University value chains as a resource for sustainability management

Sustainability management can realize its full potential when an organization understands how and where it creates impact and which dependencies exist. This is also true for universities. Mapping the value chain turns implicit knowledge about activities and interdependencies into explicit descriptions and supports the identification of impacts, risks, and opportunities. By presenting the value chains of two Austrian universities, we share key lessons learned.

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Effective sustainability management requires clarity, which can be achieved through a structured understanding of an organization's value chain (VC). We argue that mapping the VC can enhance universities' sustainability efforts. The objectives and tasks of Austrian universities are described in the *Universities Act 2002* (UG, §§1, 3, BGBl. I Nr. 120/2002[1]).

To fulfill its tasks in teaching, research, artistic development, and contributions to society, a university depends on various resources such as procurement, financing, and recruiting, on external relationships including suppliers, partners, funders, students, and alumni, as well as on framework conditions such as geography, policy, and regulatory settings. Furthermore, the university's activities impact society through knowledge diffusion, graduate pathways, technology deployment, among others.

Therefore, focusing only on operations within the organization would provide a partial picture and impair holistic sustainability management. Mapping a university's VC means breaking down activities, relationships, and dependencies into a structured framework, allowing the university to refine the focus of sustainability management.

Mapping value chains

Two Austrian universities have recently outlined their VCs to support sustainability management and reporting, namely TU Graz (Graz University of Technology) and BOKU University (University for Natural Resources and Life Sciences, Vienna). The starting point for both universities was a materiality assessment, which requires a VC (EFRAG 2024).

At TU Graz, the Sustainability Reporting Working Group of the Sustainability Advisory Board (an interdisciplinary team with representatives from faculties, university administration, and representative bodies for members of TU Graz) drafted, discussed, and finalized the VC in continuous involvement of the Vice-Rector for Infrastructure and Sustainability. At BOKU University, the Center for Global Change and Sustainability outlined a first draft of the VC, which was reviewed by the Sustainability Core Group, a group consisting of the Vice-Rector for Research and Innovation, representatives of all BOKU departments and a student representative. Finally, the Rectorate ensured completeness and accuracy.

Each university identified main activities, supporting processes and facilities (Porter 1985), and further assessed their upstream and downstream VCs, defining material and immaterial inputs and outputs. Clarification about stakeholder and business relationships, including interactions, facilitated the identification of further VC aspects.

1 *www.ris.bka.gv.at/Dokumente/BgblPdf/2002_120_1/2002_120_1.pdf*

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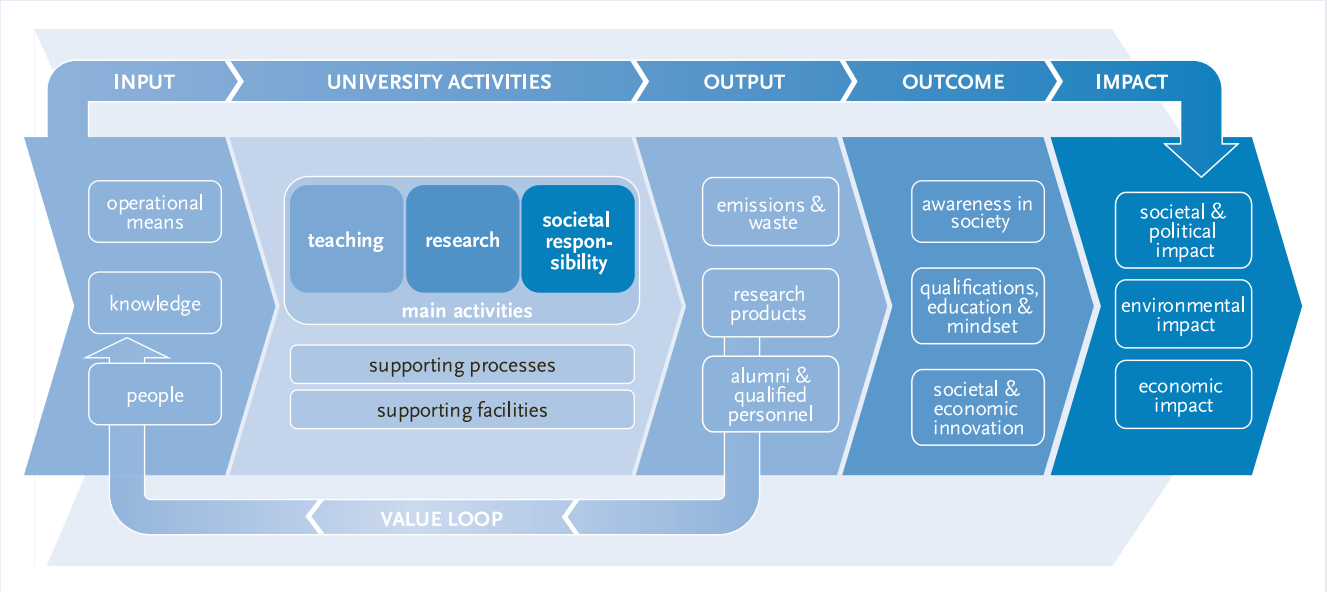

FIGURE 1: Schematic representation of the value chain of BOKU.

Value chain components of BOKU and TU Graz

Unsurprisingly, the VCs of BOKU (figure 1) and TU Graz (figure 2) are largely similar, although they differ regarding terminology, clustering, and visualization.[2] Both VCs are built around the three missions of a university in Austria, that is, "teaching", "research", and "societal responsibility". While BOKU's VC puts them as the main activities in the very center, TU Graz extends them with "infrastructure and operations" and "university management and governance". In BOKU's VC, these are part of "supporting processes and facilities" and not visualized separately. Further, TU Graz's VC includes "internal and external influencing factors" and "leadership and management" (e.g., mission statement, research and teaching profile, etc.) that span >

2 Detailed descriptions of VCs can be found on BOKU's website (BOKU University 2026) and in the TU Graz *Sustainability Report* (TU Graz 2025).

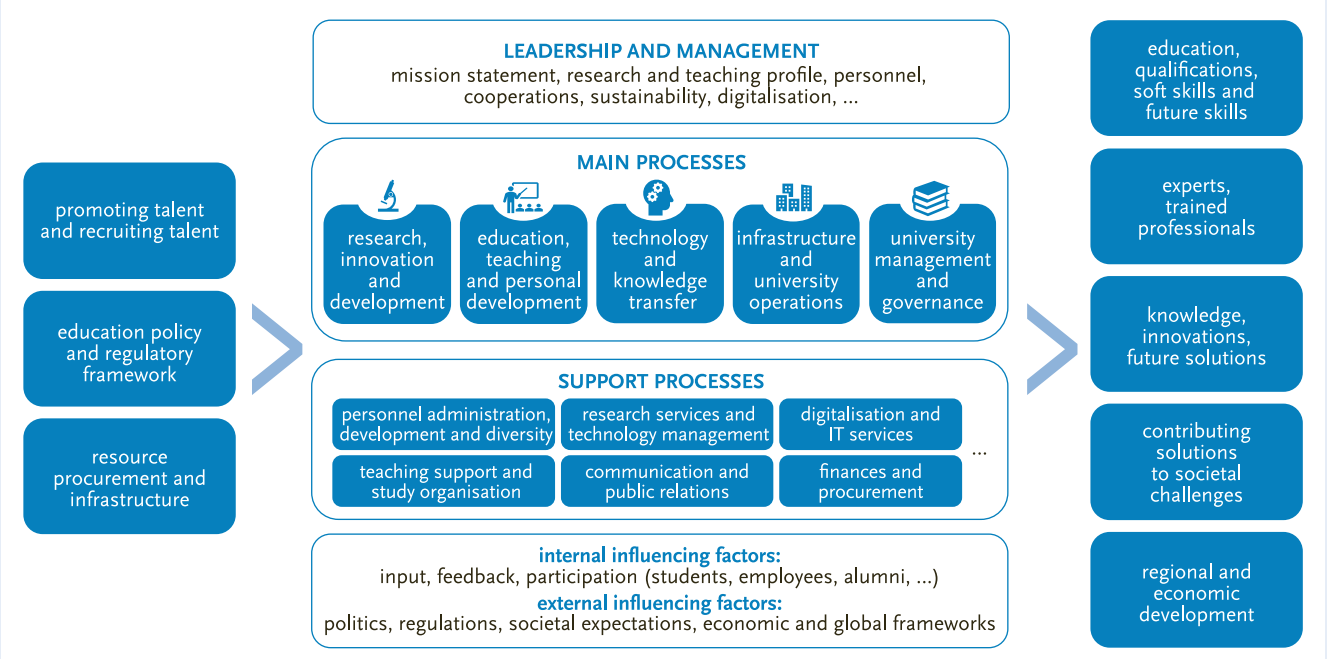

FIGURE 2: Schematic representation of the value chain of TU Graz (TU Graz 2025, p. 21).

across all activities. Both refer to contextual and normative factors, within or outside the university.

The upstream VCs are characterized by similar inputs. BOKU's "knowledge" and "people" are subsumed as "promoting and recruiting talents" in TU Graz's VC. BOKU's "operational means" are TU Graz's "resource procurement and infrastructure". TU Graz also includes "education policy and regulatory framework" among the upstream VC factors, such as the *Universities Act* (2002) acting as an institutional driver of university activities.

The downstream VCs show larger differences. TU Graz defines direct outputs that reach society and the environment through generated know-how, alumni, and role-model practices. BOKU's downstream VC is differentiated in "output", "outcome", and "impact" following the Logic Model approach (Davey et al. 2014) allowing further clarification of how measurable results for people, society, and environment can be achieved. BOKU also integrated a "value loop", illustrating the partial reintegration of certain outputs into the university.

The differences in visualization hardly reflect differences in the universities' characteristics, as the VCs remain generic. They are rather due to different intentions and discussions during the mapping processes. While TU Graz wanted to stress that their value creation is also shaped by their broader context, BOKU wanted to show that value created also feeds back directly into the university, and that a certain share of (sustainability) impact occurs along impact pathways.

Purpose of value chain mapping

Mapping an organization's VC appears evident in the production sector but seems unclear regarding the relevance for universities. This raises the question if such an approach offers value for universities or whether it risks becoming a mere compulsory exercise to meet European Sustainability Reporting Standards (ESRS) requirements. Two key takeaways can be recorded for both universities.

First, mapping the university's VCs helped to turn previously implicit assumptions into explicit descriptions, and visualizations of main aspects of universities' activities. Also, dependencies and interactions within the organizations and regarding their environment became visible. Thus, mapping VCs helped to gain a shared and deeper understanding of how value is created and how it becomes effective within society, which is particularly important for universities aiming to increase their sustainability impact.

Second, the VC perspective served as an essential input for the following materiality assessment. This assessment can offer strategic foresight by enabling systematic identification and classification of topics (or impacts, risks and opportunities – IROs) that are most important to address in sustainability management. For this purpose, TU Graz conducted a double materiality assessment in 2025, while BOKU is currently running the process.

TU Graz used the VC to identify its specific IROs for their sustainability reporting. Each VC stage was examined with regards to its relevance and potential exposure to both environmental, social, and governance (ESG)-related and university-specific topics. For example, heat waves caused by climate change can adversely affect the overall health, well-being, and performance of staff and students. At the same time, TU Graz trains specialists with the ability to take on key roles in climate adaptation measures (e.g., infrastructure and urban development) in the downstream VC.

BOKU used the VC to collect possible IROs in preparation for the materiality assessment workshops in a similar manner. For example, a sustainability focus in research or teaching can lead to positive impacts on the downstream side if research products lead to awareness raising or innovation and ultimately to societal impact. On the contrary, it can lead to negative impacts on staff and students, if a sustainability focus results in a larger workload. So far, the VC map has already proven valuable for both universities as it supports a systematic approach in identifying IROs.

Mapping the value chains also enabled a systematic identification of impacts, risks and opportunities, representing a strategic step towards managing sustainability in a more holistic and authentic manner.

Conclusion and practical implications

Mapping the VC supported a shared understanding about value creation at universities. For TU Graz and BOKU, it transformed implicit knowledge about the processes in the VCs into an explicit and visual structure. It also enabled a systematic identification of IROs, representing a strategic step towards managing sustainability in a more holistic and authentic manner.

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