

Workshop 2

Boosting security, data and IoT skills of SMEs

Date: 7 December 2018, 11.00 – 16.00 hrs.

Location: DIGITAL SME Alliance, Rue de du Commerce 123, 1000 Brussels, Belgium

Context

The digital revolution is not only about large tech companies but essentially about start-ups and SMEs that provide or use digital solutions. SMEs compose 95% of companies in the European economy. The variety in use and adaptation of these technologies is huge, from innovative and fast-growing companies that provide or use digital solutions, to those that face significant challenges such as acquiring the necessary skills to benefit from digital technologies. Understanding and addressing the need for digital skills will allow SMEs to continue to push the European economy forward.

To ensure business continuity and to realise growth, it is essential that SMEs use emerging digital technologies such as Big Data, Internet of Things (IoT) and Cybersecurity. Cybersecurity is crucial for every company, but is becoming more challenging as cyberattacks are on the rise. Such attacks can have a profound impact and are hard to defend against without the right expertise. Furthermore, SMEs can – or should - use Big Data, IoT or Cybersecurity within their business model to remain competitive and to grow their business.

With these considerations in mind, this initiative aims to analyse and support SMEs' skills development for Big Data, Internet of Things and Cybersecurity. This initiative is managed by a consortium of Capgemini Consulting, Technopolis Group and the European DIGITAL SME Alliance. The consortium initiated a comprehensive data collection on the state-of-play of major technological and market trends concerning Big Data, IoT, and Cybersecurity and the take-up by SMEs in Europe as well as the strategies, policies and initiatives in the EU and the United States related to this subject. This leads to preliminary insights on the skills needs of SMEs the barriers they face and how they can be best supported.

This workshop is part of the initiative and the second in a series of six. It aims to discuss the consolidated analysis of the current state-of-play in Europe, to further build the shared vision and to identify and validate supporting measures aimed at fostering skills development for SMEs.

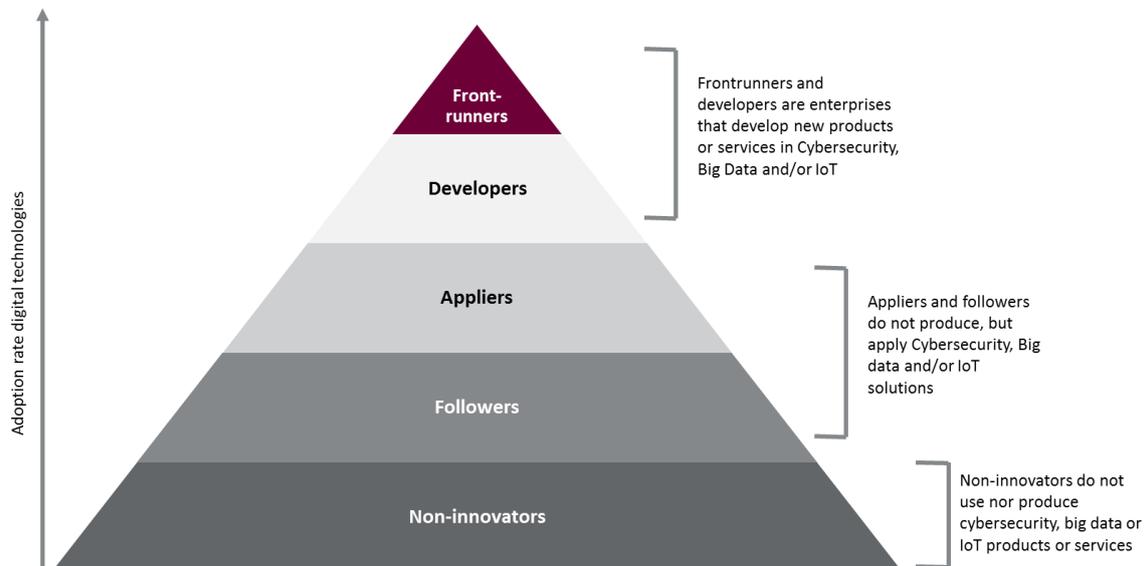
There is a clear need to adopt emerging technologies, but SMEs encounter barriers in doing so

The SME landscape is diverse, with varieties in terms of size, sector, geography, technological intensity, and market served. SMEs can be (potential) users and suppliers of emerging technologies. This makes it necessary to reduce (part of) the complexity by clearly defining the target group of this initiative.

On the one hand, interviewees stress the urgency of ensuring cybersecurity for “every company connected to the internet”, and that “Big Data offers opportunities for even the bakery around the corner”. On the other hand, it is argued that an approach can only be effective when being targeted, specific and industry-relevant. Building on a segmentation model from the Dutch Chamber of

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Commerce, five segments can be distinguished that indicate to what extent companies are engaged in (technological) innovation. Following this model, this initiative will primarily focus on frontrunners, developers, appliers and followers. By building on and collaborating with companies that understand and are already working with these technologies, this initiative will be best able to define what is needed. The group non-innovators will automatically benefit from the results, but will require a different approach to get involved.



In 2016, around 80% of companies in Europe had experienced at least one Cybersecurity incident¹, and 2 out of the 5 SMEs in the Netherlands suffered from any form of digital fraud in 2017². At the same time, applying Big Data or IoT may pose Cybersecurity issues, but could lead to significant competitive advantages. SMEs working with Big Data are growing faster than SMEs not using Big Data technologies³. SMEs however do not always possess the necessary skills to work with these technologies. Evidence from Sweden shows that access to (digital) skills is one of the top barriers for growth⁴.

Skills needs and skills strategies

What are then actually the skills needs of SMEs? To provide the foundation for the actual assessment of skills gaps, skills profiles can be developed for each of the three focus domains. The key competence areas can be defined for each of the three technologies, further specified by using the e-Competence Framework (e-CF). As an example: 'strategy making' within the cybersecurity profile consists of e-CF competences 'A1. IS & Business Strategy Alignment' and 'D1. Information Security Strategy Development'. The skills profiles need to consider different roles in a SME: management, IT

¹European Commission (2017), State of the Union 2017 - Cybersecurity: Commission scales up EU's response to cyber-attacks. Published September. Available at: http://europa.eu/rapid/press-release_IP-17-3193_en.htm

² Kamer van Koophandel (2018), Big Data en Veiligheid. Available at: <https://kvk.instantmagazine.com/e-zines-kvk/big-data#!/big-data-en-veiligheid>

³ Bluemine (2017), Big Data in het MKB, wat levert het u op? Available at http://www.bluemine.nl/wp-content/uploads/2017/06/Bluemine_infographic_Big_Data-V1.pdf

⁴ Tillväxtverket (2018), Rätt kompetens till företagen - Temarapport. Stockholm, February 2018

professional, Advanced user⁵. This can be covered by applying different levels of proficiency for each competence depending on the role, following the e-CF levels ranging from 1 (low) to 5 (high).

Big Data skills areas	IoT skills areas	Cybersecurity skills areas
Strategy making	Strategy making	Strategy making
Business development	Business development	Legal compliance
Data collecting	Software and application engineering	Risk assessing
Data storing/warehousing	Hardware engineering	Developing risk and compliance policy
Data analysis	Interoperable network engineering	Data protection
Data visualisation	Cybersecurity skills	Network protection
Decision making	Big data skills	Threat monitoring and mitigation
Cybersecurity skills		

For example, the mentioned strategy making competences might be more relevant for managers than for IT professionals and Advanced users, and will be classified at a higher proficiency level. We included a detailed profile for cybersecurity skill profiles in [the Annex](#).

To complete a Skills Profile for either of the target users it would also be essential to include:

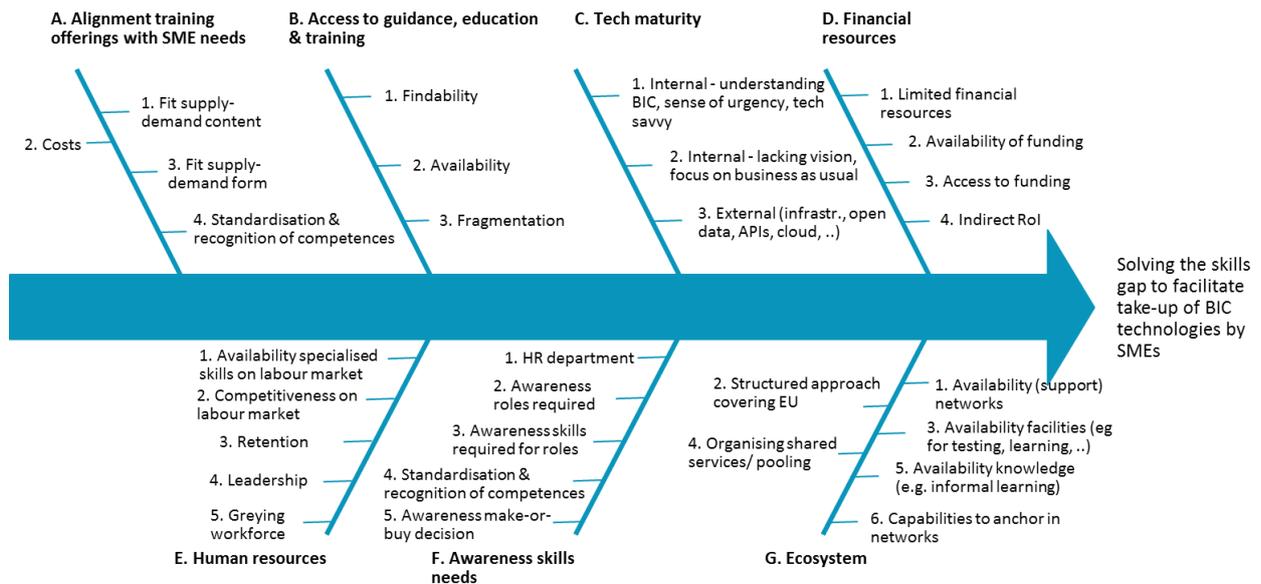
- Personal competences: related to for instance e-Leadership, Agility, Analysing;
- Business competences that are specific for a sector (Finance, Health, Consumer Products et cetera)

Barriers and supporting measures

Skills development is not straightforward for SMEs. Participating in training courses not only depends on internal factors such as capacity and financial resources, but also on the ‘fit’ between SME training demands and courses available on the market, and external factors such as internationalisation and demographic change. Hence, measures addressing skills development within SMEs should be developed from a holistic viewing point, taking into account various categories of barriers. Based on the analysis of the current state of play, seven categories of barriers can be identified, all containing multiple specific barriers.

⁵ this group of users are described as competent users of advanced, and often sector-specific, software tools’. ICTs are used as a tool for these users in a workplace context.

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The first category is about the **alignment of training offerings** with SME needs: too often, available trainings are not specifically focusing on BIC, are delivered in a format not suitable for SMEs (eg during office hours) or are too academic or costly.

Secondly, if suitable trainings are available, SMEs often have difficulties **accessing** them or are not aware of their existence. Furthermore, the availability of trainings is fragmented between regions.

Thirdly, both the internal as the external **technological maturity** hinders SMEs to adopt BIC technologies. Internally, SME manager/owners may lack a vision on BIC, and do not always understand the sense of urgency to work with BIC. Externally, the infrastructure not always facilitates the take-up of BIC.

Fourthly, SMEs are hindered by **restricted financial resources**. They need to prioritise their investments, and funding is not always readily available.

Fifth, the **scarcity of human resources** with specialised skills on the labour market hinders SMEs to attract BIC talents. Retention of personnel with specialised skills is difficult, as they are high in demand.

Sixth, before being able to develop the necessary skills, one needs to be **aware of the skills** that are needed. SMEs, not always having a specialised HR department to deal with such matters, too often lack this awareness. A lack of standardisation and recognition of competences in the market makes this even more difficult.

Lastly, whereas access to support networks could allow SMEs to overcome their competitive disadvantages (eg limited financial resources, etc), **access to such networks or 'ecosystems'** is for many SMEs not a priority. It also required managerial capabilities to become anchored in such networks (eg communications skills, networking).

To overcome these barriers, a vision and series of supporting measures have been developed, which will be presented during the workshop.

Towards a vision and roadmap

There is a clear need from SMEs to develop the skills to work with emerging technologies, but they encounter barriers and effective support structures are not always readily available. At the same time, good practices aimed at fostering skills development were found in several countries, such as

Mittelstand 4.0 in Germany, Skillnet Ireland, the services provided by the Chamber of Commerce in the Netherlands and the Swedish Agency for Economic and Regional Growth. A challenge is to make sure such services are scalable and reusable by the broader EU SME population. Another challenge is to make sure such initiatives actually reach the SME community. This is important, because SMEs are hardly able to adopt new technologies on their own, stipulating the need for connecting with other SMEs and the need to tap in to regional support structures. As an interviewee stated: “for SMEs, it is either link or die...”

In this phase of the project, the characteristics and ‘pillars’ the vision should consist of can be defined. Based on a review of existing best practices, the following **characteristics** for a vision aimed at fostering skills development within SMEs can be distilled:

- The vision, and certainly the roadmap, should one the one hand acknowledge the diverse SME landscape, whilst on the other hand allowing sufficient room to be specific, targeted and industry-relevant;
- The vision should facilitate a network or cluster-based approach. SMEs are best helped within their own network or value chain, facilitating peer-2-peer learning. SMEs alone might lack the resources to adopt new technologies, and bundling their forces enables them to easier adopt new technologies, e.g. by using shared infrastructures or platforms⁶;
- The approach should be demand-driven, preferably with SMEs (associations) being represented in governing boards. In this way, feedback from the target group is more likely to reach the highest levels of management and it is ensured that programmes respond to the needs of the target group;
- The vision should be action-oriented. Whitepapers do not resonate well with SMEs, and SMEs are best helped with concrete – and scalable - actions and tools that are relevant to their business and industry. Easy participation for SMEs is key. Not too much red tape, but action!

Objectives workshop

The goal of the workshop is to:

- discuss the the current state-of-play in Europe;
- further build the shared vision;
- identify and validate supporting measures aimed at fostering skills development for SMEs.
- learn from good practice

We look forward to exploring these aspects with a group of experts that can share experiences and views from the point of view of SMEs, government, associations, education and certification bodies.

More background information about the project can be found here: <https://www.digitalsme.eu/skills-home/>.

⁶ Eg. the new Cyber Resilience Center Eindhoven, enabling SMEs to use a collective system against online attacks: <https://e52.nl/en/cyber-resilience-centre-brainport-eindhoven/>

ANNEX: Cybersecurity profile for three roles within an SME; based on e-CF

Skill/corresponding e-CF competence	Managers	IT Professionals	Advanced users
Strategy making:			
A.1. IS & Business Strategy Alignment	5	-	-
D.1. Information Security Strategy Development	5	-	-
Legal compliance:			
B.3. Testing	2	3	1
E.8. Information Security Management	4	3	2
Risk assessing:			
E.3. Risk Management	4	3	-
E.8. Information Security Management	4	3	-
Developing risk and compliance policy:			
E.3. Risk Management	4	-	2
E.8. Information Security Management	4	-	2
Data protection:			
B.6. Systems Engineering	-	4	3
D.12. Digital Marketing	-	2	2
Network protection:			
D.1. Information Security Strategy Development	-	5	4
Threat monitoring and mitigation:			
A.6. Application Design	-	3	1
D.1. Information Security Strategy Development	-	5	4
E.3. Risk Management	-	3	2

e-Competence proficiency level (1-5)