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The 4th Generation University Initiative: its impact and relevance for CRIS systems

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In the evolving landscape of higher education, the need for universities to demonstrate their societal value has never been more pressing. This presentation will be about an innovative program that Elsevier have been developing over the past 2 years in collaboration with Eindhoven University of Technology (TU/e) and a dozen of similar universities world-wide (specifically Europe countries like Austria, the Czech Republic, Finland, Germany, Ireland and the UK are represented). This discussion will provide an overview of the 4th Generation University (4GU), an initiative designed to propel universities toward greater engagement with their local and global ecosystems while showcasing their contributions to society.

In my presentation I will discuss plans to use Eindhoven's CRIS system to showcase the various aspects of being a fourth-generation university, such as mission led research & education and knowledge transfer to (and from) small and large companies. I will also touch upon a similar view on ecosystem development, but from a funder, the NSF's directorate for Technology, Innovation and Partnership (NSF TIP) that is using a CRIS system to show how they help local innovation ecosystems with their funding.

The 4GU initiative emerged from a shared recognition between Elsevier and TU/e of the critical necessity for research institutions to articulate and demonstrate their impact on the communities that fund them. With rising public scrutiny regarding the return on investment in education and research, it is essential to shift the narrative from viewing such expenditures as mere costs to recognizing them as substantial investments in innovation and societal progress. This initiative seeks to establish a framework that supports universities in illustrating their value proposition to various stakeholders, including government entities, industry partners, and prospective students. I argue that the way the best CRIS system deal with data connections makes them a perfect candidate to support the concept.

The concept of the 4th Generation University is rooted in an article by TU/e professors Marcel Bogers and Maarten Steinbuch (1), who categorize universities into four distinct generations. The first generation represents medieval teaching institutions, while the second introduced research as a fundamental component. The third generation, shaped by American practices in the 1930s, saw the professionalization of technology transfer. The 4GU concept builds upon these foundations by promoting active collaboration with a diverse array of stakeholders, advocating for a mission-driven approach that ensures high relevance in all university operations.

While the regional focus of the 4GU does not diminish the importance of global academic engagement, it encourages universities to connect with international thematic ecosystems—such as optics research in the case of Eindhoven—while enhancing their contributions to local innovation networks. This dual focus not only enriches the academic environment but also aligns with the interests of local industry leaders requiring knowledge about these technologies, in the case of Eindhoven semiconductor related companies like ASML and Smart Photonics,

who seek partnerships that enhance their competitive edge and accelerate the commercialization of new technologies.

In my presentation, I will delve into the specific needs identified by TU/e and our other partners, particularly the desire to quantify and communicate the innovative impact of their research initiatives. As a relatively young institution, founded nearly 70 years ago in an area once dominated by Philips—known for its groundbreaking inventions—the university has evolved into a cornerstone of one of Europe’s most innovative regions. However, TU/e's president, Robert-Jan Smits, formerly the secretary general of the DG RTD in Brussels, recognized that the university's achievements were not adequately represented in existing rankings and metrics. This realization prompted the collaboration aimed at developing robust methodologies for capturing their contributions to the regional innovation landscape. The results were positive and were used—even before publication of our report - to gain a share of the so-called ‘Beethoven billions’, a one-off governmental subsidy to make Eindhoven even more attractive for semiconductor companies and their employees (2).

I will further elaborate on how Elsevier with its academic partners implemented the 4GU concept - and above-mentioned need for analyses - through our reporting, which involved identifying key elements from the framework and aligning them with the four activities outlined in the European Universities Association (EUA) report (3). Our approach included geolocation analysis of collaborations, an examination of how TU/e orchestrates its ecosystem engagements, and a focus on technology to measure impact effectively.

One of our primary objectives is to create a comprehensive set of indicators that can be utilized not just by TU/e, but by universities around the world. This endeavour is aimed at fostering a positive-sum environment where institutions can collaborate and share best practices, rather than competing for limited resources. Importantly, our program is distinct from traditional rankings, as it emphasizes collaboration over competition and aims to illustrate the broader societal contributions of universities.

Looking ahead, our shared vision is to scale the 4GU analytics framework to hundreds of universities, facilitating improved visibility of their contributions and success in securing diverse funding opportunities. We are currently working with a cohort of 12 universities globally to refine our metrics and ensure their relevance across different contexts. Some of these universities have embraced the concept fully and are even sharing their own insights with others (4). Recently we have announced that any university with the elements of 4GU in its mission is welcome to join a community of likeminded universities helping each other with best practice and continuous development (5).

Finally, as promised, we will also touch upon ongoing efforts to reflect 4GU-ness in CRIS systems. With Eindhoven we are collaborating to achieve some of this within the current functionality of their CRIS system. They are adding and technology-classifying courses and publications, but also collaborations with local large companies and creation of smaller ones: spinouts and startups (6). A great example of this approach elsewhere is the build-up of a portal for one the world’s largest governmental innovation funders, NSF TIP in the US. Their portal is already emphasizing location and technologies, with downstream impacts to follow (7).

References:

- (1) [“The Fourth-Generation University: The New Era of Open Innovation and Ecosystem Thinking”](#) by Prof Marcel Bogers and Prof Maarten Steinbuch.
- (2) [Project Beethoven](#), as described on the Brainport Eindhoven website. Brainport Eindhoven is the name of collaboration that supports the innovation ecosystem in Eindhoven.
- (3) [“Towards the 4th generation university: a collaboration between Elsevier and TU Eindhoven”](#) examines the transformative role of the Eindhoven University of Technology in delivering innovation and impact.
- (4) [Understanding our impact on the regional economy. The University of Strathclyde as a 4th generation university](#), by Prof Tim Bedford, Associate Principal Research & Innovation University of Strathclyde and Vice President of CESAER. Keynote at the Pure conference 2024 (YouTube video).
- (5) <https://4thgenuniversity.com> 4GU community website
- (6) <https://research.tue.nl/> TU Eindhoven research portal
- (7) <https://nsfmap.services.elsevierpure.com/> TIP investment pilot, by the U.S. National Science Foundation Directorate for Technology, Innovation and Partnerships (NSF TIP)