TWO-PAGE SUMMARY

Collaboration for sustainability: Making sense of smart city projects

Climate change adaptation, poor air quality and adjustments due to a pandemic are just a few examples of current urban challenges ("Goal 11," n.d.). To address these complex issues, collaboration between government, non-profit and for-profit organisations is needed (e.g. Baccarne et al., 2016; Kornberger et al., 2017). Therefore, the European Commission and local governments subsidize hundreds of smart city projects in which multiple stakeholders experiment with technological innovations in cities. Yet, scholars have observed that the different partners participating in the projects experience difficulties to develop their innovations further after the project ends, making them unable to achieve the intended impact (van Winden & van den Buuse, 2017). Despite the emphasis on collaboration by practitioners and researchers, there is a lack of empirical research showing how collaborative approaches contribute to upscaling of smart city projects and, thus, to sustainable urban development. Hence, the study focuses on collaboration in smart city projects.

Collaboration between different types of organisations is a powerful approach to address complex issues, as this brings together different expertise (Howard, Steensma, Lyles, & Dhanaraj, 2016), tangible and intangible resources (Lee, Baek, & Jahng, 2017) and multiple perspectives on the problem (Seidl & Werle, 2018). However, collaboration also implies different interests, expectations and motivations among the partners. Furthermore, the partners come from different types of organisations and have different backgrounds and frames of reference (McGivern et al., 2018; Vad Baunsgaard & Clegg, 2013; van Marrewijk et al., 2016). Given the great diversity in the team, it is crucial to collectively make sense of the urban problem and its possible solutions (Maitlis & Christianson, 2014; Seidl & Werle, 2018). This shared understanding shapes the process of identifying and committing to collective goals and actions (Bryson, Crosby, & Stone, 2015) and thus makes it essential for results and impact.

Characteristics of smart city projects add complexity to the development of an understanding among the partners. First, the context in which the smart city project teams operate is complex. The urban challenges that the project is supposed to tackle are multifaceted and often ill-defined. Also, the use of technology involves an extra dimension of complexity, uncertainty and ambiguity, because of the high speed of technological developments and ethical considerations, such as privacy. Furthermore, there are often many alternative technologies that could form a possible solution for the urban issue. To understand this complexity and to examine the effectiveness of the innovation, the thought processes and related actions of individuals in the project team are important.

Second, smart city experiments often take place in subsidized projects. Projects are assumed to be flexible, because of the temporary character (Cerne & Jansson, 2019). The question is how flexible innovation projects are in practice. The goals of innovation projects, especially in subsidized projects, are often formulated in detail before the start of the project (e.g. "Funding & tender opportunities," 2021). Usually, there is limited room for failures in sustainable innovation projects (Cerne & Jansson, 2019), because the consequences of failure are unacceptable in ethical and financial terms. Ethically, because the complex social problem – for example climate change adaptation – has to be solved on a short term. Financially, because the projects use public money. Here, the question arises how the project partners make sense of the innovation while being embedded in predefined project structures.

Although there is an extensive literature on collaboration between organisations (e.g. Colaner, Imanaka, & Prussia, 2018; Parmigiani & Rivera-santos, 2011), far less is known

about optimal collaborative approaches in the specific smart city context. Literature on upscaling of smart city projects focused mainly on enablers of scaling from an economic and institutional perspective (van Winden & van den Buuse, 2017). Moreover, studies on multi-stakeholder collaboration paid most attention to the organizational level (Kolk, Vock, & van Dolen, 2016). However, there are indications that factors on the individual level play an important role in the effectiveness of collaboration and its outcome. In particular, factors related to sensemaking (Weick, 1995). For example, Zuzul (2019) show that partners tend to leave the project or do not commit themselves on the longer term to the development of the innovation, if the decisions made in the project team are not in line with their interpretations of the "right solution". Other research emphasize the importance of including a variety of perspectives in the project team to be able to develop an integrated solution (Seidl & Werle, 2018). Thus, on the one hand it is important that partners agree upon the project goals and ambitions and reach consensus. On the other hand, it is important that partners bring in a diversity of perspectives in the project allowing for critical reflection on the innovation.

Using a longitudinal in-depth case study on a multi-stakeholder innovation project, the study aims to explore how partners in smart city projects develop an (shared) understanding on how to address an urban issue and its relevance for the outcome of the project. The sensemaking literature helps to examine this process by using concepts such as cognitive frames and the process by which individuals shape each other's interpretations of signals in the environment (Maitlis & Christianson, 2014; Sandberg & Tsoukas, 2015; Weick, Sutcliffe, & Obstfeld, 2005). This results in the following research question: *How do partners in smart city projects develop an (shared) understanding on how to address an urban issue?*

The longitudinal case used is the 'RESILIO project': acronym for '**R**esilience n**E**twork of **S**mart **I**nnovative c**LI**mate-adaptive r**O**oftops'. The case covers a 3.5-year period (start: September 2018), during which multiple actors – including public and private partners – implement an innovation for climate change adaptation: 10,000m2 roofs are replaced for *smart blue-green roofs* in five different pilot areas in Amsterdam. Smart blue-green roofs allow rainwater storage and have a smart control system to anticipate extreme weather (i.e. empty the storage when heavy rainfall is forecasted). Ultimately, multiple roofs can be linked into a smart grid, to locally optimise climate adaptation. Data collection started in February 2019 (start of the project) and will continue until the end of the project in April 2022. Rich data is collected using interviews, documents and observational data gathered during moments when the project partners interact, such as project meetings.

The study reveals two sensemaking processes: one process related to the project and one process related to the effectiveness of the innovation. The study indicates that tensions arise between strict project management and making sense of the effectiveness of the innovation. Although the partners commit to the project goals, not all partners are convinced of the effectiveness of the innovation. This is where commitment to a project can be confused with commitment to the further development of an innovation. A practical implication is that the smart city projects might benefit from a structure that provides room for failure and adjustments of the project goal during the project. This enables evaluation of the innovation during the project and learning loops that can be translated to the project goal. However, I will only be able to make firmer statements and draw wider conclusions once all data is collected and analysed, which will be done next year. Because of the inductive character of the study and the rich data already collected, I would like to discuss the (analysis of the) data and possible theoretical framing(s) during the Ivey Sustainability Academy.

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