



**Supporting specialised skills development:  
Big Data, Internet of Things and  
Cybersecurity for SMEs  
EASME/COSME/2017/007**

**Summary Expert Workshop 2**

7 December 2018, Brussels

**This workshop was carried out for the Executive Agency for Small and Medium-sized Enterprises (EASME) and the European Commission, Directorate General Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), by:**

**Capgemini Consulting, Technopolis Group and Digital SME Alliance.**



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## Introduction – Background to the project

Supporting specialised skills development: big data, Internet of Things (IoT) and cybersecurity for SMEs is a two-year initiative, initiated by the European Commission and managed by a consortium of Capgemini Consulting, Technopolis Group and the European DIGITAL SME Alliance. This initiative aims to analyse and support SMEs' skills development for big data, IoT and cybersecurity. This initiative will develop a vision, roadmap and monitoring mechanism that can help SMEs to advance skills development in the aforementioned areas.

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 extent to which SMEs are able to adopt new technologies, their skills needs, the barriers they face and how they approach skills development.

A series of expert workshops are organised within the context of this initiative to validate findings and to collect input for the design of a shared vision on skills development for SMEs. This workshop was the second in a series of six, and its conclusions are summarised in this report.

The welcoming words were spoken by Sebastiano Toffaletti, Secretary General of the Digital SME Alliance, and Jose Luis Pancorbo, who is a vice-president of the Alliance as well as Chairman of AERTIC (the regional association of digital companies in La Rioja Spain).

## State-of-play regarding skills development by SMEs on Cybersecurity, IoT and Big Data: understanding barriers that hinder skills development

After a general introduction of the initiative, Niels van der Linden (Capgemini Invent) introduced the agenda of the day to participants. The morning session was devoted to better understanding the barriers SMEs encounter as regards skills development. It consisted of a report out of the results of an online survey that was recently conducted by the consortium, a presentation of the broader root-causes of barriers (building on several sources), and a presentation by Paul Roevens (Lead-IT) on approaches for SMEs towards sourcing of skills issues. The afternoon session was dedicated to discussing way forward: what actions are required to advance skills development in SMEs and what good practices demonstrated successful approaches?

## An online survey on SME perspectives on skills development as regards Cybersecurity, IoT and Big Data

The presentation provided the participants with the key insights from the survey, clustered around five questions:

- Why would SMEs consider adopting Cybersecurity, IoT and Big Data (further abbreviated with: BIC)?
- Do SMEs feel they have sufficient (access) to skills to adopt BIC?
- Which specific competences do they value most and are short of?
- How do SMEs try to fill the shortage (approaches)?
- What supporting measures do they value and what barriers do they see?

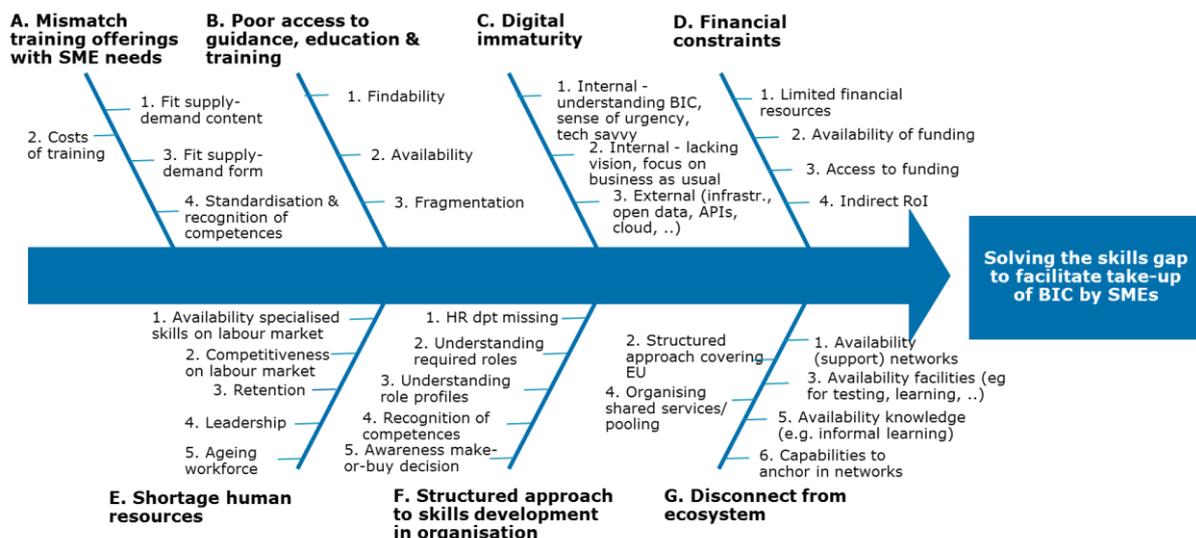
Comments that were made by the audience related to opportunities for the 2<sup>nd</sup> online survey (to be conducted in 2019) and to further gather insights on skills strategies that do also include decision to source or hire externally besides internal development (training etc), and about how that decisions is made. It might also proof valuable to include a question on effectiveness of different funding mechanisms. The research done by the International Labour Organisation (ILO) could provide initial

basis for this. The analysis should also take into account in which state of maturity the SME currently is, and what the ambition is.

Finally, there was a remark concerning the use of the word ‘skills’ (to make clear what is understood by this concept) and ‘soft skills’ (prefer other wording such as interpersonal skills or transversal skills).

## A root-cause analysis sketches the full picture of barriers

Despite digital skills shortages in various roles within organisations – from leaders to ICT professionals to practitioners and advanced users – very few SMEs provide their employees with training, as Eurostat data reveals. A comprehensive barrier analysis was performed by the consortium in the form of a so-called fishbone analysis that clusters various barriers in seven main categories.



The aim of this analysis is to be as exhaustive as possible, as it will serve as starting point for generating actions to be included in the roadmap that will support skills development for SMEs on BIC for the coming years. Indeed, it is important to view these barriers in the context of SMEs’ different maturity levels. There is a distinction between SMEs that are using basic BIC skills to survive and SMEs that are frontrunners and very much integrating BIC in their business model (referred to as legacy companies and frontrunner companies). Awareness raising, sharing good practice is key to start transformation of all SMEs. Another suggestion made by the audience was to focus funding not only on skills development itself, but also on increasing infrastructures.

## A presentation on sourcing strategies and practical experience from a SME on skills development

Paul Roevens provided his views of the current shortages SMEs face, their approaches to skills development and his recommendations for moving forward. He sketched some of the differences between SMEs and larger companies and indicated what could really support SMEs in their day-to-day operations. Smartsourcing is one of the key solutions for SMEs on a tight (digital) labour market.

The discussion that followed further deepened the element of collaboration between industry and education. There certainly is a positive movement, but more could follow the example of ensuring a high level of expertise, competent and up-to-date teachers, and sufficient facilities to optimise knowledge transfer to students. At the same time, formal education is only a part of the solution – much should also be expected from training programmes and certification for career entries and experienced workers. Every stage of the talent funnel should be covered with appropriate courses to advance skills development across the board. The role of trusted advisors and intermediaries could be essential and can accelerate the process.

## Supporting measures for skills development for SMEs

The afternoon session was dedicated to discussing the way forward: what actions are required to advance skills development in SMEs and what good practices demonstrated successful approaches? This part was kicked-off by two good practice presentations and completed by a proposal from the project consortium on action lines for a roadmap and toolbox.

### Good practice (1): Skillnet Ireland

Paul Healy excellently presented the approach in Ireland towards skills development. From mega trends impacting the context of Ireland to a model for training networks that is a) enterprise led and b) based on a cost-sharing model. Paul articulated the relevance of the intermediaries/trusted advisors that create these 66 (and counting) Skillnets and steer the process. The results are very positive and strengthen the alignment between labour market needs and skills supply, and thus contribute to stimulating Ireland's economy. Skillnet Ireland has been recognised as an international good practice by the ILO and OECD a.o. Paul mentioned a couple of examples of specific domains – one of them on cybersecurity, and how government, education and industry together created a holistic approach towards skills development in this area. His key message as regards scaling or re-using this approach: 1) make sure it is employer based – they should lead and be dedicated part of the process, 2) establish a solid footprint which a.o. implies that government should be in it with 'head and heart' and enable employers to move the skillnets forward.

### Good practice (2): towards an IoT Security Lab

Zahra Khani (CEO at Firmalyzer) presented her concept of an IoT Security Lab. An initiative she took on personally when encountering a) a huge lack of properly skilled staff and b) a general ignorance of establishing properly secured IoT devices (a market led by pricing rather than quality). She encountered shortage of IoT security experts: interested people don't have enough budget to attend practical courses, students cannot acquire practical knowledge required in the market at universities as facilities and expertise are missing, and SMEs do need these experts to grow. At the same time, she signalled an awful security state of current IoT products caused by IoT start-ups/SMEs not having enough security awareness, expertise and budget to spend on security.

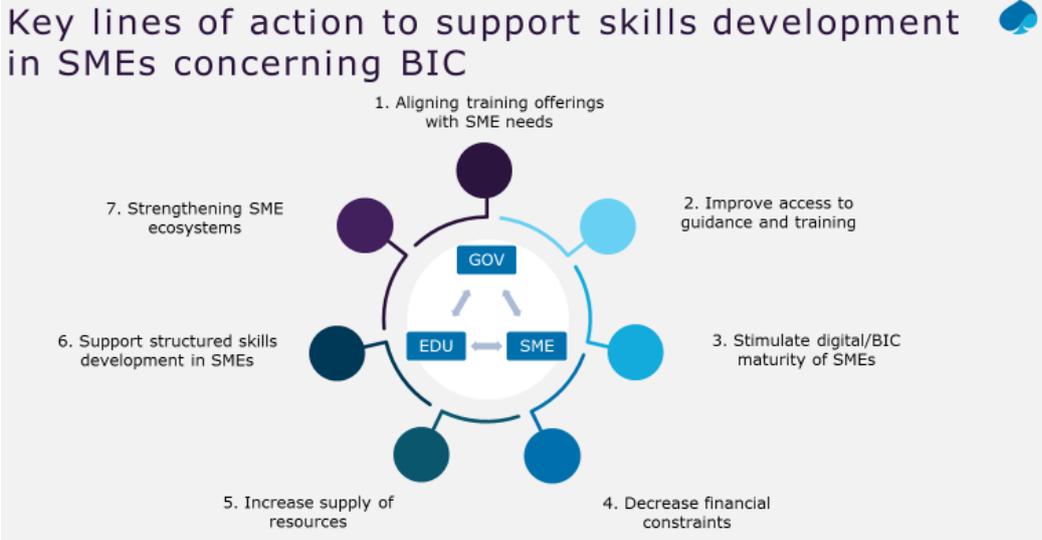
Her vision is to have a social platform that brings together cybersecurity and IoT expertise, using a lab to offer a place where IoT devices can be evaluated and improved in the field of security. It is a physical environment where expertise is brought together, where joint developments lead to safer IoT environments, and where interns are trained with practical skills. She also shared her ideas on a cost model that serves SMEs/start-ups in different stages of maturity. Funding is still required to turn this idea into reality.

## Proposals for action lines for a roadmap and toolbox to boost skills development for SMEs until 2022

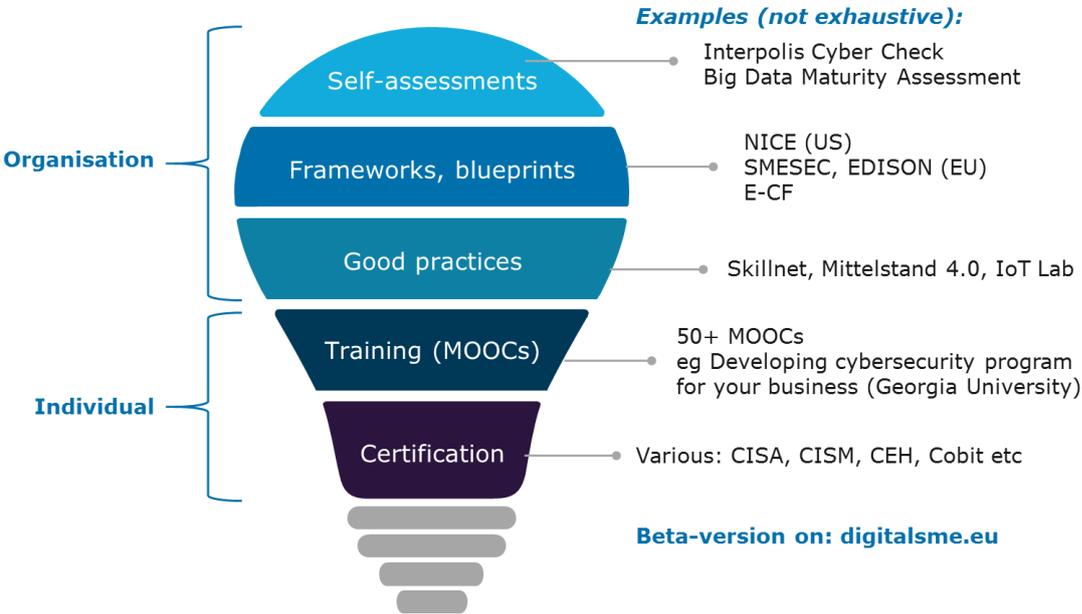
Following the good practice presentations, Niels van der Linden (Capgemini Invent) presented the initial ideas that should compose a roadmap for supporting skills development in SMEs on BIC.

The ideas were generally welcomed. In particular the need was raised to prepare proper standards that define what good looks like, when it comes to skills requirements of leaders, IT professionals, advanced users in SMEs that (have to) deal with cybersecurity, big data and/or IoT. These standards are essential and should be enabled via practical tools to stimulate take-up. The US example of a National Initiative for Cybersecurity Education (NICE) offers a good example. The NICE Framework provides a blueprint to categorise, organise, and describe cybersecurity work into Categories, Specialty Areas, Work Roles, tasks, and knowledge, skills, and abilities (KSAs). The NICE Framework provides a common language to speak about cybersecurity roles and jobs.

Such standards could also support further adoption of quality labels for certifications – for instance via universities (a practice that is already happening) or professional bodies. This increases transparency of (the system of) certifications and shows SMEs what could be the right path forward.



Where the roadmap with recommendations for moving forward targets mostly mid to long term developments, the toolbox that is in development focussed on the short term. What can we offer SMEs that they can directly apply in practice. The concept combines instruments that target development of the organisation (capability) as well as individual development (competence).



**Next steps**

The interim-report of this initiative is expected in January and will be shared for review with stakeholders. The next workshop will be on **8 February**, 11 April, 14 June and 19 September 2019.

## Annex A: List of workshop participants

<b>Name</b>	<b>Organisation</b>
Paul Healy	Skillnet
Kenny Pool	Dell
Constantinos Tsiourtos	Cyprus Cybersecurity Organisation
Akaiterini Sylla	Everis Benelux
<i>Patrick Slavenburg</i>	<i>Member IoT Council</i>
Malin Rosqvist	RISE SICS Västerås
Agata Boutanos	Union of Entrepreneurs and Employers Poland (ZPP)
Paul Roevens	Lead-IT
Prof. Peter Mirski	Management Center Innsbruck
Ana Garcia	Big Data Value Association (BDVA)
Nicolò Pranzini	ASTER - High Competences and Startup Unit
<i>Nina Olesen</i>	<i>European Cyber Security Organisation (ECSO)</i>
<i>Honza Förster</i>	<i>Cogni.zone</i>
<i>Charles Ikem</i>	<i>Service designer/consultant</i>
Zahra Khani	Firmalyzer
Jose Luis Pancorbo	AERTIC, Digital SME Alliance
<i>Rob van Kranenburg</i>	<i>IoT Council</i>
<i>Thomas Cooney</i>	<i>Dublin Institute of Technology</i>
André Richier	European Commission
Ivan Katsarski	European Commission
Sander Wintgens	European Commission
<b>Consortium</b>	
Sebastian Otte	Technopolis
Sebastiano Toffaletti	Digital SME Alliance
Justina Bieliauskaite	Digital SME Alliance
Annika Linck	Digital SME Alliance
Niels van der Linden	Capgemini Invent
Marit Blank	Capgemini Invent