomy; in contraction, firms tend to employ strategies that focus on the short-term solutions (e.g., cutting costs; OECD 2017). Furthermore, there can be differences within economies due to different **market competitive conditions**. In general, competitive product markets and tight labour markets encourage investments in skills (Service Skills Australia 2014; Tan et al. 2018). However, in some sectors, increased competition, especially from Asia, can force firms to compete on price and thus minimise costs, which can further decrease for example, the training take-up rates.

Second, **policy externalities**, deriving from, for example, education and training systems, and welfare and employment regulations, can foster skills management. For instance, it was found that a higher minimum wage might lead firms to try to increase the productivity of workers that would sustain the higher wage (OECD 2017). In addition, if there are any policy incentives to invest in training, such as the government covering part of such investments, some companies that were reluctant to invest prior, such as SMEs with limited funds, might reconsider.

Finally, some substantial **sectoral and regional factors** might play a role. Sectors with highest participation rates include social (non-health) services sector (incl. public administration and education), the producers' services sectors (finance, real estate, professional, scientific and technical activities, and the health and social work sector; Cedefop 2015). Lowest training participation rates are found in the extractive sector, the transformative sector, the distributive services sector and the personal services sector. In general, participation is higher in more innovation-driven economic sectors (information and communication; professional, scientific and technological activities) and in the public sector where the proportion of high-skilled workers is larger (Ibid.) Furthermore, conducive regional "skills ecosystems" can be built in regions or industries that push companies towards high road strategies (OECD 2017).

Negative externalities

Predominantly negative externalities stem from market gaps, which are when the demand exceeds the supply (White Jr., 1977). Hence, they can be seen as opportunities for companies as if they managed to fill in this gap, they can profit from it. This predominately includes supply side issues, such as: (i) **market failures**, which also includes **supply constraints**; as well as

constraints that prevent a higher demand: (ii) **information deficiency** and (iii) **resource constraints** (time and money).

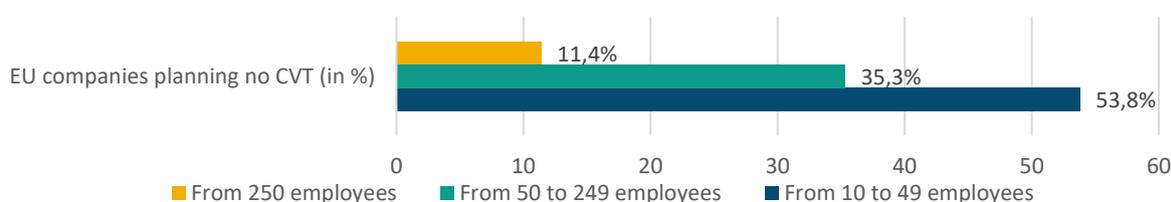
Market failures refer to lack of solutions tailored to SMEs (e.g., existing solutions are not appropriate, too expensive, cannot be implemented by SMEs). The mapping of SM tools shows, majority of existing SM solutions target large companies or all companies, but not SMEs – only 31% of the identified tools targeted SMEs.³ In addition, SMEs are in great need of solutions that could help them to assess and develop green skills (EC, 2011; Lesinger, 2015). As the pressure on businesses to become more sustainable and environmentally friendly is increasing, SMEs are likely to suffer from the lack of SM tools in this area. Another example are the tools that help SMEs to digitalise working processes. While we identified quite a number of such tools and good practices (e.g., online assessments, course constructors, benchmarking tools), there are almost none that show them how to do actually transition to using digital working modes and why they should do that (EMPL, *forthcoming*).

There are several reasons for the lack of supply. First, **since SMEs often lack resources, many SM solutions developers do not focus on them** (Schöpfer et al, 2018; Flake et al, 2019). For example, in certain countries (e.g., Austria) this problem is expressed in oligopolised educational and testing markets, which leads to higher training costs and further burdens the SMEs financially (Austrian Institute for SME Research, 2019, pp. 96-118). Moreover, it is objectively difficult for solutions developers to offer SMEs standardised tools due to the diverse nature in terms of size, sector, and company specifics (EMPL, *forthcoming*).

Second, SMEs are particularly vulnerable to **poaching** because larger corporations can easily provide bigger salaries and much better other working conditions to the talented employees working in SMEs (Acemoglu and Pische, 1998; 1999). This fear of losing their employees often prevents SMEs from training them (EMPL, *forthcoming*; ILO, 2017; Stone, 2010). This is also supported by statistics – the smaller the company, the less likely it is to provide any form of vocational training (see Figure 9).

In addition, this fear also leads SMEs that do train to focus on less transferable skills (EMPL, *forthcoming*). This is supported by the CVT survey results, which show that half of the employees working in smaller SMEs get only non-transferrable skills (see Figure 10). While this strategy can help SMEs to retain their employees, it also has an unintentional negative effect as it limits their carrier advancement opportunities (EMPL, *forthcoming*).

Figure 9. Percentage of EU companies not planning any continuous vocational training (CVT) for their employees (by size)

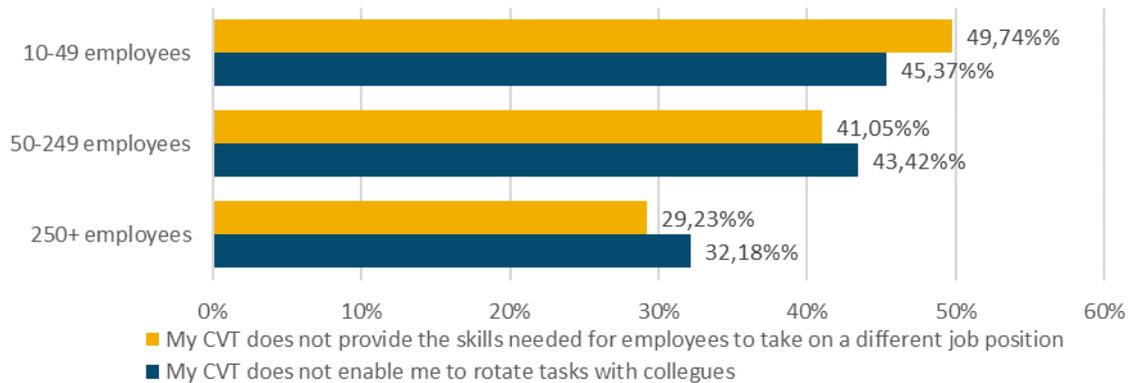


³ According to the Consortium calculations, 58 out of 184 tools.

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Source: Eurostat, CVT Survey, 2015.

Figure 10. Employee’s perception of transferability of the skills they gained from attending CVT courses



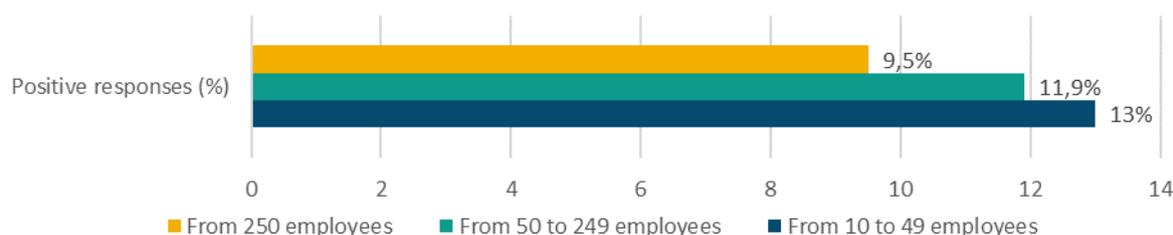
© European Union

Source: Eurostat, CVT Survey, 2015.

Finally, due to **weak external (public) education systems** in many countries SMEs often cannot simply hire graduates to fill in a skill gap that they currently might have (Holden, Jameson, and Walmsley, 2007; Soleswik and Westhead, 2019). This issue is further exacerbated by SMEs lack of formal hiring procedures that contain, for example, future employee assessments (Miller, 2014). Because of that when choosing a new employee from the list of potential candidates SMEs tend to avoid hiring graduates (Holden, Jameson, and Walmsley, 2007).

There are also several reasons for **information deficiencies**. This refers to lack of knowledge by SMEs on how existing skills management solutions could help them meet their business needs. First, **poor dissemination** of some of the existing SM solutions occasionally results from the bad marketing strategy of the solution developers. The problem is also interconnected with the issue supply constraints – SMEs are normally looking for either low-cost or free business support options (Atkinson et al, 2017). At the same time, according to the European CVT survey, the majority of European SMEs do not see this as a grave problem – only approximately 12% defined it as a market gap that prevents them from training their employees (see figure below). Though this could be connected to lack of awareness of the benefits an updated SM approach could bring to SMEs, which is discussed later.

Figure 11. Percentage of EU companies seeing limited offer of solutions on the market as a market gap (by size)



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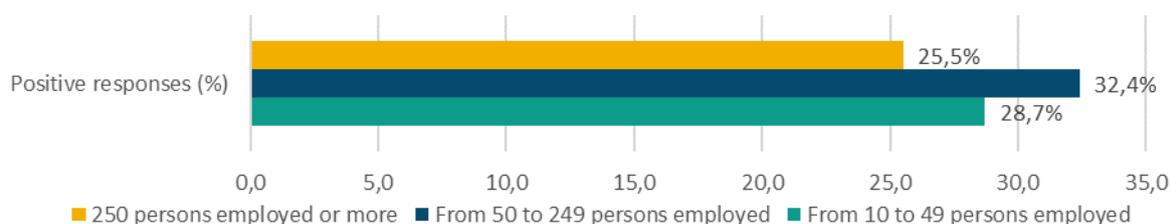
Source: Eurostat, CVT Survey, 2015.

Second, due to their limited resources, SMEs often **lack information on relevant openly available good practices** such as open access learning opportunities or SM concepts (Meyer and Brunn, 2016, pp. 436-437). This issue is worsened by the fact that many SMEs are often reluctant to invest in aspects that can provide more long-term benefits (such as training), opting out to focus on more short-term goals (Festing et al., 2017, ILO, 2017). Several factors can be to blame for this reluctance, including negative attitudes towards learning in SMEs (ILO, 2017).

Finally, **information deficiency on the benefits of updating their SM approach** results in the low levels of SME's motivation to adjust their practices. This gap might have a different nature depending on the type of SM strategy the SME uses – 'high road' or 'low road'. SMEs that use 'high road' strategies view employees and the skills that they possess as an integral part of a business's competitive advantage (OECD, 2017). They might look for relevant information and not find it. SMEs that chose to adopt 'low road' skills management strategies treat their workers only as a cost to be minimised (Ibid). They are, thus, less interested in conducting any search on SM practices whatsoever. Generally, those SMEs that tend to suffer from the problem of rigid business culture are not well aware of it (Kauffeld and Frerich, 2018). They can use the same SM methods for a long period of time without analysing the potential benefits of testing other approaches. For example, almost half of the German SMEs (48%) do not see the benefits of e-Learning, with classical paper-based / in-house seminars remaining the most popular options of CVT (Bitkom, 2018, p. 17).

Final externality is **resource constraints**, which refers to large opportunity costs and lack of resources that SMEs have, which might prevent them from taking advantage of existing solutions. First, SMEs, being smaller in size than larger conglomerates, have to make SM-related decisions using very **limited financial resources** (Flake et al., 2019). In addition, banks and other financial institutions often do not sufficiently trust SMEs due to much smaller turnover rates and rather volatile business conditions (Paradas, 2007; Voyer, 2011; Abraham et al., 2011). It is, thus, much harder for SMEs to attract financial support, especially for training (Ibid). Approximately 30% of the SMEs participating in the European CVTS pointed out that high prices constituted a problem for them when choosing whether to train their employees or not (see Figure 12 below).

Figure 12. Percentage of the SMEs seeing the high costs of CVT training as a market gap (sorted by size)



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Source: Eurostat, CVT Survey, 2015.

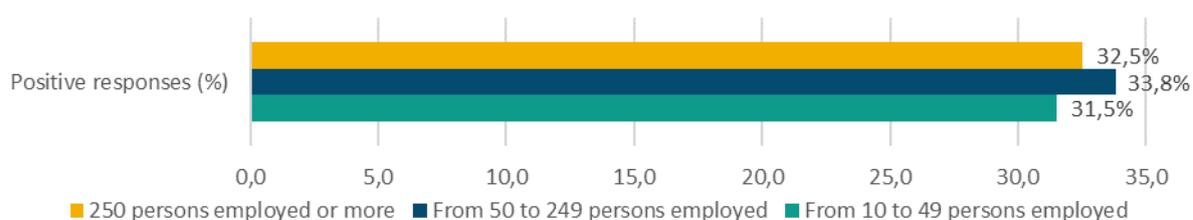
More specifically, high prices prevent SMEs from using advanced SM tools such as sophisticated LMS software or tailored online seminars (Paradas, 2007; Voyer, 2011; Abraham et al., 2011). Instead, SMEs often prefer informal training methods (e.g., mentorship programmes, internal company seminars), because they see other alternatives as excessively expensive (OECD, 2013; Drabek et al., 2017; Festing et al., 2017; Dundon and Wilkinson, 2018). While introducing innovative SM practices or tools could speed up the company digitalisation process, boost their competitiveness, and help to train employees more effectively, in many cases SMEs simply cannot afford them. Second, because of **lack of time** SMEs often have to choose between focusing on their immediate work (which brings them immediate benefits) or exploring various SM solutions (which could only potentially bring them benefits in the future). Many SMEs managers see trainings and vocational education as something unnecessary because of the high workload (Beron et al., 2006). They often treat SM initiatives as opportunity costs, which prevent their employees from working full-time (Festing et al., 2017; OECD, 2013; Stone, 2010; Beron et al., 2006). Apart from that, initial vocational education and training is often too inflexible for SMEs, especially for those that employ low-qualified employees (EMPL, forthcoming). For that reason, they tend to prefer less complex informal knowledge-sharing practices (Ibid). Approximately one third of the European SMEs participating in the CVT survey defined the lack of time as a market gap preventing them from satisfying their business needs (see Figure 13).

Text box 2. Main takeaways from Business needs

- Though many government policies and other positive external determinants can boost SMEs interest in investing in skills, they are often overshadowed by negative externalities.
- Many market gaps are interconnected with each other and present complex challenges for SMEs (e.g., supply constraints and lack of funds; lack of time and lack of human resources).
- When looking for SM tools that could effectively solve their business needs, SMEs tend to face the issue of supply gaps. Supply gaps present two problems for SMEs. First, they often cannot find tools that could address their needs. Second, if they find those, most of the tools mostly target bigger companies and not SMEs.

- Market failures are particularly problematic for SMEs there are few solutions on the market that could satisfy SMEs both in terms of tailored content and, especially, in terms of price. Therefore, SMEs do not use expensive, but innovative SM tools that could help them to satisfy their business needs.
- SMEs also suffer both from a lack of internal resources and time; the lack of financial resources prevents them from buying innovative, well marketed, SM solutions, while the lack of time and human resources prevents them from searching for free/open access SM tools or planning any SM activities internally.
- The developed tool, therefore, should be tailored to the SMEs financial needs – it should be provided free of charge, be easily accessible, and require minimum time commitment from SMEs.
- SMEs also suffer from the information deficiency problem – many of them do not see the actual benefits of effective and efficient SM. This unawareness, in turn, discourages SMEs from creating or updating their SM strategy.
- Therefore, when developing the tool, particular attention should be paid to its dissemination strategy. The tool must be easily findable, while the advantages of its deployment should be clearly formulated. It is crucial to ensure a broad user span during the first wave of distribution, since SMEs tend to follow competitors in adopting good practices.

Figure 13. Percentage of the SMEs seeing the lack of time/high workload as a market gap (sorted by size)



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Source: Eurostat, CVT Survey, 2015.

Third, **lack of human resources** presents a complex challenge for SMEs that often goes hand in hand with the lack of time problem. SMEs seldom have sufficient human resources to engage in various activities outside the direct needs of the enterprise. As a result, SMEs seldom plan and prepare for trainings or other SM activities (Parlier, 2005; Bootz et al., 2017; Voyer, 2011). This has negative consequences for SMEs, including lower competitiveness rates and decreased individual employee job satisfaction, motivation and confidence (Ibid). This further leads to higher employee turnover and, consequently, employer unwillingness to invest into employee training (Voyer, 2011; Fabi et al., 2004).

Text box 2. Main takeaways from external determinants

1.4 Summary of the needs and mitigation strategies

Table 4 below provides an overview of all identified business needs that SMEs face and which can be mitigated with more effective and / or efficient skills management. The business needs are arranged from those that are most pressing to micro enterprises to those that are more relevant to more established SMEs. In the table we also identify the skills management practices that can help to meet the needs. The table below does not go into detail explaining how the needs can be met with more effective and / or efficient skills management. A more in-depth discussion on this can be found the subsection 1.2. *Good skills management practices*.

Table 4. Shortlist of identified business needs

Business needs	Explanation	SM practices that can help to meet the needs
General needs		
Better managerial capabilities	<ul style="list-style-type: none"> SMEs often struggle to design a fair pay / benefit scheme as they lack knowledge about employees' skills, and the labour market in general (Dundon and Wilkinson, 2018; EC, 2018; Cardona and Stevens, 2004). This is exacerbated by their difficulties to accurately monitor employee performance (Cardona and Stevens, 2004). 	<ul style="list-style-type: none"> Analysis and planning Skills development
Dedicated HR personnel	<ul style="list-style-type: none"> Often in SMEs owners / managers perform the function of HR managers without having formal HR training. They also often lack knowledge on how to implement more effective skills management practices (Peng, Mole and Roper, 2019; OECD and ILO, 2017). HR management in SMEs is often concentrated on administrative tasks and is not concerned with skills development and motivation of their employees (EMPL, forthcoming; Kauffeld and Frerich, 2018; Festing et al., 2017; OECD, 2013; Stone, 2010). 	<ul style="list-style-type: none"> Skills development Skill utilisation
Better utilisation of existing skills	<ul style="list-style-type: none"> In general SMEs are less productive than large corporations (Marchese, et al., 2019). Hence, they have more room for growth and improvement. The literature shows that SMEs struggle to adequately utilise and mobilise existing human resources within their enterprises (Bernier et al., 2017; Ndjambou and Sassine, 2014; Bootz et al., 2011). 	<ul style="list-style-type: none"> Analysis and planning Skills utilisation

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<p>Effective monitoring of needs for up- and reskilling</p>	<ul style="list-style-type: none"> Along with skills assessment at individual level, the monitoring of needs for up- and reskilling among SMEs is important to lower information barriers about what training is needed at more aggregated level (EMPL, forthcoming) 	<ul style="list-style-type: none"> Analysis and planning
<p>Satisfying basic retraining needs of the employees</p>	<ul style="list-style-type: none"> SMEs often lack awareness of training needs, both in terms of what training is needed (OECD, 2013) and lack of recognition of any need for training (EMPL, forthcoming; Forth and Bryson, 2018). This is especially an issue with soft skills, as SMEs, often, are unable to hire qualified professionals that have the required soft skills (P2C, 2019; Cedefop, 2013; EC, 2010). The gap between soft skills (e.g., intercultural communication, leadership, conflict management) and the number of people demonstrating those skills sometimes forces SMEs to provide their employees with additional soft-skills training (Ibid). Due to limited resources SMEs tend to be more focused on how to utilise existing resources more efficiently and effectively, which leads to a much smaller focus on training and general HR questions, such as recruitment or internal job mobility (Festing et al., 2017; OECD, 2013) 	<ul style="list-style-type: none"> Analysis and planning Skills development
<p>Better understanding of the employees and the labour market</p>	<ul style="list-style-type: none"> SMEs often lack knowledge about skills levels, of employees and candidates, or the labour market in general (Dundon and Wilkinson, 2018). They also often lack any information about the mental condition of their employees, such as their motivation. And even if SMEs know about the skills levels of their employees, they still often lack awareness and knowledge regarding the efficiency of their skills management practices (ILO, 2017) 	<ul style="list-style-type: none"> Analysis and planning
<p>Monitoring of competition</p>	<ul style="list-style-type: none"> Influenced by both digitalisation and globalisation, SMEs no longer compete with only local businesses in their regions but also with major national and global brands (QuickSprout, 2019). In order to stay on the market and turn a profit, SMEs have to be aware of what their competitor's business strategies are (Croll and Power, 2009). 	<ul style="list-style-type: none"> Analysis and planning Skills development Skills utilisation
<p>Finding a low cost (monetary and time) skills management solution</p>	<ul style="list-style-type: none"> Quickly shifting employee roles and responsibilities make SM planning difficult and do not fit well into formalised strategies (Krishnan and Scullion, 2017; Bootz, Schenk, Sonntag, 2011). Hence, SMEs often require a specialised tool for their skills management needs. 	<ul style="list-style-type: none"> Analysis and planning

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<p>External assistance to improve skills management</p>	<ul style="list-style-type: none"> • SMEs often lack the necessary knowledge and information to provide their employees with full-scale training or monitor their skills utilisation (Voyer, 2011; Abraham et al., 2011; Paradas, 2007). • That is why some of them often turn to external institutions for assistance (e.g., public institutions, incubators, accelerators). Business owners tend to describe access to external assistance, be it financial or consultative as one of their crucial business needs (City of London, 2018; Department for Business, Energy and Industrial Strategy, 2017; CFA Institute, 2013). 	<ul style="list-style-type: none"> • Analysis and planning • Skills development • Skills utilisation
<p>External funding to improve skills management</p>	<ul style="list-style-type: none"> • SMEs often lack the necessary financial resources to provide their employees with full-scale training or monitor their skills utilisation (Voyer, 2011; Abraham et al., 2011). • Therefore, some of them turn to external financial institutions or intermediaries for assistance (e.g., banks, public programmes). 	<ul style="list-style-type: none"> • Analysis and planning • Skills development • Skills utilisation
<p>Training needs arising from the deployment of new equipment / techniques (non-ICT)</p>	<ul style="list-style-type: none"> • Installing new more advanced equipment often entails new training needs for SMEs (Cedefop, 2013). • Employees and their companies, thus, need SM solutions that help to constantly keep up with the job's learning requirements. This, however, is a specific business need that concerns SMEs working in more technical areas – e.g., medicine and health care, mechanical engineering, etc. It is not IT-related since it stems from general technological developments in respective fields (Ibid). 	<ul style="list-style-type: none"> • Analysis and planning • Skills development
<p style="text-align: center;">Specific needs</p>		
<p>Help with implementing new (digital / ICT) technologies</p>	<ul style="list-style-type: none"> • Digitalisation is one of the key factors that allows SMEs to boost their productivity (BWMi, 2016). However, this might be a difficult task for some SMEs that use outdated skills management methods (Cerchione and Esposito, 2017). For example, many SMEs have to deal with the increased importance of digital skills such as programming or software management and, thus, require assistance to implement these digital solutions (Ibid). 	<ul style="list-style-type: none"> • Skills development
<p>Developing e-commerce</p>	<ul style="list-style-type: none"> • Digitalisation and the increased usage of the Internet gives commercial SMEs the necessary tools to broaden their outreach (Bitkom, 2018). • This is especially relevant for SMEs working in retail as they are always looking for new e-commerce opportunities, e.g., by developing their 	<ul style="list-style-type: none"> • Skills development

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	<p>own online shops or delivery services (City of London, 2018).</p>	
Developing online presence	<ul style="list-style-type: none"> • Digitalisation and the increased usage of the internet gives SMEs more tools to make their presence visible – e.g., using social networks, personal websites, promotional videos, etc. (OECD, 2010) • More and more businesses are trying to use online marketing tools (City of London, 2018; OECD, 2010). For that, they need employees with sufficient digital skills. This creates needs to assess people’s digital competencies as well as potential skill gaps (e.g., how to trace the company’s current online presence). 	<ul style="list-style-type: none"> • Analysis and planning • Skills development • Skills utilisation
Safe cybersecurity environment for businesses	<ul style="list-style-type: none"> • Creating safe cybersecurity environment for business is quickly becoming a must for many European SMEs under the influence of digitalisation and cybersecurity challenges – such as the increasing number of cyberattacks and their negative financial consequences (Hiscox, 2019). • These challenges incentivise companies to educate their employees on how to protect their computer systems and networks from cyberattacks (Gaycken and Hughen, 2015). 	<ul style="list-style-type: none"> • Skills development
Building green business strategies	<ul style="list-style-type: none"> • Sustainable green growth has become a major trend in global economic development in the past two decades (Lesinger, 2015; EC, 2011). SMEs, especially in the field of manufacturing, cannot avoid this development and are increasingly pressured by governments to develop green business strategies (Ibid). 	<ul style="list-style-type: none"> • Analysis and planning • Skills development
Skills management solutions for implementing environmental standards	<ul style="list-style-type: none"> • Many European businesses have to adapt to changing environmental standards and recommendations (Lesinger, 2015). In order to implement those, they need to have qualified personnel aware of those standards and relevant technical knowledge (Cedefop, 2012). 	<ul style="list-style-type: none"> • Analysis and planning • Skills development
Cutting down administrative and paper-based costs	<ul style="list-style-type: none"> • Digitalisation presents an incredible opportunity to speed up the company’s business processes and cut down on administrative and paper-based costs (BWMi, 2016). However, SMEs often have to use outdated technologies as they do not possess the knowhow about new technologies and how to use them (Cerchione and Esposito, 2017). 	<ul style="list-style-type: none"> • Skills development

Source: Consortium, based on the literature review.

Text box 3. Main takeaways from Business needs of SMEs section

- Skills management needs in SMEs are closely related to their business needs and are shaped by the processes of improving productivity, growth, profits, as well as technological development and increased pace of business digitalisation and greening.
- Though not all business needs are directly related to skills, large portion of them could be solved with more effective and / or efficient skills management.
- SMEs are mostly looking for affordable and tailored SM tools because they have to operate under financial constraints and because their skills management practices do not fit well into formalised strategies.
- As the need for digitising the company is growing, which is further accelerated by the Corona epidemic, increasing share of SMEs want to make sure that their employees have relevant digital competencies.
- As the market is becoming increasingly influenced by the trends of sustainability and greening, SMEs are more and more often looking for opportunities to develop green skills.

2. Good skills management practices

Now that the link between good skills management practices and business outcomes is established, a benchmark still needs to be conducted to identify which practices could/should the tool recommend. By good practices we mean what SMEs could do better or change in order to meet their business needs. Though a variety of good practices could be discussed, we predominantly focus on skills management related practices. More specifically, we focus on four types of skills management practices:

- **Analysis and planning (a.k.a. skills assessment)** – e.g., workforce analysis, employee evaluation, identification of skills gaps in the company.
- **Skills development** – e.g., training (internal or external), mentorship programmes, task force assignment. Both internal – can be implemented by SME – and external – has to come from the outside of the company – were analysed.
- **Skills utilisation** – e.g., job rotation, larger involvement of employees in the decision-making process of the company.
- **Complex skills management practices** – other types of skills management solutions that could not be assigned to other practices.

Table below summarises the good practices identified in the literature review, identified business needs that they can help to meet, and what outcomes they create. Good practices are structured according to different skills management types, while outcomes are structured according to the impact the good practices might have on individuals, company, and society/economy. The table also includes references to examples of how the good practices could be implemented internally (called *Guidelines* in the table), as well as references to existing tools / solutions that are external, but which SMEs could use (called *Solutions* in the table). The table serves as a summary, while a more extensive description of good practices is provided in the Annex – 1.3. *Good practices*.

The identified list of good practices **covers all of the identified business needs but with a different degree of intensity**. On the one hand, there are some business needs that were covered exceptionally well. The two most well-covered needs are ‘Better understanding of employees and the market’, which is covered by 13 practices, and ‘Better utilisation of existing skills’, covered by 11 practices respectively. On the other hand, certain needs, particularly those related to the issues of digitalisation and greening of the global economy, are covered only with one or two good practices (e.g., the need to develop e-commerce, the need to build green business strategies, the need to create safe cybersecurity environment among others). The remaining needs are moderately covered with 4-5 solutions on average. Overall, the **specific needs, especially those related to transversal skills** (i.e. green skills, soft skills, and digital skills), **are not covered as well as the general needs**.

Table 5. Summary of the good skill management practices for SMEs (general and specific)

Good practices	Explanation and possible application	Corresponding business needs	Referencing guidelines / solutions ⁴	Outcomes
Analysis and planning				
Technology-based skills assessment	<ul style="list-style-type: none"> Definition: Software that automatically identifies the employee's / candidate's / company's main strengths and skills gaps using various forms of tests (Flake et al., 2019; BmBF, 2015) Application: Such software (e.g., Cornerstone, Rexx Systems, IceCube) helps to save time and human resources in the company's skills assessments processes, as it relies on automated e-solutions, such as automated test assessments, CV data extraction, benchmarking. Selection of candidates also becomes more precise and evidence-based. 	<ul style="list-style-type: none"> Better understanding of employees and the market Cutting down administrative and paper-based costs Effective monitoring of needs for up- and reskilling 	<p>Guidelines: Benefits of Automating Skills Assessment</p> <p>Solutions: Workplace Innovation, FutureSME Capability Diagnostic, Digicheck (FR, DE), TicCamaras (ES), Kammi, IceCube, Avilar WebMentor Skills, Cornerstone, Rexx Systems</p>	<p>Individuals: better understanding of their own capabilities</p> <p>Company: more efficient use of existing resources due to better understanding of employees and the market</p>
Skills matrix	<ul style="list-style-type: none"> Definition: A visual tool (normally a spreadsheet) that visualises employees' skill levels (McGee, 2019). Application: The matrix shows where employees may need improvement or training as well as at what pace they are carrying out the requisite project (see e.g., Cornerstone Potential Grid). The training matrix method of evaluating employees tends to be more reliable than human perception of an individual or team's skill or production level. However, it largely depends 		<p>Guidelines: How does a Training Matrix Work?</p> <p>Solutions: Free Skills Matrix Templates; Cornerstone</p>	

⁴ Languages of the tools are indicated in brackets. No indication of the languages implies that the tool is available in English (or multiple languages including it).

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	<p>on the matrix master regularly updating the document.</p>			
<p>Skills benchmarking</p>	<ul style="list-style-type: none"> • Definition: Comparing individuals' skills with each other or certain set standards (Abraham et https://twitter.com/settingsal., 2011). • Application: Benchmarking helps to evaluate highly specific individual skills, contextual needs and constraints for further skill development (Delobbe, 2014; Charles-Pauvers and Schieb-Bienfait, 2010; Fabi et al., 2004; Defelix and Retour, 2003). This approach can be used to compare individuals' skill levels (e.g., language proficiency, years of experience) to choose the most talented individuals when recruiting personnel or assigning tasks (Ibid). Moreover, it helps to track the learning progress of employees (e.g., by tracking whether they reach the standards outlined in online courses). 	<ul style="list-style-type: none"> • Better understanding of employees and the market 	<p>Guidelines: PES Network Benchlearning Guidelines; APA Benchmarking Guide</p> <p>Solutions: World Management Survey, SegidTalent, REXX Systems, IceCube, NKL (PL)</p>	
<p>Skills benchlearning</p>	<ul style="list-style-type: none"> • Definition: A process for creating a systematic and integrated link between benchmarking and mutual learning (EC, 2017). • Application: SMEs can benefit from benchlearning in two ways. Internally, they can encourage the best-performing or most qualified employees to share their knowledge with other colleagues and improve their qualification. Externally, they can get information on best practices in their industry, by mapping the most successful companies and learning from them (Freytag and Hollensen, 2001). 	<ul style="list-style-type: none"> • Effective monitoring of needs for up- and reskilling • Better utilisation of existing skills 	<p>Guidelines: EU PES Network Benchlearning Manual</p> <p>Solutions: Enterprise Europe Network (external); rexx systems (internal), Cornerstone (internal)</p>	
<p>Multidimensional skills assessment</p>	<ul style="list-style-type: none"> • Definition: Assessing multiple skills at the same time. For example, not only industry-related skills (hard skills), but also cognitive skills (e.g., 		<p>Guidelines: Why Test Multiple Skills (on example of foreign language)</p> <p>Solutions: InterviewMocha; GMAT Test;</p>	

	<p>critical thinking; Solesvik and Westhead, 2019; Holden, Jameson, and Walmsley, 2007).</p> <ul style="list-style-type: none"> Application: A multidimensional approach allows to not only evaluate the candidates comprehensively and can be applied to a variety of areas. For example, their assessing programming qualifications (i.e. hard skills), but also estimating if they possess the necessary soft skills (e.g., integrated reasoning, analytical writing, teamwork; Solesvik and Westhead, 2019). 			
<p>Problem-solving tests</p>	<ul style="list-style-type: none"> Definition: Tests that assess the employee's ability to perform a very particular type of tasks or solve a very particular type of problems (generally focused on hard skills). These can involve situational judgement tests or standard assessments targeting one skill. Application: Such tests are often presented to assess hard skills – e.g., a translation agency could send out texts for translation to its interns to compare their hard skills and identify the best candidates for promotion (Adab, 2000). This specific practice is normally used by SMEs that focus on the provision of services (e.g., ICT companies, research consultancies, translation agencies). 		<p>Guidelines: How to Develop and Score a Situational Judgement Test Solutions: InterviewMocha</p>	
<p>360-degree analysis</p>	<ul style="list-style-type: none"> Definition: A skills assessment method that relies both on employee self-assessments and external assessments (managerial and team reviews) as data sources in developing the employee's skills management strategy. Application: This approach ensures more adequate representation of the employee's / 		<p>Guidelines: Erasmus-funded EU Guide on 360-degree Feedback Solutions: Cornerstone, Skilo, REXX Systems, Small Improvements</p>	

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	candidate's strengths and weaknesses (EC, 2018; Suarez et al., 2012).			
Skills development (internal)				
In-house training	<ul style="list-style-type: none"> • Definition: Periodic courses that pull together different expertise (internal and external) for the purpose of training employees on a consequent basis (Thompson, 2019). • Application: In-house training programs make sense for companies that hire frequently, employ seasonal help or have unique training needs that would be poorly served by a generic seminar or course (Ibid). Such courses are normally conducted to ensure that employees possess skills need for using a specific new technology, product, or technique (EMPL, forthcoming). The company could organise such training with the help of an external expert or utilise the experience of its own employees. 	<ul style="list-style-type: none"> • Satisfying basic retraining needs of the employees • Training needs arising from the deployment of new equipment / techniques 	<p>Guidelines: How To Develop an In-House Training Plan; Advantages and Disadvantages of In-House Training</p> <p>Solutions: Coursefinder UK; DigitaliseSME (finished); High Level Skills Programme</p>	<p>Individuals: acquiring new skills or improving the existing ones</p> <p>Company: increase in overall competitiveness due to the newly developed / improved skills of the employees</p>
E-Learning platforms	<ul style="list-style-type: none"> • Definition: Platforms allows to utilise electronic media (typically on the Internet) to access educational curriculum remotely. • Application: Digital technologies can facilitate the provision of education and training increasing flexibility in terms of time and facilitating access to training remotely (EMPL, forthcoming). The travel and paper-based costs of training can also be significantly reduced during the process of e-learning (Ibid). 	<ul style="list-style-type: none"> • Satisfying basic retraining needs of the employees • Training needs arising from the deployment of new equipment / techniques 	<p>Guidelines: Why E-Learning?; EU E-Learning Best Practice Guide for SMEs</p> <p>Solutions: Coursera Business; Academia PARP (PL); Lecturio Unternehmen (DE); Competentum (RU);</p>	
Blended learning	<ul style="list-style-type: none"> • Definition: Represents a combination of e-learning with some in-house training elements (e.g., occasional interaction with trainers in the classroom). 	<ul style="list-style-type: none"> • Cutting down administrative 	<p>Guidelines: Babbel Guidelines on Blended Learning for Businesses</p> <p>Solutions: Access for SMEs; Fundae (ES); Kursfinder (DE);</p>	

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	<ul style="list-style-type: none"> Application: Applying for blended learning programmes is done in a way similar to the e-Learning initiatives (e.g., via course finders). Blended learning allows to use the advantages of e-learning (on a more limited scale) such as time flexibility and reduced training costs in combination with the advantages of classical training such as personalisation – the ability to interact with the coach (Brunn, 2018). 	<p>and paper-based costs</p>		
<p>Mentorship and competence tandems</p>	<ul style="list-style-type: none"> Definition: Mentorship and competence tandems (sometimes referred to as ‘skills exchange’) are the forms of informal knowledge sharing that can be organised within the company by pairing employees (Kauffeld and Frerich, 2018). These are largely based on regular communication about work-related issues and ad hoc coaching. Application: Digital or instant mentorship is becoming increasingly popular, when people can consult each other (or the entire) team immediately in work chats (Lipscomb, 2010). This saves time and makes the coaching process less formal. 	<ul style="list-style-type: none"> Satisfying basic retraining needs of the employees Help with implementing new (digital) technologies 	<p>Guidelines: EU Interreg Report on best practices in mentoring (Section III), EU SME-EMPOWER</p> <p>Solutions: GuideSpark, Rexx Systems</p>	<p>Individuals: an alternative to regular training, which is often used to disseminate more practical knowledge</p> <p>Company: increase in competitiveness, which requires a smaller time commitment than regular training</p>
<p>Job rotation</p>	<ul style="list-style-type: none"> Definition: Allowing employees to change roles within the company to ensure better knowledge transfer and better skills utilisation. Application: Smaller teams within a company are reorganised regularly, to facilitate cross-fertilisation of employees’ skills and competences, leading to a continuous learning process (EMPL, forthcoming). This might also imply using some succession planning tools (e.g., Cornerstone Succession planning, Rexx Systems Succession planning). 	<ul style="list-style-type: none"> Better understanding of employees and the market Satisfying basic retraining needs of the employees 	<p>Guidelines: Basic Guidelines on Job Rotation</p> <p>Solutions: Cornerstone, TalentSoft, Rexx Systems,</p>	

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<p>Ordering knowledge</p>	<ul style="list-style-type: none"> • Definition: Ordering knowledge strategy urges companies to utilise and structure open access sources of learning in their skills development strategies (Brunn, 2018) • Application: The first step is to map and identify relevant open access knowledge sources. Secondly, structure them using course constructor software (digital solutions that help to create your own personalised courses). Digital course constructors automate the course creation and utilisation process, which allows the company to save time and finances, as well as to reuse the trainings it developed on a regular basis. 	<ul style="list-style-type: none"> • Finding a low-cost skills management solution • Satisfying basic retraining needs of the employees • Training needs arising from the deployment of new equipment / techniques 	<p>Guidelines: Moodle, EU Foster Programme Solutions: Constructor software, e.g., Cornerstone Learning, Kammi, CourseLab, EasyLearn</p>	<p>Individuals: more comfortable modes of skills development Company: flexible organisation of trainings / informal skills development that does not hinder the company's workflow</p>
<p>Internal course repositories</p>	<ul style="list-style-type: none"> • Definition: An online platform that allows to store the company's own pre-recorded courses and / or training materials for the future use (EMPL, forthcoming). • Application: While this practice can be implemented manually by e.g., recording and uploading video courses to a cloud-based platform, many LMS and HRM system provide imbedded such solutions as a part of their package. Re-using courses stored in the company's depository allows SMEs to save time and money on (re)training new employees (Ibid). 	<ul style="list-style-type: none"> • Satisfying basic retraining needs of the employees • Finding a low cost (monetary and time) skills management solution 	<p>Guidelines: Solutions: https://icubecosortium.com/solvecubehrCornerstone, Rext Systems</p>	<p>developed/improved skills of the employees</p>
<p>Flexible training organisation</p>	<ul style="list-style-type: none"> • Definition: Drafting training programmes for employees in such a way that shows diversity of forms and scheduling formats. • Application: This practice helps SMEs to be more flexible about training their employees 	<ul style="list-style-type: none"> • Finding a low cost (monetary and time) skills 	<p>Guidelines: Flexible Work Toolkit; iSpring Step-by-Step Guidelines on Flexible 1 Hour Training Solutions: Hubstaff; KeeUnit (DE); CIPD's 'short courses'</p>	

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	<p>during working hours (Stone, 2010; Polish Sociology Society, 2009). For example, the planned training could be split into several smaller blocks and distributed over a longer period of time.</p>	<p>management solution</p>		
<p>Green training skills</p>	<ul style="list-style-type: none"> • Definition: Developing ‘the knowledge, abilities, values and attitudes needed to live in, develop and support a society that reduces the impact of human activity on the environment’ (Cedefop, 2012, p. 20). • Application: Developing employees’ green skills is particularly relevant for manufacturing industries (e.g., machine industries, energy sector), which want to expand their market share and become more sustainable. Moreover, companies contributing to green and sustainable economy receive financial and administrative support from the EU (EC, 2020a). 	<ul style="list-style-type: none"> • SM solutions for implementing environmental standards • Building ‘green’ business strategies • Cutting down administrative and paper-based costs 	<p>Guidelines: Cedefop: Skills For Green Jobs 2018, Green Action Plan for SMEs, European Green Deal Solutions: Example of a free course on Green Business Strategy</p>	<p>Individuals: acquiring or developing green skills Company: sustainable resource utilisation; eligibility for green economy support programmes Society: shifting towards a green sustainable economic model</p>
<p>Digital training skills</p>	<ul style="list-style-type: none"> • Definition: A training that boosts the employee’s skills to use digital and communication solutions to access and manage information more effectively (Bitkom, 2018). • Application: Unlike other horizontal skills, development of digital skills often requires more formalised training options (ITU, 2018). Informal knowledge-sharing practices may not be as helpful when an employee has to learn a digital skill (e.g., programming) from scratch. Thus, businesses and employees tend to choose offline courses, blended learning, or e-learning, which are more structured. 	<ul style="list-style-type: none"> • Help with implementing new (digital) technologies • Developing online presence • Developing e-commerce • Safe cybersecurity environment for businesses 	<p>Guidelines: ITU Digital Skills Toolkit; Solutions: FOSS4SMES; Digitalise SME; Interreg Trainings for SME for development of innovations and digital technologies</p>	<p>Individuals: developing soft skills, gaining more work motivation Company: broader outreach to the clients, access to new markets, acceleration of business processes.</p>

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<p>Soft skills training</p>	<ul style="list-style-type: none"> • Definition: A training that helps employees to develop personal attributes that enable someone to interact effectively and harmoniously with other people. • Application: Soft skills trainings quite often constitute a large part of the informal learning strategies in SMEs – e.g., onboarding trainings as well as mentoring practices. In certain cases, SMEs could choose more formalised courses when required (EMPL, forthcoming). These trainings are more general both in their scope in nature helping SME employees to develop a more comfortable working environment in the company (McGarry, 2020). 	<ul style="list-style-type: none"> • Dedicated personnel • Satisfying basic retraining needs of the employees 	<p>Guidelines: Benefits of Soft Skills; Guidelines on Training Formats</p> <p>Solutions: Empatico</p>	<p>Individuals: developing soft skills, gaining more work motivation</p> <p>Company: confident, satisfied workforce that helps to sustain the SME.</p>
<p>Skills development (external)</p>				
<p>Informal skills certification</p>	<ul style="list-style-type: none"> • Definition: Certifying informal skills that an employee develops through learning-by-doing-methods – e.g., digital competencies (Boxall et al., 2019; OECD and ILO, 2017; OECD, 2013; Langier, 2008) • Application: Allowing, encouraging, or helping employees to certify their informal skills by financial or administrative means (e.g., allocating a special time slot for the employee to take a certification test). This helps to strengthen the employee’s credential. 	<ul style="list-style-type: none"> • Dedicated personnel 	<p>Guidelines: OECD Recognition of Non-formal and Informal Learning, EU Digital Competence Framework</p> <p>Solutions: LinkedIn Skills Certification, REXX Systems</p>	<p>Individuals: receive confirmation of their informally developed skills</p> <p>Company: more motivated, qualified, and competitive employees</p>
<p>Business incubators (accelerators) and external support programmes</p>	<ul style="list-style-type: none"> • Definition: Working with business incubators and accelerators, apart from providing financial relief, helps the company’s founder(s) to develop their business administration skills and introduce new products to the market (Harper-Anderson and Lewis, 2018; Stokan, Thompson, and Mahu, 2015). 	<ul style="list-style-type: none"> • Better managerial capabilities • Accessing external assistance to 	<p>Guidelines: EC Support Measures for European SMEs; Sample List of European Incubators;</p> <p>Solutions: Gro Academy; EU EIC Pilot</p>	<p>Individuals: development of managerial skills</p> <p>Company: boost in competitiveness due to the financial and administrative</p>

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	<ul style="list-style-type: none"> Application: Mapping and applying for national and European incubator programmes. Currently, one could access both online (e.g., Gro Academy) and offline incubators (e.g., EU EIC). This practice, however, is reserved mostly for start-ups. 	<p>improve skills management</p> <ul style="list-style-type: none"> Accessing external funding to improve skills management 		<p>support provided by the incubator; more effective skills management due to individualised consulting opportunities</p>
<p>Synergies with education and training institutions</p>	<ul style="list-style-type: none"> Definition: Creating powerful training synergies between university education and SMEs that help to develop 'work-readiness skills' (Zizzo, 2019; Brunn, 2018; Meyer and Brunn, 2016). Application: This might imply participating in apprenticeship programmes, cooperating with centres of vocational excellence, etc. These practices not only extend the potential candidate pools for SMEs but also entail financial and marketing benefits (Zizzo, 2019; Brunn, 2018; Meyer and Brunn, 2016; Muehlemann and Wolter, 2014; Parlier, 2005). Apprentices, in comparison to full-time workers, do not receive the same salary. EU Centres of vocational excellence, on the other hand, provide training support for the SMEs' employees in certain pre-defined vocational education areas (see Guidelines). 	<ul style="list-style-type: none"> Accessing external assistance to improve skills management 	<p>Guidelines: Guidelines on the EU Centres of Vocational Excellence; Definition and Benefits of Apprenticeships for Business</p> <p>Solutions: EU Centres of Vocational Excellence; EU Alliance of Apprenticeships, CEDEFOP</p>	<p>Individuals: development of work-readiness skills</p> <p>Company: lower labour costs and wider candidate pools</p> <p>Society: more competitive local business ecosystems</p>
<p>Skills utilisation</p>				
<p>Detailed skills-based job descriptions</p>	<ul style="list-style-type: none"> Definition: A description containing the key requirements and functions of performing a certain role within the enterprise and is based on a standardised format to automate the assessment process (Bernier et al., 2017). Application: Such descriptions help to assess current employee's ability to perform their tasks 	<ul style="list-style-type: none"> Better understanding of employees and the market 	<p>Guidelines: How to Write a Skills-Based Job Description</p> <p>Solutions: Cornerstone, TalentSoft, REXX Systems, Intraknow (FR)</p>	

FEASIBILITY STUDY FOR A (SELF-) ASSESSMENT TOOL ON SKILLS MANAGEMENT PRACTICES IN SMES

	<p>as well as to recruit new employees (Bernier et al., 2017; Abraham et al., 2011; Defelix and Retour, 2003). They can also be integrated with skill-mapping/benchmarking solutions and used for employee-task matching (Colin and Grasser, 2014; Largier, 2008).</p>	<ul style="list-style-type: none"> Better utilisation of existing skills 		
<p>Semi-automated job (employee-task) matching</p>	<ul style="list-style-type: none"> Definition: This software uses the results of the analysis the skills assessment data to generate lists of candidates that are best-suited for performing a certain type of task (Delobbe et al., 2014) Application: Using semi-automated employee-task matching helps to reduce time on planning tasks and projects (Ibid) 		<p>Guidelines: Benefits of Using Job Matching Solutions: Rexx Systems, IceCube, Empatico</p>	<p>Individuals: better understanding of their responsibilities and goals Company: more efficient use of existing resources due to better planning and monitoring of skills utilisation</p>
<p>Progress-tracking software for target setting</p>	<ul style="list-style-type: none"> Description: Progress-tracking software helps to monitor the implementation of the long-term company goals and individual targets (US SBA, 2020). Application: Such software helps to identify how certain skills are used by the employees; what skills they need for different tasks; it also sends regular reminders and visualises task implementation progress. 		<p>Guidelines: EU Guidelines on Developing a Business Plan, US SBA Guidelines on Business Planning Solutions: Investors in People: Jumpstart, KeenCorp</p>	
<p>Open-book management</p>	<ul style="list-style-type: none"> Definition: A way of running business when employees have access to all the relevant financial information about the company (revenues, profits, cash flows, expenses, etc.) Application: By sharing financial and other critical data with its employees, the management challenges them to improve these indicators and utilise skills accordingly (Aggarwal and Simkins, 2001; Fotsch and Case, 2017). This method helps employees to deepen their understanding 		<p>Guidelines: Introduction to open-book management for small businesses Solutions: HR Works (DE); Sekasoft; Hamburger Software (DE); CakeHR</p>	

	<p>of the economics of the business and of how the company performs as a whole (Fotsch and Case, 2017).</p>			
<p>Complex skills management practices</p>				
<p>Skills profile</p>	<ul style="list-style-type: none"> • Definition: A personalised employee profile that creates links between the different aspects of skills assessment, development, and utilisation (e.g., by demonstrating the learning progress of the employee; demonstrating their skills gaps and key strengths; compiling the reviews they provide for different courses, etc.) • Application: The profile's contents usually include assessment results, learning progress, as well as various duty descriptions, which makes it easier to monitor company employees. Sometimes duty descriptions can be integrated with skill dimensions – in other words, provided in terms of required skills (Defelix and Retour, 2003). 	<ul style="list-style-type: none"> • Better understanding of employees and the market 	<p>Guidelines: Example of skills profile on an online learning platform</p> <p>Solutions: Kammi (FR), Rexx Systems, Perbit, TalentSoft, HCM Desk, Behavio</p>	<p>Individuals: easier way to track your own learning progress; apply for e-courses; receive and assign tasks;</p>
<p>Competency visualisation techniques</p>	<ul style="list-style-type: none"> • Definition: A form of competency mapping, or a graphical representation of how the employee's / candidate's competencies fit into the company's overall goals (Wilkens, Nolte, and Sprafke, 2015). These techniques are, normally, an essential part of various skills management solutions (e.g., Rexx Systems, Cornerstone, etc.). For example, radiograms, flowcharts, tables, colour schemes. • Application: This technique helps SMEs to understand and utilise the link between individual skills and collective enterprise activity better (Bootz et al., 2017; Sonntag, 2011; Parlier, 2005). 	<ul style="list-style-type: none"> • Better utilisation of existing skills 	<p>Guidelines: Introduction to Skills Mapping; Handbook on Competency Mapping</p> <p>Solutions: IceCube, Workplace Innovation Diagnostics, TalentSoft, Rexx Systems, FutureSME Capability Diagnostic, NKL (PL)</p>	<p>Company: better overview of SM processes on individual level</p>

FEASIBILITY STUDY FOR A (SELF-) ASSESSMENT TOOL ON SKILLS MANAGEMENT PRACTICES IN SMES

<p>Worker empowerment using gamification elements</p>	<ul style="list-style-type: none"> • Definition: Creating positive learning environment often requires expressing appreciation and acknowledgement towards the achievements of the personnel (Oiry, 2011; Parlier, 2005; Fabi et al., 2004). Gamification elements helps to do that by making the learning process less formal, praising employees for their achievements and granting them bonuses for their progress. • Application: Gamification elements can be used both in skills development and skills utilisation. For example, providing digital awards for the employee's learning progress or for finishing a certain number of work-related projects. Certain apps (e.g., KeeUnit) help to make the training process more engaging by holding friendly competitions between the company's departments or individual employees. 	<ul style="list-style-type: none"> • Satisfying basic retraining needs of the employees 	<p>Guidelines: Introduction to Gamified Learning Solutions: EasyLearn, Keeunit (DE)</p>	<p>Individuals: more motivation to perform their tasks / learn new skills</p> <p>Company: potential increase in productivity due to more motivated employees</p>
<p>External business / skills audit</p>	<ul style="list-style-type: none"> • Definition: A comprehensive assessment of the company's skills management strategy conducted by an external (private or public) auditor. • Application: A staff skills audit by an external stakeholder can be used to better identify the skills a company currently has, and where its skill gaps lie in order for it to meet its strategic objectives (PeoplePulse, 2020). It also provides an opportunity to discover a fresh third-party perspective on the company's SM strategy. According to an interviewee, whose firm has been using this practice, it also helps employees to provide feedback that cannot be collected directly by the CEO. 	<ul style="list-style-type: none"> • Better understanding of employees and the market • Better utilisation of existing skills 	<p>Guidelines: Introduction to External Business Audits Solutions: HCDDT (SG)</p>	<p>Individuals: opportunity to provide feedback on the company's SM practices</p> <p>Company: identification of SM gaps; better understanding of employees' needs</p>

FEASIBILITY STUDY FOR A (SELF-) ASSESSMENT TOOL ON SKILLS MANAGEMENT PRACTICES IN SMES

<p>Learning management systems (LMS)</p>	<ul style="list-style-type: none"> • Definition: Complex digital systems designed for the administration, documentation, tracking, reporting, and delivery of training programs/courses with flexible functionality (EMPL, forthcoming). • Application: LMS could be seen as an ‘umbrella solution’, since they normally have a very rich variety of functions that were also identified in this list. These include such functions as technology-based assessments, course constructors, benchmarking, mentorship communication systems, 360-degree reviews, course repositories, competency visualisation, employee feedback and employee-task matching among others. Companies using LMS, thus, would normally strive to satisfy multiple business needs as the same time since LMS is a complex (and, normally, a more expensive) solution. Due to their complexity, however, each LMS is unique and quite often has its own set of distinct functions. 	<ul style="list-style-type: none"> • Better understanding of employees and the market • Better utilisation of existing skills • Satisfying basic retraining needs of the employees • Cutting down administrative and paper-based costs 	<p>Guidelines: Introduction to Learning Management Systems</p> <p>Solutions: https://icubeconsortium.com/solvecubehr Cornerstone, REXX Systems; iSpring Solutions; Skilo; Eurecia (FR); ILIAS (free);</p>	<p>Individuals: comprehensively identifies skill gaps and helps to receive relevant training;</p> <p>Company: better coordination of SM processes in the company</p>
<p>Semi-automated feedback systems</p>	<ul style="list-style-type: none"> • Definition: A system allowing employees to provide feedback on skill management-related topics – e.g., on certain courses or company SM programmes (Boxall et al., 2019; OECD and ILO, 2017; Zinke, 2003). Such systems automatically calculate course review rates, collect and store open-answer reviews in special data warehouses for the user’s convenience. • Application: Such system allows to assess the courses and training modules that the company provides to its employees more effectively without micromanaging the process. While it can also be implemented manually (e.g., via surveys) there are also special programmes and 	<ul style="list-style-type: none"> • Help with implementing new (digital) technologies 	<p>Guidelines: Introduction to Feedback Engagement and Overview of Tools</p> <p>Solutions: Cornerstone Performance, Hyphen, Ultimate (Perception), NKL (PL)</p>	<p>Individuals: opportunity to provide feedback on the company’s SM practices</p> <p>Company: more efficient SM strategy adjustment due to better understanding of employees’ needs</p>

FEASIBILITY STUDY FOR A (SELF-) ASSESSMENT TOOL ON SKILLS MANAGEMENT PRACTICES IN SMES

	<p>app that allow to automate and store the assessment data (see Solutions).</p>			
<p>Networks / platforms developing local skills ecosystems</p>	<ul style="list-style-type: none"> • Definition: A business-oriented online platform that targets SMEs and shares knowledge on SM-related topics. • Application: Such platforms could help to build local skills ecosystems and business networks. They could also serve as an awareness-raising instrument, which helps to conduct outreach activities to European SMEs (Baassiry, 2019; Atkinson et al., 2017; Stone, 2010; BWMI, 2007) 	<ul style="list-style-type: none"> • Accessing external assistance to improve skills management • Developing online presence 	<p>Guidelines: Guidelines on EIC Community Platform Solutions: PeopleSkills Hub, Enterprise Europe, EU SME Envoy Network https://www.talentsoft.com/hr-software/appraisals/</p>	<p>Individuals: development of entrepreneurial / managerial skills</p>
<p>Entrepreneurs mobility schemes</p>	<ul style="list-style-type: none"> • Definition: A programme that helps new entrepreneurs gather and exchange knowledge and business ideas with an experienced entrepreneur (Erasmus for Young Entrepreneurs, 2020). • Application: The programme is based on the concept of win-win collaboration. A new entrepreneur could benefit from on-the-job training in international environment. A host entrepreneur, on the other hand, benefits from fresh ideas from a motivated colleague on their business. Such programmes also expand networking opportunities and helps to grow business contracts (Ibid). 	<ul style="list-style-type: none"> • Better managerial capabilities • Accessing external funding to improve skills management 	<p>Guidelines: Erasmus for Young Entrepreneurs: How to Participate Solutions: Erasmus for Young Entrepreneurs</p>	<p>Company: exchange of ideas and business practices Society: more competitive local business ecosystems</p>

2.1 Outcomes of good skills management practices

Outcomes the different results, intentional and not, that stem from implementation of good practices. Outcomes can be observed at three levels:

- Outcomes for individuals – professional development of employees (e.g., better career opportunities, higher wage) as well as their satisfaction with the job
- Outcomes for company – improved competitiveness of a company, increased profits, larger productivity, etc.
- Outcomes for society / economy – increased innovation, GDP growth, maximised development potential, etc.

Table 5 in the previous subsection, which provides an overview of good practices, also identifies several outcomes that can be expected to be achieved from these practices. However, the outcomes identified there are tentative and are not always based on extensive empirical evidence. Hence, in this subsection we try to identify causal chains between SM practices and outcomes which are supported by extensive empirical research.

We define a causal chain as a relationship between business needs, good practices, and outcomes, where market gaps / failures might hinder the change, and which is supported by strong empirical evidence. We consider empirical evidence to be strong when the research that identified the causal chain was identified in research that:

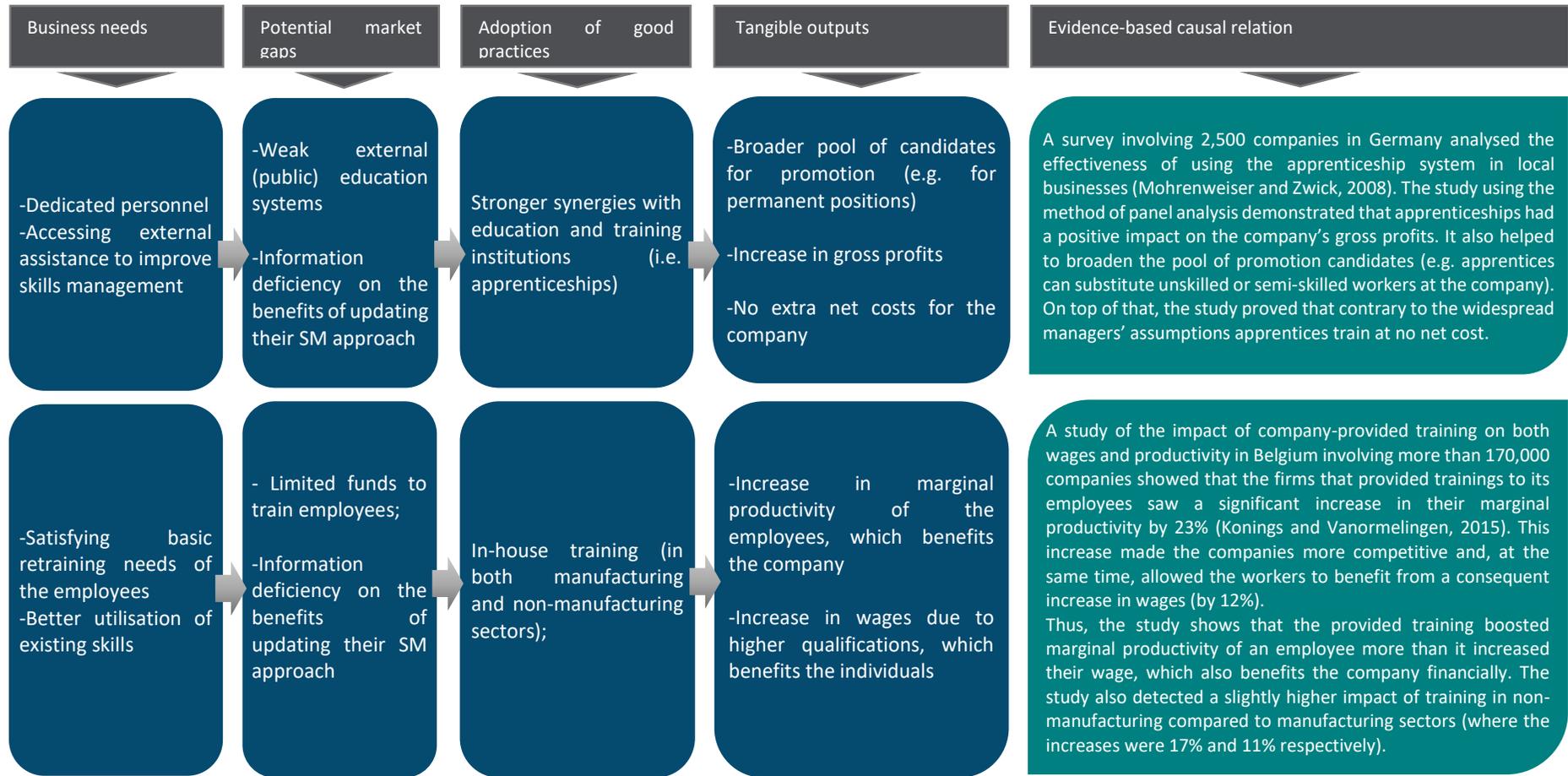
- Used robust quantitative methods both for data collection (at least 1000 observations) or analysis (e.g., using econometrics, data mining, or similar techniques);
- Achieved at least 100 citations (this ensures that the causal chain was thoroughly reviewed by peers and possibly tested more than once).

These requirements ensure that the causal chains we identify have a strong empirical support, and not just theoretical. On the other hand this also severely limits the number of such chains that can be identified. Because of that only a limited amount of causal chains were described in this study. These are illustrated and explained in the Figure below.

Text box 3. Good skills management practices: lessons learned

- A clear and comprehensive list of good practices has been established by prior research, censed in this report and can be tapped into to feed recommendations in the tool.
- The positive outcomes of those good practices are clear and impact positively the employees, the companies with a better competitive position, and in general a better economic outcome for the whole economy as SMEs – which are the overwhelming majority of business - would be more productive.

Figure 14. Graphical representation of causal links between the SME’s adopted practices and their results/outputs based on examples from the literature review



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Source: Consortium, based on literature review.

3. Overview of skills management solutions / tools

The following section dives into the currently available HR solutions that tackle skills management for SMEs and bigger companies. The goal of it is both to identify market gaps and niches for the specific public of SMEs, identify market positions where the offer is too plentiful to give our tool a comparative advantage, and get inspiration on the development of our own self-assessment tool. As in most cases the skills management solutions are offered through so-called HR solutions or software, in the following section we'll use them interchangeably.

3.1 Broad market overview

The HR technology market (HR Tech)⁵ is, relatively, young and dynamic. Currently it is experiencing extremely high growth rates and undergoing substantial readjustments to fit the growing needs for digital HR solutions among diverse companies. Key trends on the market include (Bersin, 2019; Brighteye Ventures, 2020; Harris and Gurchensky, 2019; HRWins, 2020):

- **The market is expanding** – the Total Addressable Market⁶ for HR Tech grew over 60% since 2017.
- **The volume of solutions aimed at SMEs is growing rapidly**, and small businesses are the fastest-growing segment of new HR technology buyers.⁷
- Given the tight labour markets, **there is a big focus on retention and re-skilling of employees**, leading to “running into skills-based everything”.
- **The HR Tech sector is yet to develop solutions for supporting the new ways of work**, especially remote work. Given the ongoing changes in the labour markets and the nature of work, this is expected to be a rapidly growing sub-sector.
- **European technology sectors are becoming more mature**, as more and more start-ups are “graduating” from earlier investment stages.
- **There is an increase in market fragmentation driven by specificity of demand.** Companies use increasing number of complementary solutions rather than a single complex one. For example, Slack, a 1,300 employee company, uses about 350 applications to get work done. As a consequence, the market share of the two biggest vendors, Oracle and IBM, have decreased from a peak at almost 40% to above 20% today. They are being replaced by smaller providers, often offering more targeted

⁵ HR Tech is understood here as an umbrella term for software and associated hardware for digitising and/ or automating the HR function in organisations. It includes a wide range of HR-related activities such as compensation and benefits administration, talent management, workforce analytics, performance management, etc.

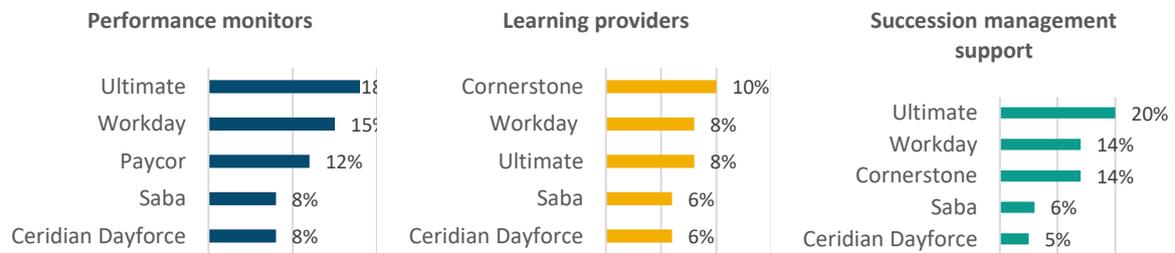
⁶ Total Addressable Market – Total revenue opportunities that are available to product or service if 100% market share is achieved.

⁷ Although the definitions of a ‘small’ company in the thematic reports tend to be very broad, including companies with fewer than 1,000 or even 2,500 employees.

products (market or content wise). This kind of start-up fuelled specialization will “continue forever” as “software gets into finer and finer niches”.

Nevertheless, a few global providers still account for a substantial share of the market. The Sierra-Cedar study of HR technology usage (see Harris and Gurchensky, 2019), which focused primarily on developed economies in North America and Europe, provides some data on the largest providers and their adoption among companies of different sizes (see Figure 15 below). However, it should be noted that the study defines a small company as one with less than 2,500 employees. Therefore, the penetration rates among SMEs as we understand them (less than 250 employees) is likely to be much lower as those providers cater predominantly to large corporations (e.g., penetration rates for large companies of 10,000+ employees are much higher).

Figure 15. Adoption of top service providers among companies with 2,500 employees or less across different tool types



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Source: Consortium, based on Harris and Gurchensky (2019)

3.1.1 Venture Capital investments in HR Tech

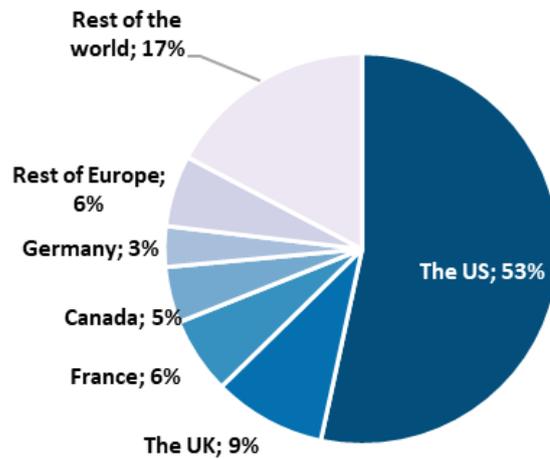
This subsection provides a general overview of investments in the HR tech market. HR Tech here refers to technologies covering a variety of SM stages and HR functions (e.g., skills assessment, development, utilisation). The HR tech market is explored by overviewing the: (i) **trends in global and EU markets**, (ii) **top deals and key market segments**, and (iii) **key takeaways**. The aforementioned three dimensions also serve as the structure for this subsection.

Trends in global and EU markets

For the past three years the HR Tech market has been experiencing a period of explosive growth (Bersin, 2019), becoming increasingly attractive for VC investors. In 2019 Global HR Tech investments surpassed \$5.3 billion, up from \$4.0 billion in 2018 and \$1.1 billion in 2017 (HRWins, 2020). The market is highly geographically focused: among a total of 238 deals in 2019, the US led with 127, followed by the UK as a distant second, with 22 deals. France reported 15 deals for the second consecutive year, and Canada broke into double digits in

2019 with 11 deals (see Figure 16 for more). Since January 2017, more than 60% of the global HR Tech Venture Capital (VC) was invested in US-based start-ups (HRWins, 2020).⁸

Figure 16. Share of investment deals made in 2019 across geographical locations



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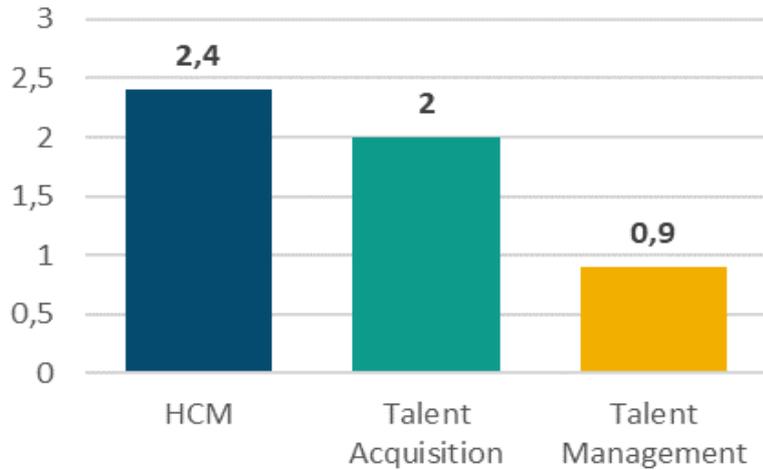
Source: Consortium based on HRWins (2020)

Top deals and key market segments

Within the HR Tech sector, human capital management (HCM) solutions, including areas like payroll, Human Resource Information System (HRIS), compliance, or benefits are the largest category within HR Tech (\$2.4 billion) in 2019. Talent acquisition solutions came in a close second (\$2.0 billion), followed by talent management solutions, including learning, staff retention, and employee experience (\$0.9 billion; see Figure 17). In terms of the deal numbers, most investments in 2019 focused on recruitment and talent acquisition (111 deals) – 64 deals concentrated on HCM and 63 – on talent management (see Figure 18).

⁸ There is a significant lack of EU-level data on VC investments in HR Tech. Available reports tend to focus on HR Tech globally (HRWins, 2020) or European VC in broader contexts (e.g. technology sector – see Wehmeier, 2018).

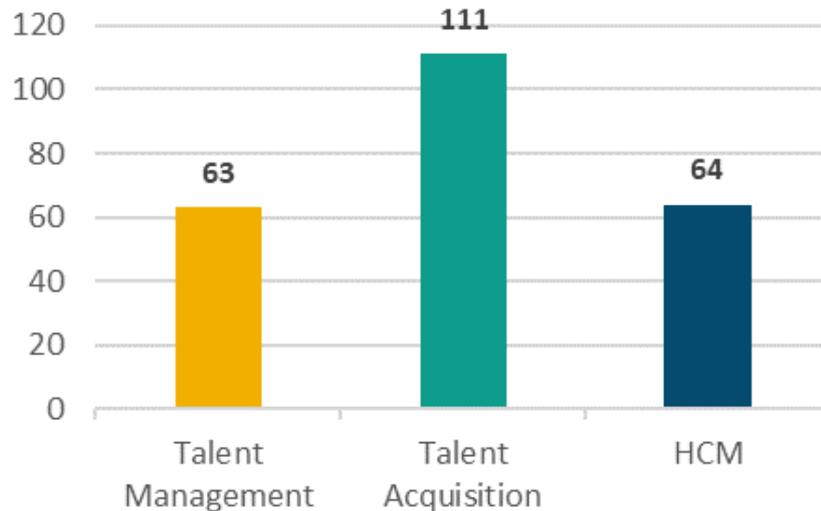
Figure 17. HR Tech VC investments by categories (\$ billion) in 2019



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Source: Consortium based on HRWins (2020)

Figure 18. HR Tech VC deal count by category



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Source: Consortium based on HRWins (2020)

On a more granular level in 2019, HR Tech investors found the following top three investment categories most attractive: recruitment, rewards and recognition, and work management (Bersin, 2019; HRWins, 2020). From a skills management perspective, **skills utilisation as well as planning and analysis start-ups received most of the investments** (with collaboration and communication software receiving \$444 million; and analytics and core HR software combined – \$440 million). Figure 19 below elaborates on VC investment in HR Tech

by category, while Figure 20 elaborates on VC investment by software type. The HR Tech categories used in the figures can be described as:

- **Recruitment** – solutions for video assessments, AI-based sourcing, behavioural analytics, gig work management and other recruitment-related functions
- **Rewards and recognition** – tools for social rewards and recognition, including pay and reward benchmarking, rewards customisation, and solutions for the conjoint rewards analysis
- **Work management** – tools for agile goal setting and effective team collaboration
- **Analysis and planning** – solutions related to analytical assessment and core HR activities
- **Well-being** – tools for behavioural improvement, well-being education and training as well diversity and inclusion trainings among others
- **Performance management** – tools for agile goal setting, team management, AI-based development planning, and online coaching among others
- **Learning and career** – eLearning platforms, career portals, and content libraries

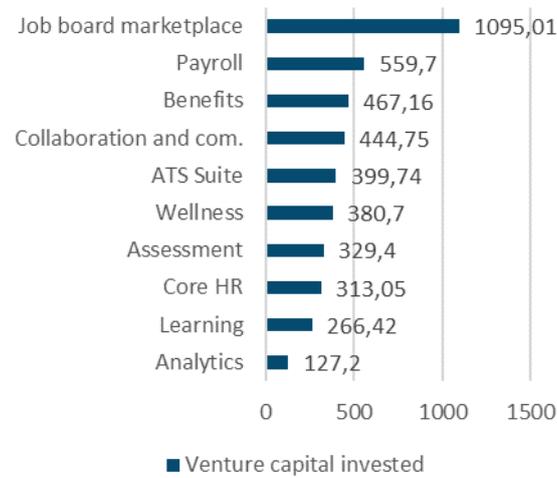
Figure 19. Total VC invested in 2019 by HR Tech category (in millions of \$).



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Source: Consortium based on HRWins (2020)

Figure 20. Total VC invested in 2019 by HR Tech software type (in millions of \$).



* The original data in Figure 19 (displayed in Figure 20) was rearranged to better fit the classification defined previously. 'Recruitment' includes 'Job board marketplace' and 'ATS Suite'; 'Rewards and recognition' includes 'Benefits' and 'Payroll'; 'Work management' includes 'Collaboration and communication'; 'Analysis and planning' includes 'Analytics' and 'Core HR'; 'Well-being' includes 'Wellness'; 'Performance management' includes 'Assessment'; 'Learning and career' includes learning.

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Source: Consortium, based on HRWins (2020). 2019 Global HR Tech VC Look-Back.

Key takeaways

Based on the review of the most recent developments in HR Tech VC in 2019, we have identified three key takeaways for our study (HRWins, 2020; World Economic Forum, 2020; Bersin, 2019):

- **European HR Tech market for VC investments** is still in its **early** stages. As of 2019, EU-27 (without the UK) accounted only for 15% of major HRTech VC capital investments worldwide.
- Nevertheless, considering the current **explosive growth of investments** in HR Tech the innovative EU start-ups could potentially catch up with their global competitors.
- As the worldwide trend clearly demonstrates **HR Tech start-ups can effectively compete with the major players** by disrupting the market with their innovative approaches to traditional HR problems.

VC investors largely focus on HCM and recruitment, while skills management remains a lower priority for them. Skills management-related investments are made in the areas of analytics, learning, collaboration and assessment, which accounts for approximately 22% of VC investments (\$1.2 billion out of \$5.3 billion).

3.1.2 Venture Capital investments in EdTech

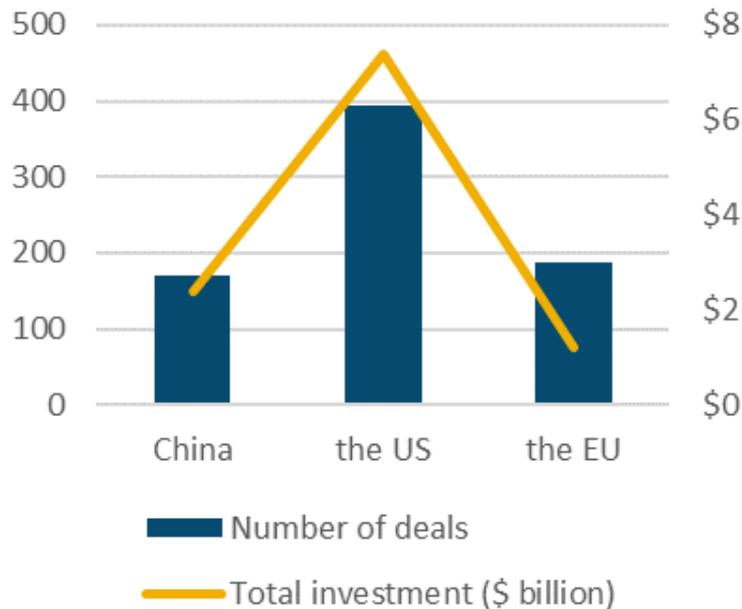
Ed Tech refers to a more targeted technology that focuses on skills development. Such technologies predominantly target education institutions (schools, universities) or individuals, while HR Tech is largely focused on companies. However, as skills development is an important aspect of skills management, insights on VC investments in EdTech could help to gauge an understanding of this subsector in the EU. This subsection overviews EdTech by analysing the same dimensions as the previous subsections (i.e. trends in global and EU markets, top deals and key market segments, and key takeaways).

Trends in global and EU markets

Patterns observed in the EdTech sector are consistent with the HR Tech developments – the US and China are the largest markets for EdTech investments (\$7.4 and \$2.4 billion invested in 2019 respectively; see Figure 21 below). However, Europe is quickly catching up and has noted a 100% year-to-year increase in all EdTech investments (\$1.2 billion invested in 2019), where between 2014 and 2019 VC investments have grown over nine times. On the other hand, investments in the US and especially China have decreased since 2018 (from \$11 and \$6.4 billion respectively).

Just like in the HR Tech, EdTech investments in Europe are very geographically focused – 73% of all investments were made in the UK, followed by France, Germany, Norway and Spain (see Figure 22 below). The UK has historically been the EdTech Investment leader in Europe, followed by Nordic countries, arguably due to high broadband and device penetration, both at homes and at schools, providing a fertile ground to test and deploy digital education solutions (Brighteye Ventures, 2018). Only about 2% of investments were made in the rest of the EU. Also, the share of these countries has significantly decreased over the years (Brighteye Ventures, 2020). In addition to that, the distance between UK and other EU countries (including Nordic countries) has also been only widening in recent years.

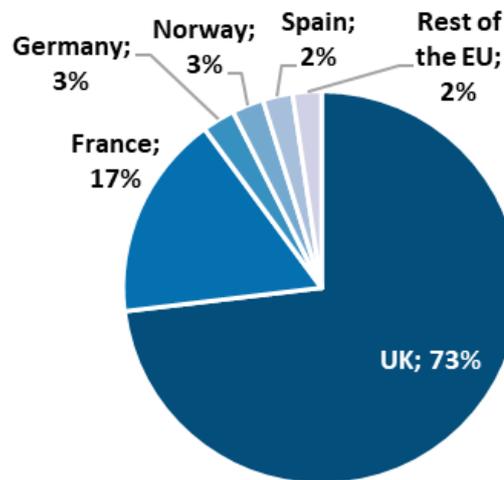
Figure 21. EdTech investments globally (number of deals and value)



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Source: Consortium based on Brighteye Ventures (2020)

Figure 22. Share of investments made in 2019 across Europe



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Source: Consortium based on Brighteye Ventures (2020)

As of 2020, one of the most popular forms of supporting start-ups by investing venture capital into EdTech are **business incubators**, also known as **accelerators** (The Tech Advocate, 2018; Brighteye Ventures, 2018). The same trend can also be seen in Europe, where incubators remain critical for the development of early stage EdTech companies (Gläsel, 2018). This is because start-ups on the European market need someone, who could guide them through both national and European regulations as well as to train extensively on

effective company management (Ibid). Their importance also should be understood in the light of the more sophisticated nature of European market regulations (if those are compared to the US or China).

Another important trend is that the majority of companies tend to choose '**institutional**' (45%) and '**freemium institutional**' (35%) business models (AGC Partners, 2019; IDC, 2019)⁹. Consumer and consumer freemium models, are not as popular with 17% and 5% respectively. All other types of business models combined together receive approximately 5%.

Top deals and Key market segments

As can be seen from Table 6 below, the global top EdTech deals in 2019 were largely dominated by American and Chinese companies. Not a single European start-up made it to the list, with top VC start-ups being Chinese (10), American (9), and Canadian (1). Chinese EdTech start-ups are gaining more ground on the market by pressuring their American counterparts (e.g., the top-funded Chinese start-up outperformed its American counterpart by more than 3 times in terms of funding). Table 6 provides more detail on the situation on the global market, while Table 7 looks into the top-funded European EdTech start-ups.

⁹ The institutional business model focuses on selling to institutions such as companies and schools and is characterised by large contract size and revenue risk. The freemium model, on the other hand, offers free product but attempts to upsell to a premium offering for a fee. Finally, a consumer-to-business model is a model in which consumers / individuals create value, while businesses consume it.

Table 6. Top-funded EdTech start-ups and companies in 2019

Name of the company	Investment (in millions of \$)	Country	Category (as defined by AGC)
One Hundred/100	1059	China	Distribution
vipkid	825	China	Distribution
17zuoye	480	China	Distribution
ZhiHu	457	China	Distribution
Better Sun Education	365	China	Distribution
HotChalk	318	United States	Management
iTutorGroup	315	China	Distribution
everfi	289	United States	Distribution
Pil	277	China	Distribution
Yuan Tiku	243	China	Distribution
Gaosi Education	211	China	Distribution
coursera	210	United States	Content
Wisdom Tree	207	China	Distribution
Edmentum	183	United States	Distribution
Kaltura	178	United States	Distribution
udemy	173	United States	Distribution
Dreambox Learning	173	United States	Content
Age of Learning	167	United States	Content
Destire2Learn	165	Canada	Distribution
KnewTon	157	United States	Distribution

Source: Consortium, based on AGC Partners (2019).

Table 7. Top-funded European EdTech start-ups and companies in 2019

Name of the company	Investment (in millions of \$)	Country
Graduway	60	United Kingdom
360 Learning	41	France

Ornikar	40	France
Immersive Labs	40	United Kingdom
Amboss	37	Germany

Source: Consortium, based on Brighteye Ventures (2019).

The EdTech market can also be subdivided into three large sectors based on the type of services the company provides (AGC Partners, 2019):

- **Content providers** sell the tools to create educational material, aggregate and develop content from disparate sources, and then publish it (e.g., Coursera™, Articulate™)
- **Management systems** facilitate, organise, analyse and administer educational coursework and material for students and teachers (e.g., moodle™, Lumosity™)
- **Distribution-focused companies** make educational content more accessible and engaging through online, gaming, and immersive learning (e.g., Duolingo™, Udacity™).

It is worth mentioning that, according to the same study, some of the **corporate eLearning giants** (e.g., Pearson™, Blackboard™, Cornerstone™) should be seen as a separate category of their own. This is because such companies can fit well into several classifications indicated above since they provide a wide range of educational services (Ibid).

Key takeaways

Based on the review of grey literature, four key takeaways for EdTech can be considered as important from the perspective of this study (Snyder et al., 2019; Brighteye Ventures, 2020; AGC Partners, 2019):

1. **EdTech is maturing:** Capital is more accessible for entrepreneurs, as investment activity at Series A stages remains strong and keeps growing and Series B investments is expanding at an impressive rate (sevenfold increase from 2018 to 2019).¹⁰
2. **The corporate (B2B) segment of EdTech is strong and growing:** Almost \$250 million (close to 40% of total investment) was invested in B2B providers in Europe in 2019. It is also noted that B2B companies have typically more stable revenue than B2C companies, tend to be less capital intensive, and thus represent less risk for investors. At the same time, the European start-ups are still largely lagging behind their competitors from the United States and China in terms of funding they receive.

¹⁰ Series A and B are third and fourth stages of investment (after pre-seed and seed stages). Series A funding is targeted at companies with already established user bases, consistent revenue figures, etc. to scale up the product (e.g. across different markets). Series B funding is aimed at companies that have already developed substantial user bases, have proven their value to investors, and are prepared for a larger scale-up.

3. **In the B2B sector**, eLearning is no longer viewed as a discretionary item subject to booms and busts in economic cycles, but **is gaining significant traction as a “must have” for many employers**, especially given the historically tight labour markets.
4. The industry’s most popular business models are ‘institutional’ and ‘freemium institutional’ (AGC Partners, 2019; IDC, 2019).

However, the European EdTech sector also faces serious challenges (Britheye Ventures, 2018; Dealroom.co, 2018; Wehmeier, 2018; AGC Partners, 2019). First and foremost, **early investment round sizes (pre-seed to series A) in Europe are still significantly smaller** than in the US or China, although are going up. EdTech companies tend to raise even smaller rounds compared to other venture sectors. Second, raising too little is believed to inhibit the chances of converting to further investment series. Indeed, **European start-ups take much longer time to “promote” to the next investment round** (e.g., 20 months from seed to series A and 23 months from series A to series B, compared to 15 and 18 months in the US respectively). Third, **institutional investor base in the EU remains undiversified**, with government agencies being largest investors in European VC funds, followed by corporate (mostly banks) and private investors, while buy-in from pension funds is particularly low.

Nonetheless, there are also some significant positive trends as well (Ibid). First, **sentiment within the European tech ecosystem around the capital raising environment is broadly positive**. In 2018, 72% of European founders and 84% of European investors believed that it has either stayed the same or has become easier to raise VC in Europe in the past year. Furthermore, **the early-stage investor base is increasing in size** (number of active investors has massively grown over the last years); and Europe has witnessed an increase in the level of investor collaboration, which can be associated with better conversion rates to further investment series. Overall, **European VC is performing increasingly well and becoming more competitive** in comparison against both European Private Equity and US VC.

3.1.3 Overview of the mapped tools

The box below (Text box 3) provides a summary overview of the tools according to the grouping criteria applied during the mapping (see inception report and section 3.6. *Mapping of tools* in the Annex), while the remainder of the section goes into more depth.

Text box 4. Review the mapped tools by grouping criteria

Annex A. SM stages:

- The tools vary in terms of skill management stages addressed –tools exist that focus primarily on one stage (although might involve some aspects of others as well, e.g., skills audit can be followed by referral to training providers).

Annex B. Operational models:

- Approaches to operational models and delivery of the tools tend to vary depending on the provider.

- A large majority of private tools are digital solutions (usually providing access to software or an online platform, sometimes accompanied by a mobile app; less often an app alone).
- Solutions offered by public actors are more varied in this respect. Although they do provide a significant amount of support through online solutions, face-to-face, and blended options are much more common than in the private market. For instance, while private HR assessment tools tend to provide diagnosis through software solutions, Singapore's HCDT involves visits to the company by the assessors.

Annex C. Providers:

- The private market is vast and the number of competing solutions offered by private providers is very high (significantly exceeding the number of tools mapped).
- On the other hand, only a few tools provided by not-for-profit organisations were identified – these tend to provide similar types of services as private ones, but are free of charge (e.g., *Investors in People*) or for a discounted price (e.g., *Workplace Innovation Europe*).
- Public actors might serve a similar function (provide a service free of charge). However, they are also likely to deliver support that is not provided by the private actors (e.g., directly provide or facilitate training, or provide information about services available in the market or about other types of support).
- Some public tools are more likely to be focused on a narrow area, most commonly, supporting digitalisation of SMEs (e.g., DigiCheck). On the other hand, public bodies are also a source of a holistic support targeted at SMEs, including one-stop-shops/national contact points – NCPs (e.g., BPI France) or financing instruments (e.g., European Investment Fund for SMEs).

Annex D. Target groups:

- The variance in target groups is rather low across mapped tools.
- In most cases, private providers do not differentiate between groups of customers and claim to offer services for companies of all sizes (even though the services often seem to be tailored towards medium-sized and large enterprises). Solutions targeted specifically at SMEs do exist but are rare (e.g., Empatico, Cornerstone for SMEs).
- Public tools do predominantly focus on SMEs. However, targeting smaller groups within the SME sector is rather rare – a few projects focus on specific industries (e.g., ROOTS targets the tourism sector); no tools have been identified that would distinguish SMEs at different development stages.
- Only two tools targeting public bodies were identified (the EU's SELFIE (focusing on schools) and the US's Human Capital Framework Diagnostic Tool).

Annex E. Tech features:

- Relatively a big portion of tools mapped incorporate some sort of benchmarking solutions and/ or data-driven approaches.

- Product features that allow for data analytics at the company level are probably even more widespread, and providers often advertise the ability to customize the indicators analysed and review the results easily (typically, using interactive, visualised dashboards).

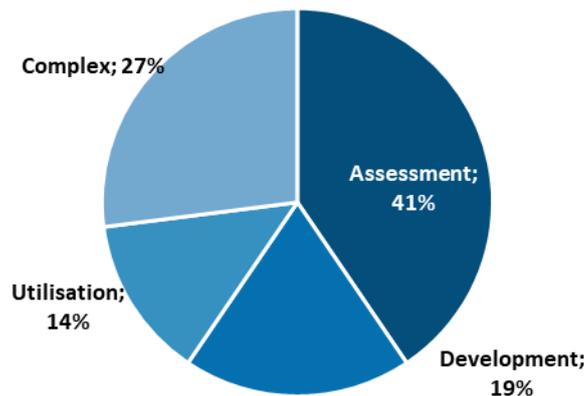
Annex F. Geographic spread:

- The US market for HR solutions is by far the most developed and features some of the largest providers and global market leaders such as Workday and Oracle. They tend to cater primarily for domestic US companies or multinationals headquartered in the US, although the digital solutions can be purchased by companies worldwide (available typically in English language only though).
- European market is more diverse and dispersed with a big number of smaller domestic providers offering services in the national language only, national language and English, or a couple of European languages.
- Among non-EU countries, Singapore emerges as a notable case of well-established public support schemes for skills management in SMEs, including its Human Capital Diagnostic Tool (HCDDT), which replaced a previous HR Maturity Diagnostic (HRMD) solution.

Source: Consortium

Regarding skills management practices, the majority of mapped tools focus on skills assessment or provide complex (i.e. including several skills management stages) solutions (see Figure 23). Going deeper, different tools can provide different solutions within the same SM stages – for example skills development can be facilitated by the use of e-learning platforms or more complex learning management systems (LMS). Thus, further groupings can be made based on the provided content across the SM stages (see Table 8).

Figure 23: Percentage of identified tools by skills management stage



N = 187

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Source: Consortium

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Table 8 - Broad groups of content provided by the tools according to the three SM stages

Tools	What do the tools do?	Representative tools
Assessment		
Skills audits and training planning solutions	They help to assess skills levels among employees/managers, identify skills gaps (training needs), and develop gap-closing strategies (often combined with clear definition of overall corporate goals and aligning training plans with those goals).	WebMentor Skills, Skills for Growth audit tool
Assessments of HR practices	They help to assess the maturity level of a company's HR/ HC practices and identify areas for improvement.	Human Capital Diagnostic Tool, Human Capital Measurement Tool
Comprehensive health-checks	They measure company's competitiveness/ productivity overall, where HR/ HC is only a part of.	FutureSME Capability Diagnostic, Canadian business productivity benchmarking tool
Development		
E-learning platforms	They offer access to online courses, typically in wide range of topics and from different providers (incl. universities, market leaders).	Coursera for Business, Akademia PARP
Learning Management Systems (LMS)	They provide learning content but also allow for a more comprehensive administration, documentation, tracking and reporting of learning and development, as well as easy creation of customized courses.	Paradiso LMS, Learnerbly
Utilisation		
Feedback solutions	They allow to share feedback about co-workers and/ or about company culture/ practices	Enterprise Feedback Suite, Sherlock Waste
Engagement and performance monitors	They help tracking engagement, satisfaction, and/ or performance levels of employees, and identifying possible solutions for increased retention of the workforce.	eNPS, GuideSpark
Communication enhancers	They provide an integrated platform for sharing knowledge and good practices and enhancing communication among employees.	Y-Box, Empl
Recruitment and succession support	They facilitate matching of candidates and current employees with positions and teams and/ or maintaining a relationship with leaving talent.	Empatico, The Talent Cloud
Digitization of HR processes	They help digitise and automate HR processes and workflows, improving	ServiceNow, People Doc

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	productivity and freeing up HR and managerial resources to address more complex and non-routine challenges.	
Complex solutions		
Complex HRM	They provide a single system for HRM that allows to manage the full worker lifecycle – from staffing to compensation to career growth, including both administrative aspect (digitalisation) and the merits (analysis, training management, etc.).	Workday Human Capital Management (HCM), Cornerstone for SMEs
Hubs and networks	They provide learning materials, space for sharing of good practices, and/ or access to networks of HR professionals.	People Skills Hub, Access 4 SMEs

Source: Consortium.

Regarding tool functionalities, the majority of tools operate digitally, mostly as software / websites / platforms (see figure 24 below). This is consistent with the evidence on HR market, which notes a clear trend in the private market to shift the deployment of tools into Cloud/SaaS (software-as-a-service) solutions: in developed markets in 2019, over 80% of HR solutions were deployed digitally (Harris and Gurchensky, 2019). Similarly, the majority of mapped tools are provided by private vendors, while the not-for-profit sector is very small (see figure 25 below).

Figure 24. Percentage of identified tools by operation mode

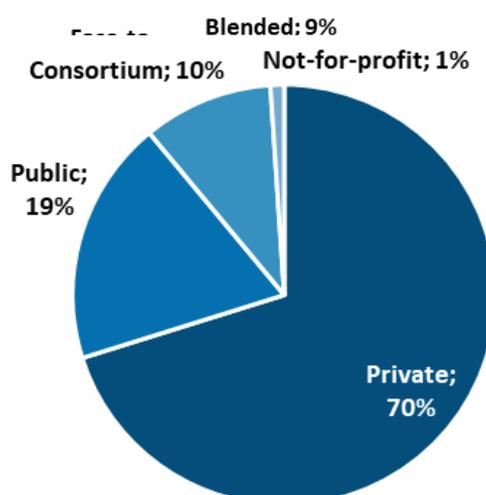


Figure 25. Percentage of identified tools by provider

N = 187

© European Union

Source: Consortium

Regarding the geographic spread, most mapped tools (around 33%) are available in English or allow users to select one of several languages (around 31%). However, likely due to mapping being focused on the European market, around 8% of identified tools use the Russian language, and 7% use Polish, German, French, or German (see Figure 26 below).

In addition, most mapped tools cater for companies of all sizes and do not offer a customised product to fit the needs of SMEs (see Figure 27 below). Nonetheless, several solutions targeted at SMEs have also been identified. However, it should be noted that the search done as part of this study focused on solutions targeting SMEs. Therefore, the share of SME-focused tools is likely to be over-represented in the selection of solutions analysed. The category “other” include tools targeted at narrower groups of users (e.g., medium-sized and large companies, a specific industry, or a broader group, e.g., companies, NGOs and public organisations).

Figure 26. Percentage of identified tools by provided language

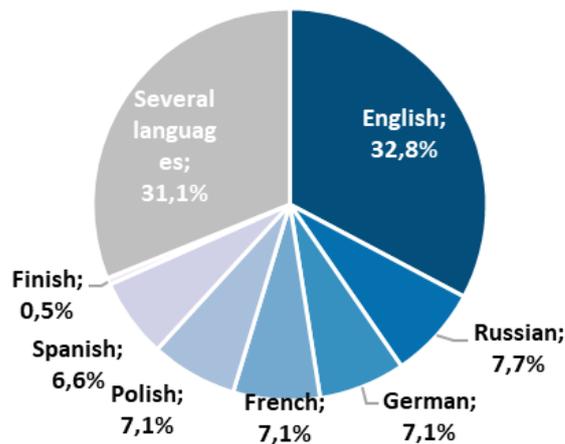
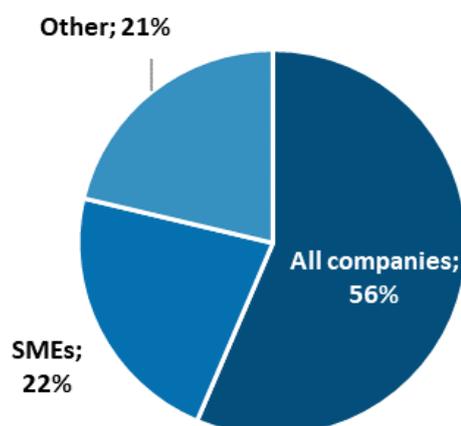


Figure 27. Percentage of identified tools by target group



N = 187

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Source: Consortium

3.1.4 Overview of skills management niches

This section provides a general overview of potential niches that could be filled by the DG EMPL tool. This is both based on the assessment of the market offer of solutions, the needs and mitigation strategies of SMEs and the external determinants of skills management that might impact the use of a solution. All of these elements have been presented in above sections.

Niches here refer to a particular type of tool that is not readily present on the market (or is present, but could be done better). Meaning, the identified niches indicate a tool that could fill a market gap where the supply does not meet the demand. The niches were identified using a combination of desk research, analysis of existing tools, and interviews with SMEs and intermediaries.

The table below provides the overview of niches by describing the:

- **Potential niche** – a short description of a tool that provides a general indication of a possible gap in the market. A more extensive overview of said gaps and how our tool could fill them can be found in section 2. *Task 2 – Analysis of possibilities to develop a (self-) assessment tool*
- **The existing demand** – elaboration how the tool could meet the existing demand. It is predominantly based on the literature review and interviews.
- **The existing supply** – elaboration on the supply of similar tools. It is predominantly based on the mapping of tools. For an extensive list of which tools cover which skills management practices see table SM in subsection 1.4. *Supply table* in the Annex.

- **Business needs** – a list of business need that the aforementioned tool could help SMEs to solve. For a more in-depth description of the needs see subsection 1.1.2. *Business needs of SMEs.*

Table 9. Potential niches based on the existing demand and supply

Potential niches identified based on the demand and supply analysis	Context of the theoretical niches: Demand analysis	Context of the theoretical niches: Supply analysis	Corresponding business needs
<p>An adjustable (industry, country, and sized-based) external benchmarking assessment of the company's SM strategy</p>	<p>The academic literature shows contradicting evidence with regard to the demand side on this issue. On the one hand, some research demonstrates that benchmarking as a practice of business performance metrics has become increasingly popular in the recent two decades (Huggins, 2010; BPIR 2020). On the other hand, the situation is somewhat different for the area of skills management, particularly in the area of skills development. Most recent studies on the topic indicate that 'no significant interest emerges on the possibility to sectoral benchmarking for actions specifically related to education and training' (EMPL, <i>forthcoming</i>).</p> <p>Interviews with the stakeholders reveal that many of the SMEs interviewed are not well aware of any SM benchmarking tools (as well as of any other SM self-assessment tools). This particularly concerns micro-SMEs. That unawareness may be a defining factor behind the problem of sluggish demand. A significant minority of the interviewed SMEs expressed their active interest for benchmarking their skills management practices when asked about this option. Most argued that they would use the benchmarking tool, if it is flexible enough (i.e. if one can adjust the industry branches and company size in a flexible way).</p>	<p>The current market offers two main types of benchmarking tools – solutions for internal benchmarking (comparing skills of the company's employees) and external benchmarking (comparing your company with other companies). We have identified a large number of internal skills benchmarking solutions (approximately 10% of the total mapped solutions; see Annex 6.3 for more details). These are normally offered as a part of more complex talent management suites (e.g., Cornerstone, rexx systems, Workplace Innovation Diagnostic). In contrast to that, the number of solutions for external benchmarking is significantly lower (only 7 solutions). This may be explained by the complicated nature of creating a tool for external benchmarking, which requires a big pool of companies participating in testing and sharing their data.</p> <p>There is a very limited number of solutions that allow benchmarking multiple areas of skills management. Although there exist some tools that allow to benchmark company's skills development and utilisation against other Polish companies (i.e. it compares training expenses, business productivity, profitability of labour costs, etc.)</p> <p>However, among the researched tools, the World Management Survey (WMS) comes closest to what one could potentially define as a comprehensive external benchmarking tool that address all skills management stages. The WMS has a talent management functionality that allows companies to gain insights into how its talent management compares to other businesses</p>	<ul style="list-style-type: none"> • Better understanding of employees and the market • Finding a low cost (monetary and time) skills management solution • Better utilisation of existing skills

		<p>internationally. The WMS scope, however, excludes the service sector, which significantly narrows its scope. Moreover, its filter criteria for countries and, especially, company sizes are somewhat rigid. For example, retail SMEs can only access data for US and UK and apply only two size filters (more than 110 employees; less than 110 employees).</p>	
<p>A catalogue of skills management solutions with implementation guidelines in several EU languages (preferably, with a review-based ranking system and / or benchlearning elements)</p>	<p>Although there is a significant variety of SM tools on the market (as Table 4 in section 1.2 demonstrates), SMEs can sometimes struggle to navigate through a large number of those SM solutions. As one of the SME leaders interviewed put their frustration, ‘googling on management issues is both time intensive and has low rewards’. Almost half of the interviewees pointed out that they would like to have a centralised, affordable, and reliable source of information on SM good practices and solutions where they could share their opinion and learn about solutions popular among other SMEs.</p> <p>Moreover, the interviewees raised two concerns regarding the future tool’s design. First, a question of accessibility in different EU languages is very relevant for them (particularly for smaller SMEs). Some interviewees stressed that it would influence their willingness to access such a catalogue or not. Second, interviewees claim that they are pressured by financial and time constraints and need low-cost solutions for their needs (which is confirmed by the academic literature, see the subsection on <i>External determinants for skills management</i>).</p> <p>The latter aspect of financial accessibility is an issue of particular concern for SMEs. Based on the Continuing Vocational Training survey (2015), approximately 30% of the EU</p>	<p>While performing the mapping of good practices and solutions, we have identified around 20 interactive platforms that inform companies on good business practices (approximately 10% of the total mapped solutions; see Annex 6.3 for more details). Apart from the issues relevant for the general business strategy, such platforms occasionally publish useful information related to the topic of skills management. SMEs often utilise these platforms because they are available for free and also allow for some basic benchlearning.</p> <p>However, most of these platforms do not focus specifically on skills management and are dedicated to broader HR issues. Furthermore, they are not always SME-friendly and often do not provide filtering mechanisms (e.g., industry-specific filters, or filters choosing the tools and publications that target SMEs). Filtering information is particularly important for SMEs, because they need to quickly navigate through a great variety of solutions (and compare those, if needed, based on review and affordability criteria). Finally, while most of these platforms allow for some basic benchlearning (e.g., user forums or blogs), there is no active interaction with other SMEs or tool developers.</p>	<ul style="list-style-type: none"> • Finding a low cost (monetary and time) skills management solution • Better managerial capabilities

	<p>SMEs are discouraged from updating their SM approach because of the high costs of the solutions they find. Considering the ongoing pandemic, the financial environment for SMEs is likely to deteriorate even further and negatively affect demand.</p>		
<p>An automated SM assessment tool, which provides recommendations on the improvement of the company's SM strategy (with a possibility of personalised follow-up consultations)</p>	<p>No clear demand for a comprehensive skills management assessment tool has been identified in the academic literature. What the reviewed literature has demonstrated, however, is that SMEs often suffer from information deficiency problems when it comes to skills management solutions (see the subsection on <i>External determinants for skills management</i>). This may explain why there has been little scientific evidence of demand (i.e. SMEs simply do not pay enough attention to this topic).</p> <p>At the same time, interviews with SMEs show that bigger SMEs with more than 50 employees would find such an assessment tool very useful. This is because they are keen on identifying their strategic SM gaps (in comparison: micro-SMEs with less than 50 employees tend to favour a benchlearning approach). Leaders of the SMEs that expressed their interest in the tool also noted that it would be useful to have personalised follow-up consultations based on the results of the assessment.</p> <p>Representatives of the intermediary organisations also support the claim that there is a potential demand for such a tool. Some of them noted that while not all SMEs might be aware what an SM strategy is, identification of gaps in individual SM stages (particularly in recruitment and skills development) is extremely relevant for all businesses.</p>	<p>The conducted mapping of good practices and solutions clearly demonstrates that there is an adequate supply of tools that help SMEs to assess a certain type of skills (e.g., digital skills – DigiCheck). We have identified multiple tools that help businesses look into their skills development, assessment, and hiring practices (e.g., Workplace Innovation Europe, HCDT). The larger supply of such tools in comparison to benchmarking solutions can be explained by the fact that automated assessments are easier to develop (one does not have to create a benchmarking pool of companies for the tool before launching).</p> <p>However, we have also discovered supply gaps in the market that relate to other issues. First and foremost, there are few tools, which assess company's skills utilisation strategy (most solutions only allow to monitor task implementation at individual or team levels). There is a lack of tools that could comprehensively assess all stages of skills management. While assessment tools produce recommendations for SMEs, those are often untailored. In addition, unfortunately, not all of these tools provide SMEs with an opportunity of a personalised follow-up consultation to clarify these untailored recommendations.</p> <p>Concerning the practice of consultations mentioned above, it can be generally seen as a good practice for tool developers (see e.g., HCTD or DigiCheck). Guiding the client through the recommendations they have received helps the SME to clarify any potential uncertainties about how to improve their SM strategy.</p>	<ul style="list-style-type: none"> • Finding a low cost (monetary and time) skills management solution • Cutting down administrative and paper-based costs

<p>A skills management assessment programme with an opportunity to receive financial support from a financial institution based on its results (including return on investment for skills, and human capital value)</p>	<p>The literature review demonstrates that SMEs often have difficulty accessing external financial assistance programmes (see the subsection on <i>Business needs of SMEs</i>). Both external surveys and interviews conducted by the consortium support this claim. According to the European CVT Survey, a quarter of SMEs gave up on the idea of training their employees because the costs were too high for them (CVT, 2015). The situation for SMEs is likely to become even more complicated as the result of the 2020 coronavirus recession.</p> <p>During the interview stage some interviewed SME leaders said they would like to receive targeted financial assistance based on the results of their SM strategy's assessment. They argued that it would help them to solve specific problems by receiving targeted loans and / or grants. However – this group were not a majority. Most of the SME interviewees were not particularly interested in financial support to help them in skills management. Their level of interest was strongly related to the actual needs and gaps that they perceived.</p> <p>However, other interviewees expressed their doubt about combining assessments of SM strategy with financial incentives. Some SMEs, who opposed the idea, pointed out that few companies would be attracted to receiving loans or credits only for the specific purpose of improving their skills management.</p>	<p>There is an adequate supply of SME-oriented financial support programmes (e.g., business incubators, accelerators) on the market – e.g., NEFI, ENEF, EIB programmes. Unfortunately, certain banks can be hesitant at times, when providing an SM-targeted loan for SMEs because of their much smaller turnover rates and rather volatile business conditions (Paradas, 2007; Voyer, 2011; Abraham et al., 2011). Their unwillingness is also likely to be affected by the financial consequences of the 2020 coronavirus recession.</p> <p>To address this financial gap, public institutions both at national and European levels arrange special programmes for SMEs. Every national government has its own special SME-support initiatives, which help companies to access the funds they need (e.g., JobStarter PLUS in Germany). However, national programmes can be unevenly spread across the EU regions as the solutions mapping shows (see Annex 1.7 for more details). Therefore, the EC and other European institutions administer a range of additional assistance programmes that support all European SMEs (e.g., EIC Accelerator, Promotion Awards, H2020 funds, etc.).</p> <p>Despite this variety of general financial support programmes targeted SM-related support is quite limited. The most popular form of SM-related support are financial programmes, which fund employees' skills development at individual level with state subsidies (e.g., <i>Mon compte formation</i> in France).</p>	<ul style="list-style-type: none"> • Accessing external funding to improve skills management • Better understanding of employees and the market
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<p>A European benchlearning platform / forum for exchange of good SM practices (in such areas as recruitment and skills development)</p>	<p>While benchlearning is a relatively new term, learning from the best in the field has been a long-standing practice both in public and private sectors (EC, 2017; Peng, Mole, and Roper, 2019). SMEs are no exception to this rule. The interviews with SMEs showed a strong interest in the concept of benchlearning (particularly, micro SMEs and small SMEs preferred the idea). Approximately half of the interviewees said that they preferred benchlearning (or a combination of benchlearning and benchmarking) over other assessment instruments (e.g., classical questionnaires). The interviewees argued that ‘learning from the best’ and getting a clearer understanding of how SM solutions work in other EU countries / companies would help them more than automated (and what they see as ‘untailored’) assessments. For these SMEs, an ideal tool would be a platform that would share tailored resources and practices on skills management and could also be used to link SMEs with training providers.</p>	<p>We have identified two types of tools that use some benchlearning elements. First, those are the aforementioned 20 interactive platforms for good business practices. SME representatives (and other users) can interact with each other and start discussion threads. Nevertheless, those platforms are usually not tailored for benchlearning and are often unstructured and not well moderated.</p> <p>Second, many other tools, such as complex talent management solutions (e.g., rexx systems), have their own client forums where company representatives can discuss how to use the software most efficiently, as well as involve the developer’s consultants into this discussion. However, most SMEs cannot afford such expensive solutions because they work under financial constraints. These financial constraints are likely to become even more acute because of the financial consequences of the 2020 coronavirus recession.</p> <p>Apart from those limited tools, supply analysis demonstrates that there is no specialised platform that is focused on skills management as a broad concept (instead of just one or two elements) and is also SME-oriented. This, consequently, makes building stable regional and interregional SME networks that would focus on sharing good practices in the field of skills management more complicated.</p>	<ul style="list-style-type: none"> • Accessing external assistance to improve skills management • Better managerial capabilities • Better understanding of employees and the market • Finding a low cost (monetary and time) skills management solution • Help with implementing new (digital) technologies • Effective monitoring of needs for up- and reskilling
<p>Potential niches identified based on the demand and supply analysis</p>	<p>Context of the theoretical niches: Demand analysis</p>	<p>Context of the theoretical niches: Supply analysis</p>	<p>Corresponding business needs</p>
<p>An adjustable (industry, country, and sized-based) external benchmarking assessment of the company’s SM strategy</p>	<p>The academic literature shows contradicting evidence with regard to the demand side on this issue. On the one hand, some research demonstrates that benchmarking as a practice of business performance metrics has become increasingly popular in the recent two decades (Huggins, 2010; BPIR 2020). On the</p>	<p>The current market offers two main types of benchmarking tools – solutions for internal benchmarking (comparing skills of the company’s employees) and external benchmarking (comparing your company with other companies). We have identified a large number of internal skills benchmarking solutions (approximately 10% of the total mapped solutions; see Annex 6.3 for more details). These are</p>	<ul style="list-style-type: none"> • Better understanding of employees and the market • Finding a low cost (monetary and time) skills management solution • Better utilisation of existing skills

other hand, the **situation is somewhat different for the area of skills management**, particularly in the area of skills development. Most recent studies on the topic indicate that **'no significant interest emerges on the possibility to sectoral benchmarking for actions specifically related to education and training'** (EMPL, *forthcoming*).

Interviews with the stakeholders reveal that many of the **SMEs interviewed are not well aware of any SM benchmarking tools** (as well as of any other SM self-assessment tools). This particularly **concerns micro-SMEs**. That unawareness may be a defining factor behind the problem of sluggish demand. A significant minority **of the interviewed SMEs expressed their active interest for benchmarking their skills management practices** when asked about this option. Most argued that they would use the benchmarking tool, if it is flexible enough (i.e. if one can adjust the industry branches and company size in a flexible way).

normally offered as a part of more complex talent management suites (e.g., Cornerstone, rexx systems, Workplace Innovation Diagnostic). In contrast to that, the number of solutions for **external benchmarking is significantly lower** (only 7 solutions). This may be explained by the complicated nature of creating a tool for external benchmarking, which requires a big pool of companies participating in testing and sharing their data.

There is a very **limited number of solutions that allow benchmarking multiple areas of skills management**. Although there exist some tools that allow to benchmark two areas. For example, NKL allows to benchmark company's skills development and utilisation against other Polish companies (i.e. it compares training expenses, business productivity, profitability of labour costs, etc.)

However, among the researched tools, the **World Management Survey (WMS)** comes closest to what one could potentially define as a comprehensive external benchmarking tool that address all skills management stages. The WMS has a talent management functionality that allows companies to gain insights into how its talent management compares to other businesses internationally. The **WMS** scope, however, **excludes the service sector**, which significantly narrows its scope. Moreover, its **filter criteria for countries and, especially, company sizes are somewhat rigid**. For example, retail SMEs can only access data for US and UK and apply only two size filters (more than 110 employees; less than 110 employees).

Source: Consortium

3.2 Offer of best practice linked solutions on the market

After the review of the skills management solutions on the market and their offer, those have been matched to specific SM practices for which they could be used. This information has been instrumental in building the fiches for the tool hen recommending certain practices and how to implement them. By identifying directly solutions they can use, the SMEs are more likely to jump into action and follow the recommendation.

Table 10. Supply of skills management solutions that cover identified good skills management practices

Skills management practices	Business needs	Supply of solutions	Summary of the supply analysis
Technology-based skills assessment	<ul style="list-style-type: none"> • Cutting down administrative and paper-based costs • Better understanding of employees and the market • Effective monitoring of needs for up- and reskilling 	<p>Employee-oriented: Cornerstone SMB (PiiQ); Jumpstart; Kammi; Rexx Systems; iSpringSolutions; Eurecia; Future SME; Narzędzie pomiaru Kapitału Ludzkiego – NKL (PL); Storhy; World Management Survey; RH Florys (FR); Avilar’s Webmentor Skills; CBM Software (FR), Eurecia; Cangaroo; (FR) among others</p> <p>Market-oriented: Workplace Innovation Diagnostic; DigiCheck; Global SME DevNet Skill Assessment; EvalNumPME (FR); Enterprise Feedback Suite among others</p>	No gaps identified; the practice is very well covered
Skills matrix		Cornerstone; Analytics in HR Matrix; AG5 skills matrix; free MS Excel-based tools among others	No gaps identified; the practice is very well covered
Skills benchmarking	<ul style="list-style-type: none"> • Better understanding of employees and the market <p>Effective monitoring of needs for up- and reskilling</p>	<p>Internal: Cornerstone SMB (PiiQ for SMEs); rexx systems; IceCube; Narzędzie pomiaru Kapitału Ludzkiego – NKL (PL); Workplace Innovation Diagnostic; iSpring Solutions; Skilo; ServiceNow; TalentSoft (DE); EasySoft; Infoniqa; Service Guru; Your Study (RU); Ilias; Open Test (RU); ProAction; LevelLab; Mirapolis; Unicraft (RU); Jacando</p> <p>External: Canadian business productivity benchmarking tool; World Management Survey; Narzędzie pomiaru Kapitału Ludzkiego – NKL (PL); Coursers for Business;</p>	This practice is relatively well-covered, however, most of the solutions offer internal benchmarking (between employees), especially on the European market.

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		Visier for People Organisation; Hyphen; NEFI	
Skills benchmarking		Enterprise Europe Network; rexx systems; Cornerstone.	While there is a great variety of different benchmarking tools most of them do not provide benchmarking opportunities. Moreover, SMEs do not have a European SM-oriented benchmarking platform.
Multidimensional skills assessment	<ul style="list-style-type: none"> Better understanding of employees and the market <p>Effective monitoring of needs for up- and reskilling</p>	IceCube; EDSI Skills Gap Analysis; Foxize Diagnosticó (ES); BBE Diagnostic Tool; Human Capital Diagnostic Tool (SG), Career Pathing Software among others	No gaps identified; the practice is very well covered
Problem-solving tests	<ul style="list-style-type: none"> Better understanding of employees and the market Effective monitoring of needs for up- and reskilling 	EasyLearn; iSpringSolutions; Unicraft (RU); STEAG (DE); KeeUnit (DE); Einstellungstest (DE)	Even though there is a high number of solutions that help SMEs in constructing and conducting tests, there is also a lack of pre-made tests that they could purchase/utilise (especially related to hard skills). Furthermore, not a single solution focuses on SMEs.
360-degree feedback	<ul style="list-style-type: none"> Better understanding of employees and the market Effective monitoring of needs for up- and reskilling Dedicated personnel 	Cornerstone SMB; Jumpstart; Sherlock Waste; IceCube; Small Improvements; Narzędzie pomiaru Kapitału Ludzkiego – NKL (PL); iSpring Solutions; Enterprise Feedback Suite; Eurecia; Carrospot; Soft Expert HDM; Skills Base; CakeHR among others	No gaps identified; the practice is very well covered
In-house training	<ul style="list-style-type: none"> Satisfying basic retraining needs of the employees Training needs arising from the deployment of new equipment / techniques 	<p>External: Better-Up, UK High Level Skills Programme; Innovative Workplaces; DigitaliseSME</p> <p>Internal: Cornerstone SMB (PiiQ); Jumpstart; Kammi; Rexx Systems; EasyLearn; Web CourseLab; ServiceNow; Skillsbook</p>	While the same solutions like course constructors can be used for structuring SME knowledge-sharing processes during special in-house trainings, there is a lack of free external in-house training programmes that target SMEs. Thus, many SMEs resort to the option of either paying for an invited expert or delegating.
E-Learning /		Coursera Business; Academia PARP; Fundae; HCM Desk; CoachHub; Lecturio Unternehmen (DE); Corp Academy;	No gaps identified; the practice is very well covered

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		Weiterbildungsmarkt (DE); Kursfinder PRO (DE); Competentum (RU) among others	
Blended Learning Platforms		Guild; BPI France, Access for SMEs; Outils et idées en gestion de ressources humaines (FR); EasySoft; Weiterbildungsmarkt (DE); Aspect (RU) among others	No gaps identified; the practice is very well covered
Mentorship and competence tandems	<ul style="list-style-type: none"> Help with implementing new (digital) technologies 	GuideSpark; BetterWorks; RexxSystems; Y-Box; Emplo; Klaxxon	The solution is covered to a certain extent but most of the practices are rather costly for SMEs, especially the smaller ones, who prefer to opt out for cheaper informal solutions (e.g., Messenger, Slack, etc). Special pricing based on the SME size was identified only in one case.
Job rotation	<ul style="list-style-type: none"> Better utilisation of existing skills Satisfying basic retraining needs of the employees 	boost.rs Skillmapper/ Talentmapper; Meta4; Talent Guard Career Pathing Software	The practice is covered to a certain extent as a part of more complex career development and career tracking solutions. Moreover, not a single identified solution focuses specifically on SMEs.
'Ordering knowledge'	<ul style="list-style-type: none"> Satisfying basic retraining needs of the employees Finding a low cost (monetary and time) skills management solution 	Cornerstone SMB (PiiQ); Jumpstart; Kammi; Rexx Systems; EasyLearn; Web CourseLab; ServiceNow; Skillsbook	This practice is relatively well-covered, however, most of the course constructors that help to 'order knowledge' are a part of larger expensive LMS software. Thus, SMEs often have to purchase more expensive solutions in order to obtain access to constructors.
Internal course repositories	<ul style="list-style-type: none"> Satisfying basic retraining needs of the employees Finding a low cost (monetary and time) skills management solution 	Cornerstone SMB (PiiQ for SMEs); Rexx Systems; Kammi; EasyLearn; ILIAS	There is a lack of course repositories integrated into open-access LMS (only one solution offers this option). Furthermore, in order to get access to such repositories, SMEs often to have to purchase more expensive complex solutions.
Green skills training	<ul style="list-style-type: none"> SM solutions for implementing 	N/A	While one can find various guidelines on green skills, there is a strong lack of relevant

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	<p>environmental standards</p> <ul style="list-style-type: none"> • Building 'green' business strategies • Cutting down administrative and paper-based costs 		<p>solutions available for SMEs; potentially, SMEs could look for on green business strategy, their environmental regulations, etc.</p>
Digital skills training	<ul style="list-style-type: none"> • Help with implementing new (digital) technologies • Developing online presence • Developing e-commerce 	<p>eSkill Employee Assessment; ROOTS Project; InnoCámaras (InnoChambers)/ TICCámaras (ICT'Chambers); InterReg; DigitaliseSME; Coursera Business</p>	<p>This practice is relatively well-covered; however, it seriously lacks SME-targeted solutions. While it is now significantly easier for SMEs to utilise basic digital tools or learn more about digital marketing, they still struggle when it comes to developing e-commerce, digitising learning processes, etc.</p>
Soft skills training	<p>Need for qualified professionals with developed soft skills</p>	<p>Empatico; ROOTS Project; CCOI – Creating Cultures of Innovation; Coursera Business</p>	<p>There is a supply gap when it comes to solutions that focus on the development of soft skills and that SMEs could access for free or at a reasonable price. However, the low number of structured solutions for this practice can be explained by the informal nature of obtaining and developing most soft skills.</p>
Informal skills certification	<p>Dedicated personnel</p>	<p>Skillsbook; Paradiso; RexasSystems</p>	<p>There is a huge supply gap of solutions that allow employees to certify their informally developed skill (e.g., digital skills). This could be a potential hindrance for the employee's career development.</p>
Business incubators (accelerators) and external support programmes	<ul style="list-style-type: none"> • Better managerial capabilities • Accessing external assistance to improve skills management • Accessing external funding to improve skills management 	<p>High Level Skills Programme; Business Development Bank of Canada; Canal Empresa (ES); Access; Liideri (FI); Mon compte formation</p>	<p>No niche identified; the practice is very well covered</p>
Synergies with education and training institutions	<ul style="list-style-type: none"> • Accessing external assistance to improve skills management 	<p>EU Centres of Vocational Excellence; EU Alliance of Apprenticeships; CEDEFOP</p>	<p>While there is quite a number of solutions that provide SMEs with the function of automated job-posting and</p>

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			<p>multiposting, we have identified no solutions that focus specifically on apprenticeships.</p>
Detailed skills-based job descriptions	<ul style="list-style-type: none"> Better utilisation of existing skills Better understanding of employees and the market 	<p>Cornerstone SMB (PiiQ for SMEs); Rexx Systems; iSpringSolutions; Whoz; boost.rs Skillmapper/ Talentmapper</p>	<p>No niche identified; the practice is very well covered.</p>
Semi-automated job (employee-task) matching		<p>Empatico; Rexx Systems; IceCube; Skilo; Carrotspot; The Talent Cloud; boost.rs Skillmapper/ Talentmapper</p>	<p>While the practice is relatively well-covered, it still remains to be a part of HR solutions and LMS systems that are more expensive and normally target larger companies.</p>
Progress-tracking software for target setting		<p>Jumpstart; BetterWorks; Clear Reviews; KeenCorp; BizzMine (FR)</p>	<p>Lack of supply has been detected throughout the mapping process. Moreover, not a single identified solution focuses specifically on SMEs.</p>
Open-book management		<p>HR Works (DE); AIX; Hamburger Software (DE); CakeHR</p>	<p>There is a number of complex HR solutions that offer basic financial management functions, but there was only one identified solution that has the option of providing free access to the company's finances for all employees.</p>
Skills profile	<ul style="list-style-type: none"> Better understanding of employees and the market Better utilisation of existing skills 	<p>Cornerstone SMB (PiiQ for SMEs); Rexx Systems; Emplo; Inser Competences (FR); BizzMine (FR); Perbit (DE); HCM Desk; Emplo among others</p>	<p>No gaps identified; the practice is very well covered</p>
Competency visualisation techniques		<p>Cornerstone SMB (PiiQ for SMEs); Rexx Systems; IceCube; World Management Survey, Business Improvement Review; Digicheck; Skills Base; Inser Competences (FR), HRider (ES), among others</p>	<p>No gaps identified; the practice is very well covered</p>
Worker empowerment using gamification elements	<ul style="list-style-type: none"> Dedicated personnel 	<p>Skilo; EasyLearn; KeeUnit (DE); Service Guru (RU)</p>	<p>Despite the fact that gamification is becoming more widespread in skills development, the number of identified SM solutions utilising it was still relatively low. Moreover, most of the identified solutions do not specifically target SMEs.</p>

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External business / skills audit	<ul style="list-style-type: none"> Better understanding of employees and the market Better utilisation of existing skills 	HCDT (SG); HR Audit Inc; Handover HR Audit	The practice of external is poorly covered, especially on the European market. Moreover, the existing audit programmes are focused on HR not SM.
Learning management systems (LMS)	<ul style="list-style-type: none"> Better understanding of employees and the market Better utilisation of existing skills Cutting down administrative and paper-based costs Satisfying basic retraining needs of the employees Training needs arising from the deployment of new equipment / techniques Effective monitoring of needs for up- and reskilling 	Immersive Labs, Cornerstone SMB (PiiQ for SMEs); Rexx Systems; iSpringSolutions; Skilo; Eurecia; ILIAS; Workday Human Capital Management; Oracle; SAP SuccessFactors HXM Suite; Mentor (ES); People Spheres; PeopleStrong; Paradiso LMS; Learnerbly; Edu-sharing; Cegid Talent among others	Most of the solutions do not target SMEs; majority of those are too expensive for smaller businesses. While there are some open access options such as ILIAS or Edu-sharing, these do not provide intensive customer support systems and, thus, require intensive training before being implemented. Other, more expensive LMS systems not only provide intensive customer support, but also sometimes offer special training programmes for free.
Semi-automated feedback systems	<ul style="list-style-type: none"> Help with implementing new (digital) technologies Effective monitoring of needs for up- and reskilling 	eNPS, Sherlock Waste; The Talent Cloud; TINYpulse; Hyphen; Perceptyx; CakeHR	No gaps identified; the practice is very well covered
Networks/platforms developing local skills ecosystems	<ul style="list-style-type: none"> Better understanding of employees and the market Effective monitoring of needs for up- and reskilling Accessing external assistance to improve skills management Accessing external funding to improve skills management 	Culture Amp; Y-Box; Emplio; Corporate Alumni Platform; Akademia Menedżera MŚP (PL); InnoCámaras / TICCámaras (ES); Network of European Financial Institutions for Small and Medium Sized Enterprises; Enterprise Training Support (SG), Workforce Training Fund (US); Higher Level Skills Match; EIB's financing for SMEs and mid-caps; Enterprise Expansion Fund (ENEF) and Enterprise Innovation Fund (ENIF); EIF for SMEs; Outils et idées en gestion de ressources humaines (FR) among others	No gaps identified; the practice is very well covered
Entrepreneurs mobility schemes		Erasmus for Young Entrepreneurs	While this EU initiative (the only identified solution) has become very popular throughout

			2010s, there is still a lack of exchange programmes for entrepreneurs at national level.
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Source: Consortium, based on mapping of tools.

3.3 Cross-case analysis of selected tools

After a broad market overlook of the solutions on offer, the objective of this section is to dive deeper in a set of tools that have a variety of characteristics to understand their commonalities, differences and potential takeaways for our tool. We compare them on the same axes that we will then use for the development strategy of our own tool.

The selection of tools for case studies was guided by two key principles. First, the tools should cover a variety of dimensions, including commercial, public and non-profit solutions, online and blended tools, tools covering different markets, etc. Second, the tools should be considered 'good practices' in their areas. In case of commercial tools, it means they are provided by market leaders, have reached a high number of customers and / or have attracted significant amount of investment. Identifying 'good practices' among public tools is less straightforward, and thus we aimed at selecting solutions that are particularly innovative / instructive in certain specific areas (e.g., People Skills™ targets only small firms which is unusual; NKL™ introduces quantitative methods of measuring human capital, etc.). Ten tools were identified using this approach, on which we wrote ten in depth case studies:

1. Cornerstone SMB™ (**Cornerstone™**) – complex HRM solutions, from a global HR Tech market leader that target companies with under 1,000 employees.
2. **Culture Amp™** – employee feedback and analytics platform, which aims to help companies to improve employee engagement, retention, and performance. It is delivered by an emerging player and has attracted significant amount of VC investments.
3. **DigiCheck™** – an online questionnaire that performs a comprehensive analysis of the company's digitalisation aptitude in six different areas: (i) communication, (ii) management, (iii) human resources, (iv) cybersecurity, (v) planning and taxation, and (vi) production and services.
4. futureSME Capability Diagnostic™ (**futureSME™**) – a self-assessment tool for SMEs focusing on four key capabilities that underpin an adaptive enterprise strategy, operations, management, and adaptability.
5. Human Capital Diagnostic Tool™ (**HCDT™**) – a Singaporean public HC diagnostic tool, which helps organisations to assess their HC maturity (i.e. the level of organisation's human resources (HR) capabilities).
6. **KAMMI™** – a cloud-based solution meant to help SME manage various aspects related to personnel, ranging from administrative issues (e.g., absence or payment) to career development, learning, and project management.

7. Human Capital Value Measurement Tool (pl. Narzędzie Pomiaru Wartości Kapitału Ludzkiego; **NKL**TM) – a tool that allows companies to continuously assess their human capital levels, using both quantitative and qualitative data.
8. **People Skills**TM – pilot programme offered free-of-charge expert HR support to small businesses through a range of free online tools as well as one-to-one advisory services. The support included assistance with day-to-day HR issues (e.g., legal compliance, writing employment contracts) as well as more comprehensive reviews of HR policies and practices to finding, recruiting and developing staff (e.g., reforming performance management practices, restructuring of pay and reward system).
9. rexx systemsTM (**rexx**TM) – a set of HR and SM instruments that aim to provide a complex support to companies across SM stages (including recruitment, talent management, and HR administration).
10. Workplace Innovation DiagnosticTM (**WID**TM) – an assessment tool, based on employee surveys that evaluates companies' workplace organisation, performance and workforce engagement, and points out areas for further improvement.

The remainder of the subsection goes in depth into different aspects of the tools that were covered during case studies, including:

- **Target group** – who the tool targeted
- **Aims** – what were the main aims of the tools
- **Content** – what each tool provides in broad sense
- **Operation and usability** – what are the unique features of each tool
- **Deployment** – how the tools are delivered to the users and how they were / are marketed
- **Sustainability** – how the tools sustain themselves

A broad overview of majority of these features could be found in the table 11 below, while the remainder of the subsection goes into more depth. The subsection ends with a short overview of the main lessons learned from the case studies.

Table 11. Cross-case comparison table

		Cornerstone™	Culture Amp™	DigiCheck™	futureSME™	HCDT™	KAMMI™	NKL™	People Skills™	rexx™	WID™
CHARACTERISTICS											
PROVIDER of the tool	Private	✓	✓		✓		✓		✓	✓	
	Public			✓	✓	✓		✓	✓		
	Not-for-profit										✓
AIMS	Improve business outcomes	✓	✓		✓		✓		✓	✓	✓
	Improve people outcomes	✓	✓				✓				✓
	Change employer outlook			✓		✓		✓	✓		✓
TARGET GROUPS	Small (<50 employees)			✓	✓	✓	✓	✓	✓		✓
	Medium-sized (50-249)	✓	✓	✓	✓	✓	✓	✓		✓	✓
	Large (250+)	✓	✓				✓	✓		✓	✓
GEOGRAPHICAL REACH (languages)	Int (43)	Int (EN)	Luxembourg (DE, FR)	Int (6)	Singapore, Malaysia (EN)	France (FR)	Poland (PL)	UK (EN)	Int (10)	Int (EN)	

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available/ number of languages available)											
SM STAGES addressed by the tool	Assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Development	✓	✓				✓		✓	✓	
	Utilisation	✓	✓		✓	✓	✓	✓	✓	✓	✓
OPERATION	Online (platform/ SaaS)	✓	✓	✓	✓		✓	✓	✓	✓	✓
	Online (mobile app)	✓									
	Offline (incl. face-to-face, offline tool and other)					✓		✓	✓		✓
PRICE	Free-of- charge			✓	✓	✓		✓	✓		
	Lump sum					\$1,600					€3,000+
	Monthly (per employee per module)	\$8					€0.5-2			~€5	
	Annually (per team)		\$3,300+								
RESULTS											

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Number of clients that have ever used the tool (unless indicated otherwise)	3,500+	2,750+	~13 monthly	~30	~1,000	240+	NA	449	2,000+	~30
Positive user rating/ feedback	✓	✓				✓		✓	✓	✓
Turnover in million (year)	\$576 (2019)	\$17.9 (2018)	-	-	-	NA	-	-	€20 (2018)	NA
Capital invested/ project budget in million	-	-	NA	~€8	NA	-	~€1	NA	-	-

Source: Consortium, based on case studies.

3.3.1 Target groups

Organisations targeted by the tools can be classified across several dimensions, including size, business units (private / public / non-profit), economic sector, and target market defined by countries/ regions or languages available (see Table 12 below for a summary of target groups across the tools).

Size of the company is a key differentiating factor across the case studies. First, commercial tools tend to target medium-sized and large companies, while public interventions are predominantly targeted at SMEs. Second, tools are often available in different options targeted at teams of different sizes. Options can vary in terms of complexity level (e.g., simplified tools for smaller teams), additional support provided (e.g., extensive analytical support and coaching for larger teams) and, in the case of commercial tools, price (i.e. the larger the team, the higher the price). Third, many assessment solutions, even if smaller companies are not explicitly excluded, are in fact **suited for medium and “big among small”, i.e. companies of around 20-30 employees or more**. The two key reasons for this seem to be: (i) there is simply no or little demand for such solutions among smaller companies due to simplicity of their operation and management as well as focus on administrative aspects of HRM, and (ii) it is challenging to ensure a relevant volume and anonymity of data in small teams, coming from employee surveys (which are often used). Furthermore, SMEs with 25-250 employees already have substantial HRM needs but still limited resources that do not allow them to access the top market solutions.

In other respects (i.e. economic sector and target market), the tools are rather universal. For example, **there was not a single case of a differentiation across economic sectors among the case studies** (i.e. tools are targeted at all sectors). Similarly, based on the case studies, but also the long list of mapped tools, differentiation of target groups across other potential characteristics (such as growth stage, business strategy, position in the supply chain) is unprecedented. This might be down to three key reasons: (i) SM- or HR-related needs are quite homogeneous across companies from different economic sectors, (ii) focusing on one or several sectors greatly reduces the pool of potential clients and is thus unfeasible as a business model, and (iii) it can be hard to identify and reach organisations with very specific characteristics (e.g., how to focus marketing strategies precisely on high-growing SMEs?). Furthermore, tools target either all – private, public as well as NGOs (even though private sector might be prioritised), or focus on the privately owned companies explicitly.

While public tools tend to be local (People Skills™) or nationally (HCDT™, NKL™) focused, commercial tools are typically open to clients from across countries, but they still sometimes focus on specific regions. Based on the case studies, but also the long list of mapped tools and overview of the HR Tech market, the global market leaders tend to originate from Anglo-Saxon countries (esp. the US), and often focus primarily on Anglo-Saxon markets. For instance, most providers establish regional offices in both US coasts, the UK and Australia first. Culture Amp™, despite the high penetration rates and maturity, offers its tool only in the English language. European providers tend to be smaller and focus on the EU or national markets (with exceptions such as

global leader SAP™). In the latter case, the languages available is an important determinant of take-up across locations.

Table 12. Target groups

	Cornerstone™	Culture Amp™	DigiCheck™	futureSME™	HCDT™	KAMMI™	NKL™	People Skills™	rexx™
Business unit	All (focus on private)	Private	Private	Private	All (focus on private)	All (focus on private)	All (focus on private)	Private	Private
Economic sectors	All	All	All	All	All	All	All	All	All
Countries/ regions (language)	International (43 languages)	International (EN)	Luxembourg (DE, FR)	Europe (EN, CZ, IT, PL, SE, TR)	Singapore, Malaysia (EN)	France (FR)	Poland (PL)	Hackney, Stoke, and Glasgow in the UK (EN)	International (EN, DE, FR, ES, IT, NL, PL, PT, RU, TR)
Size	Medium-sized and large (<75; 75-1,000)	Medium-sized and large (50-200; 200-1,000; 1,000+)	SMEs	SMEs	SMEs	All (11-250; 250-4,999)	10-49; 50-249; 250+	<50	Medium-sized and large

Source: Consortium, based on case studies.

Text box 5. Target groups: lessons learned

- Size is the key differentiating factor, both across the tools (e.g., some target SMEs while some medium-sized and large companies) and within the tools (different packages depending on the organisation size). Thus, the tool could include variations in content (thematic modules) and depth (complexity of the tool) to address varying needs of SMEs of different sizes.
- The tool could focus explicitly on SMEs with 25-250 employees as they are seen as a group most in the need of such solution. If targeted at all SMEs, the tool would have to carefully consider the very different needs of very small companies (e.g., incorporating a HR administration module to help with day-to-day HR management).
- Availability of languages seems a crucial feature to ensure international coverage, especially in the European context.

3.3.2 Aims

The tools' aims across the case studies can be analysed at two levels: (i) **end goals** or “marketing promises”, i.e. the outcomes companies ultimately want to achieve; and (ii) **intermediate goals**, i.e. specific actions that lead to the achievement of the end goals (see Table 13 below for a summary of aims across the tools). According to the case studies the end goals typically include:

- To improve **business outcomes**, especially productivity
- To improve **people-focused outcomes**, e.g., performance, engagement, satisfaction, leadership, management, culture shift, attraction, and retention of skilled employees
- In the case of public tools, to **change employer outlook/** increase demand for investment in skills

Similarly, though tools might have a variety of intermediary goals, most frequent once were:

- To **assess/ measure**, e.g., practices used, employee feedback, skill levels, performance, HR maturity
- To **provide data** to improve decision-making processes, e.g., on skills gaps to inform training planning decisions, or on employee performance to adjust performance-based benefits
- To **identify areas for intervention**, e.g., identify sub-optimal SM practices used
- To **facilitate change**, e.g., provide learning opportunities, point out effective SM practices and provide advice on how to adapt them
- To improve efficiency of day-to-day HR administration and management, e.g., provide a digital platform to manage HR issues

Hence, though there is a variety of different goals, majority of the tools tried to improve HR and / or skills management in the firms. This is because often companies have to make “baby steps” and reach more concrete, less demanding, intermediary steps before they spill over to the end goals. Hence, as is discussed in Task 2 of the study, the focus should be given to these, simpler, goals, as they are more achievable and easier to implement.

Table 13. Aims across the tools

		Cornerstone™	Culture Amp™	DigiCheck™	futureSME™	HCDT™	KAMMI™	NKL™	People Skills™	rexx™	WID™
End goals	Improve business outcomes	✓	✓		✓		✓		✓	✓	✓
	Improve people outcomes	✓	✓				✓				✓
	Change employer outlook			✓		✓		✓	✓		✓
Intermediate goals	To assess/measure		✓	✓	✓	✓		✓			✓
	To provide people data	✓	✓				✓	✓		✓	
	To identify areas for intervention			✓	✓	✓		✓	✓		✓
	To facilitate change			✓	✓	✓			✓		✓
	To improve efficiency of day-to-day HR	✓						✓	✓	✓	

Source: Consortium.

Text box 6. Aims: lessons learned

- To ensure take-up, the tool needs to present concrete benefits for business owners, i.e. contribute to improvement of business outcomes (e.g., increased productivity) or people-related outcomes (e.g., ability to attract and retain talent).
- The tool should focus on smaller, more tangible, aims rather than on broad all-inclusive goals (e.g., improve productivity, growth, etc.). To achieve the broad goals infinite amount of solutions could be proposed, while achieving the former provides structure, is easier to implement, as well as it helps to achieve the broad goals.

3.3.3 Content

Content refers to how, in very broad sense, the tools operate and what they include. This section discusses this dimension of the reviewed tools by focusing on two aspects: (i) the way content is organised in modules and across the SM stages (a.k.a. thematic modules) and (ii) benchmarking and benchlearning capabilities of the tools.

Thematic modules

The content of the tools depends largely on their key function(s). Following the typology presented in the table in section 3.1.3 (*Overview of the mapped tools*), the case studies include the following tool types:

- Complex HRM solutions (Cornerstone™, Culture Amp™, KAMMI™, People Skills™, rexx™)
- Assessment tools: Hr diagnostics (HCDT™, NKL™, WID™) and comprehensive health-checks (futureSME™, DigiCheck™)

Within complex HRM solutions, content is usually organised by thematic modules, which tend to roughly correspond to SM stages (see Table 14 for an overview of modules across the tools). Assessment and utilisation stages are often interlinked – for example modules focusing on performance, both evaluate employees' productivity, track progress, etc. (assessment) and help to put skills to better use, fill in the efficiency gaps, etc. (utilisation). Skills development is most often facilitated through incorporation of a Learning Management System (LMS) either internally within the tool or providing access to and integration with an external LMS. Modules addressing horizontal issues, such as HR administration or digitisation are also common.

As in the case of complex HRM solutions, the content / elements of the assessment tools are typically organised in thematic modules. However, among the tools focusing on HR practices, the modules are much more specific and tend to focus on skills utilisation issues, whereas questions asked within each module tend to be focused on a specific SM / work organisation practice. On the other hand, 'comprehensive health-checks' focus on issues much broader than SM and its stages, and/ or go deeper into a chosen horizontal issue across different business functions (e.g., digitisation – DigiCheck™ or adaptability – futureSME™).

Assessment tools based on employee surveys (NKL™, WID™) tend to focus around organisational and skills utilisation issues rather than assess a complex picture of SM practices. Solutions targeted more at company owners/ executives (DigiCheck™, futureSME™, HCDT™) provide a more comprehensive assessment of company situation.

Complex HRM tools typically allow users to choose one or more thematic modules that best fit their needs. Assessment tools tend to offer less content flexibility and have fixed structures – for example, users often have to complete the whole diagnostic to access the results/ reports. Nonetheless, they can still enjoy some degree of customisation, for example, inclusion of own questions in the survey to explore company-specific specific needs/ problems (WID™) or customising the set of indicators used and adjusting the optimal values of each indicator (NKL™).

Table 14. Modules across SM stages

	Complex HRM tools				Assessment tools				
	Cornerstone™	Culture Amp™	KAMMI™	rexx™	DigiCheck™*	futureSME™*	HCDT™	NKL™	WID™
Skills assessment						Strategy; Succession planning	Strategic workforce planning	-	-
Skills utilisation	Performance	Engagement; Performance	Talents and Skills; Interviews and Evaluations	Talent Management	Human Resources	Management style	Employee engagement and communication; Talent management and succession planning; Performance management	Employee satisfaction and engagement; Interpersonal relations; Knowledge sharing	Job design teams and technology; Employee-driven improvement and innovation; Leadership and employee voice
Skills development	Learning	Education	Learning			Core competencies; Skills development	Learning and Development	Competencies	-
Other stages	Recruiting	-	-	Recruitment	-	-	Talent attraction Employee value proposition	-	-

FEASIBILITY STUDY FOR A (SELF-) ASSESSMENT TOOL ON SKILLS MANAGEMENT PRACTICES IN SMES

Horizontal issues	HR	Coaching	Administration of personnel	HRM	Communication; Management	Organisational learning	Internationalisation Compensation and benefits; HR operations & technology; Organisational culture	Organisational culture	Organisation structures, management and procedures
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(*) only selected modules related to SM are included in the table

Source: Consortium, based on case studies.

3.3.3.1 Benchmarking and benchlearning of HR practices

Benchmarking refers to comparison of business processes and performance metrics to other companies. It is a quite common technical feature of the analysed tools and is often highly demanded by the users. Nonetheless, the feature is rarely advanced (i.e. offers only limited comparison opportunities). This is because accumulation of critical mass of data that would allow for comprehensive and reliable comparison is a challenge. Typically at least 5-10 records per company characteristics including size, sector, location, etc. are necessary to show the benchmark. Although public tools also very often attempt to provide a benchmarking option, they either manage to gather only a limited base (e.g., comparison is possible only in a few sectors, e.g., HCDT™, NKL™) or fail to accumulate the critical mass at all (futureSME™, WID™). Only large-scale commercial tools with high numbers of users are somewhat successful in overcoming this challenge and creating comprehensive benchmarking features, based on their large databases of clients.

Some providers also highlight the limitations of external benchmarks, including limited relevance of comparison to companies with different corporate and organisational cultures or potentially low average scores in certain industries which can demotivate companies to improve their practices. Alternatively, companies are encouraged to rely more on expert opinions (which can be customised to company's specific context, e.g., HCDT™) or on internal benchmarks, i.e. comparison within a company between different locations, departments or demographic groups (which ensures comparability of results and facilitates learning).

Alternatively, benchlearning options (learning based on benchmarks) are relatively rare, though there are some noticeable examples. One solution is a mechanism of direct referral of a company that scored low in a given field to a company that scored high, in order to facilitate knowledge sharing (see WID™ case study). This allows for some benchmarking and benchlearning processes to be implemented within a close circle of peers rather than as a comparison with the average scores across industry/ size/ location. Similarly, benchlearning can be facilitated based on internal benchmarks, in which case the better performing departments/ locations/ demographic groups can lead the learning process within an organisation (see Culture Amp™ case study).

Text box 7. Content: lessons learned

- Almost all analysed tools highlight the importance of gathering employee feedback and measuring employee and include employee surveys. Such feature should be seriously considered.
- Diagnostic targeted at company owners/ managers should focus on broad issues across (and possibly beyond) all SM stages, incl. practices used in recruitment, training, work organisation as well as issues related to business and people strategy, succession planning, and other aspects affecting long-term standing of a company. Diagnostic (or its part) focused on employees (e.g., employee surveys) should instead focus on: i) perceived employee engagement and satisfaction (which is a proxy to higher

productivity), and ii) assessment of company's organisational culture, incl. knowledge sharing, communication, job design, etc.

- Some level of content customisation seems necessary, from a relatively fixed structure with only some personalisation options (adding questions to surveys, etc.) to full flexibility in module selection, survey creation, etc.
- The tool needs to accumulate a critical mass of users, before benchmarking will be possible, which in itself can be challenging.

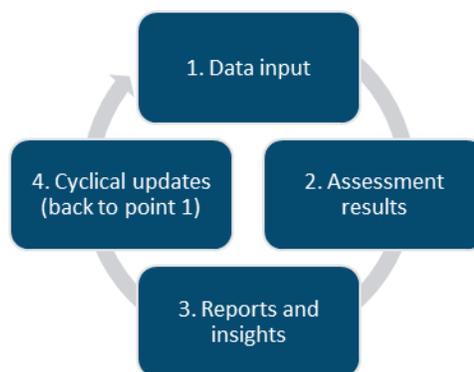
3.3.4 Operation and usability

Operation and usability refers to more technical aspects of the tool as well as how it is used by the users. It is discussed through the following three sections: (i) the key stages in the implementation of assessment tools, (ii) the support and additional ways of engaging users throughout the process, and (iii) good result visualisation practices aimed to increase user-friendliness of the tools.

3.3.4.1 The assessment process

The assessment is typically organised along four key phases (see Figure 28).

Figure 28. Assessment phases



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Source: Consortium

1. **Data input:** The core data used in the assessment tools typically comes from employee / manager surveys. These are provided within the tools, but often provide a degree of customisation (e.g., Culture Amp™ allows to create own surveys based on templates; WID™

enables users to add own questions and comments). Other data might include basic company information (sector, size, strategy, etc.) or financial data (e.g., revenues, labour costs).

2. **Assessment results:** Assessment results can be typically broken down per indicator / question / category / overall score as well as for team / department / demographic characteristics, etc. They tend to be presented along three main dimensions:

(a) **Indicator score** (e.g., 1-10) based on the average responses to each question

(b) **Colour** (e.g., green-yellow-red) or text label (e.g., “excellent”, “good”, “medium”, “poor”) showing the distance to the best score

(c) **Text interpretation**, including a short description what the score means, and possibly a brief recommendation and a link to additional resources related to the specific issue

Other scores, not deriving directly from the questions and answers, can include:

(d) Valuation of HC and other quantitative indicators (e.g., cost of employee replacement, hours of training per employee, revenue/ profit per employee – see NKL™ case study)

(e) Correlation between workplace practices used and employee satisfaction (see WID™ case study)

(f) Results comparison, including:

- Discrepancy score – difference between diagnostic results of people who took the diagnostic independently, e.g., between senior managers (futureSME™) or between business owner/ senior executive and employees (WID™). This can help to determine whether the perceptions of business capabilities are aligned within the organisation.
- Progress score, i.e. changing diagnostic results over time within the organisation

3. **Reports and insights:** Results can be presented in two main manners:

(a) **Reports summarising the assessment results** are typically accessible in two formats (see Table 15 below for more details). Simplified reports serve as information resources for employees or investors, financial intermediaries, public authorities and other external actors. Complex reporting is meant for owners / managers as a foundation for detailed analysis of identified challenges, design of action plans, etc.

(b) **Tools to analyse scores** are typically available for owners / managers / HR teams through customisable, interactive, and visual-rich dashboards including for example charts,

graphs and matrixes to help analyse the diagnostic scores across locations, departments and/ or other demographic characteristics.

(c) **Benchmarking** is another feature often used in the analysis of diagnostic results and can be included either in the reports or as part of the analytical tools.

4. **Cyclical updates:** Progress tracking can be done through several approaches:

(a) Updating data within the tool, usually recommended to be done on a continuous basis or relatively frequently (e.g., monthly or yearly depending on the purpose and use of the tool).

(b) Repeating the diagnostic, typically in tools/ programmes that highlight the transformation aspect, i.e., the diagnostic is done at the start, followed by a transformation process based on the results, and then the diagnostic is re-taken to evaluate the impact of changes.

(c) Pulse surveys used to evaluate the progress on a regular basis (e.g., quarterly) compared to the baseline diagnostic, combined with re-taking the full baseline diagnostic (e.g., annually).

Table 15. Overview of reporting features across tools*

	Culture Amp™	futureSME™	HCDT™	NKL™	WID™
Report types (target audiences)	Summary (employees); Standard (managers); Advanced (executives and HR)	Extensive overview Summary	-	Internal (managers); External (financial and other intermediaries)	Summary (employees); Detailed (managers)
Key content	Score and context Strengths – good scores and progress made Weaknesses – areas that need intervention Overview of recommended actions	Overview of key results Scores and recommendations per each module Conclusions and next steps (actions)	Top three strengths and development areas Automated suggestions/recommendations	Indicators scores Automated interpretations	-

Additional features	Ability to export the reports to PDF, Excel, CSV or PowerPoint; Option to customise the report (e.g., add and edit sections)	Additional, automatically generated but editable 'action list', incl. recommendations, priorities and actions to follow up on	Reports used as a basis for discussion between management team and a dedicated consultant	-	-
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(*) Only tools that have a reporting feature are included in the table.

Source: Consortium.

3.3.4.2 Users' engagement with the tools and support provided

Given the scarcity of resources in SMEs, including time, the extent of commitment necessary to successfully implement the tool is often an issue. The time spent on complex HRM tools is hard to estimate as they involve a big number of users and a day-to-day engagement. However, there is some insight into how much time is committed for the assessment tools. Surveys within the tools typically include 20-50 questions and take roughly 10 minutes to complete. More comprehensive diagnostics done by owners / managers (e.g., futureSME™) can take up to 2 hours, but in such cases ability to save progress and do the test over a couple sessions seems a good practice. The more complex diagnostic processes (involving consultations or more detailed data analysis) can take between 2 and 9 days.

In most cases, users can choose different depth levels of the tool (although the depth level is often recommended based on the organisation size) as well as different extent of additional support provided (see Figure 29). The latter is typically offered as different "packages" which can be generally labelled as "basic" (with full technical support and limited or no content support¹¹) and "premium" (full technical support and extensive content support).

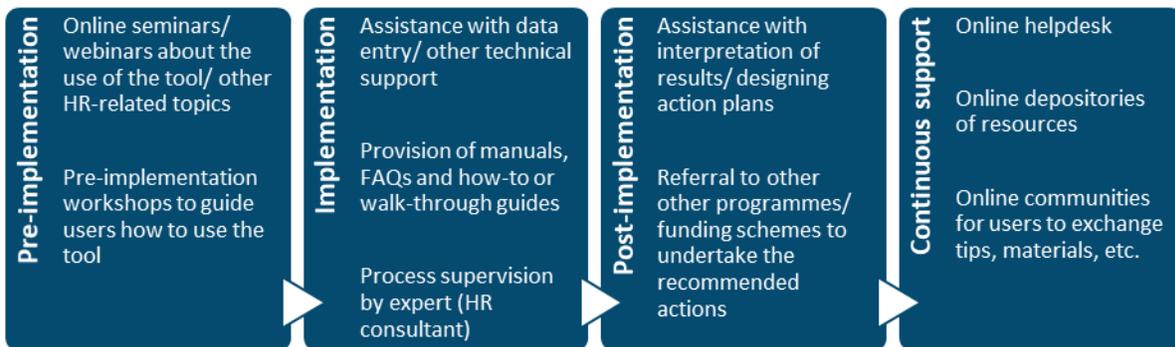
Very often, providers offer their clients additional ways of learning and engaging with one another. Two most common approaches to provide users with opportunities to learn and network include:

1. **Online depositories of resources**, including learning materials on good HR practices and how to implement them, blogs and articles on emerging HR topics, webinars and online workshops, document templates and/ or additional tools (e.g., salary calculators)
2. **Online communities** – forums or networks that allow users to directly engage with each other, exchange materials, ask questions, share good practices, etc.

¹¹ Technical support refers to guidance regarding tool functionalities and operation, e.g. how to input data, create reports, etc. Content support is HR consultancy, e.g. guidance on which actions to implement and how based on the diagnostic results.

Figure 29. Support options across the tool implementation process

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Source: Consortium

3.3.4.3 Good practices of visual solutions

Common visual features across the tools include:

- **Transparent home screen** providing access to all tool functionalities, e.g., in a tile format (see KAMMI™ case study, Figure 2)
- **Progress bar** showing the completed and pending survey parts/ assessment stages (see DigiCheck™, Figure 1; futureSME™, Figure 1)
- **Radar graph** used to present results across categories (see for example futureSME™ case study, Figure 2; DigiCheck™ case study, Figure 2)
- **Detailed results tab** in a typical format: indicator name – score – level (low-medium-high) – interpretation (see Culture Amp™ case study, Figure 2; NKL™ case study, Figure 2; People Skills™ case study, Figure 5)
- **Heatmap** used to present scores across demographic characteristics (see WID™ case study, Figure 1; Culture Amp™ case study, Figure 3)
- **Action list**, including for example the recommended activity, person responsible for implementation and timeframe, or links to additional support materials (see futureSME™ case study, Figures 3 and 6)

Text box 8. Operation and usability: lessons learned

- At least two reporting options seem necessary – more detailed for business owner/ managers/ HR and a summary for wider dissemination (among employees and/ or for financial and other intermediaries)

- Depositories of resources and online communities are highly valued by customers and are largely self-sustainable features.
- Non-human support mechanisms are most cost-effective and feasible given the EU reach of the tool – this can include detailed walk-through guides and manuals in attractive formats. Live chat could be considered.
- The tool needs to incorporate intuitive visual solutions not to scare off users with its perceived complexity and maximise user experience.

3.3.5 Deployment

This section discusses: (i) the most common ways tools are delivered to the users, and (ii) key marketing and dissemination approaches to reach out to the customers.

3.3.5.1 Delivery mode

Complex HRM solutions typically offer an integrated platform to be used on a daily basis by both employees and managers / owners. Employees can log in to view and update their data on training/ goal completion, access training, etc. Managers / owners have access to additional functionalities that aggregate the individual data and provide an overview of teams / departments / the whole company. On the other hand, assessment tools tend to be provided through a website / platform with limited customisable functionalities (in comparison to complex HRM solutions). They typically do not require continuous, day-to-day engagement with the tool but rather just updates from time to time to track progress.

3.3.5.2 Outreach and marketing

In the case of commercial tools, dissemination and outreach is predominantly done through direct sales, be it internal or based on external distribution partners. Public and non-profit tools, on the other hand, often rely on backing of existing public institutions in dissemination of the tools. This can be done in a number of ways. First, a tool can be incorporated as part of a larger support scheme – for instance WID was used as an assessment element in a programme facilitating workplace innovation in Scotland. Second, a tool can refer to other support initiatives (e.g., funding schemes) to implement recommendations generated in the diagnostic process. This can work both ways – for example in Singapore, firms who contact the tool provider are directed to other HR-related support initiatives while firms who apply to those support initiatives are encouraged to take the diagnostic first. However, NKL providers highlighted the need for the tool to be freely accessible, with ‘no string attached’ as such interlinks can create a feeling of conditionality and discourage the use of the tool, especially if trust towards public programmes is low. Finally, a tool can be implemented and disseminated by various local partners rather than a single centralised provider, which can take advantage of locally embedded institutions such as chambers of commerce, city councils, etc. and their existing relationships with local businesses.

Many case studies (especially of public tools) highlighted the necessity to ‘sell’ the merits of SM-related support to business owners. Thus, it is often not enough to effectively distribute the tool but efforts need to be made to convince SMEs about the potential benefits deriving from the use of the tool. Key promotion channels across the case studies include (see Table 16 below):

- **Demo/ taster version**, especially common among the commercial (paid) tools, but also feasible for free-of-charge tools to present their potential benefits in a time-efficient manner. Taster tools can either provide a broad overview of all/ many thematic areas (e.g., a few questions per module) or focus on a specific issue in more detail.
- **Media coverage**, including sponsored articles in HR-focused magazines and blogs
- **Social media**, often including YouTube channels with promotional/explanatory videos
- **Events**, including dedicated tool-focused promotional events or workshops where the rationale and potential benefits of the tool are communicated; and presence in general industry events (e.g., conferences and fairs)
- **Customer success stories**, which aim to present examples of tool use and its benefits in specific context (e.g., stories can often be filtered by size or sector), and other promotional materials such as free guides and publications explaining the rationale and/ or methodology of the tool, often backed by research-based evidence

In their marketing activities, providers tend to focus on the following selling points in ‘pitching’ their products to customers:

- **Affordable** – low or no cost (mostly highlighted in case of public, free-of-charge tools, which aim to address the problem of limited resources in SMEs)
- **Configurable** – ability to pick modules or otherwise adjust the content to address company’s specific needs
- **User-friendly** – intuitive interface, often including visual and interactive dashboards to analyse indicators
- **Science-based** – indication of practices that really work
- **Focused** – design to fit the needs of particular target group (e.g., SMEs) or to consider the context of a specific market (national tool)

Table 16. Marketing approaches

Cornerstone™	Culture Amp™	DigiCheck™	futureSME™	HCD T™	KAM MI™	NK L™	People Skills™	rex x™	WI D™
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FEASIBILITY STUDY FOR A (SELF-) ASSESSMENT TOOL ON SKILLS MANAGEMENT PRACTICES
IN SMES

Demo/ taster version	✓	✓				✓			✓	✓
Media coverage (e.g., sponsored articles)	✓						✓	✓		
Social media	✓	✓	✓		✓	✓			✓	✓
Dedicated promotional events		✓	✓		✓		✓	✓	✓	✓
Presence in HR events/fairs			✓			✓	✓		✓	
Success case studies	✓	✓				✓	✓			✓
Other promotional materials (guides, flyers, publications)			✓	✓	✓		✓	✓	✓	✓
Selling points	Price		✓		✓		✓	✓	✓	
	Flexibility	✓	✓	✓		✓		✓	✓	
	User-friendliness	✓	✓	✓	✓	✓	✓			
	Science-based		✓							✓
	Focused			✓	✓	✓		✓	✓	

Source: Consortium.

Text box 9. Deployment: lessons learned

- Delivery of the tool through an online platform seems most feasible – additional mobile app is not a must as it needs significant amount of backend support and seems to provide little added value for users.
- A demo / taster version is often the key promotional material. It could focus on a single narrow issue (ideally, a common or ‘hot’ problem) or provide overview across many SM aspects.
- Dissemination of the tool through existing institutions, e.g., one-stop-shops for SMEs, chambers of commerce, local / national development agencies should be considered, especially during the roll-out phase.
- Flexibility and user-friendliness are the functional areas most valued by users and thus, are often advertised by the providers. First, given the heterogeneity of needs (e.g., depending on size) among SMEs, they need to be able to adapt the solution for their specific purposes. Second, given often little or no HR expertise in SMEs as well as limited resources, incl. time, the tool needs to be easy and intuitive to use, not to ‘scare off’ users.

3.3.6 Sustainability

Two key funding mechanisms for the implementation and sustainability of the tools can be distinguished:

- **Internal funding** – commercial tools are sustained mainly through user fees (Cornerstone™, Culture Amp™, KAMMI™, rexx™, WID™). Assessment tools are typically paid for in a lump sum, while user fees for complex HRM tools are charged monthly or, less often, annually. Prices can vary depending on:
 - Company size: price per employee or based on predetermined size categories
 - Content: price per module, optionally a discounted price for a whole suite
 - Depth: different prices for packages offering different levels of complexity and/ or support

- **External funding** – public tools are financed by the government (DigiCheck™, HCDT™¹²), EU funds (futureSME™, NKL™), or a private funder (People Skills™).

A clear pattern is visible across the case studies: only paid tools and tools with secured stable government funding are sustainable over the long term. None of the EU funded projects managed to ensure sustainability – as soon as the project ends and the funds dry up, dissemination and marketing activities cease and the tool, even though it might be maintained on the servers for some time, is not used and slowly ‘dies’. Privately founded People Skills™ pilot programme was not continued either in the original form, although a ‘cheap’ continuation was ensured (via an online platform with learning materials and a space to share experience).

Text box 10. Sustainability: lessons learned

- Collecting user fees should be considered (e.g., for ‘extra’ tool features) as it seems to be the only viable long-term sustainability strategy.
- Costs can be cut to minimum by employing largely self-sustainable elements such as online communities and repositories or detailed manuals and walk-through guides instead of human support.

3.3.7 Lessons learned: enablers for SME self-assessment tool

During the case studies we also identified several enablers that might lead to a successful implementation of the tool. All of them are outlined in the Table 17 below.

Based on those conclusions and insights from the case study, we have derived the potential strategies for the development of our tool presented in the next section.

¹² HCDT can be accessed through a government initiative (in which case it is free-of-charge) or independently (the client has to pay).

Table 17. Key enablers and implications for the feasibility assessment

Key enablers	Directions for using enablers when designing the tool
Addressing the right needs for the right target groups	<ul style="list-style-type: none"> • The tool targets a narrower group within SMEs (either firms with fewer than 25 or 25-250 employees); or • The tool incorporates different elements/ modules that address various needs (esp. an administrative aspect of the tool to help small businesses with day-to-day HRM vs a ‘transformational’ aspect for larger ones to assist them in adapting more effective SM practices).
Flexibility	<ul style="list-style-type: none"> • The tool allows to pick elements/ modules freely so they fit users’ specific needs. • The tool is built on templates that can be customised by, e.g., adding or editing questions in surveys, selecting indicators to track, etc.
User-friendliness	<ul style="list-style-type: none"> • The tool incorporates a variety of intuitive, interactive visual solutions to present and analyse results.
Extensive technical support	<ul style="list-style-type: none"> • The tool involves some sort of human support, e.g., e-mail, phone line, live chat (more expensive option); or • The tool offers simple but extensive guiding materials, such as manuals, walk-through guides, FAQs (cheaper option); or • Both of the above
User engagement	<ul style="list-style-type: none"> • The tool is linked with an online repository of resources and/ or online community for users to network and exchange ideas.
‘Proof of concept’	<ul style="list-style-type: none"> • Taster version of the tool is available to demonstrate its benefits in a time-efficient manner. • The tool is promoted with customer success stories (e.g., developed during the piloting phase).
Low cost for users vs user fees as a requirement for sustainability	<ul style="list-style-type: none"> • The tool is free-of-charge in principle but incorporates ‘extra’ elements for a fee; and/ or • The tool requires fees from certain groups of users (e.g., large companies, non-EU companies).
Key enablers	<ul style="list-style-type: none"> • Directions for using enablers when designing the tool

Source: Consortium, based on case studies.

3.4 Axes of development for the creation of a self-assessment tool on skills management practices

The previous section has presented the research into the SMEs' needs and current state of play with SM practices, the offer of SM solutions, and the best practices and their outcome. In this section we analyse the feasibility of the tool and define different aspects that could make succeed. Namely, we focus on six tool dimensions that have been previously used in the case studies:

- **Target groups** – what group of users the tool could target?
- **Aims** – what should be the aim of the tool and what business needs (self-) assessment solution could solve for SMEs?
- **Content** – what the tool could contain?
- **Operation and usability** – what are the key features of the tool that would attract users and be exceptionally useful for them?
- **Deployment** – how the tool could be launch so it reaches its critical tipping point (i.e. situation when the tool accumulates critical mass of users and becomes self-sufficient)?
- **Sustainability** – what would help to sustain tool's operation and further development costs so it is self-sufficient and remains in the market for the long term.

Table below provides a general overview of the main data sources for each dimension, while the remainder of this section goes into more depth. The section ends with a summary describing several options the final tool could take.

Table 18. Correspondence between task activities and tool dimensions

TASK	TASK 1						TASK 3
TOOL DIMENSION	Literature review	Statistical Data	Expert Interviews	Mapping of tools	Case Studies	Cross-case Analysis	Stakeholder Interviews
AIMS	X	X	X	X			X
TARGET GROUP	X	X	X				X
CONTENT	X	X	X	X	X	X	X

OPERATION AND USABILITY				X	X	X	X
DEPLOYMENT				X	X	X	X
SUSTAINABILIT Y				X	X	X	X

Source: Consortium.

4. Rationale for the tool

During Task 1, we have identified a wide range of solutions that address different stages of skills management. Nevertheless, there is also a range of market gaps and business needs that these solutions have not yet addressed. This section briefly elaborates on those gaps, provides a justification for creating a new tool, and outlines the structure of the next subsections.

First, the fact that many **skills management tools are not tailored for SMEs** is a major issue that is reflected both in the academic literature and interviews with SMEs. The literature review indicates that solution developers tend not to focus on SMEs because SMEs often lack financial resources to purchase sophisticated tools and are not seen as a major target group by the developers (Schöpfer et al, 2018; Flake et al, 2019). Moreover, it is objectively difficult for developers to offer SMEs standardised tools due to their inhomogeneous nature (EMPL, *forthcoming*). The interviews also support these findings as, unfortunately, SMEs often cannot influence developers' opinions and offer extensive feedback, due to the lack of time and poor communication between SMEs and developers.

Second, SMEs tend to see some of the solutions on the skills management market, as well as the process of **looking for solutions, as too time demanding**. The literature review has shown that SMEs acutely suffer from the time constraints problem and, thus, are reluctant to spend their time on skills management when it could be spent working instead (Festing et al., 2017; OECD, 2013; Stone, 2010; Beron et al., 2006). Our interviews with SMEs support this, as some of them have pointed out that while they were aware of certain skills management assessment practices, such as skills audits¹³, they chose not to use them due to the limited amount of time they had. This unwillingness of SMEs to conduct skills management assessments, even for free, was reflected in one of our case studies, where SMEs were rather reluctant to participate in a free-of-charge skills audit programme conducted by public experts despite potential financial benefits. The most cited reason was, again, the lack of time (see the analysis of *HCDTTM* for more details). A different problem that the interviews have demonstrated is the problem of navigating through a

¹³ Skills audit is a process of assessing an employee's skills via a questionnaire or one-to-one, and then identifying potential knowledge gaps which might affect the long-term plans of the company or the growth of the individual. See: <https://www.roberthalf.co.uk/advice/human-resource-management/how-conduct-skills-audit-your-employees>

large number of existing tools and good practices. Some SMEs see it as too time-intensive, expressing demand for a tool that could provide them with filtered solution shortlists and tailored recommendations.

Third, many SMEs see the **existing solutions on the market as expensive and unaffordable**. Both the academic literature and external surveys reflect this financial problem (Flake et al., 2019; Voyer, 2011; Abraham et al., 2011; Paradas, 2007). For example, in 2015 around one third of EU SMEs gave up on looking into skills development solutions because of their high cost (CVTS, 2015). Our solutions mapping conducted during the supply analysis also highlights this problem. It has identified a limited number of solutions with special offers for SMEs (approximately 25%, see Annex 6.4 for more details). Though this percentage (i.e. 25%) might seem not too low, in reality it is much lower as the study focused on solutions tailored to SMEs. It is, therefore, not surprising that majority of interviewees argued that any tool the project would develop should either be available for free or be reasonably priced.

Fourth, apart from the issue of inadequate pricing, the literature review also suggests that some SMEs can **experience problems when it comes accessing external financial assistance from banks to purchase skills management solutions** (Voyer, 2011; Abraham et al., 2011; Paradas, 2007). This, in turn, limits SMEs' financial capabilities even further. Unfortunately, the financial situation for SMEs is unlikely to improve considering the financial consequences of the 2020 coronavirus pandemic.

Having identified the existing supply gaps in the market as well as potential theoretical niches that our tool can fill, we are also well aware of external issues that might affect SME's demand for such a tool. One of the most crucial problem in that respect is the existing information deficiency on the side of SMEs. As our desk research has demonstrated, some SMEs can be unaware of the existing skills management good practices, while others struggle to understand the tangible benefits of updating their skills management approach. Although it is objectively hard to solve this issue with a skills management tool *per se*, we should not forget about it when designing the tool's dissemination strategy. This problem can be partially addressed by one of the identified enablers – proactive marketing with a clear focus on the benefits of the tool. We will pay particular attention to it by exploring different marketing options in subsection 3.3.5. Moreover, we also fully understand the importance of questions related to the tool's long-term operational sustainability (such as financial self-sufficiency and alleviation of further development/ maintenance costs). We dwell upon these questions in subsection 3.3.6.

To sum up, **there is sufficiently strong evidence suggesting that the creation of a new SME (self-) assessment tool is well justified**, since all the aforementioned gaps could and should be addressed. Therefore, in the next subsection, we will proceed to examining various dimensions of the tool's design while bearing in mind the findings of the cross-case analysis regarding the most crucial tool enablers.

5. Tool dimensions

The following two main questions are answered during this stage: (i) how could a new skill-based solution help SMEs solve their business needs?; (ii) what kind of tool would be most practical and of direct use to the end beneficiaries? These questions are answered by describing two main aspects of the tool:

- **Needs** – target group(s) of the tool and its possible aims.
- **Features** – content, technical specifications, financial model, deployment (including marketing strategy).

In order to provide an in-depth discussion this subsection elaborates on different possible elements of the tool without making the final judgement on which of them should be included in the pilot. For our judgement on which combination of elements and features would provide the most benefits for SMEs, and at the same time can be feasibly implemented, see the next subsection – 5.8. *Options*.

5.1 Target groups

The key research question for this dimension: **For which group(s) of users would the tool be most useful?** Predominantly, the focus of the tool should be on SMEs. However, there are still several unanswered questions, such as:

- What kind of SMEs the tool should target?
- What could be the role of financial intermediaries, if any?
- What could be the role of other types of intermediaries (e.g., cluster organisations, SME association, training intermediaries such as Centres of Vocational Excellence), if any?

To provide answers to these questions, first, in this subsection we explore targeting of the tool by different types of SMEs including size, stage of growth, sector, region and types of staff within company. Second, we evaluate what role financial intermediaries could play in the tool, and should they, maybe, be the main target of the tool. Finally, we also explore the roles of other intermediaries, how they could enrich the tool.

5.1.1 Needs driven targeting

When looking at the landscape of SMEs, our research has evidenced two main elements:

- SMEs drive the EU economy;
- SMEs typically have limited time, materials and financial resources.

The consequence of the second point is that most often people are the SMEs' main resources and therefore that skills are key to their business. Indeed they rely on their employees' skills and knowledge to be efficient in the work.

But when it comes to understanding the latter there are important variations across SMEs, and this should be the base of our targeting. Indeed, the understanding of their limited resources and how it depends not only on SME size, but also relates to company maturity level or its stage of growth. In summary (detailed analysis provided in table 19 below):

- In companies with up to 50 employees HR (incl. SM) issues are usually seen as mired in red tape or blocker that slows them down. They see them as compliance requirements that demand their significant commitment in terms of time and effort, sometimes even as an imposition. Thus HR (incl. SM) tends to be reactive, with no time and money for full-scale HR taking care of transformational issues. Typically, these companies need transactional (or day-to-day) assistance.
- 50+ employees companies shift towards or fully perform strategic HR with proactive approaches (e.g., being smaller they waited for people to come in with their problems, while now they try to predict problems before they occur). They tend to have company HR (incl. SM) culture focusing on retention of staff. The goal of HR Manager or HR department is to create and maintain emotionally literate culture (i.e. retaining the quality and intimacy of what company does vs pushing command and control button). Typically, these companies search for transformative (or proactive and strategic) SM support.

Can SMEs leap right away from transactional skills management behaviour to transformative one? As companies usually grow organically, with a number of incremental changes taking place over longer period of time, the answer seems to be no. This means that the tool could not help a company to instantly transition from transaction SM needs to more transformative ones. However, the tool could increase clarity about the SM journey that awaits them (i.e. steps that need to be taken towards strategic SM).

Table 19. SM characteristics and type of support for SMEs by company size and growth stage

Growth stage	Size	Skills management characteristics	Type of support needed ¹⁴
Entrepreneurial edge (or existence stage)	up to 20	<ul style="list-style-type: none"> • SM strategy: ad-hoc (e.g., implemented via ad-hoc 1 to 1 meetings) or personal jazzy endeavour often solely based on the owner(s) gut feeling of the situation, former experience/ approaches from large(r) multinational companies and/ or education (e.g., business administration, books, blogs, conferences, peers, even google). Very high 	<ul style="list-style-type: none"> • „We are OK on our own“ – all is done by multitasking owners/ few employees

¹⁴ Some existing tools already differentiate their support according to these categories (transactional and transformative). For example, see case study on People Skills™ pilot programme in the Annex.

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		<p>time and budgetary constraints: informal practices dominate with an emergent strategy, fluid structures, vast communication, flexible functions and tacit knowledge exchange; no time to think of consistent people development. No formal HR role. Instead, HR is often seen as unnecessary bureaucracy.</p> <ul style="list-style-type: none"> • Organisation: usually no formalised systems or processes; flexible job roles (versatile employees who could wear different hats) within a loose structure, everyone is doing everything. • Talent: key skills to buy (very quick fix). • Learning dynamics: mostly experiential informal self-learning, neither structured nor formalised – people learn through doing and refine approaches to suit the context; often based also on external sources (clients, suppliers, social partners); nobody to replace those training. • Demand for solutions: use internal solutions (e.g., Microsoft Excel, Word templates) mostly for skills assessment/ recruiting, sceptical about external solutions mostly due to awareness constraints and/ or past negative experience. 	<ul style="list-style-type: none"> • Overwhelmed with day to day workflow, lack time and funds • Might need limited transactional HR support to establish some processes (e.g., payroll, contracting, time management, hiring, health and safety, legal compliance, onboarding, disciplinary procedures)
Emerging enterprise (or survival stage)	20-50	<ul style="list-style-type: none"> • SM strategy: people and performance issues becoming salient, HR processes and procedures are introduced, but not yet formalised. Thus, HR knowledge and good practices could be lost due to changes in Management. HR tends to be administrative, transactional and reactive – focus is still on task delivery and sales, rather than on anticipating labour market trends. Either separate HR or, perhaps somewhat more often, people with dual roles like HR and Finance/ Office/ Admin Manager. However, owner(s) may still resist of letting go and tend to closely supervise HR matters. • Organisation: introduction of structured systems and processes (team meetings, 1-to-1 meetings and informal chats, performance reviews, mentoring, coaching, shadowing, feedback catch-ups, peer learning, webinars (esp. for online companies), informal workshops, learning-by-doing/ imitation, tutoring, etc.); functional organisation with defined job roles and team structures • Talent: need to immediately recruit operational people (quick fix); emphasis is still on recruiting the right people rather than shaping their current employees (or to retain people who want to leave); due to lack of staff companies often recruit juniors what, eventually, may raise their demand for training management. 	<ul style="list-style-type: none"> • Mostly transactional help reacting to immediate ad hoc needs. As these companies usually develop at a fast pace this puts most of their current SM practices into question since the small advantage might quickly wear out at some point along the way. Thus, these companies may not be ready for consistent and systemic external support.

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		<ul style="list-style-type: none"> • Learning dynamics: mostly non-formal workplace training among peers for efficiency reasons; structured, but not formalised – foundational acting on immediate development needs and formalising tacit knowledge and skills; rare formal training; employees should indicate their specific training needs and these are not always aligned with company's strategy (training is seen as retainment and not business strategy); some replacement possibilities for those who train. • Demand for SM solutions: needs of small fast-growing companies change very quickly reacting to market situation, competition, legal and other changes, expansion of market/ area of expertise, etc. Hence, they often rely on internal ad hoc measures. They may start carefully exploring with external solutions (esp. in the areas of transactional HR incl. recruitment and skills development). 	<ul style="list-style-type: none"> • Some companies may need transformational support.
<p>Conso- lidating organisation (or success and take-off stages)</p>	<p>50 – 100/ 150</p>	<ul style="list-style-type: none"> • SM strategy: Written SM strategy under constant reflection and improvement. With the business strategy tending to be more planned, more strategic HR approach is required, ensuring practices support achievement of the organisation's long-term goals. Separate HR person. More pro-active/ anticipatory approach to HR. Part of SM strategy execution may be still ad hoc. • Organisation: process improvement and system refining towards formalisation. Focus on simplicity and efficiency, on clear job roles which strike the balance between functional specialism and flexibility. • Talent: planful resourcing, aligned with organisation values and long-term needs; more focus on retention issues (longer term). • Learning dynamics: looking at long-term skills requirements and a focus on both multi-skilling and management development; higher reliance on external training; employees still come to HR with their specific training needs and these are more aligned with company's strategy; plentiful replacement possibilities for those who train. • Demand for SM solutions: high need for external tools as they are keen on identifying strategic SM gaps (esp. in the areas of transactional and transformative HR incl. skills utilisation); however, fast changing business needs and requirements for tools due to rapid business growth. 	<ul style="list-style-type: none"> • Mostly transformative help focused on proactive and strategic SM practices (e.g., reforming performance management practices, developing training and development schemes, restructuring of pay and reward system, refining training management) • Still some transactional help may be needed reacting to immediate needs
<p>Established organisation (or resource maturity stage)</p>	<p>100/ 150 – 249</p>	<ul style="list-style-type: none"> • SM strategy: focus on the long-term health of the organisation. Strategic HR attention concentrates on both the internal context (such as the culture, engagement and internal collaboration) and the external context, to ensure practices and approaches support business aims and are 	<ul style="list-style-type: none"> • Only transformative support (transactional is

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		<p>aligned to the vision and values. Separate HR Manager or even HR department. Larger companies (200+) start caring not only about themselves, but also about their distributors and customers. SM strategies often use adapt practices from larger companies as many managers are coming from them.</p> <ul style="list-style-type: none"> • Organisation: uniting systems and processes; promoting cross-functional working and knowledge-sharing; move towards ISO and similar standards. • Talent: exceptional focus on retention via specific talent programmes (long term). • Learning dynamics: a learning culture is created; a focus on management development shifts to leadership development; high reliance on external training; separate Talent Development people who encourage staff demand for training; tend to have more of apprenticeship and similar programmes based on cooperation with education and training institutions. • Demand for SM solutions: high need for external tools, rather stable business needs and requirements for tools. 	dealt with by internal staff)
Growth stage	Size	<ul style="list-style-type: none"> • Skills management characteristics 	<ul style="list-style-type: none"> • Type of support needed
Entrepreneurial edge (or existence stage)	up to 20	<ul style="list-style-type: none"> • SM strategy: ad-hoc (e.g., implemented via ad-hoc 1 to 1 meetings) or personal jazzy endeavour often solely based on the owner(s) gut feeling of the situation, former experience/ approaches from large(r) multinational companies and/ or education (e.g., business administration, books, blogs, conferences, peers, even google). Very high time and budgetary constraints: informal practices dominate with an emergent strategy, fluid structures, vast communication, flexible functions and tacit knowledge exchange; no time to think of consistent people development. No formal HR role. Instead, HR is often seen as unnecessary bureaucracy. • Organisation: usually no formalised systems or processes; flexible job roles (versatile employees who could wear different hats) within a loose structure, everyone is doing everything. • Talent: key skills to buy (very quick fix). • Learning dynamics: mostly experiential informal self-learning, neither structured nor formalised – people learn through doing and refine approaches to suit the context; often based also on external sources (clients, suppliers, social partners); nobody to replace those training. 	<ul style="list-style-type: none"> • „We are OK on our own“ – all is done by multitasking owners/ few employees • Overwhelmed with day to day workflow, lack time and funds • Might need limited transactional HR support to establish some processes (e.g., payroll, contracting, time management, hiring, health and safety, legal compliance,

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		<ul style="list-style-type: none"> • Demand for solutions: use internal solutions (e.g., Microsoft Excel, Word templates) mostly for skills assessment/ recruiting, sceptical about external solutions mostly due to awareness constraints and/ or past negative experience. 	<p>onboarding, disciplinary procedures)</p>
Emerging enterprise (or survival stage)	20-50	<ul style="list-style-type: none"> • SM strategy: people and performance issues becoming salient, HR processes and procedures are introduced, but not yet formalised. Thus, HR knowledge and good practices could be lost due to changes in Management. HR tends to be administrative, transactional and reactive – focus is still on task delivery and sales, rather than on anticipating labour market trends. Either separate HR or, perhaps somewhat more often, people with dual roles like HR and Finance/ Office/ Admin Manager. However, owner(s) may still resist of letting go and tend to closely supervise HR matters. • Organisation: introduction of structured systems and processes¹⁵; functional organisation with defined job roles and team structures • Talent: need to immediately recruit operational people (quick fix); emphasis is still on recruiting the right people rather than shaping their current employees (or to retain people who want to leave); due to lack of staff companies often recruit juniors what, eventually, may raise their demand for training management. • Learning dynamics: mostly non-formal workplace training among peers for efficiency reasons; structured, but not formalised – foundational acting on immediate development needs and formalising tacit knowledge and skills; rare formal training; employees should indicate their specific training needs and these are not always aligned with company's strategy (training is seen as retainment and not business strategy); some replacement possibilities for those who train. • Demand for SM solutions: needs of small fast-growing companies change very quickly reacting to market situation, competition, legal and other changes, expansion of market/ area of expertise, etc. Hence, they often rely on internal ad hoc measures. They may start carefully exploring with external solutions (esp. in the areas of transactional HR incl. recruitment and skills development). 	<ul style="list-style-type: none"> • Mostly transactional help reacting to immediate ad hoc needs. As these companies usually develop at a fast pace this puts most of their current SM practices into question since the small advantage might quickly wear out at some point along the way. Thus, these companies may not be ready for consistent and systemic external support. • Some companies may need transformational support.
Consolidating organisation (or success and take-off stages)	50 – 100/ 150	<ul style="list-style-type: none"> • SM strategy: Written SM strategy under constant reflection and improvement. With the business strategy tending to be more planned, more strategic HR approach is required, ensuring practices support achievement of the organisation's long-term goals. Separate HR person. More 	<ul style="list-style-type: none"> • Mostly transformative help focused on proactive and strategic SM practices (e.g.,

	<p>pro-active/ anticipatory approach to HR. Part of SM strategy execution may be still ad hoc.</p> <ul style="list-style-type: none"> • Organisation: process improvement and system refining towards formalisation. Focus on simplicity and efficiency, on clear job roles which strike the balance between functional specialism and flexibility. • Talent: planful resourcing, aligned with organisation values and long-term needs; more focus on retention issues (longer term). • Learning dynamics: looking at long-term skills requirements and a focus on both multi-skilling and management development; higher reliance on external training; employees still come to HR with their specific training needs and these are more aligned with company's strategy; plentiful replacement possibilities for those who train. • Demand for SM solutions: high need for external tools as they are keen on identifying strategic SM gaps (esp. in the areas of transactional and transformative HR incl. skills utilisation); however, fast changing business needs and requirements for tools due to rapid business growth. 	<p>reforming performance management practices, developing training and development schemes, restructuring of pay and reward system, refining training management)</p> <ul style="list-style-type: none"> • Still some transactional help may be needed reacting to immediate needs
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Source: Consortium based on: EMPL study, forthcoming; interviews with SMEs and stakeholders; Miller, J. (2012) *Achieving sustainable organisation performance through HR in SMEs*. London: CIPD; Lewis, Virginia L. and Churchill, Neil C., *The Five Stages of Small Business Growth* (1983). *Harvard Business Review*, Vol. 61, Issue 3, p. 30-50.

The table above suggests that SMEs of any size and at different growth stages could potentially be interested in the tool. However, their need for support and intensity of this support would differ drastically. The tool could be universal and cater for both categories (i.e. SMEs most in need of transactional support and those in need of transformative support) or specific and focus only on one of these categories. **The most straightforward, perhaps, is those in need of transformative support** as it is comprised of SMEs that generally acknowledge that their business and skills management strategies are closely connected and therefore their particular business needs could be at least partly solved with a more effective and/or efficient skills management. SMEs that mostly need transactional support are often inactive/ less active and more often unaware SMEs to invest in skills management and thus more difficult to reach and engage. In any case, if either universal or category-specific tool is applied, it could enable vicious circle where worse performing SMEs in particular category learn from better performing ones.

¹⁵ These may include (bi-)weekly team meetings, 1-to-1 meetings and informal chats, performance reviews, mentoring, coaching, shadowing, feedback catch-ups, peer learning, webinars (esp. for online companies), informal workshops, learning-by-doing/ imitation, tutoring, etc.

The mapping of tools and cross-case analysis suggested that tools often offer different options in terms of company sizes. In this case it could be feasible to introduce different options of the tool depending on type of services selected (i.e. transactional and/ or transformative support) and company size (e.g., up to or above 50 employees).

Interviews with SMEs representatives and stakeholders provided with additional insights regarding targeting of the tool in terms of company size and growth stage. These are summarised in the box below.

Text box 11. Insights regarding targeting of the tool in terms of company characteristics

- Most of interviewed stakeholders expressed their opinion that dominating focus should be on small companies: management and decisions are still very concentrated, they want to grow/ scale up, but are not that flexible anymore. According to one stakeholder: past 15-25 employee mark companies need to start putting in hierarchies and functional divisions, and that is when things become rigid and loses the entrepreneurial spark; it is from that size of company upwards that they need to unpack their way of working and start asking more questions about how their aspiration and strategy aligns with how they have built the business up.
- Need to consider varying demand for SM within larger SME companies with 100+ employees. They have different divisions (administration, commercial, production, etc.) and these divisions are likely to have varying needs.
- Some companies may be part of the larger group that has formalised SM standards (e.g., group HR encourages the sharing of best practices inside the group).
- Companies that have been through restructuring process may more often prefer to externalise some HR processes (e.g., recruitment, skills assessment). Thus, although being rather big in terms of size they may not have a plan or a strategy for the skill management as they externalise part of their SM services.
- Quality and extent of application of SM strategies also may depend on the following factors:
 - Type of work organisation (e.g., SM strategy could be more formal in hierarchical and less formal in flat company structures with lots of employee autonomy).
 - Type of business model (e.g., companies working on B2B basis may experience higher SM requirements than those operating on B2C basis).
 - Position of an SME in the value chain (e.g., downstream SMEs may have more significant pressure from clients to up- and re-skill, while in upstream position this pressure depends on larger companies to whom SMEs supply)
- Method of distributing products or services (e.g., SM strategy is often formalised and formally implemented in franchise businesses as they need to ensure consistency across e.g., multiple selling points).
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want to grow/ scale up, but are not that flexible anymore. According to one stakeholder: past 15-25 employee mark companies need to start putting in hierarchies and functional divisions, and that is when things become rigid and loses the entrepreneurial spark; it is from that size of company upwards that they need to unpack their way of working and start asking more questions about how their aspiration and strategy aligns with how they have built the business up.

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 - Type of business model (e.g., companies working on B2B basis may experience higher SM requirements than those operating on B2C basis).
 - Position of an SME in the value chain (e.g., downstream SMEs may have more significant pressure from clients to up- and re-skill, while in upstream position this pressure depends on larger companies to whom SMEs supply)
- Method of distributing products or services (e.g., SM strategy is often formalised and formally implemented in franchise businesses as they need to ensure consistency across e.g., multiple selling points).

5.1.2 Sector driven targeting

While it makes sense to separate businesses by their sector, we did not find a lot of needs relevant only for particular sectors (see box 2 below). Skills management seems to be highly transversal. Overall, rationale for setting any limits sector-wise appears to be limited. Universal (cross-sectoral) option of the tool is more demanded – all companies, across all sectors need to be(come) learning organisations, learn from each other and improve. Thus, the most feasible option for the first version of the tool is to be demand-driven and open to companies from all sectors. In the long term it may make sense to adapt the tool to different sectors. The latter may include:

- Sectors that export high share of their production or services as their positive impact on the economy is often higher and they tend to experience more intense competition at the international markets compared to more locally oriented sectors.
- SMEs with the greatest potential for growth (otherwise, if micro/ small company is not growing there may be limited demand for external support).
- SMEs in industries disrupted by new technologies
- Sectors with high exposure to structural change (e.g., online shopping in retail after Covid-19).

Text box 12. Illustration of varying demand for skills management solutions across sectors

Companies in the following sectors are likely to experience lower demand for SM solutions (these sectors should not be disregarded immediately as they might find useful good practices in the areas of assessment and utilisation):

- Sectors with low-qualified, seasonal or temporary staff (e.g., small and specialised businesses such as retail, transport, food industry, construction, car wash and tire change companies, restaurants). They experience very high employee turnover and are exceptionally focused on recruiting new and retention of existing staff. Companies in these sectors are usually very sceptical of SM tools.
- Some sectors experiencing sufficient supply of new entrants (e.g., online media).
- Sectors with highly qualified staff (e.g., health sector). Need for skill development in these sectors may often be seen for the own sake of employees and not for the organisation. Employee qualification in these sectors is often sufficient (further skill development may lead to overqualification and employee moving to a level that institution cannot offer).
- Covid-19 has heavily impacted some sectors (e.g., event organisation) that would certainly not use the tool during survival mode due to the crisis until they recover.
- Some sectors (e.g., specialised engineering for the military), according to their representatives, are changing too fast to be able to use tools for skills management.

Companies in the following sectors are likely to experience higher demand for SM solutions (focusing on these companies may require us to create a very sophisticated state of the art tool that does something their existing solutions cannot offer):

- Companies that in general are more technology savvy as they would actually be reaching out for these kinds of tools compared to companies that are very traditional, not so digitalised.
- Staff turnover of particular professions (e.g., sales, ICT, technological professions) is usually very high across sectors due to competition (once they achieve a certain level of experience, they tend to be caught by the competitors). Companies experience very high demand for retaining and recruiting these employees.
- Sectors where employees need certifications of skills or clearances for performing certain tasks (e.g., water and waste treatment) and/ or industries with very specific employee skills sets (e.g., oil and gas, engineering).

- Traditional companies in manufacturing industries often experience higher needs for digitisation due to their on average older workforce.

Specific demand for SM solutions:

- Some sectors (e.g., online gaming/ gambling industry, event organisers) have specific demands for SM. For example, they prefer using online external training (e.g., webinars, podcasts), even for soft skills training.
- Less skills specific sectors (e.g., marketing, fashion) are focused on generalists with emphasis on certain broader skills such as strategic thinking, ability to learn, etc.

However, though there are differences between sectors, due to lack of publicly available data (see 3.3.3. *Content* subsection on more) it is not feasible, at least at the early stages of the tool, to discriminate SMEs by sector. Eventually, when the tool evolves and its user base grows, the collected data from SMEs could be used, for tailoring the tool for particular sectoral needs. However, it is very unclear at this stage, without sufficient knowledge what the demand would be from the different sectors. Thus, from the start the tool could have the widest coverage possible (i.e. point 1 in the below table) with some flexibility for later adaptation, should there be a well-justified need, to specific sectoral needs and/ or size/ growth categories (points 2a and 2b in the table). The suggested steps would be the following:

1. Introduce universal tool
2. Monitor who is interested
3. Fine tune focus of the tool depending on the demand. However, it should be done very carefully as any limitation of access may greatly reduce the pool of potential clients and thus longer-term feasibility of the tool.

Table 20. Targeting of the tool in terms of size/ growth categories and sectors

	Universal to all sectors, demand-driven	Tailored to companies of particular sector(s)/ occupation(s)
Universal to all sizes/ stages of growth, demand driven	(1) Widest, easy reach, universal language, flexibility in choosing services	(2b) Focused on sectoral/ occupation specifics
Tailored to companies of particular sizes/ stages of growth	(2a) Focused on SM processes (transactional or transformational)	(3) Narrowest, very difficult reach, limited or no flexibility

Source: Consortium.

5.1.3 Geographical targets

Most of interviewed stakeholders argued for the EU/ international focus of the tool. Arguments for this option were numerous:

- Good practices should be diffused across countries, enabling business learning across borders
- There are certain commonalities and features that all countries share
- Companies are forced to work in an international market, developing products that would be globally viable, hence they need to be familiar with international and not only national SM practice
- Mobility within the EU where employers and especially employees can move between regions.

Stakeholders arguing for national-level tool mentioned the following arguments:

- More operational with less reporting and additional bureaucratic requirements
- Some specificities (e.g., education and training systems) are country issue
- Considering specific regional needs and aspirations (e.g., you may not compare the digitisation situation between Eastern and Western EU member states)
- Certain topics or skills could be localised for certain markets/ countries (e.g., sales functions).

Mapping of tools and case studies showed that commercial tools usually are universal geographically. Only public tools tend to be focused either at local (People Skills™) or national (HCDD™, NKL™) level. If an aim is to ensure global reach, it is thus not feasible for the tool to discriminate users by country.

Additional factors that may affect geographical spread of the tool include the following:

- **Awareness and usage of similar SM tools:** On the one hand, SMEs operating in Western Europe, according to interviews, were much more informed about their skills management practices. In several cases, the companies even had some proprietary tool in place. Though a majority of such tools was aimed at helping the company with day-to-day HR issues rather than with skills management. Hence, a solution targeting such SMEs would require to be quite sophisticated so that it could provide them with information that they do not yet know. On the other hand, SMEs in Eastern and Southern Europe were less informed about such tools and some were even not sure what exactly skills management is. Because of this, a solution focusing on this region would have to be relatively light in order to ensure that the SMEs could implement the good practices offered by the tool.
- **Type of support:** transactional or transformational (as per table 20 above). Assuming the tool is only digital and focuses on 'transformational' aspect, it could easily be pan-

European (given it is translated into EU languages), but also national-specific due to relevant national practices available for benchlearning. However, if it was to involve 'transactional' aspect (e.g., in a version for small companies), it would have to constantly update information from different legal systems of each MS what may require much more resources compared to the first option (unless tool merely refers users to third-party national websites for transactional support). Transactional support may be particularly useful for companies located in more remote areas in Europe (e.g., companies in Malta face more serious problems in recruitment as they find it harder to attract candidates from outside the country and experience high competition within their small local market). Meanwhile transformational support may be needed for traditional companies in deindustrialized or digitally transforming regions that need to diversify or otherwise change their earlier business models and strategies and correspondingly retrain their pool of staff.

- **Language:** English is not for everyone – some SMEs expressed a need of having a tool with a wide variety of language options. This concern was more present in SMEs operating in Eastern Europe than in Western Europe. Hence, if the tool covers Eastern European SMEs, it is crucial for it to have at least several language options (other than English, French, or German) in order for it to be used in this region. Take-up could be further increased by not only translating the tool in multiple languages, but also introducing some country-specific content. However, this may not be feasible right from the start of the tool. Multiple language options are usually introduced in larger commercial tools to increase their global reach.
- **Broader thematic focus of the tool:** SMEs interests differ not only based on their growth stage, but also on the national context. For example, SMEs in Western Europe may, on average, experience higher demand for services enabling digital transformation of their staff. Meanwhile SMEs in Eastern Europe may, on average, find it harder to recruit and retain their staff as it freely moves across EU borders.

Table 21. Feasibility of geographical spread by type of support provided by the tool

Nature of the tool	Europe-wide coverage	National-specific
Transactional	No (unless tool only refers users to third-party national websites)	Yes (e.g., remote regions)
Transformational	Yes	Yes (e.g., deindustrialised regions, European digital innovation hubs, smart specialisation at regional level)

Source: Consortium.

5.1.4 Users to be targeted

Once the decision has been made on which SMEs to target, the definition of the internal actors of the SMEs who will use the tool is crucial. Most interviewed SME representatives and stakeholders agreed that the primary users of the tool should be company management (owners-managers and/ or authorised personnel such as HR Manager) due to the following reasons:

- They are the ones who make (or have influence on) decisions in the area of skills management and therefore the ones who need advice the most
- They tend to have the full picture of the company and its employees
- Competence management should happen where the strategy is established, so that training happens in accordance with the strategy, and not based on varying needs of employees.

Within larger companies' group of primary users may be further extended to also cover shift managers, production managers and/ or line managers. These are people who know best the practices and the employees on the ground level. Thus, they can best ensure skills management (e.g., optimise the skills use and identify skill gaps in teams due to innovations in the market).

If the tool gets more complex (e.g., 360-degree skills management assessment) access may be given to all employees so that by providing their opinion/ data they could ensure comprehensiveness and consistency of the tool's services.

5.2 Role of intermediaries

The ToR tackled the involvement of other parties than just the SMEs and the European Commission (as a tool provider). This approach is justified to leverage the tool as a catalyst for further help from other parties, may they be financial or not. The following sections delve further into it.

5.2.1 Financial intermediaries

Possible roles for financial intermediaries include the following:

- **Provision of bank loans:** usually retail banks are very conservative when it comes to financing or issuing loans for sectors non-traditional lines of business (e.g., HR activities). The latter present a higher risk for them and thus often this leads to very high interest rates or refusal of funding applications. Smaller potential borrowers have a handicap in obtaining loans from banks because credit assessment costs are fixed. In response, banks have been seeking ways to improve their SME credit assessment skills to be in a better position to price the credit risks of SMEs as well as to better assess their credits. Company could offer its skills management strategy as a collateral/ guarantee for a loan and reinforce it by explaining how the skills management can ensure the success of their business strategy.

- **B2B financial investments:** there are private (e.g., working capital type) loans to SMEs for expenditure in the area of skills (e.g., education technologies). Financial intermediaries could be interested in using the tool to assess whether the planned investment in skills of SMEs is indeed going into those areas where the SMEs need most investment.
- **Addressing financial literacy gap among SMEs:** SMEs often struggle with completing a specific business plan, simple eligibility forms. Financial intermediaries could provide support to companies to turn their sophisticated internal business understanding into the language of numbers. In exchange financial intermediaries could get potential clients with more in-depth assessment of their skills management strategies.

Although above option may look attractive, most of interviewed SME representatives and some interviewed stakeholders were rather sceptical regarding involvement of financial intermediaries due to the following reasons:

- **Trust issues and type of information** to be collected. Financial intermediary is likely to see only numbers and may not be able to see what is happening in a company beyond numbers (e.g., exceptional focus on sales). Interviewees doubted that financial intermediary could be sincerely interested in HR matters of a company. Some interviewees stressed the importance of comprehensive, in-depth assessment of the company (instead of general benchmarks) – “if you’re too far from the core, it’s hard to make a good evaluation”. Some even stressed that it should be carried out by an independent party.
- Such institutions are very **rigid in their assessments** and are not likely to use a digital SM tool.
- Financial intermediaries may even find it **difficult to assess the companies rightly about how to award such a loan**. Direct link between improved skills management and profits may not exist if, for example, SM processes are not actually implemented.
- Focus at first should be on the **operational side** of things rather than financial aspects. If operational side works then financial intermediaries can be included
- **May not work for some sectors**. For example, in the construction industry the amount and type of work depend on future projects and thus taking a loan for managing skills might be a risk not warranted by future possibilities
- Financial intermediary support is rather a solution for large enterprises that can assume risks of business development in new areas
- Would not have the company sign up for a skills management loan as training needs are often covered through already existing loans which are used generally for production/ services
- Loan process is very difficult and requires a lot of documentation and thus companies would not be motivated to apply for such loans

- Too intrusive of financial intermediary to do an assessment of skill management practices in a company.

There were few interviewees who were in favour of involvement of financial intermediaries as it:

- Ensures higher objectivity of the skills management assessment process (assessment procedures tend to raise unnecessary worries among employees when done internally – mostly just because of the term assessment)
- Could incentivize some companies to use the tool
- It increases that results of the tool are used (otherwise they may not be utilised if the SME cannot find the financial means to implement new procedures).

Only one company out of 42 interviewed had some previous contact with financial intermediaries¹⁶.

The above suggest that indirect targeting of SMEs via financial intermediaries is not an optimal option if the tool is meant to reach substantial scale. If involvement of financial intermediaries in the tool is to be maintain the tool could take form of the following **tiered approach**:

1. Tier 1 could be for companies in need of ad hoc short-term services (e.g., quick transactional support or transformational support including speedy assessment of their skills management situation and quick tips to improve it).
2. Tier 2 could target companies in need of more consistent and extensive transformational support (e.g., assessment of their skills management situation follow-up by consultations for its development over longer-time frame). In this type of support financial intermediaries could be involved to provide funds for developing transformational skills management approaches.

5.2.2 Other types of intermediaries

This category could include different categories with roles tailored to their service offer.

The first one would be the **business clusters and advisors** like Chambers of Commerce, Enterprise Europe Network, business associations, members of development agencies, HR consultants and advisors and similar type of intermediaries having close access to SMEs. They could add value in multiple ways including:

- After company receives diagnostic how it manages its skills, these intermediaries could provide support to interpret these findings and implement changes (like a doctor analysing a blood test to tell you what to do to improve your health).

¹⁶ The Company's top managers have been requested to explain their business plan and to support it with the Company's skills portfolio and elaborate how these skills will be managed for assuring the growth of the business.

- Clarify some questions regarding the tool internally, with their members. Alternatively, if questions are too specific, these intermediaries can compile them and in aggregated form present them to tool operator.
- Support small companies in using the tool.

Regarding **the education and training providers**, both public and private – the tool could link them with potential customers. The counterpart for this would be that companies could be provided with repository of training possibilities. This would be particularly helpful considering that many interviewed SME representatives experienced difficulties in identifying training offer or other needs via available platforms (e.g., offer was too broad, too many to choose from, etc.). In addition, using the tool's data shared by the company education and training providers could better understand training needs of that particular SMEs and better adapt their services to its expectations.

Trade unions might be helpful for SMEs in developing the right skills strategy and especially motivating employees to embrace it.

Aggregated data from the tool, ensuring its compliance with GDPR, could be used **by public authorities** to better target their relevant investments, chose right investment methods, plan future investment initiatives, etc.

Role of each of above-identified intermediaries would very much depend on the fact whether they will be able to use company and/ or aggregated data from the tool and also on quality of the data collected within the tool.

5.2.3 Conclusion on the intermediaries

While there seems to be little interest from the SMEs in involving financial intermediaries in the assessment, the role of the other types of intermediaries could be complementary to the objectives of the tool and harnessed.

5.3 Aims

The key research question for this dimension: **what business needs and problems could an effective (self-) assessment solution solve?** In other words, this section aims to understand what value the self-assessment tool could bring to SMEs.

We assume that for a tool to bring the most value, to both SMEs and society at large, it has to:

- Solve the most pressing issues of SMEs (in general or specific problems of a particular segment of SMEs).
- Focus on issues that SMEs cannot solve internally, or that can be solved in a more efficient and effective manner.

- Help SMEs realise what business needs can be met with more effective / efficient skills management.

However, here we do not define “the most pressing issues” or business needs as increase in productivity, efficiency, growth, etc., even though this can often be reached with better skills management. This is because these goals are too broad and the way each company reaches them could differ wildly. Because of that, we narrow down to aims that a tool focusing on skills management could have, which, in turn, could also lead to higher growth, productivity, efficiency, etc.

Keeping this in mind, we identified four aims that the tool could have, which are highlighted in the table below. More specifically, the table describes them as well as identified the business needs (for more on business needs see section 2. *Business needs of SMEs*) that the identified aims could solve. Though the table separates the aims they are not mutually exclusive, but as they require relatively different implementation strategies they were separated.

Table 22. Mapping of aims and what business needs they solve

Aims	Justification	Business needs that the aim could solve
Inform SMEs about good skills management practices (i.e. benchlearning)	During interviews many SME representatives expressed their interest in having such a tool. In addition, during desk research we identified that many SMEs are frequently not aware of existing good solutions.	In very narrow sense this aim helps SMEs with lack of information. However, in a broader sense this aim can help to solve majority of issues as the good practices provided can help SMEs to meet majority of needs (see the table in 2. <i>Good skills management practices</i> subsection).
Help SMEs to compare themselves to other similar companies (i.e. benchmarking)	Both in the interviews and literature review we identified that SMEs would like to compare themselves to others, to see what the competition is doing and maybe learn from them.	The aim, in general, helps with needs related to skills assessment, such as: (i) better understanding of the employees and the labour market and (ii) monitoring of competition.
Help to connect SMEs so that they could share good practices (i.e. benchlearning)	Connecting SMEs would allow them to share good practices and learn from each other.	In broad sense it can help SMEs solve all their needs, given if they connect with organisations that could adequately help them.
Helps SMEs to receive financial support for skills management activities	Many SMEs express, in literature and interviews, that they often do not have enough financial resources and have difficulties receiving funding due to their volatile nature.	Predominantly this will help SMEs to receive funding, while it could also help financial intermediaries to decide who could receive said funding.

Source: Consortium.

The remainder of the subsection goes in depth into the identified aims, including providing an overview on how a tool focusing on these aims could help SMEs and other intermediaries – 5.3.1.

In depth overview of selected aims. In addition, in the end of the subsection – 5.3.2. *Other possible, but not preferred, aims* – we also highlight other aims (i.e. not included in the table) that might be used, but are not preferable due to different limitations, such as difficulty of implementation or low likelihood of success.

5.3.1 In depth overview of selected aims

Inform SMEs about good skills management practices

This aim focuses on creating a knowledge bank of good practices that SMEs could use in order to improve their skills management. The need for such a tool is twofold. First, according to desk research and interviews many SME managers lack capabilities in the area of skills management and they are also often not sure how to improve them. And second, though some SMEs also mentioned that they try to learn by looking for good practices in skills management, due to lack of time they rarely find appropriate solutions. Hence, by providing such SMEs with a knowledge bank, the tool could help SMEs that want to improve to make this process as painless as possible.

However, as the desk research and interviews highlighted, SMEs have very limited time. Hence, in order to help SMEs to find not just good practices, but good practices that might help them the tool should provide tailored solutions. This could be achieved by asking SME representatives to identify what issues they face (i.e. business needs or specific skills management issues) which then is fed to the tool that identifies a good practices tailored, to the extent, to a particular SME.

Creation of such an approach can be quite time consuming. However, as a starting point, the Table in section 2. *Good skills management practices* could be used as a starting point. Namely, this table provides information about different good skills management practices that SMEs could implement. In addition, the table also provides references to several guidelines and tools that can be used by SMEs to guide the good practices implementation. Also, though the table identifies practices that can help to solve a variety of business needs, it is also important to highlight the importance of digital and soft skills to SMEs. This is because though these skills often are not perceived as issues in very small SMEs, according to several interviewees they are very important and can help the SME to improve its productivity, efficiency, and, growth.

Though during the study the identified list of good practices provides a good starting point, the list contains only a limited numbers practices. It could be expanded with a more extensive literature review, but it still would only capture a limited number of solutions. Hence, for the tool to remain relevant and to go hand-in-hand with the ever-evolving SMEs, it will have to always grow. And the simplest way for it to grow is to allow SMEs to contribute to it by providing good practices that, according to them, could help others. More on how contributions could be implemented, as well as how this aim could be achieved by the tool, see subsections 3.3.3. *Content* and 3.3.4. *Operation and usability*.

Help SMEs to compare themselves to other similar companies

Some SME representatives and intermediaries also expressed a want to have a tool that could evaluate how well SMEs are carrying out skills management activities, or are doing in general, compared to other, similar, SMEs. Specifically, some interviews expressed a want for a 'company maturity' evaluation, which might foster SMEs to improve and grow if they will see they are lagging behind. Such an approach, as some intermediaries mentioned, could also help SMEs to improve their skills management as they will see what their competitors are doing, in an aggregated sense (i.e. the tool should not provide any information regarding specific SMEs to comply with GDPR).

Though several strategies could be employed to reach this aim, most feasible one is by using benchmarking, where the SME using the tool is compared to the aggregated results of other, similar, SMEs. More on how exactly this could be implemented see next subsection – 3.3.3. *Content*. However, inconsequently on the implementation strategy, to foster a more pleasant user experience, the results should be provided in a visually appealing manner using, for example, dashboards, figures, tables, etc. For more a more in depth discussion, with illustrative examples, on how the results could be presented see subsection 3.3.4. *Operation and usability*.

Help to connect SMEs so that they could share good practices

As many interviewees mentioned, SMEs often learn from other, similar, companies. Hence, to foster this, the tool could have an aim to connected, similar, SMEs, so that they could share good skills management practices. This would not only help SMEs to solve their issues, but also provide a more targeted and personal support that any digital tool could. Separately from knowledge exchange, this might also help SMEs to network and / or establish business partnerships. However, as SMEs lack time and resources, establishing such a system requires a lot of forethought. Hence, we identified three strategies how this aim could be reached by the tool.

First, the tool could serve as a social network, where different SMEs are recommend to one another. They could be matched in variety of ways, including matching SMEs that have a particular good practice implemented with those that do not have it, or have a problem that can be solved with the practices. To improve the matching and create a more win-win situation, where possible, SMEs that excel in one area but lag in another should be matched with SMEs that that excel and lag in *vice versa* areas.

Second, instead of social network that helps SMEs to share knowledge, the tool could become a cooperation platform. Namely, as several interviewees mentioned, and literature supports their claims, SMEs lacks both time and financial resources to implement any large skills management changes. However, if they could pool their resources together, they might implement a change together. Hence, the tool, in this case, would be similar to the previous one, where SMEs are matched on different aspects, but it would be less related to "knowledge exchange: and more to "learning together", with a more clear-cut win-win incentive for all participants. Though, such approach would predominantly focus on skills development, rather than utilisation or assessment, due to much bigger ease of arranging cooperation in such skills management area.

Third, the tool could be less of a networking platform and more simply contain a forum where SMEs could network. In this case the focus of networking would be shifted, as forum does not

facilitated networking to a large extent. However, this approach is very easy to implement, and it has other advantages, which are explored in subsection 3.3.4. *Operations and usability*.

However, inconsequently of the chosen implementation strategy, if any, it is crucial to take stock of GDPR. Namely, the tool should not provide any data that the SMEs did not agree to share, and they should not be, or get, recommended if they do not explicitly agree that their information might be shared. More on questions related to security see the 3.3.4. *Operation and usability* subsection.

Helps SMEs to receive financial support for skills management activities

The tool could also serve as a helping hand to both SMEs and financial intermediaries when it comes to receiving financial support for SME activities. From the perspective of SMEs, as both the desk research and interviewers highlighted, many SMEs have difficulties receiving financial support due their volatile nature. However, as some interviewers expressed, this does not mean that they would not like to improve their skills management practices if they would receive such support. Hence, if the tool would help them receive said support, some SMEs might see a lot of value in it.

From the perspective of financial intermediaries, the tool could help financial intermediaries to assess if the skills management practice for which and SME is asking financial assistance is adequate. This can be achieved by estimating, first, if the good practice the SME is trying to implement can solve the issue that the firm is facing. How this could be done see outlined in the next subsection – 3.3.3. *Content*. Second, by assessing if the good practice that the SME is trying to implement is appropriate for the firm the SME is. For example, as is discussed in *Target groups* subsection, small SMEs cannot implement a complex solution due to time constraints. Hence, for them, such a solution would not be recommended. Finally, as the tool could provide some benchmarking information on similar (see next subsection for more details) the financial institution could get a better feel how the SME is doing compared to other, similar, companies before deciding on providing financial support.

5.3.2 Other possible, but not preferred, aims

In addition to the aforementioned main aims, we also identified several others, including, but not limited to, helping SMEs with recruitment, retaining talent, assessing skills of their employees, implementing good practices by providing direct, human, support. Though these, and similar, aims were heavily discussed during interviews, we believe the tool should not focus on them. This is because, in many cases, there are already tools that provide such support.

For example, rexx systems, Infoniqa, TalentSoft, and others have a CV parsing functionality that helps with employment. CV parsing is an automatic CV data extraction approach that uses keyword-searches and templates to find suitable candidates. Many other tools (e.g., Culture Amp, NKL, WID) also have a very customisable and deep employee assessment tool that use both

statistical and graphical approaches, such as radiograms, flowcharts, coloured tables, etc. Hence, though there is a need, it is already met by many existing solutions on the market.

Regarding direct help with implementing good practices, though it is a possible aim, there is too many issues that prevents us from recommending it. First, due to lack of both time and financial resources in SMEs, many of them would not be able to spare the time or money in order to fully utilise such a solution. Second, such a solution would be relatively costly as it requires to have a large staff of trained professionals on retainer. Finally, there already exists several such solutions on the market (e.g., JobStarter PLUS, WID, Cornerstone), which are relatively successful. Hence, though this aim of the tool is possible it is non-preferable.

However, as interviews expressed a want for such as solution, these aims should not be completely ignored. The tool could address them, to an extent, by providing a list of good practices and tools to the users that would help them with the identified issues. More specifically, as many interviewees expressed difficulties finding an appropriate solution or tool, the tool could shine in helping them finding them. In addition, the tool could have HR support functionality, but due to large resource requirements it should only be a premium option. More on this see subsection 2.2.4. *Operation and usability*.

5.4 Content

The key research question for this dimension: **what skills management information would be most useful for the users?** This includes what information, for example from literature review and / or interviews, SMEs might find useful as well as if the tool could have benchmarking and / or benchlearning capabilities. It also explores how, using a questionnaire, the tool could identify the type of the company (e.g., by size, sector, country) and the issues it faces in order to provide more tailored solutions.

To control for the scope, as well as only focus on the most relevant information, this section explores very broad topics, including:

- **Questionnaire** – what kind of questions the tool should ask SME representatives in order to assess the companies' skills management maturity level, identify main issues, provide targeted recommendations, etc.
- **Benchmarking capabilities** – can the tool have benchmarking capabilities and how they could be implemented.
- **Benchlearning capabilities** – can the tool have benchlearning capabilities and how they could be implemented.

For a more technical discussion on different possible features of the tool see the next subsection – 2.2.4. *Operation and usability*.

5.4.1 Questionnaire

The main goal of the questionnaire in the tool is to gather information about the SME in order to get a better understanding of the users. This, in turn, will help the tool to give more targeted feedback as it will understand what issues companies facing and what kind of solutions they could implement. For this, three broad groups of questions are necessary:

- **SME characteristics** – cover different features of SMEs, such as size, sector, country, etc.
- **Business needs** – general issues that SMEs face, which would come from subsection 1.1.2. Business needs of SMEs.
- **Good skills management practices** – what kind of practices SMEs already are implemented or tried to implement

These groups of questions allow the tool to figure out what problems companies face and tailor the solutions accordingly. More specifically, the first three questions identify the situation in the company as well as what issues it faces, while the last questionnaire group allow to make sure that any solution proposed to the SME is not something they already are carrying out. More practically, this could be done by using the Table 5 in section 2. *Good skills management practices*, which not only identifies good practices but also provide information on what business needs the can help SMEs to meet. A more in-depth discussion on how this could be carried out is provided in the subsection 3.3.3. *Content*.

In addition, to improve the automatic analytical capabilities of the tool, it is crucial that as many questions as possible are not open (i.e., respondents cannot write their own answers). Meaning, that the users must select from a list of possible answers. Hence, the tables below, which provides an example list of questions, also indicate how to ensure high quality of answers that could be automatically used by the tool. The table provides only a preliminary list of questions as an illustration. Namely, we exclude any follow up question, such as questions about type of training provided in SMEs spending on SM activities, what skills gap identification procedure the company has, etc. For a more extensive list of possible indicators see subsection *Indicators* in the Annex.

Table 23. Example questions on SME characteristics

Question	Justification	How to ensure high quality of answers
In which country the SME is located?	In order to capture the different characteristics of companies as well as to provide them with more tailored solutions (e.g., simple solutions for small SMEs, while more involved and complex for larger ones).	To ensure that SMEs do not make any mistakes answering these questions the answers should be provided using an autofill search bar. Autofill search bar is an approach where someone starts writing something into the search bar and then the software provides them with
In which economic sector it operates?		

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		a list of options they can choose from. For example, if an SME representative would write <i>AUST</i> in the country search bar, he would be able to choose between Australia and Austria.
How many employees work in the company?		Number as an answer.
What is the turnover of the company?		Often this is very sensitive information. Because of that SMEs should be able to select several turnover ranges, or opt-out from answering this questions altogether.
How old is the company?	This can be an additional question to measure the maturity of a company, which would allow the tool to offer more targeted solutions.	Number of years as an answers.

Source: Consortium

Table 24. Example questions on SME business needs

Question	Justification	How to ensure high quality of answers
Which of the following general needs you have?	By identifying what kinds of needs companies have, the tool could propose appropriate solutions. Said solutions could be extracted from Table 5 in the 2. <i>Good skills management practices</i> section, by connecting SMEs with other companies that could provide them good practices, etc. Justification By identifying what kinds of needs companies have, the tool could propose appropriate solutions. Said solutions could be extracted from Table 5 in the 2. <i>Good skills management practices</i> section, by connecting SMEs with other companies that could provide them good practices, etc. Justification	Provide a list of needs using the needs identified in the 2. <i>Business need</i> section as a starting point. SMEs should be able to pick and choose the needs that are most pressing to them. This can be done by them ticking boxes connected to the needs. In addition, to not overwhelm SMEs, the three questions should be asked separately, with any follow up questions appearing only after the users answer previous questions. How to ensure high quality of answers
Which of the following digitalisation needs you have?		
Which of the following greening needs you have?		

Source: Consortium

Table 25. Example questions on good skills management practices

Question	Justification	How to ensure high quality of answers
Do you perform regular workforce analysis?	The questions allow to identify issues that the company faces in relation to analysis and planning .	The respondents could provide answers by selecting Yes / No or specifying, on a Likert scale, how extensively they implement a particular practice (e.g., from 1 to 7). To further simplify the questioning process for SMEs, it could be separated into three blocks corresponding to the three broad groups of skills management (i.e. assessment, development, and utilisation). For a more extensive list of possible questions see subsection <i>Indicators</i> in the Annex.
Do you have a procedure in place to identify skill gaps in the company?		
Do you provide inside company educational / training course?	The questions allow to identify issues that the company faces in relation to skills development .	
Does the company provide for training outside the company?		
Does your company has any on-the-job coaching / mentoring initiatives?		
Does your company have any job rotation initiatives in place?	The questions allow to identify issues that the company faces in relation to skills utilisation .	
How strongly employees participate in the decision making process of your company?		

Source: Consortium

5.4.2 Benchmarking

This subsection summarises: (i) if there is a possibility of implement a benchmarking capabilities in the tool using publicly available data (e.g., from Eurostat, CEDEFOP) and (ii) how this capability could be implemented in the tool. Benchmarking here refers to the functionality of the tool to compare SMEs in terms of company characteristics (e.g., size, sector, country) and skills management practices (i.e. assessment, development, utilisation). Here we focus on external rather than internal benchmarking (i.e. inside a company) as there already exists variety of solutions that do the former. The section provides only a summary of the analysis, including conclusions regarding benchmarking capabilities of the tool, several benchmarking options that can be selected, and lessons learned. For a more in-depth evaluation, including the logic behind data set selection, evaluation of data accessibility, scope, and aggregability of the selected sources, and selected indicators, see section 1. *An extensive overview of benchmarking capabilities* in the Annex.

Considering data accessibility, scope, aggregability (see subsection *Data accessibility, scope, and aggregability* in the Annex for more), as well as the identified indicators (see subsection *Indicators* in the Annex), several conclusions can be reached in regard to benchmarking possibility of the tool:

- It is possible to implement benchmarking in the tool using the publicly available data. However, to do so, information from different data sources has to be combined to get a comprehensive overview of companies (see subsection the Annex and Table 26 below for more).
- Though the combination of data sources is possible, there are several major caveats that have to be kept in mind, including: different data available for different time periods and lack of information on skills management practices in SMEs.
- As majority of data sets provide only information about the economic sector of the company at the NACE rev. 2 level one, only benchmarking of skills management for a relatively broad company segment is possible (NACE rev. 2 level one, and in some cases (e.g., CVTS) for 20 NACE sectors).
- Majority of data sets that contain useful information (e.g., ECS, CVTS) are relatively old (2013 and 2015 respectively). This is a major issue as SMEs are much more volatile than large companies, meaning what was relevant several years ago might not be as relevant now. However, this issue might be mitigated soon as new ECS and CVTS should be carried out during the upcoming years (i.e., ECS carried out a survey in 2019, while the results of the survey could become available in 2020; CVTS will be carrying out in 2020, with the data itself will likely become accessible in 2021).

Hence, we propose several possible courses of action how benchmarking could be implemented in the tool, which is presented in the table below. Specifically, to have benchmarking several sources should be aggregated to get the most complete picture of skills management in SMEs. Out of them, we believe that the third is the most reasonable. This is because:

- It aggregated ORBIS and CVTS where the former provides extensive information about company characteristics (e.g., size, turnover, sector) while the latter an extensive overview of skills management in SMEs (assessment, development, utilisation).
- CVTS provides information about 20 economic sectors, which is often much more than other data sources that also provides information about skills management (see the Annex)
- Time wise the alternative does not require a lot of resources as there is no need to match: (i) the economic sectors of different data sources (i.e. some data sources use different classification of company economic sectors) and (ii) surveys that were carried out at different time periods, (iii). And even if such matching can be performed, it might produce biased results as SMEs are volatile and hence information from different time periods might be incompatible.

However, this option is not without its drawbacks, which are outlined in the table below, and which will have to be considered more thoroughly before implementation.

Table 26. Benchmarking options, their pros and cons

	Options	Pros	Cons
1	Not use any available data sets for benchmarking	<ul style="list-style-type: none"> None of the aggregability issues mentioned in the subsection. Data accessibility, scope, and aggregability apply Least costly solution 	<ul style="list-style-type: none"> The tool, at launch, will not have any benchmarking information and will only use results from interviews and literature review. This may decrease its appeal to users.
2	Only using information on company characteristics for benchmarking (ORBIS)	<ul style="list-style-type: none"> Very expansive list of company characteristics, which comes from the ORBIS data set Very deep market segmentation, as ORBIS contains information on company sectors at NACE rev. 2 level 4 	<ul style="list-style-type: none"> Access to the data requires a payed license Only information on company characteristics is available (i.e. no information on skills management)
3	Aggregating ORBIS, CVTS	<ul style="list-style-type: none"> Available information provides both indication about company characteristics and skills management practices All skills management practices will be accounted for (assessment, development, utilisation), though not all indicators can be calculated (see subsection Indicators in the Annex for a list of indicators that can be calculated with the aforementioned data sources) Though the data is available only for 20 NACE rev. 2 economic sectors, this data set is one of the most deep data sets when it comes to segmentation of companies (see the Annex) 	<ul style="list-style-type: none"> More costly than the other alternatives, in terms of time and money, as it requires aggregation of data sources. Currently CVTS data is only available for 2015, which might be not as relevant to SMEs today. If all company segments are used (i.e. size, location, sector) the sample size for some sectors could be relatively small, which might introduce bias
4	Aggregating ORBIS, EWCS, CVTS, and ECS	<ul style="list-style-type: none"> The largest possible amount of skills management indicators will be covered (see subsection Indicators in the Annex for a list of indicators that can be calculated with the aforementioned data sources) 	<ul style="list-style-type: none"> Most costly, in terms of time and money, option If all company segments are used (i.e. size, location, sector) the sample size for each sector will be relatively small Data for some data sets was collected during different time periods (e.g., ECS – 2013; CVTS and EWCS - 2015)

	<ul style="list-style-type: none">• Will also contain deep information about company characteristics, which will come from ORBIS	<ul style="list-style-type: none">• Only information for companies at NACE rev. 2 level one (six sectors) could be used for benchmarking, which could be considered as too broad
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Source: Consortium.

However, inconsequently from the selected option, the tool should also evolve its benchmarking capabilities using the data from SMEs that used the tool. This can be done by using the user information that SMEs filled while using the tool. Though the data collection should adhere to GDPR, including anonymising as much data as possible and only providing aggregated (e.g., at least 50 companies in a particular segment) information on other SMEs to the users of the tool. By, using such aggregation, the tool will also ensure that any information provided to other users is based on a relatively large sample size.

After deciding on the benchmarking option, the tool could have a list of different indicators according to which SMEs will be compared. For an extensive list of possible benchmarking indicators see subsection *Indicators* in the Annex.

5.4.3 Benchlearning

The content of the tool could be also further expanded by including benchlearning capabilities. Benchlearning here refers to a link between benchmarking and learning activities where the formal help to identify the best practices of the latter. The benchmarking aspect could be implemented using what was outlined prior, while the learning aspect could be implemented using two options: (i) providing SMEs with good practices identified during desk research and / or (ii) allow SMEs to share good practices.

According to the first option, after SMEs use the benchmarking capabilities of the tool, it would provide some good practices that the SME could implement. This could include, but not limited to, providing a general explanation of a good practice that could be implemented, providing links to the guidelines on how to implement the practice, and / or linking different tools that could help. All of this information for the tool could be extracted from Table 5 in *2. Good skills management practices* section and from the table in the *1.4. Supply table* subsection in the Annex.

In addition, the list could be further expanded if SMEs using the tool would indicate any good practice. However, this expansion approach also requires additional resources, as all proposed good practices would have to be vetted by a human. How this could be carried out see the next subsection – *3.3.4. Operation and usability*.

According to the second option, SMEs, after benchmarking, would not receive concrete guidelines or help, but would be connected to a company that is similar to them, but which is doing especially well in the problematic area. Though some SMEs might be unmotivated to help others, they might be more motivated if SMEs that have issues in one area but excel in another will be matched with

SMEs that have *vice-versa* problems. More on how this sharing of information could be implemented from a technical standpoint see next subsection – 3.3.4. *Operation and usability*.

However, inconsequently which of these options will be selected, the good practices that the tool offers should be tailored to SMEs according to their size, sector, country, etc. Meaning, that, for example, micro and small SMEs should not receive good practices that are too difficult to implement for them due to severe time and financial constraints. More on this see subsection 3.3.1. *Target groups*.

5.5 Operation and usability

The key research question for this dimension: **what are the key features of the tool that would attract users and be exceptionally useful for them?** This includes how deep or light the tool should be, how SMEs could use the tool, how the results should be presented, etc. When deciding on operational aspects of the tool, it is important to evaluate:

- **Backend and technical features** – what would be the technical features that the users do not see, or are not useful for them directly, but which make the tool better?
- **Frontend and usability** – what are the features that bring direct value to the end consumer?

Hence, the subsection elaborates on a variety of features that could be integrated into the tool. However, for the tool to be slick and relatively simple to use (this is a big selling point for SMEs as was identified during interviews and literature review), only some combination of features should be used for the pilot. Though, inconsequently which combination of features is selected, the tool itself should be modular. Namely, that users should be able to easily opt-out from features that they do not want or need. Similarly, when assessing skills management and business needs in SMEs, the users should be able to pick and choose what they wish to evaluate. This way we will ensure that the tool only provides answers to the questions SMEs ask, and does not overwhelm them with information.

It also bears mentioning that, in the early stages of the tools life it will not be heavily tailored to very specific SMEs (as was discussed in subsection 3.3.1. *Target groups*). This is because there is a lack of information, and it would be not feasible to find unique recommendations for each SME in each sector and each country (as was discussed in subsection 3.3.3. *Content*). However, as the SMEs use the tool it should evolve, reaching a critical mass that will allow for the tool to provide tailored solutions. This, in turn, would also allow the tool to grow in terms of features.

5.5.1 Backend and technical features

The relevant backend aspects of the tool could be divided in to three broad categories: (i) information, (ii) functionality, (iii) data protection and updates. Information refers to what kind of data the tool should contain, which includes: **data on good practices, data on available tools,**

and **data on SMEs**. Functionality refers to on how the tool will operate, which includes: **registration possibility**, **multilingual support**, and **ability for users to give feedback**. Data protection and updates refers to features that are crucial for a long term survival of the tool, including: **high security** and **regular updates**.

The features provide a starting point for the prototype of the tool. However, they are not exhaustive as more technical aspects are excluded (e.g., how the tool should store data in a data set, what kind of data set it should use (tabular, relational, other), in what programming language the tool should be written, etc.). Hence, the features discussed in the remainder of the subsection should not be used as a blueprint for the tool, but rather as features that are important to consider.

Information

For the tool to provide value for its users at launch it has to contain some useful data for SMEs. This should include **data on good practices**, **data on available tools**, and **data on SMEs**. These three data sets were selected as they are at the heart of the tool. Namely, data on good practices and tools is the main source of benchlearning information, while data on SMEs allows the tool to both provide benchmarking information and identify which good practices and / or tools would suite the SME the most. More on what exactly this data could be see subsection 3.3.3. *Content*.

Functionality

First, to better track the answers users provide and to prevent double counting the tool could have a **registration** functionality. From the perspective of the tool managers, the registration would allow to monitor the answers to the questions, ensuring that the same SME is not counted several times in the data set. Also, as the issue of double counting will be mitigated, information from registered SMEs could be used to expand the benchmarking of the tool by using the answers of respondents. Registration could also provide additional functionalities to the users, which could be put behind a paywall. More on this, see subsection 3.3.6. *Sustainability*.

From the perspective of the users, registration could provide additional functionalities, including those that are only accessible to paying users. For example, users that registered and filled in the questionnaire once, could have their data prefilled if they would wish to repeat the procedure, but change some answers. In addition, the tool could provide “success planning” for registers users by allowing them to select good practices that they wish to implement, keep track regarding how extensively this practice was used in the firm, and if it had any positive outcomes. This could be also expanded with the tool sending reminders to the users who selected but did not completely implement a practice.

The tool could also have a **user feedback** functionality, where the users could indicate any issues that they encountered with the tool or its contents. The feedback could be delivered via e-mail, live chat, or forums. However, this feedback should only contain aspects related to the tool itself, as more content oriented feedback should be expressed and collected through other means (see

3.3.4. *Frontend and usability features* for more). This type of feedback predominantly would allow the tool developers to always improve the tool in line with the main issues that the users have.

Finally, as many SMEs indicated during interviews that they would not use a tool that does not support their language, it is also quite important to make the tool **multilingual**. Though at the early stages it is unlikely that the tool will have too many language options, by focusing on the most widely spoken EU languages (e.g., English, German, French, Spanish, Polish, and Italian) it could reach a larger share of SMEs. However, if the tool would get steam and there would be demand, it should also be expanded to other languages.

Other

To make the tool more appealing to the users, it, first and foremost, must be **secure**. Meaning, any data that is entered by SMEs should be encrypted and protected so that others could not have access to it. This is especially important now due to the GDPR. The security aspect also could include protection from cyberattack such as distributed denial of service attack (DDoS). And though this feature can be both time and resource intensive to implement, it is necessary and cannot be omitted.

In addition, as SMEs are highly volatile and always changing, it is also important to have relatively **regular updates**. These updates should not only fix bugs or issues, but also should improve the tool by introducing new business needs, good practices, etc. These updates would be especially crucial for SMEs working in the ICT sector as these companies are incredibly dynamic and always changing, or, quoting one of the interviewees: “70% of tools you are using today did not exist six months ago”. However, this feature could be quite time consuming if there is a lot of issues with the tool or a lot of good practices. Although, to some extent, it can be simplified with user feedback, which is explored in the next subsection.

5.5.2 Frontend and usability features

When it comes to the frontend the tool, first and foremost, should be as **user friendly** and simple to use. This is because during desk research, case studies, and interviews we saw that many SMEs will not use any solution that is too complicated or requires too much time. Hence, when deciding on specific features of the tool, as well as on how to implement them, it is crucial to ensure clarity, simplicity, and usability, without sacrificing the content too much. This could be achieved in a variety of ways, which we explore in this subsection.

To simplify the subsection, the good frontend practices were divided in to three broad categories: (i) **results**, (ii) **functionality**, and (iii) **other**. Results refer to how the tool will present information to the users, using: **reports**, **insights**, **colour scoring**, and **graphics**. Functionality refers to additional aspects of the tool that could bring direct value to the users by helping them to improve their skills management, but which are not directly related to presenting results. This includes **goal tracking**, using a “**four eye principle**”, **referencing SMEs to each other**, **user**

contributions, and a **rating system**. Other features relate to features that will not help SMEs to solve their business or skills management needs but could create a more pleasant user experience. These include **forums**, **FAQ**, **exporting results**, and **search functionality**. The remainder of the subsection goes into each of these groups in more depth.

Results

The results of (self-) assessment of SMEs could be presented in two broad ways. First, the information could be provided as an **insight**. In this case, after evaluating the SME, the tool would provide the results of benchmarking, a list of good practices that the SME could implement (including links to the guidelines), and / or references to tools that can help them to implement said practices. This approach makes the tool into a “knowledge bank”. This is also the most simplistic solution, as it only involved comparing the SME to similar ones and “filtering” the good practices and tools (using the Table 5 in section 2. *Good skills management practices*) according to the SME answers before providing it.

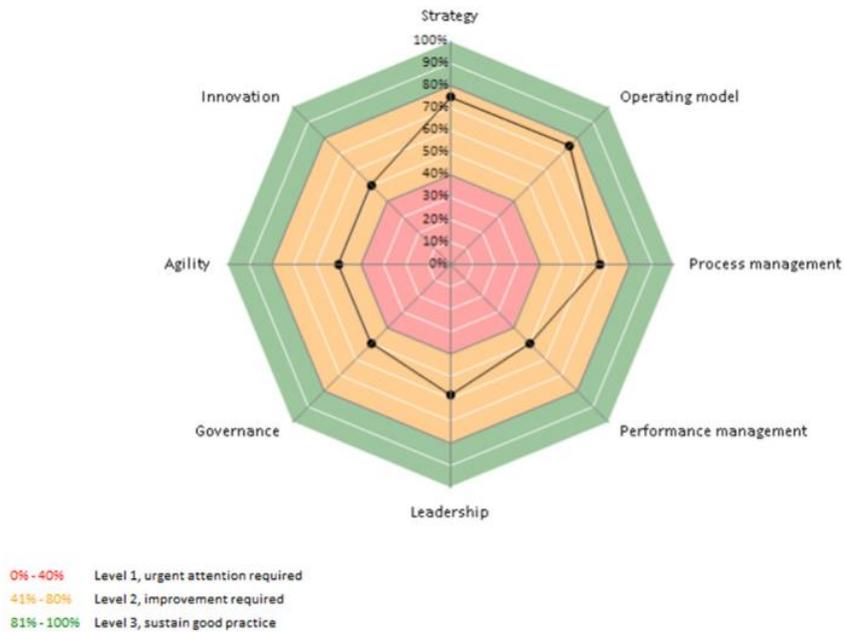
Though insight could be provided simply using numbers, providing links, or short descriptions, they could be also further expanded with **capability diagnostics** and **colour scoring**. Capability diagnostics refers to indication if a particular solution could be implemented by the SME. For example, if a company is relatively small the tool could warn if a particular solution is recommended for bigger companies, and similar. While colour scoring refers to assigning colours to, for example, benchmarking results. This way SMEs can quickly see in what areas SMEs are doing better and where worse. To further strengthen the effects of colour scoring it could be linked with company’s skills management maturity level. That is, after calculating by how much the SME is better or worse than other, similar, SMEs it would receive a maturity score depending on the distance from the average.

Second, some SMEs, as interviews demonstrated, would like to receive more involved recommendations in a form of a **report** based on the answers they provide. Such a report could, contain, for example, a quick summary of the company, comparison it to others with indication in which fields it is doing better and which worse (this could be done with figures and graphics), list of recommendations on how it could improve the problematic areas of skills management, list of recommendations on how the company could try to solve the business needs through more effective and / or efficient skills management. However, creation of such reports is a time consuming endeavour, and hence they would have to be created automatically. Though this might imply high generalisation, the report could be made quite detailed and tailored following the answers provided by the SMEs. For example, the tool could have a variety of short recommendations that are specific for each business need and good practices, which will be provided to SMEs if they have said need or they should implement a particular practice.

In addition, to further boost the appeal of the presented results, a lot of different **graphics, figures, and tables** should be used. For example, to show how an SME differs from the average three radar charts could be used each representing a different skills management practice. Alternatively, using bar charts the tool could indicate the priorities of different issues that the

company has based on how they answered the questionnaire. For an example on how these figures could look like see the figure below, while large number of examples could be found in the case studies for the tools.

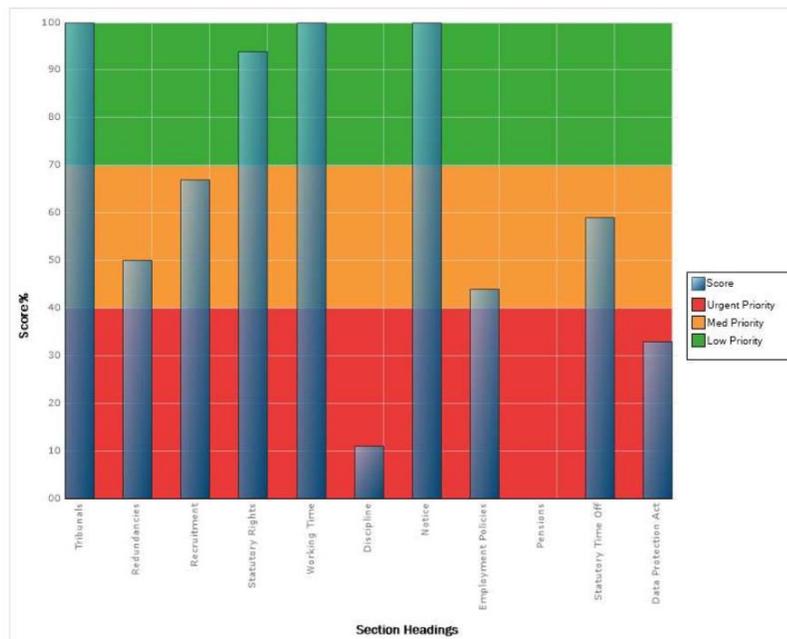
Figure 30. Example of a radar chart



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Source: Consortium

Figure 31. Example of a bar plot



© European Union

Source: Consortium

Functionality

Functionalities are additional features that can help SMEs to improve their skills management. One of such possible features is **goal tracking** – ability to save the results (e.g., benchmarking or good practices) so that later they can see how far they have come after implementing good practices. This feature, if implemented, would help SMEs to better understand if the changes they implemented had any positive effects. This functionality could be also expanded with a “pulse check” where the company periodically (e.g., annually or quarterly) assesses how it is doing, which would provide information about the “pulse” of the company in terms of skills management. However, for such an approach to work, the tool should have registration functionality, through which the data for SMEs would be saved.

Skills management could also be improved by implementing a “**four eye principle**” for assessment, where different representatives from the firm could fill in the same questionnaire allowing them to “compare notes”. The need for this stems from the fact that both desk research and case studies identified that sometimes higher and lower-level employees do not see the situation in the company the same. Hence, a “four (or more) eye principle” would help SMEs to see discrepancies inside the company as well as identify issues that the higher ups do not see. However, as several interviewees expressed that they want only CEO and high-level company

representatives to access this information, the tool should allow the CEO, or other managers, to disseminate the results and the questionnaire only to specific employees.

In addition, to improve knowledge sharing the tool could have a **referencing** option where SMEs that did particularly well in specific areas would be references to other SMEs for assistance. However, for this approach to work, the company that did well will have to have a say if they want any SMEs to be referenced to it and what SMEs could be referenced. This way we will ensure a win / win situation where a less developed SME learned from the more developed one, while the more developed one, for example, can use this as networking opportunity. More specifically, an SME that operates in retail might get references to an SME that operates in manufacturing (if both SMEs agree of such referencing), which might lead to a partnership beyond skills management. However, in order to implement such a system, it has to comply with GDPR and data protection laws.

The tool could also have a feature of users' contributions, where SMEs could share any good practices that they believe could help other SMEs. It could be implemented into the questionnaire or allow SMEs to express their issues in a forum (the forum feature is explored in more depth in the next subsection). However, as such information will be unstructured, an expert in the field would have to evaluate the recommendations before deciding if they should be implemented into the tool. And this entails large financial costs, which should be considered before implementing this feature.

This functionality could be expanded by also allowing tool managers to refer their tools. If such a functionality would be implemented it would allow the new tool to always grow as it will include most recent, state of the art, solutions. Though, to improve this referencing the tool managers should be required to, in extensive detail, explain their tool so that it would be only recommended to users with specific problems (in a specific country / sector) that the tool solved.

In addition, to ensure high quality of recommendations, as some interviewees suggested, SMEs should be able to **rate the guidelines and the tools** (e.g., of a five-star scale). This way, first, the users would be able to express which solutions they found useful, and which were not. And second, after reaching a critical mass, the ratings could be used to better tailor recommendations for SMEs as only the best of the best would be recommended. To further improve this functionality, the rating system could be assigned for each business need or good practice, so that tools that are particularly good in solving a specific issue would not be overshadowed by more all-purpose solutions.

Other

The *other* features do not directly help with skills management, but they improve the user's experience, which might increase the appeal of the tool. One of such features is having a **forum** in insight the tool where the users could share their opinions, recommend changes, and be informed by the tool managers on the upcoming changes. From the side of SMEs, the forum would help them to connect with other companies and maybe help them in implementing good

practices. From the side of the tool, it could be used to “check the pulse” of the tool, what changes majority of SMEs wish to see, what major issues they have, etc. Also, from the technical perspective, one of the main benefits of this approach is that it is easy to implement. Though an individual would have to be assigned to periodically moderate it.

Other smaller features include **export functionality**, **search functionality**, **FAQ**. **Export functionality** refers to the ability of the users to extract the results (e.g., .pdf or .xlsx form) of, for example, benchmarking, which was a concern for some interviewees. **Search functionality** refers to the ability of the users to, using specific keywords, find, for example, good skills management practices that they could implement. By implementing this, the users that only want specific knowledge and do not wish to fill in a questionnaire, will be able to also utilise the tool. Finally, **FAQ** refers to a page in the tool that covers the most frequently asked questions. It could include explanation what the tool is and how it could be used, cybersecurity (a short explanation how the data is kept safe), overview of key features, etc. It could be also supplement with a more extensive manual on how to use the tool.

5.6 Deployment

The key research question for this dimension is: **how to most effectively launch the tool so it reaches its critical tipping point** (i.e., situation when the tool accumulates critical mass of users and becomes self-sufficient, not only enabling benchmarking, but also possible for-profit usage of the tool)? This subsection answers this question by:

- Exploring different marketing approaches and channels, their pros and cons, as well as marketing content
- Outlining roles of various intermediaries (e.g., financial intermediaries, SME associations, training providers) in deploying the tool
- Identifying possible deployment strategies and business models
- Indicating possible links with existing EU financing instruments and programmes.

5.6.1 Marketing

To effectively deploy the tool in the market there is an obvious need to “sell” the merits of the tool providing SM support to SMEs in a way that is not apparent for other types of support, such as finance, IT or traditional marketing.

Marketing approaches and channels

The table below outlines possible marketing approaches – direct, indirect and conditional marketing – and their more detailed channels. Effective deployment should perhaps build on a combination of all three approaches and their selected channels. In addition, targeted actions are

essential. Otherwise, the tool will essentially benefit those that are already aware of and using similar tools.

Table 27. Analysis of different approaches and their channels for marketing of the tool

Marketing approach/ channel	Advantage(s)	Disadvantage(s)
Direct – focused on hard-to-reach SMEs		
Social media (e.g., LinkedIn, Facebook, Twitter) advertisements or even videos	<ul style="list-style-type: none"> • Cost-effective • Enables targeting of some hard-to-reach SMEs that are present online • Clear insight in results and reach 	<ul style="list-style-type: none"> • Requires specific expertise and experience • Demands full-time and fast support resources to react to questions, complaints, etc.
A dedicated blog, newsletters, etc.	<ul style="list-style-type: none"> • Keeps/ builds relationship with existing users 	<ul style="list-style-type: none"> • Not effective channel for attracting new users
Digital press (e.g., sponsored articles in HR-related media)	<ul style="list-style-type: none"> • Enables high quality communication of messages • Suitable for specific (HR) readers 	<ul style="list-style-type: none"> • Limited reach, most likely to attract SMEs that already are quite advanced in SM (e.g., have HR) • Little space with a small budget
Presence at HR-related events, fairs, etc.	<ul style="list-style-type: none"> • Has local flavour • Physical presence 	<ul style="list-style-type: none"> • Expensive and time-consuming • Target group not very specific (likely those who are already engaged/ aware)
Indirect approaches		
Partner marketing – national/ regional intermediaries representing SME interests (e.g., Chambers of commerce, employer associations or similar) who have access to extensive networks of SMEs (and often their trust)	<ul style="list-style-type: none"> • Intermediaries have access to and trust of SMEs enabling wider and deeper reach • Use of established groups and networks is more effective • Messages distributed via intermediaries are more likely to catch attention of potential users 	<ul style="list-style-type: none"> • Intermediaries need to believe in value of the tool (e.g., disseminating something very valuable for local business community), otherwise they will not engage. That may require a lot of energy • Often leaves the 'hard-to-reach' SMEs unengaged –

FEASIBILITY STUDY FOR A (SELF-) ASSESSMENT TOOL ON SKILLS MANAGEMENT PRACTICES
IN SMES

		<p>these arguably need support the most</p> <ul style="list-style-type: none"> • Depends on intermediary marketing competences (only face-to-face communication or also posts in their social media/ blogs/ newsletters). This may require extra support
Partner marketing – hyperlink/ banner in websites of all relevant intermediaries (incl. also public institutions, financial institutions)	<ul style="list-style-type: none"> • Notices to visitors of the relevant sites – widens reach 	<ul style="list-style-type: none"> • Depends on quality of partner websites and the banner to catch visitor attention • Requires specific expertise and experience
Partner marketing – using marketing channels of other tools by integrating our tool within them (users of other tools are redirected to the tool once they see banner or recommendation)	<ul style="list-style-type: none"> • Significantly widens reach of the tool compared to standalone approach • More appealing to users (e.g., more services with less input) 	<ul style="list-style-type: none"> • Integration may compromise simplicity and user-friendliness of the tool that could deter users • Requires specific expertise and experience – need to establish concrete useful interlinkages
Word of mouth (i.e. real-life examples of tool's benefits)	<ul style="list-style-type: none"> • One of the most effective ways of marketing • Intermediaries could play a very important role there. 	<ul style="list-style-type: none"> • Slow to gain pace – more relevant once the tool accumulates more significant user base • Limited reach
Paid search (using search engine optimisation (SEO) services)	<ul style="list-style-type: none"> • Potentially very effective in terms of value for money 	<ul style="list-style-type: none"> • Can reach only digitally literate SMEs • Limited reach (only those who search internet)
E-commerce stores such as Capterra™ ¹⁷	<ul style="list-style-type: none"> • Diversification of existing channels 	<ul style="list-style-type: none"> • Not so many SMEs search for tools using e-commerce stores
Conditional marketing		
Using a tool as a pre-condition (e.g., requirement to complete tool's assessment together with application for funds)	<ul style="list-style-type: none"> • Many public tools are linked to their application in public 	<ul style="list-style-type: none"> • Could deter some users who could treat it as a red tape/ unnecessary administrative

	processes, for example Europass CV.	burden before they get actual benefits (e.g., funds). To prevent this, users should be well aware of tool's benefits.
Marketing approach/ channel	• Advantage(s)	• Disadvantage(s)
Direct – focused on hard-to-reach SMEs		
Social media (e.g., LinkedIn, Facebook, Twitter) advertisements or even videos	<ul style="list-style-type: none"> • Cost-effective • Enables targeting of some hard-to-reach SMEs that are present online • Clear insight in results and reach 	<ul style="list-style-type: none"> • Requires specific expertise and experience • Demands full-time and fast support resources to react to questions, complaints, etc.

Source: Consortium based on interviews with stakeholders and own elaborations

Marketing content

Effective marketing is not only about how one should promote the tool, but also what to communicate about it. SMEs tend to have very short attention span with regard to questionnaires and diagnostic processes due to high opportunity costs, lack of funds and time. Thus, marketing should most importantly focus on and be very clear about “value for money and time” that users are about to get from the tool. As one stakeholder put it, marketing should demonstrate evidence-based rationale behind its questions and actionable results rather than “a fat glossy document that SMEs will not have the time nor patience to wade through”. The possible **benefits**, as argued by some stakeholders and SME representatives, include:

- **Profitability** or, otherwise, return on investment in this tool in terms of increased employee productivity, higher turnover or similar indicator. For example, this is done in Polish Human Capital Measurement Tool that estimates the value for money of the company’s human capital (see 1.3 for details). However, there is a catch – value for money could be demonstrate only via some illustrative company cases, otherwise, if company-specific value for money is required, a potential user needs to become an actual user and provide all necessary information for such calculation. Actual users are already aware of the benefits of the tool and are not obsessive about value for money calculations. Thus, it may make sense to provide value for money calculations on one-off basis (instead of permanent functionality within the tool), in illustrative company cases (more details on them below).
- Illustrative company cases may be subject to more comprehensive evaluation demonstrating assessing **wider human capital benefits** of tool usage such as higher

employee motivation, reduced sickness levels, better effective recruitment and retention results.

- Emphasis could be on **establishing efficient and effective SM practices** in the company so it can be more efficient (higher productivity above), innovative and, more importantly, create favourable employee culture (wider human capital benefits above) in the company which, in turn, can then also lead to even higher employee productivity and innovation levels.
- **Competitive advantage:** tool helps companies to sustaining their business by empowering employee human capital to match the innovative trends in the market. In addition, tool could help SMEs to compete with large firms for talent based on improved SM offer.
- The tool could help to solve the **human capital dilemmas in business** (e.g., whom to hire – more junior or senior employees). The tool could help companies, directly or indirectly, to better organise e.g., SM of sales people so that it leads to both financial and human resource benefits. This could be illustrated in marketing cases.

Even in case of marketing benefits one needs to consider differences among potential target groups. For example, digital natives may be perfectly aware of benefits of similar IT tools, while older demographics might be less aware or more sceptical. The latter could perhaps require more and slightly different attention of the marketing people.

In order to effectively promote the tool, marketing should build on the following content-related aspects:

- **Demo version/ taster:** could be considered to show users the potential benefits of the tool not taking a lot of their time. Some may be reluctant to invest time in the full version of the tool without having a taste of what it does. It would take little time from users (light assessment; keeping in mind the time constraints SMEs face) and demonstrate the key functionalities of the tool. The taster could focus either on a single specific issue/ practice (e.g., Culture Amp has a free diversity & inclusion kit) and demonstrate relevant recommendations or it could provide a brief overview of many/all SM elements. Specific issue/ practice would be more feasible due to concrete added value for users.
- **Real-life examples:** marketing should extensively use very concrete and down-to-earth company examples how tool contributed/ could contribute to business success illustrating above-outlined concrete benefits. Ideally, these examples of companies using the tool should be wider in terms of sector coverage: not only such usual suspects as ICT or technology-intensive industries, but also traditional industries and services, franchises, etc. Making the tool appealing for many sectors and types of businesses rather than the selected few should be helpful in extending its reach.
- **Adaptation to local markets:** the marketing should not only be translated, but also adapted to local markets. For example, marketing material that is successful in more mature Western markets (e.g., Germany where employers provide initial investment in their human capital and are well-aware of similar tools) could lead to unsatisfactory results in Eastern markets (e.g., Baltic States, Romania, Hungary where both employers and employees invest less in human capital and are not familiar with and quite sceptical about

similar tools). It may make sense to prepare a core marketing content and then allow to adapt it in order to meet each country's market needs.

- **Marketing messages:** marketing language ideally needs to build on well-framed messages to sensitise potential users. In any case they should use business language and avoid complex concepts (e.g., interviews showed that even the term “skills management” may be hard for some SME representatives to grasp). Examples of possible framing of messages include:
 - Recruitment challenge that is relevant for most SMEs. It may be especially relevant for some regions (e.g., Eastern Europe due to high outward flows of workers) or some sectors (e.g., transportation where workers frequently change jobs due to internal competition). Recruitment ends eating up quite a lot of resources from companies and they search for more effective approaches in this area. Tool could improve recruitment processes by e.g., spotting particular skills gaps based on skills assessment, preventing recruitment by finding or acquiring required skills within company with the help of skills utilisation or development approaches or referring to other solutions to otherwise improve recruitment.
 - Social and economic benefits of moving from small to medium company. As one stakeholder put it, all would greatly benefit if you got people to the point where they could move from S to M. Reasoning behind is simple – a lot of start-ups and other micro and small companies are bought out by investors and then start again. Marketing could build communication on the ambition of remaining an SME and growing towards M.
 - Resilience to economic and other crises. Marketing could emphasize building resilience in businesses – things might be fine now, but you will need similar tool at some point when things get difficult. According to one of stakeholders, possible message could sound like 'when a crisis like Covid comes and puts your company at risk, here is a tool that can help you with that'.
- **Selected promoters of the tool.** SMEs wish to work with the biggest brands to make it effective. As one stakeholder put it, if it is EU-sponsored it sounds more like 'hey this is for everyone' i.e. non-exclusive. Thus, by agreeing with one or more brands that are appealing to SMEs internally the marketing campaign could send the right signal to potential users.

5.6.2 Roles of intermediaries in deploying the tool

Intermediaries (esp. SME representatives) may have an exceptional role in ensuring effective marketing of the tool (see earlier sub-section). However, intermediaries may have additional roles in deploying the tool including:

- Support to SMEs in navigating the tool by, for example, explaining what the tool offers and how it works (e.g., Chambers of Commerce, Enterprise Europe Network, business associations, members of development agencies, B2B consultants and advisors and similar type of intermediaries having close access to SMEs).

- Providing long-term mentoring relationship (similar intermediaries as above). As one stakeholder said, a lot of interventions fail because very often leadership just loses momentum, it does not produce immediate wins for people. Company management try and train their certain staff, but if it is not aligned with the rest of the organisation employee may develop resistance to change and go against the new skills management new initiative. Overcoming this requires identifying interdependent factors and supporting company management through this change.
- Using the tool in providing (or even updating it with) systemic and company-specific information on learning opportunities (possibly including their quality and price aspects) that would otherwise be too scattered to be accessed autonomously by one company (e.g., PES, CoVEs, clusters).
- Collaborating in design and/or delivery of additional skills management solutions, but also linking graduates with employers (e.g., Universities, High Level Skills Programme¹⁸).
- Based on tool's insights, providing extra expertise, guidance and support to better organise skills management and therefore increase added value to users (incl. HR agencies, PES, CoVEs).
- Identifying additional needs of SMEs with regard to skills management (e.g., business associations, chambers of commerce), this way improving the tool's content.
- Promoting networks of companies in the tool's benchmarking side (e.g., sectoral training funds, business associations). This would develop economies of scale and provide users with more adequate learning offer in terms of price, quality and accessibility. The recent EMPL study (forthcoming) indicates that networks of companies receive employers' interest in some countries and are still considered as an insufficiently exploited opportunity.

However, the major risk here may be the need for formal agreements with intermediaries. If they are required, they may involve significant time investment and financial costs.

5.6.3 Deployment strategies and business models

Deployment strategies

An important question for the tool is how it could overcome an initial hurdle of limited data content. A number of possible approaches exist in this respect:

- **Beta version or testing:** We could start with a group of companies who join in with somewhat lower expectations for the tool as testers dealing with tool's prototype/ beta version (full and free version of the tool). These companies would test tool's functionalities and this way provide significant amount of data before final release version is launched. In addition, these companies will not complain due to their lower expectations and due to possibility to comment what needs to be fixed where.

¹⁸ https://www.ntu.ac.uk/_data/assets/pdf_file/0025/880117/High-Level-Skills-Programme-FINAL.pdf

- **Early adopters:** Once final release version of the tool is launched, we could offer a free access within a limited timeframe for companies that would be early adopters of the tool. We could try to attract companies that are actually willing to participate and are fine with temporary compromises – as a compensation for the fact that their initial engagement will not provide them as much benchmarking and benchlearning possibilities as they could expect we could offer them free access to the tool and/ or some additional support (e.g., expert consultations provided by intermediaries).
- **Competition:** Use of the tool could be turned into a competition where we award some users for excelling in skills management area based on pre-defined categories and criteria. This campaign could be backed by some EU institution or organisation in Europe to increase its appeal for users. This may spark interest among SMEs and this way generate a needed data set and a reputation that could further encourage more companies to use the tool.

Despite what deployment strategy is chosen, clear numerical targets (numbers of users) for scaling up the tool need to be set. It should also include an indicative tipping point that would be sufficient for accumulating critical mass of users and becoming self-sufficient for benchmarking purposes.

Business models

Tool should be deployed using a number of business models (some of those mentioned earlier in sections 3.1.1 and 3.1.2 on venture capital investments in HRTech and EdTech). The most feasible ones include:

- **The freemium model** as it offers free product but attempts to upsell to a premium offering for a fee. Tier 1 (transactional support as indicated in section on target groups) could be free and tier 2 (transformational) could be premium version of the tool.
- **Public-private partnership.** ‘Public’ to cover the initial development costs of the tool and ensure close link to existing EU financial instruments. ‘Private’ to access private market funds, keep close monitoring of market trends (not possible within public model as it is too far from the market) and ensure sustainability of the tool (see next section).
- Although the tool focuses on corporate dimension, it may be rational to also partly exploit **academic dimension** (e.g., using the tool in research projects to provide more/ better evidence on its outcomes).
- Tool could also exploit a **distribution type of services**, one of the types usually provided by EdTech start-ups, by transforming it to skills management tools (rather than content) more accessible and effective.

5.6.4 Possible links with existing EU financing instruments and programmes

Table 28 below overviews a number of potential links between a tool and EU financing instruments and programmes.

Table 28. Links between the tool and existing EU financing instruments and programmes

EU financing instrument or programme	Possible linkages with the tool
Invest EU	<p>The tool could be linked to the Invest EU initiative as a helpful instrument for implementing partners when defining what skills-related areas to finance and how much investment to put into them. This could be particularly relevant for SME-oriented funding programmes such as COSME, which could also serve as promotional platforms for the tool (e.g., detailed information on the tool could be provided in the application sections or on the programmes' homepages). Furthermore, the tool could serve as a guidance measure for Implementing and Advisory Partners in Invest EU funding programmes, providing useful information for them based on the aggregated tool data. However, this linkage could be activated only at a later stage of the tool once it aggregates sufficient company data.</p>
European Social Fund (ESF): business and training projects	<p>Organisations implementing European Social Fund (ESF) could promote the tool to be used in projects for boosting business and promoting education and training (mostly vocational). Moreover, the ESF could benefit from the tool internally as it finances a wide range of different skills-related projects at different levels. Firstly, the tool could potentially help, provided significant number of company data is collected, both Member States and European Commission in planning their ESF investments. It could help these authorities to tailor the help for SMEs in need of assistance. There could be rationale of promoting this tool for Member States and regions who are particularly struggling in reviving their economies (incl. human capital in companies) after Covid-19 crisis.</p> <p>The second option would be to use the tool as a precondition for companies to receive ESF grants, loans or other types of funding for improving talent management systems, training company staff and related areas. Company applying for support in these areas could be asked to fill in assessment of its skills management situation using the tool to better identify areas of investment.</p> <p>Finally, the tool could be used as a gateway for companies to access ESF (and potentially other InvestEU) funds.</p>
Skills and education guarantee pilot of the European Investment Fund	<p>The skills and education guarantee pilot by the European Investment Fund is another potential link. According to the EIB's website, one of target groups of the instrument are enterprises investing in skills. Expressions for interest are accepted till October 2020. If the pilot proves feasibility of this financial instrument and it is continued, the instrument could integrate the tool as an additional information function for beneficiaries deciding on the scope and type of their skills investments.</p> <p>To illustrate it with a practical example: an SME wants to apply for debt financing by the instrument in order to develop the competencies of its employees. However, its management is not exactly sure what areas it should focus on in terms of skills development. During the processing stage, the instrument would suggest to use the tool as a potential solution to the problem. The tool could help the SME to identify its main skill management gaps and make an evidence-based decision.</p>
Digital Innovation Hubs (DIHs) in Digital Europe Programme	<p>The tool could potentially be linked with the DIH in Digital Europe programme in three different ways. Firstly, the tool could be promoted in the DIH Network as an innovative good practice on skills management and an effective digital solution. Secondly, the DIH Innovation Hubs platform – DIHNET.EU – could promote the tool among DIHs for identifying applicants' skills management needs more precisely (enabling DIHs to target their skills and training as well as investment search services more precisely). Thirdly, the tool could refer to some of the services provided by the DIHs as an intermediary in certain areas that are relevant to the tool's scope such as: digital maturity assessment; webinars on digital skills; webinars on work process management ; online courses on</p>

	hard-skills related to IT-industry (e.g., applied machine learning). Finally, the tool could use the DIH concept for deployment or later expansion of the tool (i.e. collaboration between SMEs on skills management issues in different types of national and international networks).
European Institute of Innovation and Technology	<p>The Institute could promote the tool on its website as well as use the tool internally in its Online Education and Skills for the Future initiatives. If used in educational context, the tool could help to strengthen the focus of a new generation of entrepreneurs on the issues of skills management in their curriculum.</p> <p>Moreover, the Institute could promote the tool via its Knowledge and Innovation Communities (KIC) and, thus, make its impact more targeted and extend its benchlearning capacity. For example, links between the Manufacturing KIC and the tool could help manufacturing SMEs learn more about good skills management practices that are particularly relevant for them and increase their networking capacity through benchlearning.</p>
Erasmus for Young Entrepreneurs	The tool could be internally marketed by the ‘Erasmus for Young Entrepreneurs’ programme administrators as a pre-condition for companies to participate in the programme. Ensuring that the participants use the tool will increase its outreach, raise awareness about the importance of skills management among European SMEs and young entrepreneurs, as well as help the programme to pair SMEs based on their skills management-related business needs.
EU financing instrument or programme	Possible linkages with the tool
Invest EU	The tool could be linked to the Invest EU initiative as a helpful instrument for implementing partners when defining what skills-related areas to finance and how much investment to put into them. This could be particularly relevant for SME-oriented funding programmes such as COSME , which could also serve as promotional platforms for the tool (e.g., detailed information on the tool could be provided in the application sections or on the programmes’ homepages). Furthermore, the tool could serve as a guidance measure for Implementing and Advisory Partners in Invest EU funding programmes, providing useful information for them based on the aggregated tool data. However, this linkage could be activated only at a later stage of the tool once it aggregates sufficient company data.

Source: Consortium based on websites of respective EU financing instruments and programmes, interviews with stakeholders.

5.7 Sustainability

The key research question for this dimension is as follows: what would help to sustain the tool’s operation and further development costs so it is self-sufficient and remains in the market for the long time? This section explores different options on how the tool could be sustained and focuses around the following two key questions:

- What would be source(s) of income for the tool?
- Are there any non-financial measures to ensure sustainability of the tool?

5.7.1 Sources of income for the tool

One of the lessons we have learned from case studies is that only tools with regular income (either from user fees or secured stable government funding) are sustainable over the long term. With no stable sources of income, the tool will quickly cease to be viable.

The question is what sources of income could be possible for the tool? We come up with the following three options in ensuring funding for the tool:

- **Option #1 – free tool with alternative source of income.** SMEs are not likely to pay not because they do not have money, but because of their mindset (e.g., understandable scepticism towards anything that is paid and/ or what does not quickly provide the expected value). Therefore, the strategy would be to offer the tool free of charge to users and use alternative streams of income to sustain the tool including both internal and external sources of income (see table 29 below).
- **Option #2 – gradual move from a free to freemium version with possible alternative sources of income.** Builds on option 1 for one or more years depending on take-up and stability of income from alternative sources. Once the tool accumulates certain user base during the first or more years (depending on above identified factors) it may be reasonable to update the tool splitting it into at least two modules or Tiers (e.g., Tier 1 with transactional or day-to-day support and Tier 2 with transformational or complex support including services from intermediaries, for details see section on target groups). Tier 1 could still be offered for free, while Tier 2 could be a paid version of the tool providing larger array of additional support including financial and HR consultations. SMEs. Logic of this step – once user experienced the tool for the first (or more) year it may start to see the value in paying to carry on. At least two Tiers as some SMEs of particular size (e.g., micro and small companies) and/ or in particular region (e.g., Eastern Europe) will still be more hesitant to pay for additional services they may not need and/ or value.
- **Option #3 – freemium tool with or without alternative sources of income.** Separate option offering above-outlined Tier 1 and Tier 2 services right away without any phase out from completely free version. Types of user fees depend on complexity of the solution: in case of light version (i.e. assessment-based knowledge bank indicated in section 5.8 below) it could perhaps take a form of a lump sum or one-off licence fee, while in case of more complex version (i.e. platform, see the same section) it could be based on a monthly fee that would be charged per employee or company size. User fee is an additional and important piece of friction in making the tool sustainable. So the strategy of having a paid version of the tool needs to be very well weighted. To minimise risk initial cost of the paid version of the tool should have to be very low not to discourage users. The balance, at least for the beginning once the tool accumulates user base, should be taken from alternative ways of funding.

Table 29. Sources of internal and external income for the tool

Sources of income	Advantage(s)	Disadvantage(s)
Internal		

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<p>User fees For Tier 2 services – either lump sum (light version) or monthly subscription possibly per employee or company size category (platform version)</p>	<ul style="list-style-type: none"> • Stable and potentially significant income source • Useful data source to monitor usage trends 	<ul style="list-style-type: none"> • An additional and important piece of friction in making the tool sustainable as fee could discourage both existing and new users • Cannot be set uniformly for all users what complicates management • Requires active sales
<p>Fees from intermediaries (e.g., financial) for accessing potential clients, for systemic skills management data to improve risk-assessment</p>	<ul style="list-style-type: none"> • Potentially high influx of income • Could be exchanged for in-kind support (e.g., marketing or advisory) 	<ul style="list-style-type: none"> • Will flow in only in the long-run when tool will prove useful for SMEs using financial intermediary services
<p>Fees from tool providers for an being listed in the platform for wide group of users</p>	<ul style="list-style-type: none"> • Potentially high influx of income 	<ul style="list-style-type: none"> • Only feasible if tool eventually becomes platform, options 2 or 3)
<p>Income from ads within the tool (e.g., of financial intermediaries offering their services, tool providers, advisors)</p>	<ul style="list-style-type: none"> • Passive source of income 	<ul style="list-style-type: none"> • Unfeasible to expect high influx of income from this source until tool accumulates critical mass of users
External		
<p>Grants from EU (e.g., the ESF, Erasmus+, H2020, other InvestEU grants)</p>	<ul style="list-style-type: none"> • Work well for a limited and pre-defined time. Primarily for launching of the tool • One-off, but possibly high influx of € 	<ul style="list-style-type: none"> • Unlikely source for stable long-term financing • Comes with administrative burden
<p>Private investors (e.g., angel investors, accelerators, venture capital, crowdfunding)</p>	<ul style="list-style-type: none"> • Helps for marketing the tool (e.g., extra reassurance for future users) • One-off, but sufficient funding to finance the tool for longer term 	<ul style="list-style-type: none"> • Investors might not be willing to commit on a continuous, long-term basis • Requires very active sales • Comes with high expectations for ROI and loss of independence in decisions
<p>Sources of income</p>	<ul style="list-style-type: none"> • Advantage(s) 	<ul style="list-style-type: none"> • Disadvantage(s)

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Internal	•	•
User fees For Tier 2 services – either lump sum (light version) or monthly subscription possibly per employee or company size category (platform version)	<ul style="list-style-type: none"> • Stable and potentially significant income source • Useful data source to monitor usage trends 	<ul style="list-style-type: none"> • An additional and important piece of friction in making the tool sustainable as fee could discourage both existing and new users • Cannot be set uniformly for all users what complicates management • Requires active sales

Source: Consortium

An effective sustainability strategy should aim to minimise costs and maximise income. In addition to the above-mentioned ways (e.g., in-kind support) costs can be cut to minimum by employing largely self-sustainable elements such as online communities and depositories or detailed manuals and walk-through guides instead of expensive human support. Meanwhile income should be maximised not only by intensively exploiting one of the above indicated and any extra income source, but actively seeking combination of internal and external sources of income. Benefits of multiple sources of income would help to ensure greater stability and faster upscaling of the tool.

Exploiting multiple sources of income very much depend not only on entrepreneurship of the tool owners/ managers, but even more on active salespeople behind the tool. Active sales can be important in a number of ways:

- Active sales approach would be particularly needed at the beginning when tool has to accumulate critical mass of users to become more useful.
- It is inevitable if either option 2 or option 3, outlined above, are introduced containing freemium business model. Salespeople will have to explain benefits of the tool and convince companies to try the tool.
- Last, but not least salespeople could be needed in attracting external sources of income (esp. venture capital and other sources of private investment).

5.7.2 Non-financial measures to ensure sustainability of the tool

Sustainability is not only about numbers in the bank account (direct income). It is also about indirect ways to increase income by strengthening the brand, building evidence-base, concluding partnerships. Possible ways of non-financial measures to ensure tool's sustainability include:

- **Public-private partnership.** As mentioned in the earlier (deployment) section ‘public’ side of the partnership could cover the initial deployment costs of the tool. However, for the tool to be viable for a long time it needs a very dynamic and proactive, thus ‘private’, side of the partnership. The more complex the tool is created or the more complex it becomes the more significant role should be of private organisation managing the tool. One option would be to grant rights to manage the tool to a private entity for a fixed period of time through concession agreement. This would be especially needed in case of no or limited public funding for the tool. Otherwise, the tool risks to quickly fade out similarly as many other tools funded by EU grants or other public funding once this main source of income has vanished.
- **Building evidence-base by using academic dimension.** The tool will try to sell services the outcomes of which will not be crystal clear and numerical. The tool’s data in aggregated form could be used in research projects to provide more and better evidence on individual, company and societal outcomes of skills management improvements. This would help to strengthen the evidence base of the tool and this way reassure higher numbers of potential users.

Long-term marketing strategy. The tool could build and sustain its social image. For example, following the assessment, users excelling in skills management could receive a digital badge as a positive indicator to strengthen their competitiveness on the market. This way, the tool could create a brand signalling skills management excellence among SMEs in the market. Another example of building long-term strategy would be long-term partnership with some high standing organisation (e.g., scientific, financial) that would help to promote the tool. This could also help to reassure potential users regarding value of the tool.

5.8 Options

This subsection provides a general overview of combination of features and elements, which we call options, on which the tool could focus on. However, before describing these different combinations it is crucial to mention features and elements of the tool that, inconsequently from the selected option, should be included in the tool. That is, there are some universal aspects of the tool that inconsequently of specifics cannot be omitted. For each dimension discussed prior, we have identified a number of these “universal” features and / or elements that are highlighted in the table below, while a more in-depth discussion on all of them can be found in in section 5. *Tool dimensions.*

Table 30. Necessary features / elements of the tool by dimensions

Dimension	Features / elements	Justification
Target groups	The tool should focus on SMEs	As the focus of the study is SMEs, the main beneficiaries of the tool should be them, even if it will be decided that the tool could provide services to all companies. Other companies could still use the tool although they would not be seen as main beneficiaries.

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	The tool should provide flexible and tailored support to target groups	SMEs have very divergent needs with regard to SM based on their size and, more importantly, growth stage (see section 2.1.1). Because of that, different SMEs should receive different support: <i>ad hoc</i> transactional or day-to-day support services; and transformative or more extensive and complex support services accompanied by financial, advisory and other support from intermediaries for implementation of skills management changes.
	In the beginning the tool should be universal in terms of sectoral and geographical coverage (European, cross-sectoral and demand-driven)	Companies across all sectors need to be(come) learning organisations, learn from each other, and improve. Tool should build on features that are common across countries. It should enable international good practice sharing that is crucial for SMEs that are mobile and export-driven. In the long run it may make sense to adapt the tool to different sectors and/ or countries.
	The tool should first be targeted at company management (owners-managers and/ or authorised personnel such as HR Manager)	Company management makes (or has influence on) decisions in the area of skills management and thus need advice the most. They tend to have more comprehensive picture of the company and its employees. Lastly, skills management should happen where the business strategy is formed, so that both are closely aligned. Eventually, when expanding the tool, it may make sense to also target line/shift/ production managers or even employees.
Aims	It should inform SMEs about good skills management practices	Though each discussed aim is unique and could be implemented separately, we believe that the tool should, at the very least, have a goal to inform SMEs about good skills management practices. However, how this is carried out would heavily depend on other selected aims. If this is the singular aim, informing SMEs should receive a lot of attention. Alternatively, in the case of, for example, creating a social network, the tool could only contain some information on good practices, as this knowledge would predominantly be shared between SMEs.
Content	At the very least the tool should contain a questionnaire on company characteristics, business needs, and skills management	In order to provide benchmarking, benchlearning, help SMEs to receive funding, and / or match different companies (those excelling and those eager to improve in the area of skills management), it is crucial to gauge (or diagnose) the situation in the company.
Operation and usability	From the backend the tool should be secure and be regularly updated.	Security is a huge concern for many users, and hence the tool should cover this in order to ensure that no data will be leaked. Regular updates is also a crucial aspect of the tool as SMEs are highly volatile and always evolving. Hence, the tool should evolve with them.
	From the frontend the tool should be user friendly and easy to use, as well as have an ability to receive user feedback	All the data sources that were analysed in the study highlighted the importance of the tool being accessible and simple to use. To achieve this a variety of approaches could be used, such as, making the tool modular, goal tracking, allowing the users to export results. User feedback, especially regarding new / emerging solutions, is also crucial for the tool as this will help the tool to grow and provide more targeted and tailored recommendations.
Deployment	Marketing of the tool should combine	Effective deployment should combine different marketing approaches to exploit their advantages and neutralise weaknesses.

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	direct, indirect and conditional marketing approaches	
	Marketing should focus on SMEs with up to 50 employees	Targeted actions are crucial, otherwise the tool will essentially benefit those that are already aware of and invest a lot in SM. Micro and small SMEs mostly need transactional or day-to-day support, are often inactive/ less active and more often unaware/ sceptical of SM issues and thus more difficult to reach and engage.
	Marketing should significantly use partner support to exploit various local access points	Tool should extensively use local intermediaries representing SME interests (e.g., Chambers of commerce, employer associations) who have access to extensive local networks of SMEs and their trust could effectively promote the tool.
	Marketing of the tool should emphasise its very concrete benefits	Marketing should, most importantly, focus on and be very clear about “value for money and time” that users are about to get from the tool. As one stakeholder put it, marketing should demonstrate evidence-based rationale behind its questions and actionable results rather than “a fat glossy document that SMEs will not have the time nor patience to wade through”.
	To ensure higher take-up the tool should be closely linked with other EU financing instruments and programmes and translated	Link with other EU financing instruments and programmes could help to more widely promote the tool and increase its attractiveness to potential users. Translation would help to reach non-English speakers further boosting an array of potential users of the tool.
Sustainability	Tool needs multiple sources of income to be sustainable in the long term	Perhaps most feasible approach would be to offer transactional or day-to-day support for free, while transformational or complex, accompanied by intermediary support, would be part of a paid premium version of the tool. In addition to user fee tool also has to consider additional internal and external sources of income.

Source: Consortium based on earlier Task 2 sections of the report

In addition, before deciding on the options it is also important to consider several aspects on the feasibility of the tool:

1. We should be realistic regarding what is possible with the available time and financial resources. After reflecting on tool’s feasibility across key dimensions we consider the most feasible approach to be assessment-based information brokerage option. In other words, it is most feasible for the tool to take a form of diagnosis of skills management situation in companies followed by some general guidelines or good practices rather than creation of a specific solution (e.g., solution to address recruitment challenges in SMEs).
2. The tool should accommodate both very straightforward and simple version and a more complex one. Interviewed SME representatives and stakeholders emphasized numerous times the importance of the tool being very simple and easy to use. Thus, one option would be to first deploy the tool as a light solution quickly demonstrating its benefits to users. In time, after securing decent user database and sufficient dataset to determine user

preferences, the tool could take a more complex form (e.g., varied types of services and functionalities with much higher role of intermediaries). However, it still should allow users to select the simple module if they do not require a complex solution. Alternatively, right from the start, the tool could be deployed in two versions – light and more complex. The latter version of the tool could be used by companies keen in transformative services (e.g., financial and other support) without high initial expectations for benchmarking.

3. The tool should move from universal to specific focus, i.e., from all SM stages to higher focus on particular stage, from European and cross-sectoral to country- and sector-specific content, from universal services to flexible types of services. The major reason for this principle is the already mentioned user preferences – the tool needs to accumulate critical mass of data to determine reasonable path for fine-tuning its approach. Otherwise, being specific, tool might fail at deployment stage as it may not pass the initial hurdle of accumulating enough user data to be more useful for users.

The above aspects are summarised in a simplified table that also embodies key groups of options proposed for the tool. The latter are elaborated in table 31 below.

Table 31. Options for the tool in terms of its complexity and specificity

Specificity/ Complexity	Universal	Specific
Simple	(1) Assessment-based knowledge bank for particular group of SMEs	
Complex	(2) Universal platform with Types or Tiers of services incl. support of intermediaries	(3) Platform with specific content focused, based on user preferences, on e.g., country- and/ or sector-specific content

Source: Consortium.

During desk research, interviews, and case study analysis we have identified several options that the tool could take. They are outlined in the table below. However, it has to be noted that the table is not exhaustive as only the most important features and elements of each option are mentioned. In addition, the table provides only a very general overview of features and elements without going into depth in any of them.

We tend to see these options not as alternatives to choose from in this particular moment, but more as stages of possible evolution of the tool, starting from very simple approach and moving, in case of success, to a more complex and specific SM services solution.

Table 32. Elaboration of options for the tool by key dimensions

No.	Options	Explanation	Target groups	Aims	Content	Operation & usability	Deployment	Sustainability
1A	“Knowledge bank” + optional simple diagnostics for SMEs at the early stages of development	<ul style="list-style-type: none"> The tool would provide, generally or based on an optional quick diagnosis, information to SMEs how to address their business needs using good skills management solutions. However, as the focus here is on SMEs at the early stages of development, solutions should be very simple to implement and they should focus on transactional or day-to-day activities of SMEs (e.g., hiring, health and safety, legal compliance, 	<ul style="list-style-type: none"> Micro and small SMEs at early stages of development 	<ul style="list-style-type: none"> Informs SMEs about good skills management practices Help SMEs to compare (benchmark) themselves to other similar companies 	<ul style="list-style-type: none"> Very simplified benchmarking with only several questions 	<ul style="list-style-type: none"> Data on good practices, tools, and on SMEs Registration possibility Multilingual support Simple insights Graphics Goal tracking Rating system for the good practices and/or tools Exporting results 	<ul style="list-style-type: none"> Well-targeted conditional and esp. indirect partner (e.g., local SME networks like Chambers of Commerce) marketing Carefully selected marketing messages adapted to local contexts Additional measures to raise tool’s appeal (e.g., high-profile promoter of the tool, financial or similar incentives) 	<ul style="list-style-type: none"> No user fees Sustainability to be ensured solely via alternative sources of income and non-financial measures

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		onboarding, disciplinary procedures, skills mapping). No support from intermediaries is included.						
1B	Simple diagnostics + Benchlearning For all SMEs	<ul style="list-style-type: none"> The tool would connect SMEs that could learn from each other in terms of skills management. The matching should connect the most similar SMEs that can help each other. 	<ul style="list-style-type: none"> All SMEs, but with somewhat higher focus on small and medium SMEs at later stages of development (more likely users) 	<ul style="list-style-type: none"> Help to connect SMEs so that they could share good practices and tools (benchlearn) 	<ul style="list-style-type: none"> A simple questionnaire that helps to connect similar SMEs would be enough, though the benchmarking capabilities could also be a valuable addition to this version of the tool. 	<ul style="list-style-type: none"> Registration possibility Data on good practices, tools, and on SMEs Capability diagnostics Referencing SMEs to each other Forum Rating system for the good practices and/or tools 	<ul style="list-style-type: none"> All types of marketing, lower need for targeting Extra support staff 	<ul style="list-style-type: none"> No user fees Sustainability to be ensured solely via alternative sources of income and non-financial measures
1C	Deep diagnostics + optional financial	<ul style="list-style-type: none"> The tool would better enable SMEs to use its skills management 	<ul style="list-style-type: none"> All SMEs, but with somewhat higher focus on small and 	<ul style="list-style-type: none"> Helps SMEs to compare (benchmark) themselves to other 	<ul style="list-style-type: none"> Deep benchmarking in order to assess the situation in 	<ul style="list-style-type: none"> Registration possibility Data on SMEs 	<ul style="list-style-type: none"> All types of marketing, esp. targeted at financial benefits 	<ul style="list-style-type: none"> Freemium model: free for benchmarking low-cost premium for

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	<p>intermediary support</p> <p>for all SMEs</p>	<p>strategy as an additional risk-lowering factor for acquiring funding at better terms. It would also help financial intermediaries to improve their SME credit assessment skills so as to be in a better position to price the credit risks for SMEs as well as to better assess their credits.</p>	<p>medium SMEs at later stages of development (more likely users)</p>	<p>similar companies</p> <ul style="list-style-type: none"> • May help SMEs to receive financial support for skills management activities 	<p>the SME, to be used for self-learning and, optionally, for obtaining funds from financial intermediaries</p>	<ul style="list-style-type: none"> • Optional financial intermediary services 	<ul style="list-style-type: none"> • Numerous and very well throughout links to financing intermediaries • Extra support staff incl. active sales 	<p>financial intermediary support</p> <ul style="list-style-type: none"> • Alternative sources of income (e.g., intermediary fees) and non financial measures
<p>1D</p>	<p>Transformative diagnostics + optional financial intermediary support and benchlearning</p> <p>for SMEs at the later stages of development</p>	<ul style="list-style-type: none"> • Combines options 1B and 1C, but with more complex diagnosis with more complex or transformative solutions proposed, which might have an effect after some time (e.g., reforming performance 	<ul style="list-style-type: none"> • Small and medium SMEs at later stages of development 	<ul style="list-style-type: none"> • Same as above plus: • Helps to connect SMEs so that they could share good practices and tools (benchlearn) 	<ul style="list-style-type: none"> • Deep benchmarking with additional questions for transformative support • Benchlearning including both simple and complex ways to implement solutions (i.e. good 	<ul style="list-style-type: none"> • Same as option 1B and 1C above plus: • Actionable insights with reports • Search functionality 	<ul style="list-style-type: none"> • All types of marketing, lower need for targeting • Very clear value for money incl. demo/ taster version • Numerous and very well throughout links to 	<ul style="list-style-type: none"> • Freemium model: free for benchmarking low-cost premium for benchlearning and financial intermediary support • Sustainability strengthened with the help of alternative

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		management practices, developing training and development schemes, refining training management). Includes optional financial intermediary support and benchlearning.			practices and tools that will bring benefits after some time, such as skill development initiatives) based on benchmarking		financing intermediaries	sources of income and non-financial measures
2A	Universal tool with flexible support	<ul style="list-style-type: none"> The tool that combines options 1A with options 1B, 1C and/ or 1D 	<ul style="list-style-type: none"> Freemium (free and few paid versions) 	•	•	•	•	•
2B	Universal tool with flexible and more extensive support including Financial and other intermediary services +	<ul style="list-style-type: none"> The platform would have functionalities of earlier options incl. benchmarking, benchlearning and financial intermediary support. In addition, it will 	<ul style="list-style-type: none"> All types of SMEs with somewhat higher focus on small and medium SMEs at later stages of development 	<ul style="list-style-type: none"> Same as above plus: Helps SMEs to receive other intermediary support services including HR advisory, training 	<ul style="list-style-type: none"> Deep benchmarking with additional questions for transformative support Benchlearning including both simple and complex ways to implement 	<ul style="list-style-type: none"> Internal database of SME-specific SM tools Pool of intermediary services Registration possibility 	<ul style="list-style-type: none"> Much more extensive deployment: beta and other versions, multiple marketing approaches and channels, 	<ul style="list-style-type: none"> Freemium model: free and several premium (paid) version depending on selected services Multiple alternative sources of

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	<p>Internalised access to skills management tools</p> <p>(„Skills Management platform“)</p>	<p>have two extra modules:</p> <ul style="list-style-type: none"> • Other intermediary services. Some SMEs may not (only) need financial, but also other type of support including HR advisory, training support and similar services. Services may be used for optimising SM strategies, choosing the right set of solutions, solving complex SM issues, etc. • Internal database of SME-specific SM tools. Option 2A provides, based on diagnosis, recommendations for possible SM tools, but no access to them. 	<p>(more likely users)</p>	<p>support and similar services</p> <ul style="list-style-type: none"> • Simplifies SME access to relevant SM solutions, allows to experiment and choose the best solution or set of solutions 	<p>solutions (i.e. good practices and tools that will bring benefits after some time, such as skill development initiatives) based on benchmarking</p>	<ul style="list-style-type: none"> • Capability diagnostics • Referencing SMEs to each other • Forum • Referencing SMEs to intermediaries based on chosen type of support services • 	<p>lots of support staff</p> <ul style="list-style-type: none"> • Numerous and very well though through links to financing, advisory and other possibilities for users • Extensive support staff for sales and maintenance • Integration with SM tools 	<p>internal (e.g., intermediary and tool provider fees) and external income and non-financial measures</p>
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		<p>This option would internalise SME-specific SM solutions and users would be able to access them within a platform instead of directly contacting their providers. It would be based on a business model similar to Netflix™ where users could select and try any SME-specific tool for a fixed monthly fee.</p>						
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Source: Consortium

Annexes

1. An extensive overview of good practices

This section provides an extensive overview of good skills management practises that we have identified in the academic literature. This includes both the explanation of the good practices, indications how they could be implemented in SMEs, and what benefits the identified good practice can bring to them. The section is divided into four subsections, each of which is focused on a particular type of skills management: (i) **analysis and planning (a.k.a. skills assessment)**, (ii) **skills development**, (iii) **skills utilisation**, and (iv) **complex skills management practices**.

1.1 Analysis and planning (a.k.a. skills assessment)

Analysis and planning refer to the skills management activities aimed at identifying skills that employees currently have and skills that are most needed considering short-, medium-, and long-term business strategies. Skills assessment also refers to activities of evaluating skills of potential employees during the recruitment process. We have identified six main good practices in this area: (i) **technology-based skills assessment**, (ii) **skills benchmarking**, (iii) **skills benchlearning**, (iv) **multidimensional skills assessment**, (v) **problem-solving tests** (vi) **skills matrices**, and (vii) **360-degree analysis**. The subsection first elaborates on the first solution (technology-based skills assessment), which is a complex and multidimensional approach to skills assessment. Then it provides an overview of other solutions, which often are parts of the technology-based skills assessment. The subsection concludes with a short overview of main takeaways from good skills assessment practices.

First, with the increasingly digitalising economic environment **technology-based skills assessment** began to play a more important role in both assessing and hiring employees. Technology-based skills assessment methods imply using software that helps companies to identify the employee's / candidate's main strengths and skills gaps in a semi-automated way (BmBF, 2015; Flake et al., 2019).

As the cross-case analysis of solutions and tools demonstrated in section 1.5. *Cross-case analysis of selected tools*, such software relies on online test scores and CV parsing, among other techniques. CV parsing is a method of automated CV data extraction and storage that uses keyword-search and template scanning methods to identify suitable candidates for the position (Zu and Wang, 2019). Moreover, data used by technology-based skills assessment tools can also be utilised in automated employee-task matching (see the *Skills utilisation* subsection in the Annex for more details). Hence, implementing this solution could help SMEs to better understand their employees and the market, cut down administrative costs, and provide a platform for an effective monitoring of employees needs for up and re-skilling.

However, implementation of technology-based skills assessment tools might be a big challenge for certain SMEs. First, while there are some free options on the market (e.g., see *Mapping of skills management solutions* in the Annex), a large majority of the existing technology-based skills assessment tools are not. This is a major issue for SMEs as many of them have very limited resources (Bootz et al., 2011; Ndjambou and Sassine, 2014; Bernier et al., 2017). And second, to adequately use these solutions companies will also have to invest time, and potentially money, to train their employees on how to use the tool (BmBF, 2015). Hence, often, SMEs might decide to implement a more targeted solution, which are discussed through the remainder of the subsection.

Second, **skills benchmarking** is a practice of comparing the individual's skills to the standards pre-set by the company. It helps to evaluate specific skills on an individual level, identify individual's skill gaps, need, and constraints for further skill development (Abraham et al., 2011; Defelix and Retour, 2003; Fabi et al., 2004; Delobbe, 2014; Charles-Pauvers and Schieb-Bienfait, 2010). For example, a company might set a particular English level as a benchmark for a particular task (e.g., translation, interviews), and only allow employees that reach it to do this task, ensuring quality of the results. In addition to evaluating employees, skills benchmarking can be also used during hiring to compare different candidates (Bakkali et al., 2010; Largier, 2008; Parlier, 2005; Defelix and Retour, 2003).

Third, a related practice of **skills benchlearning** is a practice that creates an integrated link between benchmarking and mutual learning (EC, 2017). Internally, SMEs can organise mutual learning more efficiently, having identified the employees that receive good results in benchmarking evaluations. Those employees can then be encouraged to share their knowledge with other colleagues and contribute to the company's skills development strategy. Externally, SMEs can also apply benchlearning in two stages. First, a company maps the most successful businesses in its industry. Then, based on the mapping results, it identifies their best practices that can be adopted and implemented with the purpose to improve the SME's own performance (Freytag and Hollensen, 2001).

Fourth, both skills benchmarking and benchlearning could be further developed by combining them with **multidimensional skills assessment**. It refers to assessments where in addition to assessing very industry relevant skills soft skills are also evaluated (e.g., critical thinking, teamwork, social skills). Soft skills are relevant as Solesvik and Westhead (2019) argue that universal competencies (e.g., communication) help with teamwork, while non-cognitive competencies (e.g., memory, planning) are important in day-to-day organisation of work. Many SMEs agree with those arguments, often citing the lack of soft-skills in their employees as an issue they face (EC, 2010; Cedefop, 2013; P2C, 2019). This issue is also not only prevalent in sectors with a lot of interpersonal communication, as many software developing companies also often cite the lack of soft skills (e.g., communication, teamwork) as a pressing issue (Ahmed et al, 2012).

Fifth, though skills could be estimated directly through surveys and other means, often it is also useful to evaluate the skill level through **problem-solving tests**. Such tests

provide different tasks for employees and depending on how well they do on them they are assigned a particular skill level in different fields. However, though problem solving tests could be used in a way that was described, they are predominantly used during recruitment (Adab, 2000). The main positive of this good practice is that it is relatively easy to implement. However, as many SMEs have lack of knowledge how to do so, many of them still opt-out from using it.

Sixth, while problem-solving tests help SMEs to assess skills of individual employees, a **skills matrix** represents a powerful skills visualisation tool for the whole team. Skills matrix is a spreadsheet tool that displays people's proficiency in certain skills, as well as their interest in working on assignments using those skills. It allows to keep track of their abilities and competences at departmental or company level. A skills matrix can also help to identify critical tasks quickly because of the visualisation opportunity it provides for HR personnel and managers (McGee, 2019). Normally, such matrices have to contain data on staff requirements as well as quantified assessments of their skills. They are relatively easy to draft and do not require any financial investment. However, skills matrixes are manual data-driven tools and, hence, require constant updates. Moreover, they are not well-suited for medium-sized enterprises with larger numbers of employees because the tracking process become too complex (Ibid).

Seventh, alternatively to skills matrixes or direct assessment by managers, assessment could also be carried out using a **360-degree assessment** approach. It is an assessment approach where both the employee and their manager / their colleagues assess the employee's skills (Pettersen and St-Pierre, 2009; Brasseur et al., 2012). Using this combination helps to evaluate skill gaps as well as gaps between managers' and employees' perceptions of skills (EC, 2018; Atkinson et al., 2017). This approach is often combined with technological based assessment to produce graphics (e.g., radar charts, bar plots, pie charts) that help the company visualise the results. However, as this solution requires a dedicated software, its implementation normally implies relatively high costs (buying the software and training employees). This might prevent SMEs from implementing this approach.

Text box 13. Main takeaways from good practices on assessment and planning

- The recommendation of good practices, including skills assessment, should take into account the firm's size, as micro and small companies often do not have enough resources to implement complex solutions, while simple solutions would not provide a lot of value for larger firms.
- To make the assessment process more robust, it should use both benchmarking and benchlearning when comparing individuals (e.g., years of experience, test scores, colleague's assessment).

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- The assessment process should be automated as much as possible due to very limited resources in many SMEs.
 - To make the skills assessment process more balanced, some SMEs could use 360-degree assessment if they have spare financial resources. Such assessment tools and methods should utilise both internal (self-assessments) and external data sources (managerial reviews, team reviews).
 - The assessment process as well as the company's SM strategy should not concentrate only on industry-related skills but rather be multidimensional (e.g., also focus on non-cognitive or universal competencies). While soft skills are often overlooked, their improvement can bring real positive and tangible benefits to SMEs.

1.2 Skills development

Skills development refers to up- and re-skilling activities in companies, such as training, mentoring, learning-by-doing, etc. In the literature we have identified two different types of skills development: internal and external. Internal refers to skills development activities that SMEs could implement by changing something inside their company. External refers to activities that are external to SMEs, but which can help them with skills development if they participate in them. The remainder of the subsection goes in depth on both of these types of skills development good practices.

Internal skills development

We have identified eleven main good practices that SMEs could implement internally: (i) **in-house training**, (ii) **e-learning platforms**, (iii) **blended learning**, (iv) **mentorship and competence tandems**, (v) **job rotation**, (vi) **ordering knowledge**, (vii), **internal course repositories**, (viii) **flexible training organisation**, (ix) **green skills training**, (x) **soft skills training**, and (xi) **digital skills training**. These skills development practices could be also subdivided into three broad groups: learning, organisation of learning, content. The first five good practices could be assigned to the first group, as they focus on activities that are directly related to learning and training. The next three mostly focus on how to improve the training process through different organisational questions, such as how to make them more flexible, easier to access to new employees, etc. The last three activities refer to the content that is often overlooked by SMEs but which is very important. This includes green, soft, and digital skills training. We exclude hard skills as majority of training activities in SMEs already focus on them.

When deciding on how to train their employees, companies have a variety of different options to choose from. First, they could **organise in-house training**, which refers to

courses organised inside of the company. This type of training can be both constant or need based. The first type is most relevant for companies who frequently hire new employees and hence have a constant need for training (Thompson, 2019). The second type refers to internal training that is organised when a need arises, such as when a new technology, product, or technique is introduced in a company (EMPL, *forthcoming*). Both types of training could be organised by employees and / or some external experts. However, this type of training also entails quite large expenses, as it requires a lot of time from the company to prepare the training curriculum, which often prevents smaller SMEs from using this good practice.

Second, alternatively, SMEs could use **e-learning platforms** to meet their training needs. This approach to training, unlike the more classical ones, allows SMEs to save time and finances as they do not need to prepare the courses themselves (EMPL, *forthcoming*). It could also be of higher quality as a majority of **e-learning** courses presented online are prepared by professionals with educational experience. However, as this type of training is not prepared internally, some SMEs might struggle to find a course that meets their needs. Moreover, as several SME managers mentioned during interviews that often “googling” their problems takes a lot of time and is often fruitless, and this might be a severe issue for them.

Though this problem can be partially addressed with, third, a **blended learning** option, which represents a combination of in-house training and E-learning. By using this approach, the advantages of both options could be combined. With the E-learning aspect companies could save time and money on preparing the training programmes, while from in-house training employees could receive personalised training, where they have an ability to ask questions (Brunn, 2018). Though, this approach is not without its drawbacks as the in-house coach has to spend their time preparing, and though the issue of finding an appropriate E-learning course is diminished, it does not disappear completely.

Because of that many companies and SMEs use the fourth training options – **mentorship and competence tandems**. This type of knowledge sharing is informal and can be organised within the company by pairing employees on task where they can learn from each other (Kauffeld and Frerich, 2018). The appeal of this approach is that the training is conducted indirectly through work and communication between and employee(s) and a mentor, which saves time. Though, to reach the maximum potential, this approach should also include aspects of *ad hoc* coaching on relevant questions and problems. With digitalisation, this approach also evolved as many companies use the so-called digital or instant mentorship, where people can consult each other (or the entire) team immediately in the work chat (Lipscomb, 2010).

However, mentorship and competence tandems is not without its drawbacks. First, its informal nature also means that often only knowledge that is relevant to the problem at hand is conveyed. This, in turn, could lead employees learning only how to solve a problem at hand rather than get general knowledge about how to solve similar problems. Second, as this approach requires the mentor to use their time to explain and help the mentee it could be very time consuming, depending on the mentor and employee.

Finally, even though the mentor is almost always an expert, or at least is knowledgeable, in their field, he/she rarely has training on how to educate in the most efficient fashion. This, in turn, could lead to a relatively inefficient sharing of information between participants.

Similarly to mentorship another flexible solution is, five, **job rotation**. By rotating jobs this companies ensure better knowledge transfer, which leads to a continuous learning process (EMPL, *forthcoming*). This can be done on a set bases or *ad hoc* after finalising a project. It can also be implemented manually or using some succession planning tools (e.g., Cornerstone Succession planning, Rexx Systems Succession planning). While this approach is relatively cheap in terms of time and finances, it has a major drawback of decreased productivity as employees need to spend time learning how to do a new job. Though this issue often is mitigated with time as employees become comfortable with their new tasks.

In addition to different learning and training initiatives SMEs could also implement a variety of approaches to ease or improve the training process itself. First, they could try **ordering knowledge**, which refers to structuring online courses in such a way so that later they can be used as systemised training material (Brunn, 2018). To simplify this process SMEs could use *course constructors* which orders knowledge in a semi-automatic way (e.g., iSpringSolutions, RexxSystems, UniCraft). Main benefit of this approach is that though this practice might be time-consuming, it helps SMEs to significantly cut down on training costs later. This is because SMEs can reuse the training material they developed on a regular basis (Brunn, 2018). However, as it requires a large initial investment of time (to find courses, to order them, to extract most relevant information) and the benefit of this approach is only seen after some time, some SMEs, which are more concerned about the day-to-day business, might lack motivation or resources to implement this practice.

This, second, could be easily combined with another good practice – **internal courses repositories**. This is a practice of storing own pre-recorded courses and / or training material for the future use. Main appeal of this good practice is that it does not require a lot of time or financial resources, and it can also save time and money on (re)training employees (EMPL, *forthcoming*). This good practice could be carried out manually, by uploading the resource to the company's own repository, or automatically, by using one of the tools available on the market (e.g., CourseLab, rexx systems, EasyLearn).

Finally, another approach to improve the learning process is to have **flexible training**. Drafting training programmes in a way that shows diversity of forms and scheduling helps SMEs to be more flexible, which helps to solve the time constraint problem many SMEs face (Polish Sociology Society, 2009; Stone, 2010). More practically, training could be divided into several smaller modules that are spread over a relatively long period of time, which makes it more comfortable both for the employees and their managers (Polish Sociology Society, 2009; Stone, 2010). It is also a quite appealing option for smaller SMEs as it does not require major time or financial resources.

In addition to the above, there are also several important knowledge areas that are ignored by many SMEs, but which should not be. First, **green skills training** is becoming increasingly important with the rise of sustainable development concerns throughout the world (EC, 2011; Lesinger, 2015; Commission, 2020). Here we follow the Cedefop (2012, p. 20) definition of green skills as ‘the knowledge, abilities, values and attitudes needed to live in, develop and support a society which reduces the impact of human activity on the environment’. Green skills training includes such key areas as assessment of sustainable energy use, awareness of key environmental standards, and technical knowledge of environmentally friendly technologies among others (Cedefop, 2012).

However, some SMEs could see this as a burden rather than a goal to strive for, even though sustainable development has several financial benefits that should not be ignored. First and foremost, SMEs can tap into growing market demand for green products and increase their market share or capture new markets (OECD, 2018). Second, SMEs can generate efficiency gains from greening and reduce their long-term costs (OECD, 2018). Third, contributing to green and sustainable economy can get financial and administrative support from the EU (EC, 2020a). However, even with these benefits, many SMEs ignore green skills due to financial and time constraints, or some preconceptions on the value added of green skills.

Second, similarly to green skills, **digital skills training** in recent years have become increasingly important with the digitalisation of the world (BWMi, 2016). We define digital skills, following Bitkom (2018) as the skills to use digital and communication solutions to access and manage information in a more effective manner. Hence, improving the digital skills level of employees could lead to large increases in individual efficiency and productivity, which, in turn, would result in the growth in productivity and in turn revenue of the company as a whole.

Though one major downside of digital skills training is that, unlike many other skills, the development of digital skills often requires more formalised training solutions (ITU, 2018). That is, informal knowledge-sharing practices may not be as helpful when an employee has to learn a digital skill (e.g., programming). Because of this, digital skills development in many cases is much more resource intensive than many other skills development practices, which might discourage SMEs with limited resources from implementing it.

Finally, there is also a need in many SMEs for **soft skills training**, as was discussed in the *An extensive overview of business needs* subsection in the Annex. Namely, many SME representatives cited the lack of soft skills in their employees as one of the major issues they face (EC, 2010; Cedefop, 2013; P2C, 2019). Though, not all SMEs identify this lack as a problem, which might lead to it being ignored. While not all SMEs agree that it is an issue, due to the flexible nature of soft skills, they can be taught using relatively flexible training strategies, such as mentorship or competence tandems. Some even argue that these skills should only be taught using such strategies as the general

(both in scope and content) nature of helping SME employees to develop a more comfortable working environment in the company (McGarry, 2020).

External skills development

In addition to internal skills development options, we have also identified three broad external activities. These include: (i) **informal skills certification**, (ii) **business incubators (accelerators) and external support programmes**, and (iii) **synergies with education and training institutions**. Though these activities are not something SMEs could implement on their own, these practices still could help SMEs with their skills development needs if they take part in them.

When it comes to internal training, especially learning-by-doing or mentorship programmes, employees often have difficulty proving (e.g., to new employers) that they have acquired any skills from learning-by-doing (Langier, 2008; OECD, 2013; OECD and ILO, 2017; Boxall et al., 2019). Hence, in recent years, **informal skills certification** has started to gain popularity as a means to bridge this issue. An example of a solution that provides such certification is the European DigComp framework, which allows to demonstrate digital competencies of employees (EC, 2020). Even though this good practice does not directly help companies, it could motivate its employees to spend more time in training, which, could improve the productivity. According to the OECD (2013) survey, its merit is that such a system not only helps to verify but also encourages informal skills development.

In addition, SMEs could **cooperate with business incubators and accelerators** in order to receive funding and knowledge that can be used, apart from other things, to develop the skills of their employees (Stokan, Thompson, and Mahu, 2015; Harper-Anderson and Lewis, 2018). Business incubators here refer to companies or publicly-funded entities that help innovative early-stage SMEs in introducing their products to the market. Cooperation with them, however, is reserved only for early-stage SMEs or start-ups (Stokan, Thompson, and Mahu, 2015). According to empirical research, with their help SMEs can boost their growth rates and ensure entrepreneurial success (Stokan, Thompson, and Mahu, 2015; Harper-Anderson and Lewis, 2017). Currently, SMEs can access both online (e.g., Gro Academy) and offline incubators (e.g., EU EIC).

Finally, SMEs could also **cooperate more with education and training institutions** to help develop 'work-readiness skills' of the students in the local business ecosphere (Zizzo, 2019; Brunn, 2018; Meyer and Brunn, 2016). This can take different forms, but academics agree that apprenticeship systems as they are in Germany/ Sweden/ France are the most viable option (Parlier, 2005; Muehlemann and Wolter, 2014; Meyer and Brunn, 2016; Brunn, 2018). In these countries, students have to enrol into an apprenticeship programme in order to graduate from educational programmes. This way, both the students and companies benefit, as the formal get 'work-readiness skills' while the latter a short-term employee than can become a full-time employee with all the relevant skills.

However, establishing such a network can be relatively difficult for SMEs. First, because SMEs are small, such network would have to be established by a group of SMEs, which entails large cooperation and communication costs. Second, establishing connections with education and training institutions can be time consuming. Finally, if the hired student lacks basic skills, SMEs have to spend more time on training them. Hence, as many SMEs cite lack of time as a large constraint, this option is reserved for the more established SMEs, who have the time and know-how to spare.

These good practices could be further expanded by establishing cooperation that does not simply focus on training needs. Namely, by sharing know-how between companies, training providers, local authorities, etc., SMEs could achieve economies of scale in accessing services (Baassiry, 2019; Atkinson et al., 2017; Stone, 2010), as well as exchange best practices (BWMI, 2007). They also serve as channels for the national authorities and European bodies in their outreach activities (e.g., campaigns to change SMEs' outlook by presenting 'the business case'). Receiving such information as well as going through various consultations often allows SMEs to change or reconsider their attitude towards their existing skills management approach (Stone, 2010). Participating in such platforms does not entail any financial costs but requires investing some time resources.

Text box 14. Main takeaways from skills development

- Before choosing an appropriate skills development approach, SMEs should decide if what needs to be taught can be learned efficiently by using informal training methods (e.g., mentorship, job rotation) or it should be taught using a more formal approach.
- To improve training SMEs should order or save the knowledge and training material they gather so that it can be easily conveyed to future employees.
- Ensuring flexible time management, which does not undermine the company's general work flow, is crucial to successful SM. One way to ensure it is, for example, to organise very short learning modules and spread them over a relatively long period of time.
- Though focus in training is often given to industry specific skills, SMEs should not forget about digital, green, and soft skills, as they can open new market segment for SMEs and also bring a lot of benefits for the company, such as improved productivity, effectiveness.

1.3 Skills utilisation

Skills utilisation refers to activities that aim to put the existing skills into best use, maximising potential of each employee and the enterprise as a whole. In total we have identified four of such practices: (i) **detailed skills-based job descriptions**, (ii) **semi-automated job (employee-task) matching**, (iii) **progress-tracking software for target setting**, and (iv) **open-book management**. The remainder of the subsection goes in each identified practice in depth.

First, using in depth **skills-based job descriptions** could help SMEs to not only improve the recruitment process, but also contribute to more flexibility in internal company mobility and to more precise skills utilisation. To be effective, such descriptions should contain key requirements and functions of performing a certain role within the enterprise and it should be based on a standardised format to automate the assessment process (Bernier et al., 2017). If they are standardised, they can also be integrated with skill-mapping / benchmarking tools and used for employee-task matching or tracking their skill utilisation progress (Largier, 2008; Colin and Grasser, 2014).

Second, to further improve utilisation of skills SMEs could implement a **semi-automated employee-task matching**, which is a technique that allows to assign tasks that employees are best at. The semi-automated nature comes from the fact that the matching is performed by some sort of a tool (e.g., Rexx Systems, IceCube, Empatico). This tool works by analysing the results of previous conducted skills assessment and then it recommends assigning employees to the tasks that match the skills (Delobbe et al., 2014). The link between skills and tasks in this case is made very explicit (e.g., employees with the highest scores on communication and knowledge of German would be sent to a networking event in Berlin). Thus, this approach works best when employees have either a relatively wide range of skills (i.e., they can replace one another) or very specific one (i.e., it is clear who is most capable of performing tasks).

Third, SMEs could also use **progress-tracking software** for target setting to ensure that the company is approaching its goals. In relation to skills utilisation, it can be used to identify how certain skills are used by the company's employees and visualise what skills are needed for performing tasks related to strategic goals (US SBA, 2020). Such software (e.g., Jumpstart, Keencorp) can also send regular reminders on goals to be reached and visualise task implementation progress, which could motivate some employees.

Finally, utilisation can be further boosted by running **open-book management**, which allows employees to have access to all relevant financial information about the company, including data on revenues, profits, cash flows, and expenses. Even though it is not directly related to skills, it can help with skills utilisation as it will show how employee's actions directly affect the company (Aggarwal and Simkins, 2001; Fotsch and Case, 2017). It also helps employees to deepen their understanding of the economics of the business (Fotsch and Case, 2017). However, in order to not leak any sensitive information, it is recommended to use this approach only with high level employees.

Text box 15. Main takeaways from skills utilisation

- Visualisation of goals and skill levels helps SMEs to relate how skills of their employees help them to reach their strategic goals.
- When possible any improvements to skills utilisation should be automated as many SMEs operate under severe time constraints.
- When it comes to skill utilisation, an important aspect that should be always consider is team motivations.

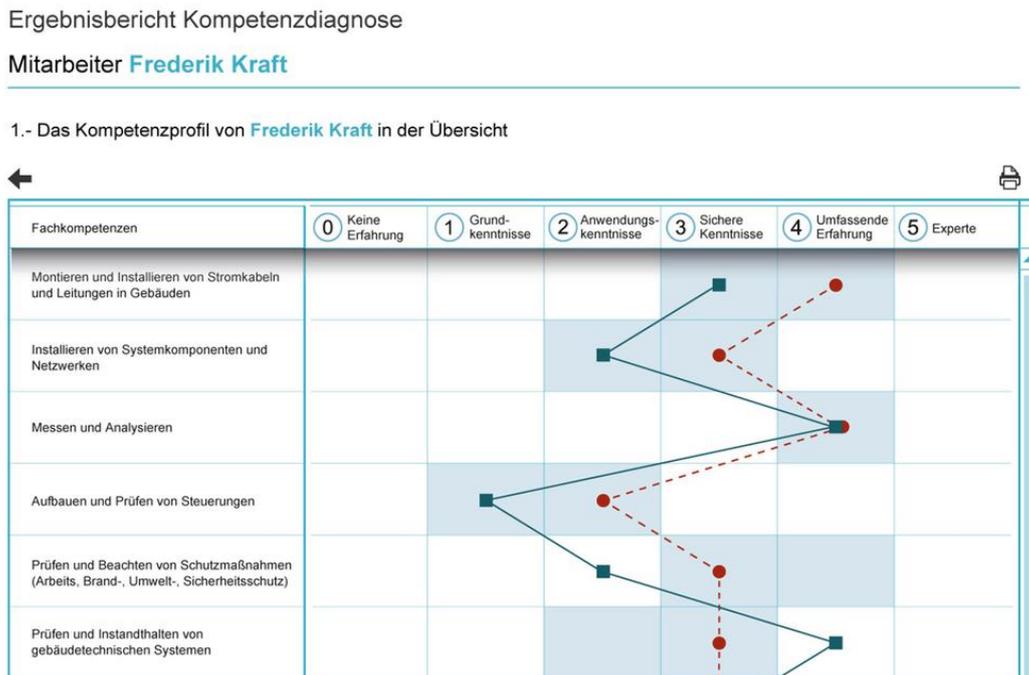
1.4 Complex skills management practices

Complex skills management practices refer to practices that combine, to a large extent, at least several other skills management practices. In the academic literature we have identified six of such practices, including: (i) **skills profiles**, (ii) **competence visualisation techniques**, (iii) **work empowerment using gamification elements**, (iv) **learning management systems**, (v) **semi-automated feedback systems**, (vi) **external business / skills audits**, and (vii) **entrepreneurs mobility schemes**.

One of such complex solutions is personalised **skills profiles**, which contain skill dimensions – e.g., set targets for the required skills and track their development (Defelix and Retour, 2003). These profiles could also include previously identified skill gaps (from skills assessment), suggested training plans, and individual skill development track based on the employer's learning progress (Defelix and Retour, 2003; Bencherqui et al., 2011). Skills profiles also allow employees to keep track of their external assessments. On top of all that, this technique helps HR personnel and management to quickly address the company's training needs and monitor employees' development.

To improve on skills profiles, some SMEs could also implement **competence visualisation**. It is a technique that graphically represents how the employee's / candidate's competences fit into the company's set goals (see figure below for an illustrative example; Wilkens, Nolte, and Sprafke, 2015). This approach can be used both to visualise the competences of current, or potential future, employees. Namely, Wilkens, Nolte, and Sprafke (2015) argue that before hiring employees / assigning tasks the company should look at how the skills of their employees / candidates fit into achieving the company goals. Main benefit of this approach is easy visualisation of competences, which often helps SMEs to understand and utilise the link between individual skills and collective enterprise activity (Bootz et al., 2017; Sonntag, 2011; Parlier, 2005).

Figure 32. An example of employee’s competence visualisation utilising a skills matrix*



*Translation note: On top – Competency diagnosis report, Employee Frederik Kraft. Overviews of the competency profile of Frederik Kraft. Columns’ translation, from left to right: Professional competency, (0) No experience, (1) General knowledge, (2) Applicable knowledge, (3) Reliable knowledge, (4) Extensive experience, (5) Expert. Rows translation, from top to bottom: Assembling and installing electric cables in buildings; Installation of system components and networks; Measuring and analysing; Control development and examination; Monitoring of security measures (work and fire security; environmental protection; general security); Examination and maintenance of the building’s technical systems.

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Source: Consortium

In addition, to improve workers motivation and simplify skills assessment, development, and / or utilisation a company could introduce **gamification elements** into their skills management. Gamification could take different forms, including, but not limited to: awarding prizes and bonuses for completing particular tasks, setting different levels of skills development, providing them with information on strategic business issues, and so on (Fabi et al., 2004). In addition, though implementing such a system internally could be burdensome to SMEs, it can be alleviated by using the already existing tools on the market (e.g., KeeUnit).

More developed SMEs could also implement a complex **learning management system** internally to further improve their skills assessment and development. Such a system could be considered as an “umbrella solution” as it provides a technology-based assessment, course constructors, benchmarking, mentorship communication systems,

360-degree reviews, course repositories, competency visualisation, employee feedback, employee-task matching, and many more. Hence, its flexible nature can be used to solve a variety of business needs. However, due to its complexity only developed SMEs with relatively large time and financial resources could use it.

To also reduce the burden on HR personnel when it comes to skills management, some SMEs could implement a **semi-automated feedback system**. Such system, for example, could summarise the feedback on training from employees, ensure a constant flow of communication between employees, HR personnel, and management, and ensure a high quality of different skills management initiatives (Zinke, 2003; OECD and ILO, 2017; Boxall et al., 2019). It can also help with activities such as planning and scheduling trainings, choosing the topics, and looking into the issues of skills utilisation, among others. Such systems are normally integrated into software that provide e-Learning platforms (e.g., REXXSystems, Cornerstone Learning). However, as it requires a relatively high level of digital competences, it is predominantly usable by more developed SMEs.

A similar but more complex feedback mechanism is an **external business / skills audit**. External audits are normally performed either by experts from private audit companies or public institutions. They help to better identify the skills an organisation currently has, and where its skill gaps lie in order to meet its strategic objectives (PeoplePulse, 2020). This allows the company to better utilise its existing skills and identify relevant training needs for the employees. According to one of our interviewees, whose company has been using this practice, audits also help employees to provide feedback that cannot be collected directly by the CEO due to the nature of employee-manager relations (e.g., employees do not want to criticise management directly). However, because external audits are often time-consuming and can be financially costly not all SMEs can afford to engage into such activities¹⁹.

Finally, SME managers could also participate in **entrepreneurial mobility programmes**, which allows owners-managers to gather and exchange knowledge and business ideas with more experienced entrepreneurs (Erasmus for Young Entrepreneurs, 2020). Such programmes, like the previous good practice, can also serve as multifunctional consultation networks but at interregional or international levels. Entrepreneurial mobility programmes are based on the concept of win-win collaboration. A guest entrepreneur benefits from on-the-job training in international environment. A host entrepreneur, on the other hand, benefits from fresh ideas from a motivated colleague on their business. Such programmes expand SMEs' networking opportunities and help to establish business contracts in other European countries, which can later on serve as new channels to expand their business (Erasmus for Young Entrepreneurs, 2020).

¹⁹ In one of our case studies, HCDT™ could charge companies up to \$1,500 for a two-days audit, which is relatively big sum for a micro or small SME.

Text box 16. Main takeaways from complex good skills management practices

- Implementing good practices does not always solve existing management issues (Oiry, 2011). What good practices help to do effectively is to anticipate skill needs, foresee skill development pathways and contribute to more effective skills utilisation (Brillet et al., 2010).
- While complex solutions allow to solve a lot of business needs at once, they are predominantly reserved for more developed SMEs as they require time and, sometimes, financial commitment, which is could be an issue for smaller SMEs.
- Majority of complex solutions require digital tools in order to implement them in SMEs.

2. An extensive overview of benchmarking capabilities

In order to evaluate the possibility of introducing benchmarking in the tool, eight data sets were analysed extensively:

- **Continuing Vocational Training Survey (CVTS)** – enterprise-based survey carried out around every five years with an aim to collect information on continues vocational training in companies.
- **European Company survey (ECS)** – a survey carried out once every four years by Eurofound that aims to provide an overview of company policies and practices, as well as what impact they have. The survey is comprised from two parts that include interviews with company management and employer representatives.
- **Structural business statistics (SBS)** – an annually updated data set describing economic activities and performance of different company segments (i.e. companies by sector, size, country) throughout the EU28.
- **ORBIS** – one of the largest databases on private businesses (containing over 365 million companies²⁰) with a focus on company characteristics, such as turnover, size, sector, etc.

²⁰ <https://www.bvdinfo.com/en-us/our-products/data/international/orbis/orbis-infographic>

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- **Labour Force Survey (LFS)** – annually collected survey that captures information about the labour market throughout the European Union.
 - **Survey of Adult Skills (PIAAC)** – conducted by OECD it assesses the key cognitive and workplace skills that adults need.
 - **European Skills and Jobs Survey (ESJS)** – carried out in 2014 by CEDEFOP the survey contains information about skills development and skills mismatch.
 - **European Working Conditions Survey (EWCS)** – a survey carried out every three years by Eurofound that contains information about different aspects of employment from the perspective of employees.

In addition to the eight data sets, several others were also considered. However, they were excluded from the analysis due to a variety of limitations, which are highlighted below:

- **Survey of HRM Policies and Practices (CRANET)** – according to the managers of the data: “the data is not available outside of the network members who collect the data as this is one of the benefits of membership”.
- **Business performance and skills survey (BPSS)** – focuses on Singapore, which is outside of the scope of the study.
- **Skills Online Vacancy Analysis Tool for Europe (OVATE)** – data set on job ads that does not provide information on skills management or other insights useful for the study.
- **Adult Education Survey (AES)** – contains similar information to more accessible data sets (e.g., CVTS, EWCS, LFS, PIAAC, ESJ).
- **World management survey (WMS)** – only contains very basic information about skills management (e.g., it contains several questions related to training of employees and their participation in decision making), which is already covered by other data sources (e.g., CVTS, EWCS, LFS, PIAAC, ESJ).
- **European Social Survey (ESS)** – contains very seldom information about skills management as it is primary focused on the general population, rather than employment.
- **Business Structure Database (BSD)** – only focuses on the UK businesses, which are only a small part of the research.

The in-depth overview is carried out in two steps, which also serve as the subsections of this section:

1. **Data accessibility, scope, and aggregability** – technical aspects of the data that ensure that it can be accessed, its scope is large enough to use for benchmarking purposes, and how information from different data sets could be combined together.

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2. **Indicators** – which indicators can be extracted from the selected data sets and used to benchmark SMEs.

2.1 Data accessibility, scope, and aggregability

This section explores the more technical aspects of the data sets that are crucial to evaluate before analysing the possibility of benchmarking, including the following:

- **Accessibility** – how easy it is to access and/or extract the data at both macro and micro levels.
- **Scope** – is the scope of the data, as a whole and according to different segments (company size, sector, country), appropriate for benchmarking purposes.
- **Aggregability** – how information from different data sources could be combined in order to create a fuller picture of skills management practices in SMEs.

First of all, the **accessibility** of selected data sources is high (apart from the ORBIS data set, which is discussed later). Namely, all selected data sets publish publically accessible macro data, which can be used to derive relatively deep insights about SMEs throughout the EU. All of them, apart from ORBIS and SBS, also contain anonymised microdata that can be access with a different level of complexity:

- **Open access** (anonymised microdata that is accessible without registration or a formal request) – Survey of Adult Skills (PIIAC)
- **Require a short registration process** (microdata that is accessible after a quick, less than an hour, registration procedure and which is not limited to only research institutions) – European Company survey, European Working Conditions Survey, European Skills and Jobs Survey, Survey of Adult Skills.
- **Require a formal request** (microdata is only accessible to research institutes and is obtained through a lengthy application process) – Labour Force Survey, Continuing Vocational Training Survey.

The only notable exception to the trend is the ORBIS data set. Unlike the others, ORBIS can only be accessed by those who purchased a license. However, as one of the consortium partners (Kantar) has access to this data set, it is included in the analysis.

Second, the **scope** of the available data sets is also wide. On the one hand, the selected data sources have information about companies (or individuals) ranging from around 35 thousand (ECS) to over 365 million (ORBIS). On the other hand, all data sets contain information on company size, sector, and country, allowing differentiation between SMEs. However, they, apart from ORBIS, do not contain information about turnover. Meaning, if the collected data will be used for benchmarking, the size of companies will be only defined by the number of employees (i.e. 1-9 – micro enterprises, 10-49 – small enterprises, 49-250 – medium size enterprises, 250+ - large companies).

When it comes to individual company segments (i.e. size, country, and sector), the observation number is also relatively high. For example, European Company Survey

employee representative interviews is by far the smallest data set. However, even it contains, on average, 238 observations per country, and 1260 observations per NACE rev. 2 level 1 sector (see table below for more).

However, when it comes to a combination of market segments, all data sets, apart from ORBIS, only include a relatively small number of observations. We found that none of the data sets, apart from ORBIS, contains more than 100 observations when the three segments are combined (i.e. size, country, and sector). More specifically, the largest average amount of observations by country, sector, and size of a company is contained in the Continuing Vocational Training Survey – 75 (see table below). What is more concerning is that the standard deviation of this estimation in all data sets is above the average value, implying that there is a large spread between the market segments, some of which might be too small for benchmarking. An example of such market segment is medium sized companies (50-249 employees) in Hungary operating in the *activities auxiliary to financial services and insurance activities* sector. According to the CVTS around seven companies from this market segment participated in the survey.

This is a major issue as a small sample size of several market segments could mean that any benchmarking information derived from the data for those segments is biased. However, this issue could be mitigated, to an extent, by focusing on particular sectors, countries, companies, or by combining the information from different data sources. Hence, before deciding on what data will be used, it is crucial to decide on which company segments will be used (e.g., maybe some sectors should be combined together in order to ensure a large sample size).

Table 33. General overview of selected data sets (standard deviation in brackets)

	CVTS	ECS M*	ECS E*	SBS	ORBIS	LFS**	PIAAC
Focus (Company / Individuals)	Company			Individual			
Highest economic classification available	NACE level 1***	NACE level 1 (6 sectors)	NACE level 4	NACE level 4	NACE level 1	ISIC 4*****	NACE level 1
Available information on the number of employees	10-49, 50-249, 250+	0-9, 10-19, 20-49, 50-249, 250+	Exact number	1-10, 11-19, 20-49, 50+	1-10, 11-50, 51-250, 251-1000, 1000+	1-9, 10-49, 50-99, 100-249, 250-499, 500+	1, 2-9, 10-249*****, 250+
Average number of respondents in each sector	5954 (2400)	4462 (3157)	1260 (1056)	-	331850	Over 50 in most cases	6962***** (6027)

(NACE / ISIC level 1)							
Average number of respondents by country	4410 (4036)	844 (411)	238 (149)	-	196667	Over 50 in all countries	6541 (3800)
Average number of respondents by sector (NACE / ISIC level 1) and size	1985 (1317)	1487 (1282)	420 (363)	-	82962	Over 50 in all countries	1158***** (1367)
Average number of respondents by country, sector (NACE / ISIC level 1), and size	75**** (102)	46 (54)	13 (17)	-	2514	Over 20 in most cases	33***** (58)
Regions covered	EU-28, Norway, Macedonia.	EU-28, Iceland, Macedonia, Montenegro, Turkey.	EU28, Iceland, Norway, Switzerland, North Macedonia, Serbia, Bosnia and Herzegovina	EU28 and other countries	EU-28	24 OECD countries	EU28
Year of latest available data	2015	2013	2017	Daily updated	2018	2014-2017 (depends on country)	2014

* European Company Survey (ECS) is comprised from two surveys. One focusing on managers (M), while another on employee representatives (E).

** As LFS cross-tabulation tables do not provide exact information about number of representatives surveyed

*** CVTS presents information on 20 sectors, some of which are disaggregated NACE level 1 sectors (e.g., manufacturing), while others are combined level 1 sectors (e.g., real estate is combined with, Professional, Scientific and Technical Activities, Administrative and Support Service Activities, Arts, Entertainment and Recreation, and Other Service Activities).

**** Average number of observations was derived for 20 NACE rev. 2 sectors used in the CVTS data set.

***** ISIC rev. 4 is an economic activity classification system, which resembles NACE rev. 2. (i.e. majority of sectors match).

***** Excluding the activities of extraterritorial organisations and bodies due to small sample size

***** The data set also contains more granular information on the number of employees at the location where the individual works. However, as this information contains much more missing values, a less granular grouping was used.

Source: consortium based on mapping of statistical data

Finally, in addition to the aforementioned issue, the data sets also contain other problems. The issues include:

- Company based surveys, which are more relevant for the study as they focus on companies and not individuals, often do not contain information about micro enterprises (0-9 employees).
- Different data sources have a different amount of information about company characteristics and about skills management practices. Because of that, none of them provide a full overview.

However, these issues could be mitigated, to an extent, by **aggregating** several data sets together. With the available data this can be achieved quite easily, as almost all data sets use similar classifications of size, sector, and country (see table above). For example, by using CVTS data set it is possible to evaluate the percentage of companies that participate in CVT activities in each country, sector, and different sized companies. Similarly using ORBIS and the same classification of companies as used by CVTS, it is possible to compliment the data set by also providing information on the average turnover, average legal status, etc., of companies in the same country, sector, and of the same size.

However, there are several caveats that should be mentioned before aggregating data sets:

- On the one hand, the two data sets that contain very deep information about different sizes, sector, and country companies (ORBIS and SBS), also predominantly contain only information about company characteristics (e.g., number of employees, productivity, turnover, etc.). On the other hand, the other data sets are more thematically deep (i.e. they contain information about skills management practices), but are shallow in terms of data segmentation. Because of that, even after aggregation, it is only possible to extract benchmarking information for SMEs at the first NACE rev. 2 level. Or, for CVTS, for 20 sectors that do not completely follow the NACE classification.
- Though majority of data sets use compatible company size variables, they often have different amount of information about company economic activity classification (i.e. NACE). Hence, if several data sets are combined, the highest possible classification level has to be used in order not to introduce bias. More specifically, if we aggregate several sources that contain information on skills management, and some of this information are more granular (e.g., contained in CVTS, which has 20 sectors) while other is less (e.g., contained in ECS, which has 6 sectors) by having different level information
- As majority of data sets are not updated annually, any benchmarking information extracted from them could be outdated.

- As the surveys were conducted during different time periods, there could be some compatibility issues between the data sources. This is especially true for SMEs due to their volatile nature.
- The PIAAC data set cannot be combined, reliably, with others as it, first of all, uses a different company classification approach (ISIC instead of NACE), and second, it groups the number of employees in a different fashion than other data sets (see table above).

Having these issues in mind, the data sets could be combined by aggregating information on companies in each country, sector, and of different sizes. In majority of cases only these three variables can be used to aggregate the data as they are present in almost all data sources. However, as different data sets contain different information, as well as were comprised during different time periods, we propose several possible ways how the data could be aggregated in the table below. Our conclusion on which of these approaches is the most appropriate is provided in section 1.3. Benchmarking capabilities of the tool.

Table 34. Aggregation options

	Aggregation options	Selected data sets	Explanation and issues
1	No aggregation; only using a data set that provides extensive information on company characteristic	ORBIS	<ul style="list-style-type: none"> • Only using ORBIS data set for benchmarking ignoring other data. • This approach is the most robust as: (i) the data is the most current; (ii) the scope is very large, allowing for very deep benchmarking (e.g., for companies of a very particular size, from specific countries, and sectors); (iii) there is no compatibility concerns. • It only provides information on company characteristics and no information on skills management. • The data set can only be accessed with a payed license.
2	Aggregating the most comprehensive data set (CVTS), with data sets providing company characteristic information (ORBIS)	CVTS, ORBIS	<ul style="list-style-type: none"> • ORBIS data set is used for a general overview of companies (i.e. to extract company characteristics), while CVTS is used to extract skills management practices. • Though CVTS provides information on different skills management activities, it does not cover all of them in full (see next section for more information)

			<ul style="list-style-type: none"> • Though ORBIS provides relatively recent information, the newest CVTS is from 2015 (although a new survey is planned for 2020). • Only information on skills management in small (10-49 employees) and medium (49-249 employees) size enterprises is available in the CVTS. • The CVTS has information on six NACE sectors for all countries and information on 20 NACE sectors for majority of countries. Hence, any benchmarking information derived from this data set will be very broad in nature.
3	Aggregating the most comprehensive data set (CVTS), with data sets providing company characteristic information (ORBIS), and data on micro enterprises	CVTS, ORBIS, EWCS, ECS	<ul style="list-style-type: none"> • The approach is similar to the previous one, but it also uses information from the EWCS and ECS. • By adding EWCS the final data set takes into account micro enterprises (0-9 employees) • By adding ECS the final data set takes into account almost all aspects of skills management (see next section for more details) • As for both CVTS and EWCS the latest available data is from 2015, there is no incompatibilities between the two (new EWCS micro data should become available sometime in 2020-2021). However, as ECS was carried out in 2013, there could be some compatibility issues.
4	Aggregating all data sets	All except PIAAC	<ul style="list-style-type: none"> • Would provide the most comprehensive list of indicators that can be used for benchmarking of SMEs • Majority of available data sets were collected at different times, which might lead to incompatibility issues • Several data sets were collected are quite old (e.g., ECS, ESJS), meaning that the data contained in them could be outdated.

Source: Consortium.

2.2 Indicators

Based on the mapping of statistical evidence as well as on Cotton (2007), Robinson and Hish (2008), Berger and Berger (2004), OECD (2017), and Schweyer (2010), we propose four broad groups of indicators: (i) **company characteristics**, (ii) **skills assessment**, (iii) **skills development**, and (iv) **skills utilisation**. Each of them is comprised of several indicators, which are discussed through the remainder of this subsection.

Company characteristics refers to specific aspects of the company, such as number of employees, economic sector, type of company (i.e. private / public), and similar. Majority of identified data sets contain this information, while ORBIS provides the most comprehensive overview. The table below elaborates on possible company characteristic indicators that can be derived from available data. It only contains the most appropriate and relevant questions from the selected data set. For a more comprehensive list of available variables see 2.2. *Mapping of statistical data* in the annex.

Table 35. Company characteristics indicators and how to measure them with the available data

	Indicator	Most appropriate variable / survey question	Source of the variable/survey question	How the tool could use the variable / survey question
1	Location	All data sources contain	All	<ul style="list-style-type: none"> To separate companies and information available in the data sources into different segments To combine different data sources together
3	Economic sector			
4	Number of employees			
5	Turnover	Contains exact turnover of companies	ORBIS	<ul style="list-style-type: none"> To provide benchmarking information
6	Age of the company	When the company was established / age of the company	ORBIS, ECS	<ul style="list-style-type: none"> Allows to differentiate between start-ups and more established enterprises As this variable is only contained in two data sources, one of which provides some insights about skills management in SMEs (ECS), only the results from that particular survey

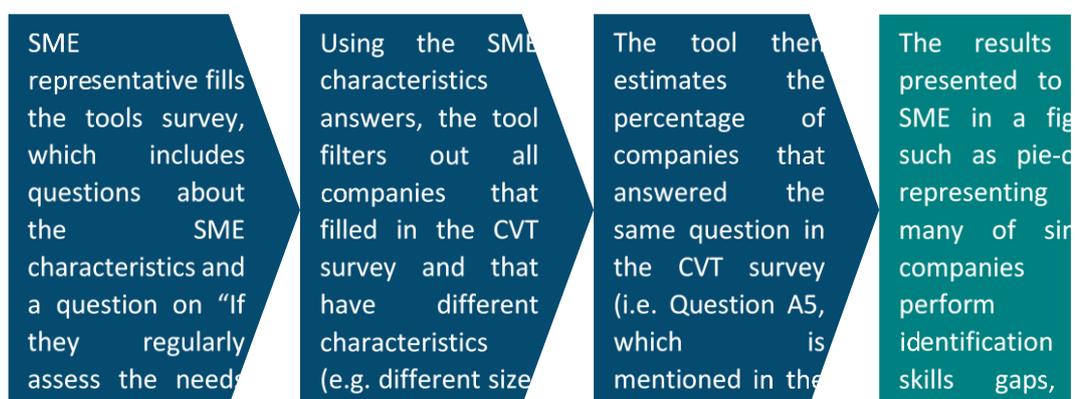
				(ECS) could be used for assessing skills management in different age enterprises
7	Legal status of the company	Majority of data sets contain information about the legal status of the company	CVTS, ECS, SBS, LFS, ESJS, EWCS, ORBIS	<ul style="list-style-type: none"> • Can be used to evaluate skills management in different types of companies (e.g., public vs private)

Source: Consortium, based on statistical mapping.

Skills assessment refers to activities that aim to identify skills employees have and skills that are currently most needed for the company. It is typically carried out in several stages, according to Cotton (2007), and Robinson and Hirsh (2007), which are included in the table below and which serve as the basis for the skills assessment indicators.

According to the results, all skills assessment steps, at least to some extent, can be evaluated through the available data. This implies that the tool could have some benchmarking capabilities in relationship to skills assessment on release. An example on how “identification of skills gaps” in an SME could look like in the tool using the CVT survey is provided in the figure below. The same logic can be applied to other indicators.

Figure 33. Example of benchmarking “identification of skills gaps” indicator of an SME



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Source: Consortium

Majority of measures for the indicators come from the CVTS and ECS, while one of the indicators (analysis of internal and external environments) can only be measured using the PIAAC survey (see table below). On the one hand, as CVTS and ECS contain the same information about countries (i.e. location, sector, number of employees) the two

data sets can be aggregated. However, as last ECS was carried out in 2013, while CVTS was in 2015, the data sets might present relatively different, and somewhat incompatible, results. On the other hand, as PIAAC uses different company sectoral and number of employees' information, it cannot be used with other data sources. This implies that the "analysis of internal and external environments" indicator cannot be used in benchmarking.

Table 36. Skills assessment indicators and how to measure them with the available data

	Indicator	Explanation	Most appropriate variable / survey question	Source of the variable / survey question
1	Definition of business strategy	Review the performance requirements of an organisation's strategic plan and identify the core or strategic skills and competences needs for success Evaluating challenges and opportunities flowing from outside the company (e.g., government policies, market conditions)	A7. In your enterprise, which skills/competences are generally considered as most important for the development of the enterprise in the next few years? Q26D (E*). In the last 12 months, were any major decisions taken by the management of this establishment in the following areas (training and carrier development)? D_Q13c. How often does your job involve keeping up to date with new products or services?	CVTS ECS PIAAC
2	Economic sector			
3	Analysis of internal and external environments			
4	Workforce analysis	Identifying employees current level of skills	H8 (M*). Approximately what percentage of employees have a performance appraisal or evaluation interview at least once a year?	ECS
5	Identification of skills gaps	Based on business strategy and current level of skills, identify skills that are necessary to attain company's	A5. Does your enterprise regularly assess the needs of skills and competences in the enterprise?	CVTS

		short-, medium-, and long-term goals.		
6	Development of gap-closing strategies	Identifying most appropriate approaches to obtain the necessary skills	A6. How does your enterprise usually react to future needs of skills and competences (e.g., Continuing vocational education of current staff, Recruitment of new staff with the suitable qualifications, skills and competences, etc.)?	CVTS
7			M. T9. Do employees in this establishment document and keep records of their good work practices or lessons learned, with the purpose to share these with other employees?	ECS

* E refers to employee representative interviews while M refers to management interviews.

Source: Consortium, based on statistical mapping, Cotton (2007), and Robinson and Hirsh (2008).

Skills development refers to any activity that lead employees to acquiring new skills. Following Berger and Berger (2004), OECD (2017), and Schweyer (2010) we identified six different groups of activities that are part of skills development, which are described in the table below and which serve as indicators.

First, majority of surveys contain questions about training, though they rarely differentiate between internal and external training. The only notable exception is the CVTS, which has several questions that indicate if the training was inside or outside the company (see table below).

Second, though we identified six different avenues of skills development, two of them are not represented in the available data sets (see table below) – (i) emergency fill-in assignments and (ii) special one-person projects / task discretion / work autonomy. Hence, if the tool will use benchmarking based on available data, only several aspects (predominantly training and mentoring) of skills development could be included in the tool. However, the other aspects could be added later using input from users.

Finally, as with skills assessment, majority of information comes from the CVTS and ECS. However, this does not mean other data sources do not contain this type of information, such as information on training. This simply shows that CVTS and ECS provides enough data in order to cover skills development as wide as possible. And if we included other data sets, then it will introduce additional complicated stemming through the need to combine different data sets together (on possible issues see subsection 1.3.1 *Data accessibility, scope, and aggregability*).

Table 37. Skills development indicators and how to measure them with the available data

	Indicator	Explanation	Most appropriate variable / survey question	Source of the variable / survey question
1	Emergency fill-in assignments	Allowing lower level employees to carry out an emergency assignment, which builds adaptability, performance under pressure, versatility of employees.	-	-
2	Special one-person projects / task discretion / work autonomy	One person tasks that helps to build autonomy of employees.	-	-
3	Task force assignment	Cooperative assignments where employees focus on a specific problem, share their knowledge and experience, build their team working skills.	B2. d) In 2015, did your enterprise provide any of the following other forms of CVT? Learning or quality circles.	CVTS
4	Company educational courses (incl. e-learning)	Training courses that build skills requirements for the company.	B1. a) In 2015, did your enterprise provide internal CVT courses?	CVTS
5			B1. b) In 2015, did your enterprise provide external CVT courses?	
6	Courses outside the company (incl. e-learning)		(INTERNAL OR EXTERNAL COURSES) H3. (M) In the past 12 months, what percentage of employees received paid time-off from their normal duties to undertake training, either off or on your premises?	ECS
7			(INTERNAL OR EXTERNAL COURSES) Q65a. Over the past 12 months, have you undergone any of the following types of training to improve your skills? Training paid for or provided by your employer	EWCS
8			A semi-structure guidance where a	B2. In 2015, did your enterprise provide any of

		higher-level employee shares their knowledge with lower level employees.	the following other forms of CVT? Guided on-the-job training. B2a. How many persons employed participated in guided on-the-job training in 2015?	
9	On-the-job coaching / mentoring		H5. (M) In the past 12 months, what percentage of employees have received on the job training?	ECS
10			Q65c. Over the past 12 months, have you undergone any of the following types of training to improve your skills? On-the-job training (led by co-workers, supervisors)	EWCS

Source: Consortium, based on statistical mapping, Berger and Berger (2004), OECR (2004), Schweyer (2010).

Skills utilisation activities are those that help to put the existing skills of employees to better use. Based on academic literature five different groups of activities were identified, which are presented in the table below and which can serve as indicators of skills utilisation in SMEs. As can be seen from the table below, unlike with other skills management practices, different data sources contain relatively different information about skills utilisation. Hence, to get a full picture it is crucial to combine several data sets together.

Table 38. Skills utilisation indicators and how to measure them with the available data

	Indicator	Explanation	Most appropriate variable / survey question	Source of the variable / survey question
1	Staff meetings on current problems	Sharing of knowledge, information, insights between the members of the staff.	A11a. In your enterprise are staff representatives/committees usually involved in the management process of CVT?	CVTS
2			Q61D. For each of the following statements, please select the response which best describes your work situation. You are involved in improving the work organisation or work processes of your department or organisation	EWCS

3	Job rotation	Changing the jobs with a goal to discover the breadth and versatility of employees and to help them expand their skills	B2b. How many persons employed participated in job-rotation, exchanges, secondments or study visits in 2015?	CVTS
4			T7 (M*). Do any of the employees at this establishment rotate tasks with other employees?	ECS
5			Q55 Does your job involve rotating tasks between yourself and colleagues?	EWCS
6	Assistance from counsellor or psychologist	Discovering barriers to personal development	-	-
7	Job redesign	Change the role or description of a job so that the skills of employee are put to better use	D_Q11b. To what extent can you choose or change ... how you do your work?	PIAAC
8	Employee participation	Use employees' knowledge and experience in discussions of business strategies	Q40D (E*). You identified other areas in which the management of this establishment recently took major decisions. Would you say the [ER**-body] had no influence, some influence or a strong influence on the management decisions in the following areas? Training and career development.	ECS

Source: Consortium, based on statistical mapping, Berger and Berger (2004), OECR (2004), Schweyer (2010).

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