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Building platforms to scale the circular economy in the construction sector

PROJECT

Industrial PhD
CircOP

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The pressure on the global construction sector is two-fold: the growing population increases the need for affordable living space while global resource scarcity drives rising construction costs. At the same time, current construction practices contribute to the exceedance of absolute environmental boundaries. Reaching international goals of remaining within planetary boundaries requires reducing the consumption footprint (European Union, 2020), which in turn gives rise to attempts to implement the circular economy (CE) in the construction sector. The CE offers not only potential financial benefits, but also a lessening of ecological burdens. This research project sets out to investigate whether platforms can help overcome the difficulties of implementing at scale a systematic approach like the CE in a highly fragmented industry such as the construction sector.

Both practitioners and academics point to the importance and challenges of implementing CE in construction (e.g. Styles et al. 2018, Osobajo et al., 2020, Ottosen et al., 2021). Difficulties and opportunities related to value-chain integration (Osobajo et al., 2020, Ottosen et al., 2021) and documentation (Styles et al 2018) are currently not covered by systematic research and development. Today, value chains follow an institutionalized division of labor organized in short-term projects as the primary mode of production, which leads to a fragmented construction industry (Sheffer and Levitt 2010). The adoption of an inclusive approach to implementing circularity is hampered by fragmentation along three dimensions: (1) Vertical fragmentation represents

the lack of knowledge exchange between various project phases. (2) Horizontal fragmentation describes the lack of synchronization between various stakeholders at the same project stage, and (3) longitudinal fragmentation results from knowledge dissipating as project teams dissolve (Jones et al., 2021).

Platforms are generally described from either a technical or ecosystem perspective. The technical perspective (Baldwin & Woodard 2008) views a platform as “a set of stable components that support variety and evolvability in a system by constraining the linkages among the other components”. The ecosystem perspective focuses on the actors around the platform ecosystem and creates infrastructures for organizational learning and innovation that enable specialization and optimization across the value chain. By carefully optimizing products, processes, and the division of labor, platforms facilitate the pursuit of value while minimizing waste, and have proven to be successful tools (Gawer 2011) for achieving long-term strategic benefits in such industries as automotive, aerospace and defense. Since their current application in construction is limited (Thuesen & Hvam 2011, Jones et al. 2021), even more so in terms of sustainability and the CE, this project sets out to unlock both the industrial and academic potential for developing platforms that systematically improve the competitiveness of circular products and services in the construction sector, and thereby help to reduce the construction sectors’ absolute impact on the environment.