

SUBJECT OF THESIS 2021 2022

Thesis title : A Serious Game Approach to Capturing the Challenges of Building Circular Economy Innovation Ecosystems

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Doctoral school: I-MEP2

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Funding envisaged: I-MEP2 scholarship requested

Context

This thesis is part of a set of research work carried out by the CPP team (product-process design) of the G-SCOP laboratory around the theme of the circular economy, eco-design, product-service systems, as well as methods, tools, organizations and systems of innovation. The candidate will join a dynamic and motivated team, full of diversity and curiosity. Frequent and regular communication with many industrial partners in France, Europe and beyond is part of the culture of our laboratory, and will be an essential element of this thesis.

Possible partners:

A partner laboratory in human and social sciences for the serious game approach, collaboration with many industry partners

Brief Description:

Driven by the increasingly perceivable effects of climate change, the Circular Economy constitutes one of the most important megatrends of our era. In combination with ever-shrinking product margins and rapidly accelerating innovation cycles in almost every industry sector, Circular Economy implementation goes along with the creation of complex company networks, increasingly often called innovation ecosystems, which cooperatively provide added-value services to customers. Innovating and simply cooperating in such contexts that go far beyond the “extended enterprise” represents huge challenges to industrial organizations. These challenges are linked to both technical complexity (diverse enabling/communication technologies, standards, core competencies, etc.) as well as organizational complexity (diverse organizational cultures, legal frameworks, strategic objectives, etc.) factors. Moreover, innovation ecosystems for Circular Economy require new innovative business models that satisfy the needs and expectations of each node in the complex interlinked stakeholder network. In particular, from a design perspective, their

consideration needs to be integrated in the very co-design of products and related services (Industrial Product-Service-Systems, IPS²) for the closed life cycle.

In order to tackle these various interlinked challenges, companies cannot even rely easily on outside help: consultants have a very limited influence on and insight into the networked ecosystem as a whole. In this context, the objective of this PhD thesis is to design a serious game approach to helping companies early identify, experience and understand the challenges and risk of building such Circular Economy innovation ecosystems with the partner network they envisage to build. Gaining such insights early and in a practical, ludic form will inspire them about appropriate ways of tackling technical and organization design challenges, as well as mitigating associated risks. The doctorate student will take a design-science approach to designing the serious game in close collaboration with diverse stakeholders from industry (interviews), as well as with support from social scientists (to well capture the appropriate pedagogic approach to the game). The student will need to envisage and design adequate scenarios, rules, and guidelines in a way as to assure a close practical relevance, as well as effects of insight generation and solution guidance. While a focus on one or several particular industry sectors is not required, the game shall cover challenges that are linked to the entire ecosystem life cycle, including in particular the IPS² supply chain. The design validation on a broad basis shall be leveraged through an on-line implementation and moderation of the serious game.

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