

Smart Cities and Associated Risks: “Technical v/s Non-Technical Factors”

- Priyanka Singh (Priyanka.Singh@lero.ie)
- Dr. Markus Helfert (Markus.Helfert@lero.ie)

1 Motivation and Objective

- The connotation of smart city services introduces risks not only with the **technology** but also with **non-technical aspects** like process and management where **human element** is also involved. However, there are only limited attempts to **investigate risk** in the context of **process and management** while the literature of technology oriented risks is adequate.
- Risk: “Risk can be defined as the probability or threat of damage, injury, liability, loss, or any other **negative occurrence** that is caused by **external or internal vulnerabilities**, and that may be **avoided through pre-emptive actions** [3].”



Fig 1: Smart City Services [1]

Objectives:

- To examine the **internal vulnerabilities** in terms of **process and management** in order to minimise the impact of risks.
- Develop **risk assessment framework** to include **sociotechnical** perspective.

2 Findings

- Disparate influencing factors like **organisational issues** [4], **governance** [5], **lack of economical aspects and negligence of social factors** [6] have been highlighted other than the technical aspects in the literature to address risk in smart city domain.
- A case study for analysing risk and **influencing factors** from the lens of **Enterprise Architecture (EA)** within the Limerick Enterprise Architecture Project.

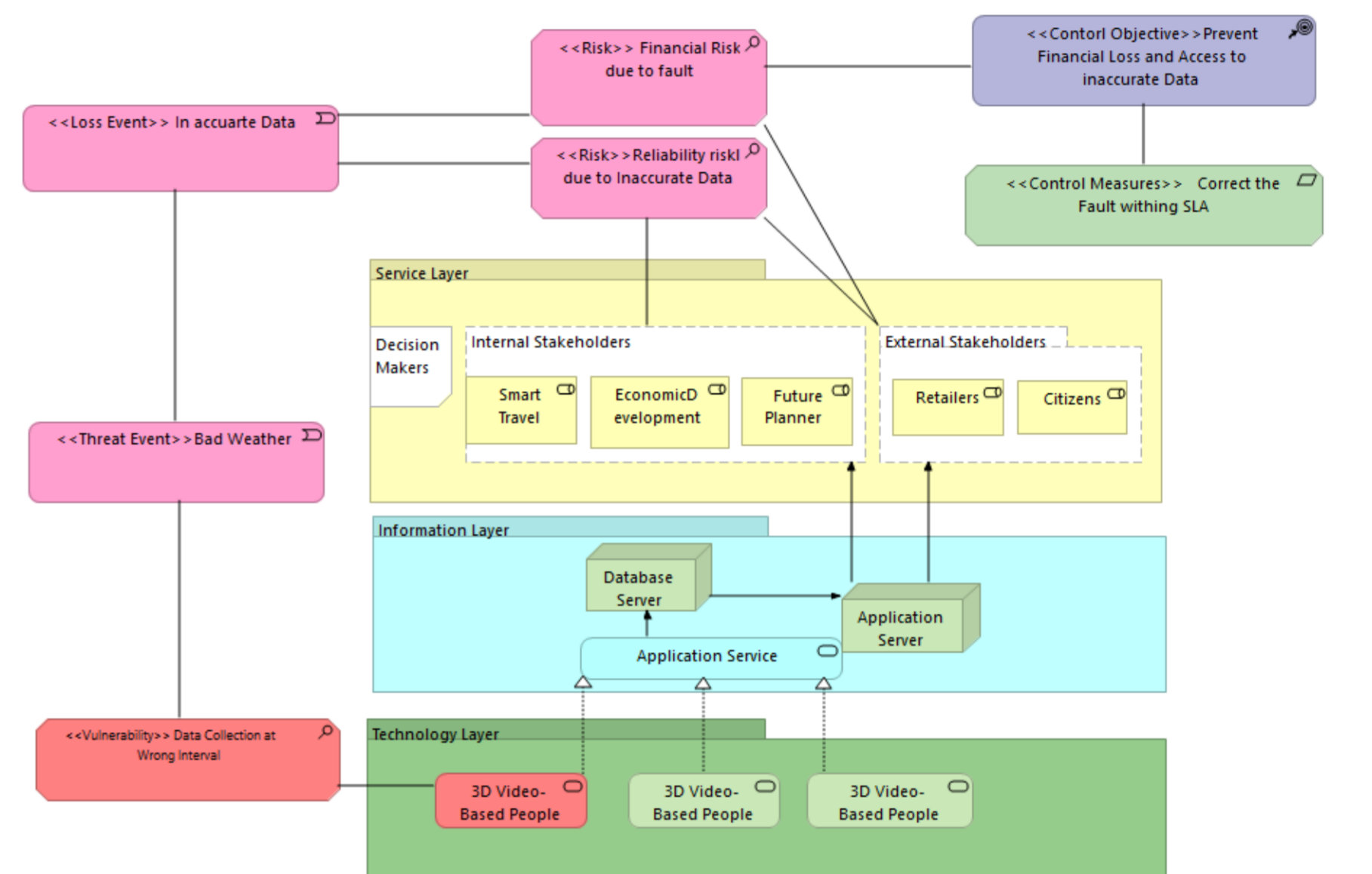


Fig 2: Footfall counter Service with Reliability and Financial Risks

Results:

- An analysis of disparate **types of risks** in smart cities and influencing factors for them.
- Analyzing **sociotechnical** perspective for **risk assessment process** for smart city services.

3 Methodology

- This research follows Design Science Research methodology (DSR). **Limerick City** and **Waterford City** have been selected for **case studies** to explore the services and risk associated with them.

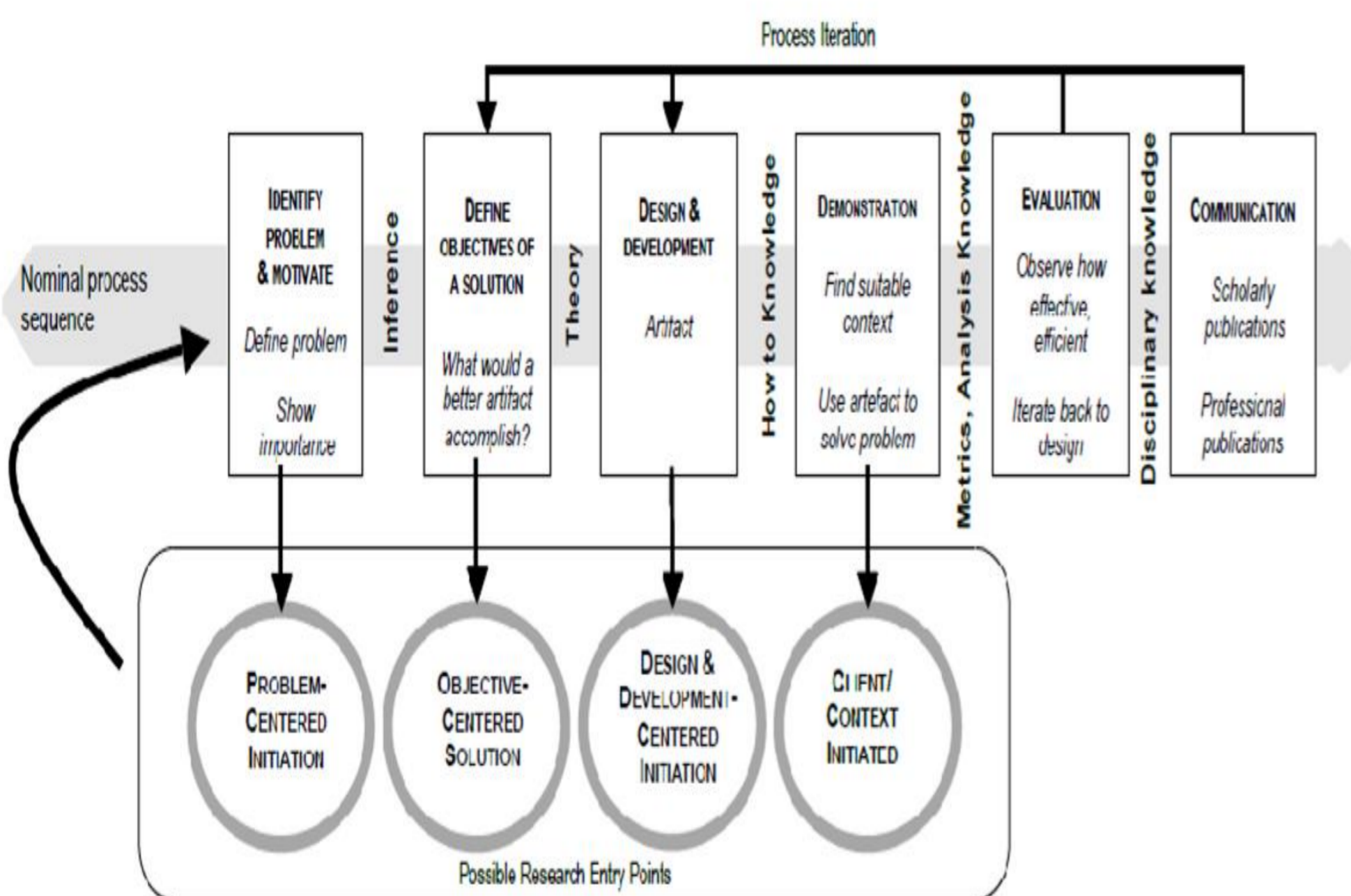


Fig 2: Design Science Methodology [2]

4 Future Work

- Analysis of risk management process from governance perspective
- Reviewing process involved in risk management and analyzing its impact
- Analyzing different viewpoints missing in risk analysis process with the help of Enterprise Architecture
- Developing framework on the basis of case studies and analysis done in previous steps

References:

[1] D. J. Cook, G. Duncan, G. Sprint, and R. L. Fritz, "Using Smart City Technology to Make Healthcare Smarter," Proc. IEEE, vol. 106, no. 4, pp. 708–722, 2018.

[2] S. Gregor and A.R. Hevner, "Positioning and Presenting Design Science Research for Maximum Impact", MIS Quarterly, 37(2), 337-355,2013.

[3] "Waterford City and County Council Risk Management Policy June 2017," no. June, 2017.

[4] S. O. Johnsen, "Risks, Safety and Security in the Ecosystem of Smart Cities," Intech open, vol. 2, p. 64, 2018.

[5] H. S. M. Lim and A. Taihagh, "Autonomous vehicles for smart and sustainable cities: An in-depth exploration of privacy and cybersecurity implications," Energies, vol. 11, no. 5, 2018.

[6] N. Marie et al., "Landscape and Urban Planning ' Rage against the machine ' ? The opportunities and risks concerning the automation of urban green infrastructure," Landsc. Urban Plan., vol. 180, no. September 2017, pp. 85–92, 2018.