

Digitalisation of critical infrastructures

Infrastructure systems, such as water, energy, and transport, are the building blocks of our society. Beyond providing critical societal services, they also bring stability and predictability to society at large. However, due to growing concerns with resource depletion, loss of biodiversity, and climate change, the conventional way of providing these services is being questioned. Instead, there is a growing demand for new and more innovative ways of providing these services (Köhler et al., 2019; Markard et al., 2012).

One technology trend that holds promises of new innovative ways of managing and operating these services is digitalisation. While the (potentially) disruptive impact of digitalisation already has been evident in sectors such as music, media, and finance (Geurts and Cepa, 2023; Karimi and Walter, 2015; Malar et al., 2019), it is expected to impact all sectors in society (Legner et al., 2017; Westerman et al., 2014).

Within the water sector, the usage of digital technologies is promoted under the label of 'digital water' (Sarni et al., 2019) and holds promises of improved efficiency and performance of water services. Water utilities have a key role as providers of water services and are often seen as 'gate-keepers' to introducing novelty to the sector (Lieberherr and Truffer, 2015; Smith et al., 2005). Yet, previous studies have shown that many water utilities suffer from an 'innovation deficit' and are often stuck in old ways of working (Kiparsky et al., 2016, 2013). Instead, they often rely on technical and non-technical innovations from other sectors that invest heavily in R&D and innovation (Wehn and Evers, 2015). What is the role of external actors in the digitalisation process of water utilities? Can water utilities manage this transition by themselves or do they rely on the actions of other actors?

The purpose of this thesis is to investigate the role of external actors in the digitalisation process of water utilities. These external actors include, among others, suppliers and consultants. The study is conducted in a Swedish context and will, among others, include interviews with representatives from the sector and an extensive literature review of the topic.

This master thesis is done as part of the research programme Mistra InfraMaint and allows the students to work closely with highly topical research. Mistra InfraMaint focuses on how opportunities provided by digitalisation can be used to improve the operation and maintenance of infrastructure systems. The programme studies how municipal processes and organisations can be developed to meet the large needs for infrastructure investments that the Swedish society is facing today. Mistra InfraMaint started in 2018 and consists of approximately 20 research projects. This master thesis is done in collaboration with project 2.1 *System logics and alignment of business models in smart maintenance of infrastructure*.

Practical information:

- Expected deliverables: Completed master thesis and presentation to the partners of Mistra InfraMaint.
- Compensation: The work is compensated when the thesis is finished.
- Application: Recruitment process is ongoing. For application, send an email to Amelie with a short description of your research interest within this topic.

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