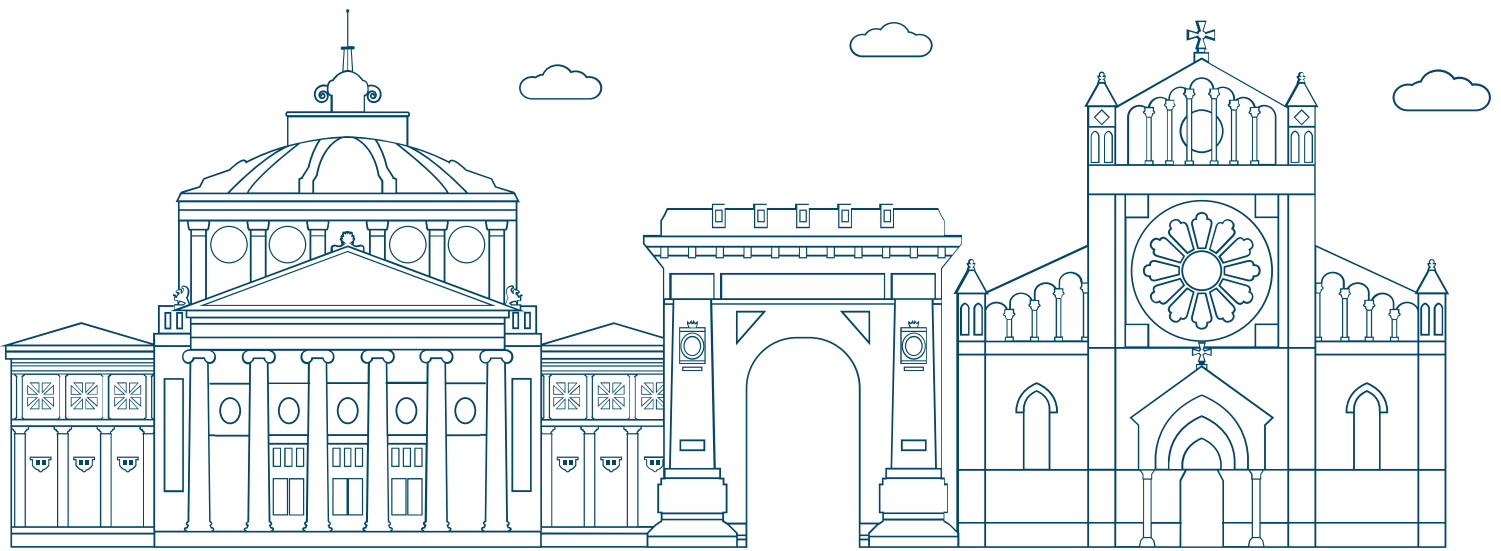


Global Engineering Deans Council Industry Forum

*Developing the next generation of
engineering experts and leaders*

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Concept Paper

*Rationale for the first regional GEDC Industry Forum
to be held in Bucharest, Romania - 20-22 March 2019*

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The first regional **Global Engineering Deans Council (GEDC) Industry Forum** is taking place in **Bucharest, Romania** from **Wednesday 20th to Friday 22nd March 2019**. Building on the immense success of the 2017 global Industry Forum, this event will focus on stimulating innovation through bringing together universities and industry, and tackling the growing gap in digital and scarce skills as well as developing key graduate employability skills, including intra-/entrepreneurship skills. This event will be followed by a global GEDC Industry Forum, taking place in Fontainebleau, France from Wednesday 3th to Friday 5th July 2019.

These events, as the original, highly successful global Industry Forum, is by invitation only with limited places that will be allocated on a first-come basis. If you have not yet received an invitation and would like to, or would like to propose someone be invited, please contact contact@gedc-industryforum.com.



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1. The GEDC Industry Forum

The Global Engineering Deans Council (GEDC) Industry Forum – created and managed in collaboration by the GEDC and Petrus Communications – is a developing initiative designed to bring leading engineering employers, relevant NGOs, and SMEs together with engineering Deans and other stakeholders for mutually beneficial exchange and knowledge sharing. Driving the creation of the Industry Forum was the recognition there is an existing and widening gap – especially in engineering and digital fields – between the skills that employers need and those available in university students and graduates, and in the existing workforce. This skills gap is being exacerbated by changes brought on by the ‘fourth industrial revolution’, which is marked by an exponential rate of technological innovation which is bringing about paradigm shifts in the economy, business, society, and individually.¹

In response to fast-evolving industry and technology requirements, global engineering employers are looking for innovative ways to attract and develop the best talent for their businesses. In parallel, SME’s and dynamic start-ups all over the world are looking for talented engineering and technology students to work internationally, in new and creative, digitally enabled ways which may require different skills from the past. The role of education providers in engineering and digital fields, specifically in the technology development that is shaping the future of the world requires a responsible, ethical and collaborative response from industry, employers, universities and other stakeholders to ensure students are developing relevant skills.

It was with these requirements in mind that the first Global GEDC Industry Forum was held in Fontainebleau, France in June 2017. The purpose of the event was to provide a platform for engineering education and industry leaders to come together to discuss and build viable solutions to develop the engineering experts and leaders for the future and understand better each other’s needs. Multiple challenges were addressed, for example the skills gap in the engineering and digital fields mentioned above, which are attributable to a confluence of megatrends such as increased globalisation; increased digitalisation; and the blending of technical, economic, and societal structures, which have pushed the world into the beginning of the aforementioned fourth industrial revolution. The event included input from expert panellists in addition to highly interactive and innovative group work, centred around eight themes:

1. Developing Professional Skills – developing skills such as effective communication, teamwork, global and cultural awareness, which some employers say engineering graduates do not possess sufficiently or are not sufficiently evaluated alongside engineering skills.
2. Educating Engineering Leaders – developing a common understanding of what ethical leadership skills are and how to build these while still at university.
3. Commercial Awareness and Entrepreneurship – developing enterprise skills (commercial awareness) and then teaching how to apply those skills to create and grow organisations in order to identify and build on opportunities (entrepreneurship). As these skills are of particular importance to small and medium-sized enterprises (SMEs), the needs of SMEs will be central to this theme.
4. Learning to Learn – developing the ability and desire to learn throughout one’s lifetime, particularly the fast-changing technical skills required for a successful ongoing career in engineering.
5. Technical Fundamentals of 21st Century Engineering – explores what common set of technical skills are needed in today’s engineers. How are these fundamentals changing, and how can we adapt?
6. Developing High Demand Skills of Today and the Future – how can we quickly develop the high-demand skills of today (e.g. cybersecurity, data science, etc.)? To minimise future talent shortages when we cannot predict with certainty what skills will be needed, how can we create a kind of ‘rapid response’ system when it becomes clear that a certain skill will be in high demand?
7. Authentic Assessment of Skills – how to assess and communicate students’ skillsets in a manner that reflects how industry measures such attributes, especially for high demand non-technical skills

¹ For more on the fourth industrial revolution, see Schwab, K. (2016). The Fourth Industrial Revolution. Geneva, Switzerland: World Economic Forum.

8. Developing Employability Programmes in Resource Poor Environments – how to build employability programmes that develop technical and/or professional skills when there is a lack of resources, such as limited access to technical equipment.

A rotating brainstorming session kicked off group work, during which challenges related to each theme were explored in-depth. After identifying challenges, delegates chose one theme to concentrate on, forming Dynamic Design Groups. Dynamic Design Groups are a concept developed specifically for the Industry Forum by its organisers and working group members, and were a real-life example of multi-stakeholder, collaborative innovation in practice. Each Design Group was tasked with designing solutions to challenges identified under each theme, and then presenting these solutions in creative and engaging ways at the end of the Forum.

During group work and presentations, a number of issues were raised repeatedly as needing to be addressed in order to best develop skilled engineering leaders of the future:

- Making accreditation systems more flexible – a more agile system is needed to keep up with the pace of change today
- Teaching students to learn how to learn – so that they can continue to learn beyond their formal education, to keep up with the changing demands of the labour market, society, etc.
- Incorporating other disciplines in engineering education – so that future engineers better understand how their work fits into a highly-interconnected world
- Allowing failure – because failure is an essential part of innovation and creativity, how can universities accommodate failure in their curricula?
- Using more problem-based learning – turning students into more active learners and teaching them skills they need for the workplace by providing them with ‘real-world’ problems faced by industry
- Increasing amount and regularity of collaboration between universities and industry – to ensure that both communities understand each other’s needs and expectations.

Questions of ethics and of diversity were also often raised during the event. Formal teaching on ethics, using projects, case studies and by integrating work with other disciplines was felt to be essential in particular with a consideration of the potential unintended consequences of the fast pace of technological change. In terms of diversity, delegates clearly wanted engineering and engineers to make a positive contribution for the whole of society, with people of all profiles and backgrounds being able to find their place within engineering.

2. Introducing Regional Industry Forums

While the Industry Forum is an ongoing initiative aimed at uniting education and industry leaders and other stakeholders globally via a number of actions, we recognise that the environment within which universities and businesses work together varies according to city, country, and region. This is why the decision has been made by the GEDC and Petrus Communications to not only hold a global Industry Forum event annually, but also to hold regional events throughout the year, hosted where possible with GEDC Members. These regionally-focused events will address issues specific to the region and will help attendees build their networks close to home. Of course we expect attendees to come from around the world - the international nature of the GEDC and of engineering lends itself to global collaboration - however for the regional events it is likely that the delegates will all have some level of specific interest in the region concerned.

The first regional Industry Forum event will be held in Central and Eastern Europe (CEE), which for our purposes includes the following countries: Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Serbia, Slovakia, and Slovenia. CEE has long been an engineering powerhouse in Europe, has been one of the fastest growing regions in Europe, and has the potential to become a global centre of innovation as well. The reasons for choosing CEE are outlined in the next section, along with some of the challenges the region currently faces that could be addressed during the first regional Industry Forum.

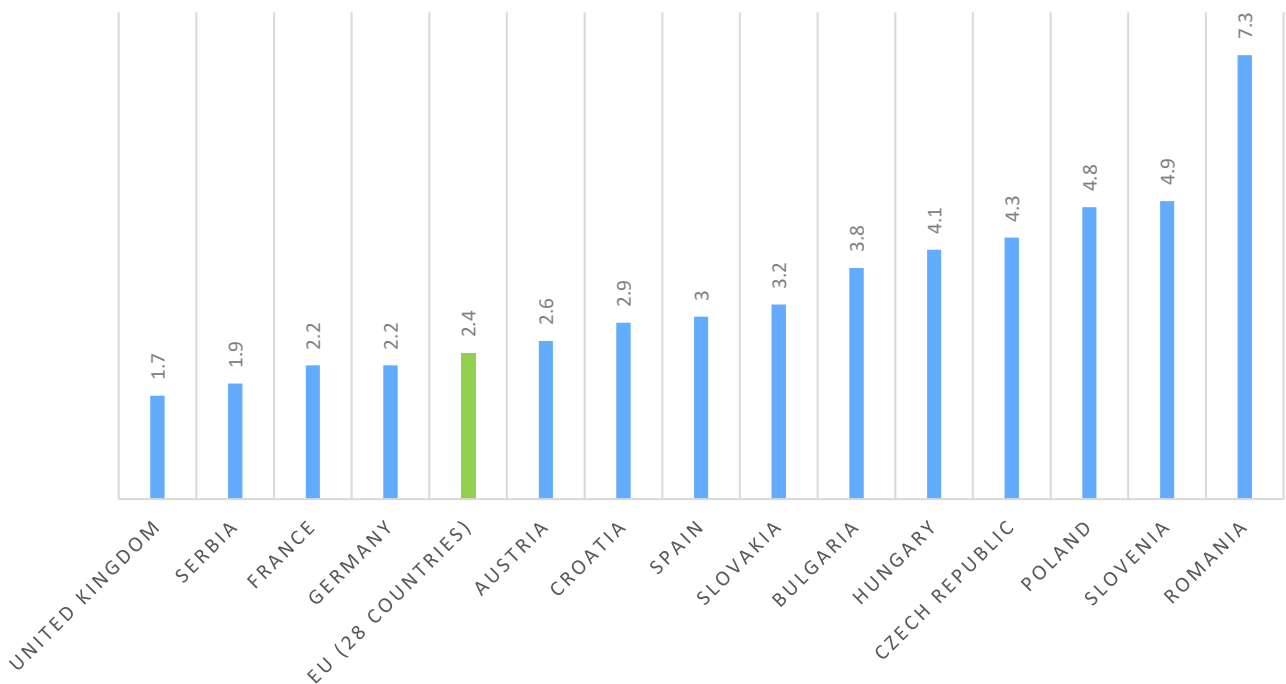
3. Why Central and Eastern Europe?

CEE is a dynamic region that has undergone rapid and significant change in the past nearly three decades, and one that is at the beginning of another major transition. There have been two major turning points in the modern development of the region, with the first being the “collapse of a centrally planned system and the beginning of the building of a free-market economy” in most countries in the region in 1989/90, resulting in fundamental economic and political reforms. The second turning point was the formal membership of eight CEE countries in the European Union in 2004.²

After the first major transition in the 1990s, private western European and U.S. companies flocked to the region, “eager to profit from the low wages”, and after 2004, tariff-free access to the European Union (EU).³ For example, Germany’s Volkswagen AG bought the Czech Republic’s Skoda Auto in 1991, Whirlpool Corp. set itself up in Slovakia – the country which then went on to become the world’s largest car producer per capita. The region therefore became a “vital link in the supply chains” of foreign multinationals.⁴

Capital brought by these companies was matched by “cheap, well-educated local workers”, leading to booming economies in those countries in the CEE region in the EU. Today, CEE countries have some of the highest annual growth rates in the EU, as seen below.

Figure 1: 2016-2017 GDP % Growth



Source: Eurostat

However, this economic success combined with shrinking populations has recently led to rapid and significant rises in wages, especially since 2010. Already some multinational companies have started to move further east, where labour is still relatively cheap.⁵

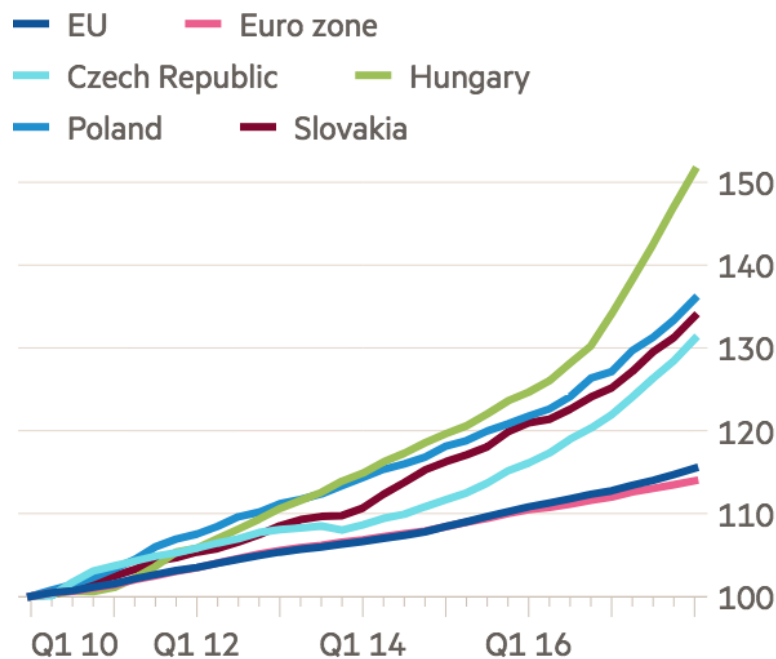
² Jasinski (n.d.), p. 2

³ Timu & Seputyte (2018)

⁴ Ibid.

⁵ Shotter (2018)

Figure 2: Nominal Wages and Salaries in Central Europe, Rebased



Source: Eurostat as cited in Financial Times⁶

These trends have resulted in CEE countries being pushed to reconsider their current economic models, which experts predict will be the next major turning point for the region.⁷ CEE countries have already moved from net importers of knowledge-intensive manufacturing to net exporters. To fully embrace the new transition that the region is at the cusp of, however, CEE economies will need to attract more innovations, raise investments in R&D, and focus on higher value-added products.⁸ Rapidly increasing demand for high-skilled labour in the region will also need to be addressed. While many CEE countries have an increasing amount of graduates with in-demand skills, many more are needed, meaning that “CEE needs to work to create a hospitable environment” to develop more human capital, which includes changes in the current system of higher education.⁹

All of the above means that “innovation is an economic necessity” in CEE, and one key way to address regional challenges and promote innovation in CEE is to promote more collaboration between universities, businesses, and other local, national, and regional stakeholders.¹⁰ While there is currently some collaboration in the area, CEE is still in the early stages of developing university-industry collaboration compared to Western Europe.¹¹ This makes the region a perfect location for an Industry Forum event, which will inspire and develop regional university-industry relations.

⁶ Shotter (2018)

⁷ McKinsey Global Institute (2013)

⁸ McKinsey Global Institute (2013)

⁹ Adecco (2018)

¹⁰ Economist Intelligence Unit (2008), p. 4

¹¹ European Parliament (2018)

4. Goals and Themes of the 2019 CEE Industry Forum

Given the context particular to CEE outlined above, the goal of the 2019 CEE Industry Forum will be to develop the networks of universities, businesses, and other stakeholders in the region in order to facilitate collaboration.

To allow participants of the 2019 CEE Industry Forum ample opportunity to share about their organisations and experience, the event will be centred around some region-relevant themes, which could possibly include:

1. **Making university-industry collaboration effective** – what is needed in CEE to make new and existing collaborations most effective given the particular context of the region?
2. **Developing high demand skills of today and the future** – how can we quickly develop the high-demand skills of today (e.g. cybersecurity, data science, etc.)? To minimise future talent shortages when we cannot predict with certainty what skills will be needed, how can we create a kind of ‘rapid response’ system when it becomes clear that a certain skill will be in high demand?
3. **Digital skills and lifelong learning** – Reskilling is now needed around every five years, not 20 as before, making lifelong learning a necessity in today’s labour market.¹² Lifelong learning has been seen in the past as the responsibility of the individual with some support from employers, but to ensure that skilling and re-skilling are occurring at the rapid rate needed today, all stakeholders will need to get involved. The role of universities in CEE will especially need to be reimagined, as education systems in the region “often focus more on raw knowledge acquisition than on equipping the workforce with skills for the new knowledge economy”.¹³
4. **How to tackle brain drain** – Brain drain is a significant problem in CEE as many high-skilled workers leave for what they perceive to be better opportunities in other countries. This is especially the case for individuals with management skills.¹⁴ How can stakeholders work together to help reverse brain drain by slowing outward flows and even repatriating talent in high-demand areas?
5. **Skill-based educational assessment** – Many countries in CEE do not have well-established assessment processes in place resulting in a lack of data on student learning and employment outcomes. At the same time, universities in the region tend to be focused more on theoretical aspects of education, not employability.¹⁵ How do assessment processes need to change in order to increase the amount of available data, and take into account employability of university graduates in CEE?
6. **Soft skills in the 4th industrial revolution/digital age** – As automation in jobs increases alongside technological innovation, the demand in “human” skills such as communication, empathy, ethical mindset, etc. will increase as well. How can stakeholders work together to ensure soft skills take the necessary prominent role alongside “hard” digital skills in higher education?
7. **Diversity in the digital workplace** – Diversity in the digital workplace is increasing as multiple generations work alongside each other, and workforces are increasingly international, especially in CEE where foreign companies play an essential role as employers. How can stakeholders work together to ensure that new graduates are prepared to work in increasingly diverse workplaces?

¹² Adecco (2018)

¹³ McKinsey Global Institute (2013)

¹⁴ McKinsey Global Institute (2013)

¹⁵ Adecco (2018)

5. 2019 CEE Industry Forum Location: Bucharest, Romania

Participants of the 2019 CEE Industry Forum will be building networks and discussing university-industry collaboration in a location that serves as a great example of present and future success in the region: Bucharest, Romania. Not only is Romania one of the fastest growing economies in all of Europe (see Figure 1 above), but in recent years the country has been establishing itself as a tech hub.

Strong growth in the tech sector is built on a “legacy of excellence in science, mathematics and technical education, as well as Romania’s strong language skills, which have long made it a hub for IT outsourcing”.¹⁶ And this strong growth is only expected to continue, with a doubling of the sector’s share to 12% of GDP projected by 2025, spurred along by one of the fastest broadband internet speeds in the world after only Singapore, Hong Kong, South Korea, and Iceland.¹⁷ Overseas companies often have “Romania DNA”, for example the video advertising optimisation start-up LiveRail acquired by Facebook a reported \$400-\$500 million, the social analytics platform UberVU which was acquired by Canadian company Hootsuite for \$15-\$20 million, and the Vector Watch which was acquired by FitBit.¹⁸

It’s not only the tech sector which has been booming in Romania, however. The services sector, along with exports and manufacturing are growing, and major foreign companies such as Siemens, Ford and Bosch setting up or expanding in the country has only served to boost this already strong growth.¹⁹ Google has also recently been expanding its presence in the country. The company already has an office – opened in 2010 – in Bucharest that employs around 53,000 people, and plans to increase work with universities by opening six permanent hubs in Romanian universities as part of its Digital Workshop programme.²⁰

This exciting environment of innovation and growth in Romania makes the country a perfect location for the first regional Industry Forum, and is sure to provide rich networking opportunities for participants. We look forward to seeing you there.

¹⁶ Gillet (2017)

¹⁷ Ibid.

¹⁸ MacDowall (2017)

¹⁹ Gillet (2017)

²⁰ Banila (2017)

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