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Disruption, Innovation, Opportunity : The power of circularity within the commercial built environment

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Urban populations have been growing at an unprecedented rate around the world and there is growing concern that building-related environmental impacts also continue to rise. This has prompted a range of stakeholders in the built environment to make commitments to create and implement more sustainable building and construction solutions.

One popular approach is using a circular economy model, which encompasses three key principles: design out waste and pollution, keep productions and materials in use, and regenerate natural systems (Ellen MacArthur Foundation, n.d.). At scale, adopting circular economy principles could significantly enhance global construction industry productivity, saving at least US$100bn a year (World Economic Forum as quoted in ARUP 2017, p.15).

Our research question thus mines this untapped potential: How might we enable widespread participation by actors in the built environment to participate in the transition toward a more circular economy? Our synthesis map focuses on the prosperous Canadian commercial building sector, and aims to empower actors within this industry to discover their unique role.

Process:
We adopted our mapping process and approach from Gharajedaghi (2004), applied holistic thinking via an iterative process of inquiry to gain greater understanding of the complexity of the situation. We used operational thinking to map an entire circular system case study to look for balancing and reinforcing loops, gaps and delays in the system which were critical for deepening our understanding for potential system or behaviour change.

We investigated socio-cultural elements of the problem area through sector research, and conducted deep stakeholder analysis, to investigate and better understand foundational mental models of the system. Applying results, we formulated a systemagram of interrelationships between stakeholders, and a sphere of influence map that further situated stakeholders in the problem area.

During this process, we uncovered archetypes which revealed patterns of behaviour in systems to provide insight into underlying structures (Braun 2002). We looked to Meadows (2008) to consider potential leverage points and the most effective places to intervene in the system. Finally, we used a panarchy model to formulate theories of how complex and rapid change towards a circular operating model could occur (Gotts, 2007). This conceptual framework was used to organize and structure our insights and proposed levers of change, to demonstrate the ways in which the system can change over time, through the widespread support from each actor. These phases of change were applied to our core set of actors, and organized into three panarchical levels. The *micro-system* includes individual and organizational actors

such as architects, designers, building owners, and tenants. The second is the *meso-system* of the larger industry and municipal level governments. Finally, the *macro-system* includes larger governance structures and the biosphere. The biosphere, while an invisible actor within the built environment, is placed within the macro system as a driving force for rapid change as the impacts of climate change push towards resource-scarcity and mass migration. Change across time requires increased capacity and connectedness, and as we move across the panarchical levels from micro to macro, change moves more slowly.

Throughout, we used an Appreciative Inquiry (AI) lens, to reframe barriers as opportunities, and to design interventions that could heighten energy, vision, and action for change (Cooperrider, Whitney & Stavros, 200s8). Our synthesis map inspires action by providing a full-scale picture of how the tangible actions of each major actor within the commercial built environment work in relation to each other to stimulate growth and change.

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