# Value Creation and Sourcing Strategies in Urban Platforms

**Masterarbeit**

zur Erlangung des akademischen Grades „Master of Science (M.Sc.)“ im Studiengang Wirtschaftswissenschaft der Wirtschaftswissenschaftlichen Fakultät der Leibniz Universität Hannover

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# 1 Introduction

The concept of smart city has emerged as a response to rapid urbanization, increasing environmental concerns and technological development. A smart, sustainable city uses information and communication technologies (ICT), among other things, to improve the quality of life, the efficiency of urban operations and services, and competitiveness, while ensuring that it meets the economic, social and environmental needs of present and future generations (Mohanty et al., 2016). In recent years, the concept of the smart city has also become increasingly fashionable in the political arena (Sta, 2017). Many cities and local governments, as well as technology organizations and research institutes, have already been working to link smart cities solutions with policy goals and initiatives (Romualdo-Suzuki and Finkelstein, 2020). Today, the world is intrigued by its research nature and its specific dimensions that encompass people, economy, mobility, environment, ICT infrastructure, lifestyle and public administration (Ojo et al., 2015).
In the past, urban infrastructures were often developed and provided by independent, vertical silo systems to support scenarios with special services. In many cases, integration with other services and scenarios was not planned and not possible (DIN e.V., 2017). However, the emergence of new digital infrastructures has led to a transformation in urban service models. The accompanying new digital services, such as on-demand transportation, smart water management, responsive lighting, and decentralized energy resources, are rapidly replacing the old infrastructure and service models that served the cities of the twentieth century. As a result, the millions of interactions and transactions that take place in cities every day are now generating huge amounts of data. The volume of data in cities is growing at an unprecedented rate and is of increasing value to governments and businesses (Barns, 2018; Lnenicka et al., 2024). To take advantage of the opportunities of digitalization with its new digital infrastructures, cross-sector collaboration of intelligent services in combination with data analysis is necessary (DIN e.V., 2017). Soon after government data was first published, cities realized that re-using their data by private and public entities is a tool for fostering innovation and improving and creating new city services (Romualdo-Suzuki and Finkelstein, 2020). Therefore cities must transform big data into valuable and actionable insights and open it up to different applications in different business sectors. This can be achieved by building a flexible and efficient big data analytics platform between data sources and applications (Cheng et al., 2015). Despite the high expectations,

the implementation and operation of an urban data platform (UDP) is a major challenge for the government. In general cities are not in a position to build platforms on their own (Gong and Yang, 2022). Various organizational-, financial- and IT-specific barriers hinder the innovation process and the development of urban data platforms (Cinar et al., 2019; Demircioglu and Audretsch, 2017; Mu and Wang, 2020; Romualdo-Suzuki and Finkelstein, 2020). Many governments are still unclear about their strategic options for developing digital platforms and the corresponding requirements and possible outcomes (Thompson and Venters, 2021). In the past, it was common practice to outsource entire IT technologies to one provider (Cordella and Willcocks, 2010). However, this approach involves the risk of considerable dependence on external service providers (Mykytyuk et al., 2021). To counteract this and at the same time maintain control over the IT landscape, a selective outsourcing approach combined with the targeted development of internal expertise is possible (Cordella and Willcocks, 2010; Gong and Yang, 2022). The choice of strategy leads to different forms of cooperation between authorities and technology providers, each of which is associated with different advantages and disadvantages as well as capacity requirements for the local authorities (Gong and Yang, 2022). Furthermore, there are also critical questions about the extent to which cooperation with private sector players in the context of big data, especially data that is generated from the behaviour of citizens, is responsible in terms of security. In general, there are concerns that information collected to improve the quality of public services could be made publicly accessible or used illegally (Almarri and Boussabaine, 2025; Liu et al., 2020).

This leads to the following research questions regarding the sourcing of UDPs:
**RQ1:** What are the design requirements for an urban data platform and what are the barriers to its implementation?

**RQ2:** Which factors influence outsourcing strategies in the public sector when building urban data platforms?

**RQ3:** Which factors enable cities to actually carry out insourcing and outsourcing activities?

The risks and concerns associated with cooperation with private sector actors must be carefully weighed up by public decision-makers in order to find a balance between the interests of citizens and the private sector on the other hand (Lam and Yang, 2020). In addition, the pursuit of public value creation is increasingly seen as a central paradigm in public administration (Neumann et al., 2019). How-

ever, often public services are measured in terms of their financial cost rather than the quality their service can provide in terms of economic, environmental and social sustainability (Díaz-Díaz et al., 2017). Due to the growing IT-supported innovations, the aspect of citizen-oriented value creation has become increasingly important (Neumann et al., 2019). Therefore, the question arises as to how city governments can take responsibility for smart city projects to ensure that they create added value for residents (Timeus et al., 2020). This leads to the last research question:

**RQ4:** How do urban data platforms contribute to value creation within a city?

To address the research questions, the Design Science Research Methodology (DSRM) proposed by Peffers et al. (2007) is used as it provides a structured approach to developing an artifact that addresses a relevant research problem, as it offers a structured, problem-oriented approach to developing and evaluating artifacts that help solve organizational challenges. The first step consists of a literature analysis according to Webster and Watson (2002) and expert interviews from a previous study in order to build up a knowledge base. In a second step, the findings from the literature are used to derive design requirements. In a second step, the findings from the literature are used to derive design requirements. These are then discussed with experts in order to develop design principles and create a substantiated foundation for the further discussion of influencing factors and strategies of the outsourcing decision.

# 2 Theoretical Background

## 2.1 Urban Data Platform

For cities to leverage data-driven tools and services to address their most pressing challenges and realize the potential to drive economic growth, improve administrative transparency and create innovative new urban value-added services, governments must take a much more active role in managing their city's data assets (Romualdo-Suzuki and Finkelstein, 2020; Sta, 2017).The data itself is of limited value, linking the data is necessary to achieve results (Malomo and Sena, 2017). However, conventional database management tools or traditional data processing applications cannot handle the huge volume and heterogeneity of big data (Chen et al., 2014). In order to efficiently coordinate the various infrastructure systems

therefore be seen as an instrument for promoting transparency, participation and comprehensibility of municipal decisions, provided that the decisions are based on solid data analyses. In addition, the new and improved services offered by the city can also deliver social benefits.
The following figure 8 shows the complete implementation of the relevant aspects from the literature and expert interviews in the City Model Canvas of the UDP.

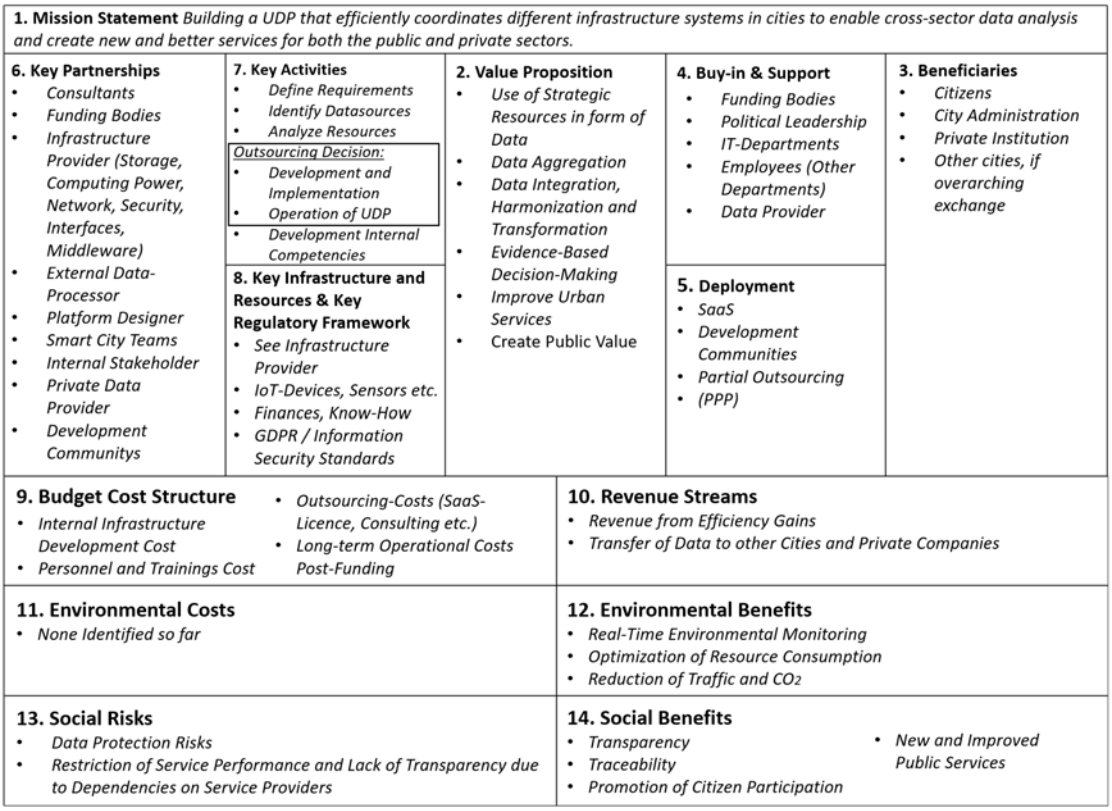


Figure 8: City Model Canvas UDP Based on (Timeus et al., 2020)

# 9 Conclusion

The thesis examines the development and procurement strategy of urban data platforms (UDP), as well as their value creation in the public sector. It analyses the identified barriers, the factors influencing outsourcing decisions and the contribution of UDPs to public value creation. The Design Science Research Methodology enabled a structured problem-oriented research approach in order to derive concrete design requirements based on the literature and expert interviews, and to verify their relevance in practice. This created a fundamental basis for the practical

investigation of the various outsourcing approaches of the six cities interviewed. The results show that despite their great potential, UDPs face a number of organizational, financial and technical challenges. In particular, rigid administrative structures, insufficient expertise, limited financial resources and a lack of technical infrastructure are key obstacles to the independent development and operation of urban data platforms in many cities.

None of the cities decided in favour of a complete internal implementation of the UDP. The majority of the cities surveyed have decided in favour of SaaS solutions, although decision factors such as dependencies, data security and data protection speak against it. Furthermore, although there is an overwhelming desire for hybrid models in which external expertise is specifically involved without losing control over critical platform components, this is not possible in all cities. The processing of personal data was rated as particularly critical by all experts. The decision to outsource depended largely on whether such data had already been integrated into the UDP. If processing is planned, cities tend to internalize security-relevant functions again in the medium term or at least control them more closely. In some cases, interim solutions such as data hubs were established in order to technically separate sensitive information and thus mitigate the subsequent outsourcing decision. In general, the cities distinguish between the development and operation of some UDP components. While development is often carried out in collaboration with external partners, several experts are in favour of internal operation in the medium term. Especially when processing real-time data in connection with critical infrastructures, municipal responsibility is important in order to fully guarantee functionality and control. Initial implementation, on the other hand, can be outsourced. In general, it is becoming apparent that the technical knowledge of external service providers is being used for complex tasks.

In order for cities to be able to make fully autonomous decisions, three clear factors were identified: Financial Resources, Available Knowledge and Existing Infrastructure. It became clear that none of these factors alone is sufficient to open up new scope for action. Only the interplay of these dimensions determines the actual scope for decision-making. In addition, it became clear that development communities between cities play a central role in providing access to technological solutions and expertise, especially for smaller or less resourced municipalities. The cooperative approach enables the exchange of knowledge, technical solutions and resources. This increases the cities' freedom of decision and allows them to become independent of individual large providers. Finally, it should also be noted that the

City Model Canvas could be completely filled in with the information from the literature and the experts, thus shows the value creation.