

# Design-Oriented stakeholder engagement in service ecosystems

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## ABSTRACT

This study investigates the role of stakeholder engagement in service ecosystem design through a longitudinal case study of a mobility-as-a-service ecosystem. The study makes three key contributions to the literature on service ecosystem design and stakeholder engagement. First, we conceptualize design-oriented stakeholder engagement (DOSE) as a stakeholder's level of resource investments and expenses in design and non-design processes toward a focal design object. This framework reveals how stakeholders' varying resource endowments manifest across both design processes (reflexivity and reformation) and non-design processes (reproduction). Second, we identify that stakeholders' reflexive capabilities manifest in three degrees – focused on self-perceived role, current systemic role, and future systemic role – with those stakeholders who are capable of systemic reflection demonstrating higher voluntary resource investments than those who focused solely on their current roles. Third, we identify role myopia and role uncertainty as barriers that impede higher degrees of reflexivity, explaining differences in stakeholders' resource investments and engagement levels throughout the design process.

## 1. Introduction

Research and practice are increasingly adopting a systemic view of society and the economy (Van der Byl & Slawinski, 2015). In the field of service, this manifests itself by extending beyond the service provider-customer dyad to encompass a multi-level view of stakeholders and the complex interrelationships and dynamics among them (Chandler et al., 2019; Vargo & Lusch, 2016). This view is captured in the concept of service ecosystems, which are defined as relatively self-contained, self-adjusting systems of loosely coupled social and economic actors connected by shared institutional logics and mutual value creation through service exchange (Lusch & Nambisan, 2015). While service ecosystems emerge and evolve dynamically through self-regulatory processes beyond any single stakeholder's control, stakeholders can intentionally participate in shaping these systems through service ecosystem design – a process defined by the intentional shaping of institutional arrangements and their physical enactments through reflexivity and reformation (Vink, Koskela-Huotari, et al., 2021). Hereby, the level of a stakeholder's resource investments – in other words, their engagement – has been highlighted as critical in successfully designing service ecosystems (Taillard, Peters, Pels, et al., 2016; Brodie, Fehrer, Jaakkola, et al., 2019; Danatzis, Karpen, & Kleinaltenkamp, 2022).

Especially, the recent conceptualization of stakeholder engagement defines engagement as “a stakeholder's resource investment- or expense-based endowment in his/her role-related activities” (Hollebeek, Kumar, & Srivastava, 2022, p. 335), and equates the level of resource investments with the level of stakeholder engagement (Hollebeek, Kumar, Srivastava, et al., 2023). The level of stakeholder engagement can differ across different stakeholders due to differing or conflicting motives, expectations, and goals (McCull-Kennedy, Cheung, & Coote, 2020; Hollebeek et al., 2022), and may cause some stakeholders to disengage (Lehtinen, Aaltonen, & Rajala, 2019; Lievens & Blažević, 2021). In particular, when a stakeholder perceives a threat to their role value due to the resource investments of another stakeholder, that stakeholder may use their resources to defend and maintain their role, which can cause role-related resource expenses (Hollebeek et al., 2022). Applied to service ecosystem design, the level of stakeholder engagement can not only indicate a stakeholder's disposition to invest in resources in designing the service ecosystem (Brodie et al., 2019), but also the role value-originating engagement dynamics between stakeholders (cf. Vink, Koskela-Huotari, Tronvoll, et al., 2021; Hollebeek et al., 2022). Thus, stakeholder engagement provides a possibility to analyze the potential success of service ecosystem design processes. However, despite its suggested criticality, the role of stakeholder engagement in service ecosystem design processes remains empirically and

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conceptually underexplored. In particular, our theoretical understanding of how different forms of stakeholder engagement manifest and evolve during these processes remains limited. By analyzing service ecosystem design through the lens of stakeholder engagement, we reveal how stakeholders' role-related resource endowments manifest in service ecosystem design processes. Through our analysis, we conceptualize design-oriented stakeholder engagement (DOSE), advancing our understanding of the nature and variations of stakeholder engagement in service ecosystem design, which equips us with a framework to better understand and manage stakeholder behavior when designing a service ecosystem. Moreover, we answer calls by Vink et al. (2021) to further refine the conceptualization of service ecosystem design and calls to improve our understanding of stakeholder engagement in multi-stakeholder design processes (Lievens & Blažević, 2021; Hollebeek et al., 2022; Viglia et al., 2023).

To do this, we integrate literature on service ecosystem design (Vink, Koskela-Huotari, et al., 2021) and stakeholder engagement (Hollebeek et al., 2022) and investigate stakeholder engagement in the design process of a mobility-as-a-service (MaaS) ecosystem through a longitudinal rich case study between 2018 and 2022. Data were collected from a multitude of sources, encompassing 29 in-depth interviews with a wide set of stakeholders, participant observations, and field notes originating from internal workshops, as well as extensive document analysis of internal and secondary evidence.

Our study makes three contributions to the literature on service ecosystem design and stakeholder engagement.

First, by conceptualizing design-oriented stakeholder engagement (DOSE), we provide a novel theoretical framework that characterizes how stakeholders' resource endowments manifest in service ecosystem design processes. This contribution advances our understanding by revealing how stakeholders' varying levels of resource investments and expenses reflect their engagement, both in design processes (reflexivity and reformation) and non-design processes (reproduction).

Second, we identify three distinct types of stakeholder engagement in service ecosystem design: reflexivity-oriented engagement, reformation-oriented engagement, and reproduction-oriented engagement. This typology provides a nuanced understanding of how different forms of engagement manifest during design processes.

Third, we reveal that stakeholders' resource endowments in design processes depend on their reflexive capabilities; those stakeholders that are capable of systemic reflection demonstrate higher voluntary resource investments than those focused on their current roles. Specifically, we identify that a stakeholder's role-related reflexivity consists of three degrees – focused on self-perceived role, current systemic role, and future systemic role – and highlight role myopia and role uncertainty as barriers to higher degrees of role-related reflexivity.

Taken together, these contributions add to our theoretical understanding of stakeholder engagement in service ecosystem design by providing a comprehensive framework for analyzing how different forms of engagement manifest and evolve during design processes.

## 2. Theoretical framework

### 2.1. Service ecosystem design

A service ecosystem represents “a relatively self-contained, self-adjusting system of mostly loosely coupled social and economic (resource-integrating) actors connected by shared institutional logics and mutual value creation through service exchange” (Lusch & Nambisan, 2015, p. 161). Due to their self-regulatory and adaptive nature, service ecosystems evolve dynamically over time as different stakeholder constellations, shared world views, and mental models enter, materialize, and change and are thus continuously emerging (Lusch & Nambisan, 2015; Taillard et al., 2016; Frow et al., 2019).

While a service ecosystem's emergence is beyond the control of any individual stakeholder (Chandler et al., 2019), stakeholders possess a

degree of agency to shape a service ecosystem in its formation and evolution (Lusch & Nambisan, 2015; Taillard et al., 2016; Mele et al., 2018; Randhawa, Wilden, & Akaka, 2022). This shaping has been conceptualized as service ecosystem design, defined as the “intentional shaping of institutional arrangements and their physical enactments by actor collectives through reflexivity and reformation to facilitate the emergence of desired value cocreation forms” (Vink et al., 2021, p. 172). Considering that stakeholders are constituted and entangled in assemblages of institutional arrangements – in other words, their systemic self (Vink, Wetter-Edman, & Koskela-Huotari, 2021) – a stakeholder's intentional efforts to shape institutional arrangements (that is, reformation) require the stakeholder's awareness of the existing institutional arrangements (that is, reflexivity) (Vink, Koskela-Huotari, et al., 2021; Vink, Wetter-Edman, et al., 2021; Vink & Koskela-Huotari, 2022). Institutional arrangements are invisible if not physically enacted, and each stakeholder will inhabit a different assemblage of institutional arrangements that may be invisible to other stakeholders in the service ecosystem. Consequently, reflexivity must go beyond one's own awareness of their inhabited entanglement and emphasize the systemic nature of the design process (Vink, Wetter-Edman, et al., 2021). Based on this systemic understanding of the design process, the framework of service ecosystem design distinguishes between design processes and non-design processes (Vink, Koskela-Huotari, et al., 2021).

Design processes concern the design of the different elements and interrelated activities aimed at the focal service ecosystem itself. This process entails an iterative loop of stakeholders becoming aware of the mutability of the different design elements (reflexivity) and intentionally shaping them (reformation) (Vink, Koskela-Huotari, et al., 2021). Non-design-related processes entail institutionalized practices in conflict with the intended design processes and thus resist design-oriented changes. These processes occur due to the unconscious reproduction of pre-existing institutional arrangements (Vink, Koskela-Huotari, et al., 2021).

While service ecosystem design provides a framework for understanding how stakeholders can intentionally shape institutional arrangements through reflexivity and reformation, it does not fully address the dynamic nature of stakeholders' willingness and ability to participate in these design processes. Here, the concept of stakeholder engagement offers valuable insights into these dynamics by examining how stakeholders engage with one another and with the institutional arrangements to facilitate or resist the desired changes within a service ecosystem. In the next section, we present the concept of stakeholder engagement as a theoretical framework that allows us to gain a deeper understanding into the dynamics that drive design and non-design processes in service ecosystem design.

### 2.2. Stakeholder engagement

In recent years, service scholars have continuously refined the concept of engagement has been continuously refined by service scholars (van Doorn et al., 2010; Brodie, Hollebeek, Jurić, et al., 2011; Brodie et al., 2019; Kumar & Pansari, 2016; Hollebeek, Srivastava, & Chen, 2019). Most of the discussion on engagement can be traced back to the concept of customer engagement (CE) focusing on the dyadic interaction between a customer and a brand (Brodie et al., 2011; Pansari & Kumar, 2017). Due to the limitations of the dyadic nature in the initial conceptualization of CE, a broader notion of actor engagement (AE), defined as a “dynamic and iterative process that reflects actors' dispositions to invest resources in their interactions with other connected actors in a service system” (Brodie et al., 2019, p. 174), was introduced to better understand engagement in multi-stakeholder settings and to widen the scope in which engagement occurs (Jaakkola & Alexander, 2014; Kumar & Pansari, 2016; Alexander, Jaakkola, & Hollebeek, 2018).

Recently, Hollebeek, Kumar, and Srivastava (2022) expanded on and refined the concept of AE by integrating stakeholder theory, further

widening the lens. They argued that “stakeholder engagement” not only results in mutual value creation, but can also have detrimental effects due to tensions and conflicts arising from the diversity of goals, expectations, and responsibilities in a service ecosystem (Hult et al., 2011; Hillebrand, Driessen, & Koll, 2015). For example, while sociopolitical agendas of different stakeholders can result in role value creation for some stakeholders, they can also have role value-diminishing effects for others (Clark, Lages, & Hollebeek, 2020; Hollebeek et al., 2022). Thus, stakeholders’ intention to engage is prone to fluctuate (Brodie et al., 2011) due to changing personal and sociopolitical dynamics (Hollebeek et al., 2022). Therefore, Hollebeek et al. (2022) conceptualized stakeholder engagement as state-based, with the aggregation of all stakeholder engagement states culminating in a holistic stakeholder engagement process. This state-based view allows for stakeholder engagement to be analyzed as a continuum at different points in time, and thus explains the dynamics in the engagement process; for example, by elucidating the level of role-value creating intentionality.

Furthermore, stakeholder engagement distinguishes “resource endowments” into “resource investments” focused on a stakeholder’s value-seeking objective and “resource expenses” employed to maintain a stakeholder’s current role (Hollebeek et al., 2022). Thus, a stakeholder’s resource investment indicates higher engagement volitionality and role value-creating intentionality as the stakeholder invests to extract greater role-related value in the future. However, if, for example, the stakeholder is dissatisfied with decisions made in the service ecosystem, the stakeholder might display lower role value-creating intentionality and consequently less volitional stakeholder engagement, as the stakeholder might be burning emotional resources (Hollebeek et al., 2022).

The distinction between resource investments and resource expenses in the stakeholder engagement concept provides a valuable lens through which to analyze stakeholders’ engagement in service ecosystem design processes. While the stakeholder engagement literature emphasizes how resource endowments reflect role value-creating intentionality, combining this with service ecosystem design allows us to better understand how these resource endowments manifest in both design and non-design processes. In the following section, we develop an analytical framework that integrates these theoretical perspectives to examine how stakeholders’ resource investments and expenses reflect their engagement in service ecosystem design.

### 2.3. Analytical framework

Service ecosystem design and stakeholder engagement scholars both consider intentionality and value cocreation as central aspects of their respective conceptual development. For service ecosystem design, intentionality refers to a stakeholder’s purposeful shaping of institutional arrangements to facilitate desired value cocreation forms (Vink, Koskela-Huotari, et al., 2021). For stakeholder engagement, intentionality refers to a stakeholder’s resource investments in their role-related interactions to create role value (Hollebeek et al., 2022). While role value implies value creation for an individual stakeholder, individual stakeholders are entangled and constituted by the social systems they inhabit (Hallett & Ventresca, 2006; Vink, Wetter-Edman, et al., 2021). Thus, role value is created and derived through the instantiation of specific value cocreation forms.

By combining service ecosystem design and stakeholder engagement, we further distinguish between design and non-design processes and their respective resource endowments (cf. Vink, Koskela-Huotari, et al., 2021; Hollebeek et al., 2022). Here, we expect that reflexivity and reformation (design process), and reproduction (non-design process) will result in varying types of resource endowments by the stakeholders involved in the focal design process. Reflexivity and reformation require resource investments because they constitute active design efforts by a stakeholder to intentionally shape institutional arrangements. Reproduction constitutes the non-design process and symbolizes the maintenance of the service ecosystem and the stakeholder’s role,

necessitating resource expenses. As the level of a stakeholder’s resource investment reflects their role-value creating intentionality, the level of voluntary resource investments will be indicative of a stakeholder’s design intentionality (Vink, Koskela-Huotari, et al., 2021; Hollebeek et al., 2022). Thus, evaluating the level of resource investments and resource expenses of a stakeholder in a design process enables us to understand not only the role of value-creating intentionality of the respective stakeholder in accordance with the concept of stakeholder engagement, but also the design intentionality toward the focal design object.

## 3. Methodology

Considering the multitude of different stakeholders, relationships, and activities embedded in service ecosystem design and the complexity of the process, we adopted a longitudinal case study approach. Such an approach allows us to capture this complexity and also any emerging changes and influences over time (Pettigrew, 1990; Eisenhardt & Graebner, 2007). The case of “Middletown MaaS” was selected primarily due to three reasons. First, it allowed the investigation of a service ecosystem design process from its very conception until its end. Such a longitudinal approach enabled a wider and more in-depth data collection (for example, attending meetings could not have been accessed after the project’s end). Second, Middletown MaaS provided the opportunity to investigate the changes in stakeholder engagement during the design of a service ecosystem. Third, this case provided real-time observations of the unfolding dynamics within the design process due to first-hand access to the project.

### 3.1. Empirical background

The Swedish municipality of “Middletown” aims to reduce travel by private cars to 40 percent by 2030. It seeks to do this by promoting sustainable travel through such means as the “Green Travel Plans” (launched in 2016) that promote more sustainable commuting and business trips at seven large employers through a more efficient public transportation service and improved cycling infrastructure, or the station-based e-bike rental service. During 2018–2019, representatives from the Middletown municipality, the private technology company MaaSTech, three municipality-owned companies (ParkingCo, ApartmentsCo, and Real Estate Co), a shared mobility startup (CarP2P), and the regional public transport company (PubTransport) obtained a grant to implement MaaS in the municipality (see the timeline in Fig. 1).

### 3.2. Data collection

Data collection occurred in parallel to the unfolding of the case (2018–2022), consisting of three different sources: semi-structured in-depth interviews with key representatives of service ecosystem stakeholders involved in the design process, participant observations, and documentary evidence. The first round of interviews was conducted during Year 1 of the project in March 2020; the second round of interviews was conducted during Year 2 of the project (February–May 2021); and the third round of interviews was conducted after the project’s end in November 2022. This resulted in 29 interviews with key informants involved in the Middletown service ecosystem design process (see Table 1, anonymized). The averages lasted an average of 41 min and were transcribed verbatim, resulting in 235 single-spaced pages. The interviews were conducted by at least two interviewers and carried out with the aid of semi-structured interview guides to allow for an open discussion and a more dynamic data collection (Kvale, 1994; Denzin & Lincoln, 2000). In the first round of interviews, questions were kept open and flexible to inspire respondents to freely elaborate on their experience, which made it possible to pursue new and interesting insights. In the second round, the interviews were guided by our preliminary analysis of the case data. Our primary focus was the ongoing design of the

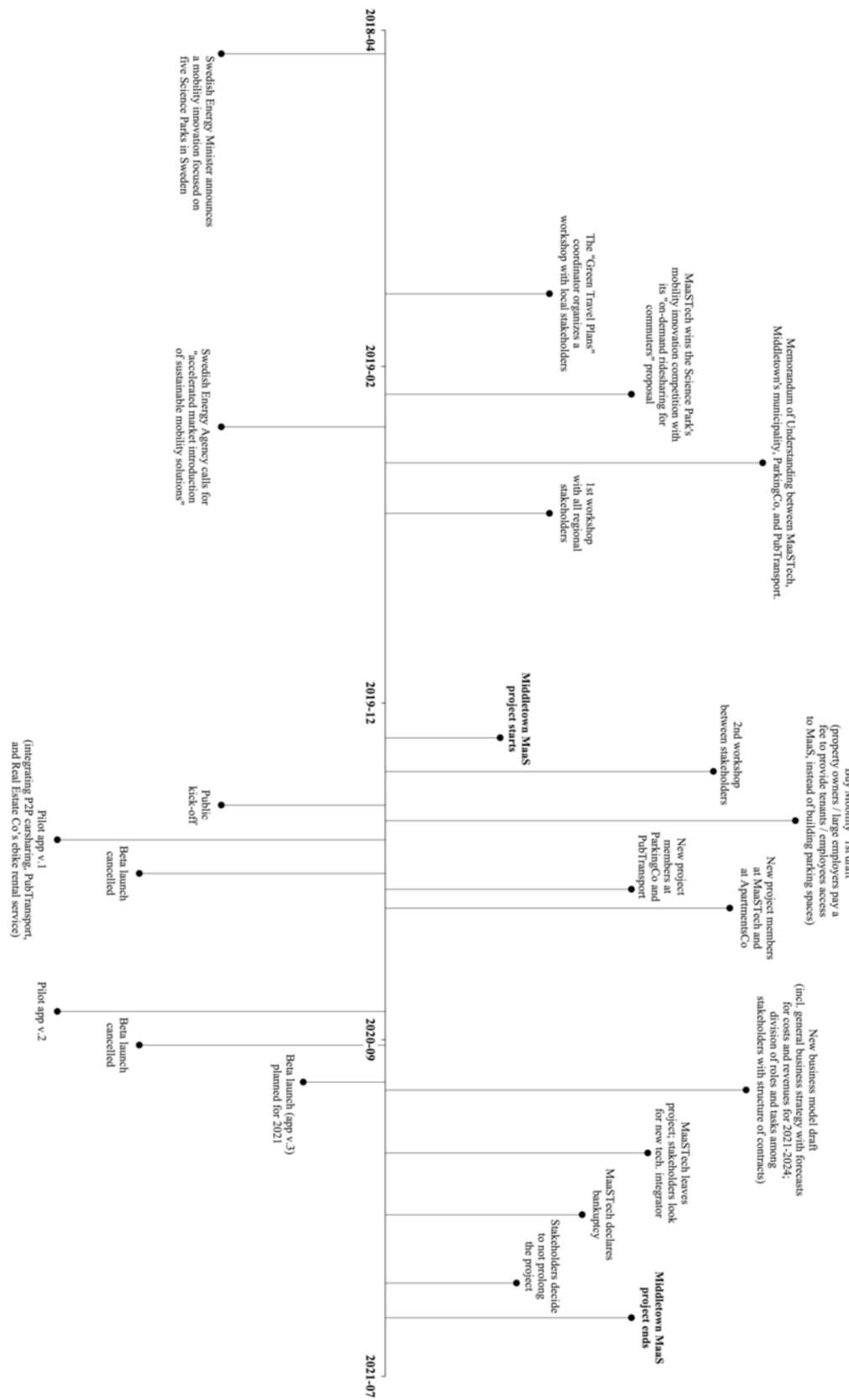


Fig. 1. Timeline and key activities of the MaaS development project.

**Table 1**  
List of interviewees.

Position	Organization	Year 1	Year 2	Year 3
Chief marketing officer, head of business development	PubTransport	–	28 min.	–
Market strategist	PubTransport	17 min.	57 min.	–
Sustainable mobility strategist	PubTransport	–	65 min.	–
Co-founder, chief executive officer	CarP2P	33 min.	56 min.	–
Co-founder, chief technical officer	CarP2P	–	43 min.	–
Co-founder, chief product officer	MaaSTech	–	63 min.	–
Business development director	MaaSTech	–	47 min.	–
Project manager	MaaSTech	30 min.	–	–
Middletown MaaS project leader	Real Estate Co	20 min.	44 min.	–
Business developer (parking)	Real Estate Co	15 min.	53 min.	–
Mobility manager	ParkingCo	–	41 min.	–
Communication manager	ParkingCo	–	41 min.	–
Middletown MaaS project coordinator	Municipality	56 min.	75 min.	–
Parking expert	Municipality	–	22 min.	–
Traffic planner	Municipality	–	51 min.	–
Project manager	Municipality	–	39 min.	–
Project manager (new production)	ApartmentsCo	18 min.	48 min.	–
Head of administrative development	ApartmentsCo	–	37 min.	–
Project manager	Science Park	20 min.	–	–
MaaS consultant	MaaS Consultancy	–	54 min.	–
Project leader	SW Municipality	–	–	28 min.
Project leader	NW Municipality	–	–	43 min.
Research program coordinator (transport efficiency)	Swedish Energy Agency	–	–	41 min.

service ecosystem, different types of agendas, perspectives, objectives, and levels of engagement among stakeholders. In the third round, questions were specifically oriented to compare the focal MaaS service ecosystem with two additional MaaS service ecosystems in order to further strengthen and ultimately confirm the case study findings. Two interviewees were project leaders responsible for two other MaaS development projects being developed at the same time as Middletown MaaS. The third interview involved the coordinator at the funding agency responsible for all transport-related initiatives like MaaS.

The second source of qualitative data was participant observations in workshops and meetings with Middletown MaaS stakeholders, after which detailed notes were systematically written down (Grove & Fisk, 1992; Van Maanen, 2011). The research group had direct access to the project, which allowed them to follow meetings and different processes: for example, the development process of the brand, the pilot app, and the business model. Participant observations provided crucial data as they allowed for the direct observation of their level of stakeholder engagement in the service ecosystem design process. This enabled exploration of the differences between stakeholder representatives' statements during interviews and at joint meetings.

Lastly, we collected various types of documents during the research process, including internal working documents, applications for grant

funding, communication materials (press releases and web pages), project reports, and secondary data such as newspaper articles and industry reports. This documentation amounted to 2723 pages of text.

### 3.3. Data analysis

First, following Eisenhardt's (1989) suggestion, we specified a priori the main constructs that would guide our analysis: reflexivity, reformation, reproduction processes, resource investments, and resource expenses. Second, we closely read all empirical material and open-coded the interview transcripts guided by the aforementioned guiding constructs, but we did not discriminate data to allow for unexpected constructs to emerge; this method is appropriate for exploratory and theory-building case study research (Eisenhardt, 1989). Third, through a process akin to axial coding, we grouped the empirical first-order concepts into distinct second-order themes representing different types of tensions and constraints (Corbin & Strauss, 2014). Fourth, following the Gioia methodology (Gioia, Corley, & Hamilton, 2012), the second-order themes were later aggregated into distinct dimensions guided by the a priori constructs. An overview of the final coding exemplified with illustrative quotes is presented in Appendix A.

Throughout this iterative analytical process, we continuously triangulated the interview data with our field notes, participant observations, and secondary data (Eisenhardt, 1989; Denzin & Lincoln, 2000). For example, we compared statements in interviews by a respective stakeholder with their actual engagement documented in our field notes and internal documents. In order to maintain and strengthen issues of reliability and sensitivity, differences in the final coding were managed by a consensus discussion approach by all three authors (Gibbert & Ruigrok, 2010). The above steps were taken to triangulate the findings from the longitudinal case study using different data sources to increase the validity and credibility throughout the research process (Eisenhardt, 1989; Denzin & Lincoln, 2000; Voss, Tsiriktsis, & Frohlich, 2002; Voss, Johnson, & Godsell, 2016).

## 4. Findings

In the following section, we have structured our findings based on the analysis of stakeholders' role-related resource endowments in each of the three service ecosystem design processes: reflexivity, reformation, and reproduction. Hereby, we identify three types of design-related stakeholder engagement, three degrees of role-related reflexivity, and two barriers to engaging in higher degrees of role-related reflexivity.

### 4.1. Stakeholder engagement in service ecosystem design processes

Following Vink et al.'s (2021) separation of the design process into reflexivity and reformation, we first examine the reflexivity processes of the stakeholders in our case study and identify three distinct degrees of reflexivity centered on the stakeholder's self-perceived role, systemic role, and future systemic role. Second, through our analysis of the reformation processes of the different stakeholders in our case, we further note that the outcomes of these reflexivity processes directly impact the stakeholder's resource endowments.

#### 4.1.1. Reflexivity-oriented engagement

The initial reflexivity process delves into the present role of each stakeholder, indicating that their self-awareness revolves around their own perceived role. Here, the reflexive process will result in the stakeholder's subjective understanding of their current role value, disconnected from the social system they are part of (Vink, Wetter-Edman, et al., 2021). Many stakeholders in our case study often remained in this reflexivity process due to self-interest, short-term thinking, and low incentives stemming from their high current role value. For example, PubTransport had been the main transport provider and covered the majority of transport needs in MiddleTown. Consequently, its reflexivity

process was heavily focused on their current role value,

*“As they [PubTransport] have a monopolistic view. ... Why should I be somewhere else? Why should I be in this MaaS? What’s in it for me?”* (MaaS consultant, MaaS consultancy).

This was not only an isolated case for a high role value stakeholder like PubTransport but also other stakeholders that did not look further than their current role, often driven by self-interest. This is well illustrated by the following quote from the MaaS Consultant:

*“They don’t want to lower their pricing too much, so they can easily say, ‘well we don’t want to do anything’ and then you have to go down the classic office politics where people have their own agenda to make as much money or look after their own self-interests.”*

We call this inability to look beyond one’s current role and reflect in a more systemic way *role myopia*. Due to role myopia, some participating stakeholders failed to develop a systemic understanding of the future service ecosystem. Consequently, they either displayed apathy in the design process, abstaining from committing resource investments in the reformation process, or focused on role maintenance activities, resulting in resource expenses in non-design processes (Srivastava, Shervani, & Fahey, 1998; Hollebeek et al., 2022).

The second identified reflexive process allows the stakeholder to become aware of their systemic role. Here, the stakeholder receives a better understanding of their current role value about the social system and the role value of other stakeholders in the system (Danatzis et al., 2022). While some stakeholders did engage in systemic role reflection, they often struggled to make sense of their reflexivity process. This resulted in some stakeholders not understanding their systemic role in the design process and thus either focusing on their own role or reducing their level of resource investments due to their role uncertainty. As the MaaS consultant stated:

*“The role of MaaS Tech in this context wasn’t clear for anyone and everyone didn’t have the same picture of what role they were going to play in this project. Not clear. And then I think MaaS Tech was also a bit confused about their role.”*

Lastly, the third identified reflexive process focuses on the stakeholder’s future systemic role (Vink, Koskela-Huotari, et al., 2021; Hollebeek et al., 2022). In line with stakeholder engagement, the higher the potential future role value, the higher the resource investments toward the design process (cf. Hollebeek et al., 2023). For example, Real Estate Co. was designated as a potential owner of Middletown MaaS, which would provide them with a high role value. Consequently, they were one of the stakeholders that had high resource investments in the design process. However, other stakeholders did not understand what role they would play in the MaaS, and had even less understanding of their future role value. Such role uncertainty indicates that their reflexive processes did not allow the stakeholders to determine their potential future role value in the design process of the service ecosystem, which resulted in confusion and resource investment hesitations, as expressed by the sustainable mobility strategist from PubTransport,

*“What is our responsibility? Should we stick only to public transport and let others? ... We don’t involve ourselves more than we agree to collaborate ... Or should we actually take a more active part?”*

Thus, stakeholders’ resource endowments depend on their ability to reflect not only on their self-perceived role but also on their current systemic role and potential future systemic role in the new service ecosystem. In our case, we discovered that many stakeholders barely engaged in the second and third reflexivity processes, partially due to *role myopia* and partially due to *role uncertainty*. As stated earlier, the outcome of the individual stakeholder’s reflexivity processes determined whether they invested resources in the reformation process of the service ecosystem or focused on resource expenses to maintain the role by reproducing the current system. The next sections further explore the stakeholders’ resource endowments in the reformation and reproduction

process.

#### 4.1.2. Reformation-oriented engagement

A stakeholder’s resource investment in the design process depends not only on the outcomes of the different reflexivity processes, but also on their engagement in the design activities of the service ecosystem. Consequently, the level of resource investments in designing the service ecosystem is dependent upon finding mutual value cocreation forms that provide stakeholders with the opportunity to increase their role value.

In the case study, the low level of resource investments in the reformation process can be attributed to the stakeholders’ inability to engage in systemic reflexivity, which resulted in significant challenges in aligning the stakeholders’ role perceptions and role value expectations. For example, finding a common vision for the design of the service ecosystem was one of the main challenges in the design process. As PubTransport’s market strategist pointed out, the underlying issues inhibiting the alignment toward a common vision were related to the diversity of goals, interests, and agendas of the respective stakeholders:

*“One of the biggest challenges the project has, I think, is all the different parties and wishes and goals; one is a common main picture. It is for the whole of Middletown MaaS that there is not a sane clear main picture to hang up.”*

This divergence in visioning can be traced back to an inability or willful ignorance of systemic reflexivity, which focuses more on envisioning a service ecosystem that increases the respective stakeholder’s own future role value, rather than a vision representing a mutually beneficial service ecosystem. Such a misalignment of visions may result in low resource investments, as each stakeholder wants to invest resources in the design process that realizes their service ecosystem vision and will be reluctant to support other stakeholders’ vision.

This hesitation to invest resources also translated into the design of the service ecosystem value proposition. In other words, as the respective stakeholders desired to create as much role value for themselves as possible, they attempted to steer the design process toward a value proposition design that would enable them to have significant role value in a future service ecosystem. Thus, many stakeholders were more focused on ensuring their inclusion in the service offering than on the design of a mutually beneficial value proposition. However, if their desired value proposition form, and thus their future role value, was not accepted, they refused to invest in any resources in the reformation process. As indicated by an interviewee from PubTransport:

*“I think that if we can’t provide enough and good services, there is no reason for us to start in the first place. ... We need perhaps five, good services. If not, there is no point.”*

This applied not only to the stakeholder’s own propositions of their future role value, but also to how certain changes may impact their current role value. For example, there were significant difficulties in incentivizing additional mobility providers to become part of the service ecosystem as they feared the loss of control over certain value capture processes, such as valuable data points that could be collected within their app:

*“I think that some of the larger players might feel that they don’t want to be a part of it because they want their users on their own app and not in other apps, so you lose kind of control of the customer journey.”* (Chief executive officer, CarP2P).

Much of this sentiment can be attributed to the underlying presence of cooptation in the design process, which can be traced back to lacking capabilities to engage in systemic reflexivity processes. This is augmented by the fact that competitors need to agree on the value of their roles in relation to their competitors’ roles. In particular, an informant from the funding agency pointed out the lack of collective reflexivity in the design process of the MaaS service ecosystem that resulted in cooptative tensions:

*“It’s kind of like it threatens the official public transport provider and it is*

**Table 2**  
Overview of Engagement Dynamics in Service Ecosystem Design.

	Year 1			Year 2			Year 3		
Stakeholder	Reflexivity-oriented Engagement	Reformation-oriented Engagement	Reproduction-oriented Engagement	Reflexivity-oriented Engagement	Reformation-oriented Engagement	Reproduction-oriented Engagement	Reflexivity-oriented Engagement	Reformation-oriented Engagement	Reproduction-oriented Engagement
PubTransport	High	High	Low	Low	Low	High	Low	High	Low
	PubTransport demonstrated a high degree of reflexivity, primarily focused on its self-perceived role as the dominant transport provider. This led to role myopia, hindering the company's ability to envision a future systemic role within the MaaS ecosystem. Its reformation-oriented engagement was initially high, participating in early memorandums.			PubTransport's initial enthusiasm waned as the perceived threat to its existing role increased. It considered the MaaS project as a customer acquisition tool for other stakeholders, failing to grasp the collaborative and systemic nature of the initiative. This demonstrates role myopia, as the company focused on its current dominant position and struggled to envision a beneficial future role within the MaaS ecosystem. Consequently, its reformation-oriented engagement decreased significantly, and it shifted towards protecting its current role, leading to high reproduction-oriented engagement.			In the third year, a shift in personnel at PubTransport brought a new perspective to the MaaS project. The new leadership demonstrated increased reflexivity, recognizing the significant role PubTransport could and should play in the MaaS ecosystem. This shift coincided with the Municipality's recognition of the stalled design process. Seeing an opportunity to leverage PubTransport's expertise and infrastructure, the Municipality proposed that PubTransport take ownership of the design process. PubTransport accepted this responsibility, offering renewed hope for its successful development.		
CarP2P	High	Low	High	Low	Low	High	Low	Low	Low
	CarP2P exhibited high reflexivity regarding its current systemic role. The company understood its position as a minor startup compared to established transport companies. Its reformation-oriented engagement remained low, as it prioritized customer acquisition and maintaining the existing car-centric transport system. Thus, it reflected a reproduction-oriented engagement, prioritizing its current business model over adapting to the MaaS ecosystem.			Despite its awareness of its status as a small startup within a larger transport landscape, CarP2P prioritized immediate customer acquisition over engaging with the MaaS ecosystem design process. This led to low reformation-oriented engagement, as the company did not invest any resources into the design process. Its primary focus remained on its existing car-centric business model, leading to high reproduction-oriented engagement. Recognizing the limited potential of the Middletown municipality, the company shifted its focus to other markets, effectively reducing its resource investment in the Middletown MaaS project.			CarP2P withdrew from the project entirely, focusing on its established business operations elsewhere.		
MaaS Tech	High	High	Low	High	High	Low	High	Low	High
	MaaS Tech demonstrated the highest degree of systemic reflexivity, understanding the roles and interdependencies of all stakeholders. This is due to the company's unique position as the technology provider and their prior MaaS experience. Its reformation-oriented engagement was high, driven by its understanding of its key role in enabling the MaaS ecosystem. The company invested heavily in developing the necessary technological infrastructure.			MaaS Tech remained highly engaged and demonstrated a strong awareness of its crucial role in the MaaS ecosystem's development. The company understood its importance in facilitating the project's technical aspects and recognized both its key role within the MaaS project itself and its broader systemic role in enabling the integration of different mobility providers. MaaS Tech continued to invest in the design process, exceeding the value of its future role. This overinvestment stemmed partially from the company's technical and domain expertise and partially from its desire to leverage Middletown MaaS as a reference project for future MaaS projects.			MaaS Tech went bankrupt and ceased to exist.		
Real Estate Co	Low	High	Low	High	High	Low	High	Low	Low
	Real Estate Co displayed low reflexivity regarding its role in the future MaaS ecosystem. Its understanding of the system and its potential role within it was limited. However, its reformation-oriented engagement was high, driven by its connection to ParkingCo and the potential benefits of MaaS for their properties. This engagement was influenced by external factors rather than a deep understanding of the MaaS ecosystem. The company's reproduction-oriented engagement was low as it was not a significant player in the existing transport system.			Real Estate Co showed an increased understanding of its future systemic role within the MaaS ecosystem. This enhanced reflexivity, combined with its recognition of the potential benefits of MaaS, led to continued high reformation-oriented engagement. The company participated actively in the design process, coordinating activities and exploring opportunities for value creation.			Real Estate Co. maintained high reflexivity, demonstrating awareness of the project's status, stakeholder engagement, and its own role. However, it disengaged from the design process due to the lack of engagement from other stakeholders, leading to low reformation-oriented engagement. The company adopted a wait-and-see approach, neither actively reforming nor reproducing the system.		
ParkingCo	High	High	Low	Low	Low	High	Low	Low	High
	From the start, ParkingCo demonstrated a keen awareness of its existing role in the Municipality's transport system. It recognized the potential disruption posed by MaaS and viewed this as an opportunity to evolve from a parking-centric business to a broader mobility provider. This forward-looking perspective indicates high reflexivity concerning their current and future systemic role. Driven by its vision of becoming a mobility company, ParkingCo invested significant resources in the design process during the first year. It actively engaged in discussions, collaborated with other stakeholders, and explored ways to leverage			The politically motivated replacement of ParkingCo's CEO led to a drastic shift in the company's engagement. The new CEO, demonstrating low reflexivity and perceiving MaaS as a threat to ParkingCo's existing profitable parking business, withdrew the company completely from the MaaS design process. The CEO's refusal to share revenues with other stakeholders resulted in the cessation of all resource investments further underscoring their shift towards reproduction-oriented engagement and lack of a reflexivity.			ParkingCo continued its previous stance, demonstrating low reflexivity regarding the potential benefits of MaaS. This resulted in continued low reformation-oriented engagement and high reproduction-oriented engagement, as it prioritized existing parking operations and maintaining the status quo.		

(continued on next page)

Table 2 (continued)

	Year 1			Year 2			Year 3		
	their existing parking infrastructure for the MaaS ecosystem.								
Municipality High	High	High	Low	High	High	Low	High	Low	High
	<p>Low</p> <p>From the outset, the Municipality demonstrated a strong understanding of its current systemic role as the orchestrator of the MaaS ecosystem. It recognized the need for change in the transport ecosystem and envisioned MaaS as a key driver in achieving sustainability goals, specifically mitigating the climate impact of transport. This indicates high reflexivity regarding its position and influence as a public stakeholder. The Municipality understood that its initiative and leadership were essential for the realization of the MaaS project. In the first year, the Municipality took concrete steps to initiate the MaaS project. This included securing grant funding, actively engaging in the design process, and initiating collaborations with key stakeholders like PubTransport to shape the future service ecosystem. Its significant resource investment in these activities demonstrates a strong commitment to reforming the existing transport system.</p>			<p>The Municipality maintained a strong understanding of its role in the MaaS design process and its responsibility to facilitate the project, actively working to expand the ecosystem by recruiting larger mobility stakeholders. While the Municipality continued to invest resources in the design process, they encountered challenges due to shifting engagement levels from other stakeholders. Changes in personnel and priorities among participating stakeholders led to a decrease in overall reformation-oriented engagement, requiring the Municipality to navigate tensions and address the resulting discrepancies. This necessitated unanticipated resource expenditures (non-volitional resource expenses) to manage these challenges and maintain project momentum.</p>			<p>Entering the third year of the Middletown MaaS initiative, the Municipality found itself at a crossroads. While maintaining high reflexivity regarding its own role and the roles of other stakeholders within the MaaS ecosystem, it was aware the design process had been unsuccessful. Recognizing the need for a shift in strategy, it proposed that PubTransport, as the established transportation provider, take ownership of the design process. This decision reflected a continued belief in the potential of MaaS, but acknowledged the need for a different approach. The Municipality's focus shifted to facilitating new stakeholder constellations, demonstrating a persistent commitment to the long-term vision of a functioning MaaS ecosystem.</p>		
ApartmentsCo High	Low	High	Low	High	High	Low	Low	Low	High
	<p>Low</p> <p>ApartmentsCo initially demonstrated limited understanding of the broader MaaS ecosystem and its complexities. Its focus was primarily on the potential benefits for its tenants, such as reducing the need for parking spaces and offering integrated mobility solutions. This narrow perspective suggests low reflexivity regarding the company's role within the larger transport system. Despite its limited systemic understanding, ApartmentsCo exhibited a strong desire to integrate MaaS offerings into its rental agreements. This motivation, driven by the potential for increased tenant satisfaction and alignment with broader sustainability initiatives, led to high resource investments in the design process during the first year. It actively participated in discussions and explored ways to bundle MaaS memberships with its rental offerings.</p>			<p>High</p> <p>ApartmentsCo remained optimistic about the potential of MaaS to create value for its tenants. This sustained reflexivity regarding its future role within the ecosystem led to continued high reformation-oriented engagement.</p>			<p>Low</p> <p>Regulatory constraints hindered ApartmentsCo's participation in the MaaS design process, leading to disengagement from the design process and effectively dropping out. Its need to comply with existing regulations (such as building more parking spaces) forced it to engage in involuntary resource expenses and thus in reproduction-oriented engagement.</p>		

a problem, but it should be like the idea that it just adds services and improves the mobility possibilities for the people.” (Research program coordinator, Swedish Energy Agency).

As illustrated in the quote, coepetitive tensions were not attributed to any stakeholder, but rather to the lack of underlying systemic reflexivity in the collective design process. Much of this coepetition can be related to the stakeholder's perception that competing stakeholders may have a value-diminishing effect on their role value. Thus, the competing stakeholders exhibited lower levels of resource investments due to competitive tensions between them, thereby displaying low role value-creating intentionality, as they considered the service ecosystem to be role value-diminishing rather than role value-creating.

Finally, the fact that a stakeholder invests resources into the reformation process does not automatically mean that the design process moves forward. Even when mobility providers joined and engaged with significant resource investments in the design process, some considered their engagement in the design process to be futile, as they did not fit the envisioned value propositions of another stakeholder:

“MaaS*Tech* wanted to have something to launch, and they selected the most important services... and we were not [included]...” (Chief technical officer, CarP2P).

Thus, for a service ecosystem design process to move forward, it is not sufficient for an individual stakeholder to be highly engaged in a reformation process through its resource investments; it also necessitates mutual value co-creation between stakeholders in the design process.

#### 4.1.3. Reproduction-oriented engagement

The non-design process consists of reproduction processes of pre-existing institutional arrangements that impede intentional design efforts. Our data indicate that the volition to engage in reproduction processes was often stakeholder-specific. In other words, when the reformation processes affected a stakeholder's current or future role value, the stakeholder was more inclined to engage in reproduction processes to maintain the role value, thus causing resource expenses. Throughout the case study, stakeholders that wished to uphold the status quo occasionally reacted negatively toward the design of the service ecosystem. These stakeholders benefited from the current institutional arrangements and were actively engaged in maintaining them, as these arrangements warranted and secured their current role in the service ecosystem. However, considering that service ecosystem design involves creating and shaping new institutional arrangements, they can be at odds with the vision of a service ecosystem, and thus stakeholder engagement can be constrained by the reproduction of institutions they desire to uphold (Vink, Koskela-Huotari, et al., 2021).

“It's not that people don't understand this; it's more that the embedded structures and decision-making structures make it difficult.” (MaaS consultant, MaaS consultancy).

For example, stakeholders whose role and value creation depend on maintaining current institutions can be constrained by their entrenchment in the current institutional order. In combination with the rigidity of institutional constraints – which is measured, for example, by the number of stakeholders maintaining the status quo – resource investments in the design process can become resource expenses because

they are focused on reproducing the status quo rather than reforming it. This becomes especially visible with stakeholders from the public sector or those that depend upon other public stakeholders that are influenced by the political landscape. For example, ParkingCo started with high resource investments in the design process of the service ecosystem until the politicians' reflexivity process perceived the service ecosystem as unfavorable, and ParkingCo's CEO was replaced with a new CEO who immediately reduced the company's resource investment in the design process of the service ecosystem. This example clearly shows how a stakeholder's role maintenance ambitions can inhibit it from resource investments in the design of a service ecosystem.

Moreover, the MaaS stakeholders encountered ill-suited regulations and legal structures that forced them to engage in non-design processes. For example, ApartmentCo wanted to include its new tenants in the service ecosystem and provide them with a mobility solution. Instead, the housing company was forced to follow the current parking legislation and build more parking spaces.

As ApartmentsCo's head of administrative development explained:

*"To include [mobility] services in the rent is illegal according to the Rental Act. Services and products must be on a voluntary basis. So, the rental legislation puts a stop to us."*

Similarly, even though some stakeholders from the public sector had high levels of role-value creating intentionality, the current legislation impeded them from processing payments or from making a profit, which involuntarily reduced the role value and resource investments. This shows how, despite stakeholders' expression of high levels of role-value creating intentionality, reformation processes can render stakeholders' resource endowments to be nonvolitional, which affects the level of role-value creating intentionality and turning intended resource investments into resource expenses. For other stakeholders, the possession and access to resources, such as capital, varies significantly. For example, stakeholders in the public sector typically grapple with constrained budgets, while startups heavily prioritize rapid revenue generation to sustain their operations. Consequently, the level of resource investment is likely to be lower, either due to the inherent risk associated with resource investment or simply because of a shortage of resources. In our case, MaaS Tech's level of resource investments decreased as their financial situation became worse because they had to focus on nonvolitional expenses to maintain their role (for example, using resources to find funding to be able to survive), which lowered their value-creating-role intentionality.

Whereas some resource expenses originate from the reproduction of existing institutional arrangements, others may arise from the lack of systemic reflexivity and the overreliance on a single stakeholder's resource investments. In our case, to integrate their services into the ecosystem, many stakeholders either lacked the necessary API<sup>1</sup> or were unwilling to develop a new one. MaaS Tech began to develop the APIs for the respective stakeholders, although this meant that the project relied entirely upon the technological knowledge of MaaS Tech. Once MaaS Tech left the service ecosystem, the stakeholders did not have the capabilities and knowledge to use the developed APIs and thus they did not increase their level of resource investments.

As the chief product officer of MaaS Tech pointed out:

*"You are dependent on the other stakeholders and their actions, and if you don't have agreements in place that require that you have APIs in place, it will take time."*

This situation resulted in an increase of nonvolitional resource expenses by other stakeholders, especially MaaS Tech, who needed to invest more hours into developing the platform due to the technological challenges posed by PubTransport.

<sup>1</sup> API stands for application programming interface, which allows different computers and applications to communicate with one another.

Surprisingly, the stakeholders did not invest any resources into acquiring technological capabilities, despite a significant amount of resource expenses (for example, burning of emotional resources, worrying about the dependence on MaaS Tech's technological capabilities). In other words, there was no intention to create future role-related value generated by resource investments to acquire technological capabilities.

#### 4.2. Dynamics of stakeholder engagement in the design process

By following the design process over a period of multiple years, we were able to observe how the respective stakeholder's reflexivity-oriented, reformation-oriented and reproduction-oriented engagement changed and affected the design and non-design processes of the service ecosystem over time (see Table 2).

##### 4.2.1. Initial phase: Municipality-Led Orchestration with high stakeholder investment and emerging role myopia

The Middletown MaaS project began in 2019 with high collective engagement, driven by the Municipality's leadership and political commitments to sustainability. The Municipality demonstrated high levels of reformation-oriented engagement by securing funding, establishing clear work packages, and driving the process. This leadership role was widely accepted by other stakeholders, which created an environment of collaborative engagement. At this stage, stakeholders exhibited high reformation-oriented engagement, motivated by optimistic perceptions of future role value within the ecosystem. As the project had not started designing concrete elements of the MaaS ecosystem (for example, the business model), some stakeholders such as ApartmentCo and Real Estate Co displayed high levels of reformation-oriented engagement based solely on their self-perceived role reflexivity and the potential benefits for them from a MaaS ecosystem.

As noted by a MaaS consultant,

*"Everyone was happy, hopeful and excited to be part of this project and make it reality."*

However, first signs of role myopia also emerged, with some stakeholders focusing predominantly on their current and future role value, which limited their capacity for systemic reflexivity.

##### 4.2.2. The Middle Phase: Growing role Uncertainties and MaaS Tech-Dependence

As the design process progressed, stakeholder engagement patterns began shifting significantly. Leadership transitioned from the Municipality to MaaS Tech as technical challenges emerged. However, as MaaS Tech saw the MiddleTown MaaS as a potential reference project that would open future MaaS projects for them, their level of reformation-oriented engagement was the highest among all stakeholders. This fact was exploited by other stakeholders, who saw it as a way to reduce their level of resource investments. Consequently, MaaS Tech unwillingly became not only responsible for technical challenges, but also many other design challenges such as the business model design. This introduced new engagement dynamics between the stakeholders as other stakeholders had begun to disengage. For example, PubTransport shifted their reformation-oriented engagement towards reproduction-oriented engagement as they increasingly felt that MaaS threatened their dominant position, demonstrating how role myopia can turn reformation-oriented engagement into reproduction-oriented engagement. While CarP2P's limited reflexivity-oriented engagement became even more evident because they were focusing on immediate customer acquisition, the company reduced its design-oriented stakeholder engagement due to the limited scope of the Middletown market.

Moreover, the design of the pricing model and revenue distribution became major points of disagreements. Especially the larger and more established stakeholders, such as PubTransport or ParkingCo, considered themselves as the main revenue drivers and thus entitled to the

largest revenue share. As PubTransport's interviewee stated,

“There is no way that we can compromise, for example, regarding bundles, discounts or free rides or something like that.”

This situation resulted in a continuous decrease of reformation-oriented engagement by the stakeholders who had high role value in the status quo.

While ParkingCo was initially very positive towards MaaS, a political election resulted in the election of politicians who had low reflexivity; they perceived the MaaS ecosystem as unfavorable and replaced ParkingCo's CEO. The new CEO promptly reduced the company's resource investment and disengaged from the design process. This illustrates how the lack of reflexivity of non-participating stakeholders such as political stakeholders can negatively influence other stakeholders' engagement.

These shifts in engagement among the participating stakeholders introduced tensions and necessitated nonvolitional resource expenses by the Municipality and MaasTech to move the design process forward.

#### 4.2.3. The final Phase: PubTransport's reluctant Leadership, collective Disengagement, and recognition of systemic challenges

Following MaaS Tech's bankruptcy and the persistent lack of reformation-oriented engagement by some of the participating stakeholders, the design process of the MaaS ecosystem effectively came to a standstill. The Municipality, which maintained high reflexivity and reformation-oriented engagement throughout, recognized the need for strategic realignment and facilitated PubTransport's leadership transition. However, several stakeholders withdrew during this period. ParkingCo and CarP2P, which had already significantly disengaged from any reformation-oriented engagement in the year prior, withdrew completely. While Real Estate Co maintained high reflexivity-oriented engagement, it also disengaged from reformation-oriented engagement due to the lack of engagement by the other participating stakeholders. Lastly, regulations forced ApartmentsCo to disengage from the design process and involuntarily engage in non-design processes, thus reproducing the status quo.

These dynamics in stakeholder engagement throughout the design process reveal three key insights: (1) how different types of engagement manifest in design and non-design processes, (2) how stakeholders' reflexive capabilities influence their resource endowments, and (3) how the interplay between reflexivity and resource endowments shapes the overall design process.

These insights form the foundation for our conceptualization of design-oriented stakeholder engagement (DOSE), which we conceptualize and discuss in detail in the following section.

## 5. Discussion

In this section, we discuss the theoretical contributions and practical implications for service ecosystem designers based on our rich case study findings (see Table 3 for a summary).

### 5.1. Theoretical contributions

Stakeholder engagement has been highlighted as crucial in the design of service ecosystems (Danatzis et al., 2022; Anzivino, Nenonen, & Sebastiani, 2024). However, besides calling for the need for stakeholder engagement in the design process, the role of stakeholder engagement in a service ecosystem design process has not received particular research attention. The present study addresses this research gap by combining service ecosystem design and stakeholder engagement to examine a service ecosystem design process of a MaaS service ecosystem. Our analysis reveals how stakeholders' varying resource endowments manifest across both design processes (reflexivity and reformation) and non-design processes (reproduction). Through this lens, we conceptualize DOSE as a *stakeholder's level of resource investments and resource expenses in design and non-design processes toward a*

*focal design object*. DOSE encompasses an aggregation of resource investments and expenses within the design and non-design processes, which enables us to assess whether a stakeholder is more engaged in actively designing a service ecosystem, or conversely, focused on maintaining the status quo.

This conceptualization enables us to understand not only the role of value-creating intentionality of the respective stakeholder in accordance with the stakeholder engagement concept (Hollebeek et al., 2022), but also the design intentionality toward the focal design object (see Fig. 2). This adds another layer of granularity to service ecosystem design, particularly further elucidating underlying processes influencing a stakeholder's intentionality in a service ecosystem design process. Thereby, we answer calls to further refine the conceptualization of service ecosystem design, especially regarding the role of engagement in service ecosystem design (Vink, Koskela-Huotari, et al., 2021).

In line with the stakeholder engagement view in marketing, which equates resource investments to the level of engagement by a stakeholder (Kumar & Pansari, 2016; Brodie et al., 2019; Hollebeek et al., 2019), our findings indicate that the higher the level of resource investments in reformation processes in relation to resource expenses in reproduction processes, the higher the level of DOSE.

Preceding and influencing the level of reformation-oriented engagement and reproduction-oriented engagement are the outcomes of reflexivity processes. We find that stakeholders' resource endowments depend critically on their degree of reflexivity, which manifest in three degrees: *self-perceived role*, *current systemic role*, and *future systemic role*. Stakeholders that are capable of systemic reflexivity demonstrate higher voluntary resource investments in design processes than those that are focused solely on their current roles. This aligns with stakeholder engagement's notion of current and future role value influencing resource endowments (Hollebeek et al., 2022). While earlier literature has highlighted reflexivity as crucial for reformation processes (Vink, Koskela-Huotari, et al., 2021; Randhawa et al., 2022), it has mainly focused on stakeholders' ability to become aware of surrounding social structures and their mutability (Suddaby, Viale, & Gendron, 2016).

Our findings reveal how different degrees of reflexivity directly shape DOSE levels through their impact on resource investments and expenses, thereby showing how stakeholder engagement provides a new lens to explicate the link between reflexivity outcomes and engagement in reformation or reproduction processes. Building on Suddaby et al.'s (2016) typology, we find that stakeholders with limited reflexive capability (“Superficial Reflexives”) primarily focus on their self-perceived role, resulting in lower engagement levels. In contrast, stakeholders with high reflexive capability (“Super Reflexives”) can reflect on both their current and future systemic roles, enabling higher engagement through increased resource investments in design processes.

Our analysis reveals two critical barriers that impede higher degrees of reflexivity. First, we identify what we term ‘role myopia’; that is, a stakeholder's focus on their current and short-term role value while disregarding long-term or potential future role value. In business and management literature, myopia generally refers to a manager's tendency to focus on and prioritize short-term outcomes and the immediate environment (Shepherd, McMullen, & Ocasio, 2017; Opper & Burt, 2021). Our findings extend this concept to service ecosystem design contexts. In a design context, such as service ecosystem design, we propose that *role myopia* refers to a stakeholder's focus on their current and short-term role value, disregarding long-term or potential future role value, either due to reflexive inability or intentional disengagement (Lehtinen et al., 2019). For example, while PubTransport did not necessarily display high degrees of reflexivity, it perceived the MaaS service ecosystem as a threat to its current and future role value, thus barely investing any resources into the design process (see also PubTransport's refusal to develop an API in the findings).

Beyond role myopia, our findings reveal that an inability to engage in reflexivity processes can foster *role uncertainty* in the design process.

**Table 3**  
Summary of Contributions.

Key Findings	Theoretical Contribution	Practical Implications
<b>Role-related Reflexivity</b> <ul style="list-style-type: none"> <li>• Self-perceived role</li> <li>• Current systemic role</li> <li>• Future systemic role</li> </ul>	<p>Reflexivity has been considered a crucial first step in the design process of a service ecosystem (Vink, Koskela-Huotari, et al., 2021). Moreover, literature has shown that stakeholders possess differing degrees of reflexivity (e. g., Suddaby et al., 2016), but has not investigated this in a service ecosystem design context. We contribute to the concept of reflexivity in service ecosystem design by illustrating that the reflexivity process is constituted by three distinct processes focused on the stakeholder's role. These processes are self-perceived role reflexivity, current systemic role reflexivity, and future systemic role reflexivity.</p> <p>This threefold reflexivity model provides a novel lens with which to understand how outcomes of reflexivity processes shape stakeholder engagement in service ecosystem design and explicates the link between reflexivity and the notions of current/future role value that drive stakeholders' resource endowments.</p>	<p>Building reflexivity across stakeholders requires systematic and structured approaches, as this capability directly impact stakeholders' engagement in service ecosystem design processes. Service ecosystem designers should implement regular reflexivity-building workshops focusing on three distinct levels: self-perceived role assessment, current systemic role mapping, and future systemic role visioning. These workshops should be documented and tracked using specific tools like stakeholder role assessment matrices and role evolution roadmaps.</p> <p>Vink and Koskela-Huotari (2022) outlined various methods and approaches that can be employed to build reflexivity, such as leveraging specific design techniques. Through systematic implementation of these methods, designers can help stakeholders develop reflexivity across all three identified role reflexivity degrees. This structured approach to building reflexivity helps reduce the likelihood of stakeholders experiencing role myopia or role uncertainty during design processes.</p>
<b>Design-oriented Stakeholder Engagement</b> <ul style="list-style-type: none"> <li>• Resource investments</li> <li>• Resource expenses</li> </ul>	<p>DOSE represents the combination of a stakeholder's resource investments and resource expenses toward a focal design object. The distribution of resource investments to resource expenses depends on the stakeholder's ability to engage in different degrees of reflexivity and the outcomes from this process, as it informs the stakeholder's participation in reformation or reproduction processes.</p> <p>DOSE encapsulates the sum of resource investments and expenses across both design and non-design processes, allowing us to gauge whether a stakeholder is actively engaged in designing the service ecosystem or is more focused on maintaining the status quo. Consistent with the stakeholder engagement view in marketing, which links resource investments to stakeholder engagement levels (Kumar &amp; Pansari, 2016; Brodie et al., 2019; Hollebeek et al., 2019), our findings suggest that higher levels of resource investments in reformation processes compared to resource expenses in reproduction processes correspond to higher levels of DOSE.</p>	<p>Design-oriented stakeholder engagement enables service ecosystem designers to systematically analyze and manage stakeholder participation in design processes. By distinguishing between resource investments in design processes (reflexivity and reformation) and resource expenses in non-design processes (reproduction), designers can better understand the underlying factors influencing stakeholders' engagement levels and implement targeted interventions.</p> <p>Service ecosystem designers should establish structured monitoring systems to track stakeholders' resource investments and expenses over time. This includes documenting participation in design activities, mapping resource commitments, and identifying early warning signs of disengagement. Regular evaluation of these metrics allows designers to evaluate stakeholders' DOSE levels and detect potential issues requiring intervention, such as declining participation in reflexivity workshops, resistance to reformation activities, increased focus on maintaining status quo, or signs of role myopia or uncertainty.</p> <p>When problematic patterns are identified, designers should implement specific interventions such as targeted reflexivity-building workshops, one-on-one engagement sessions, or adjustments to design activities to better align with stakeholder capabilities and objectives. This systematic approach to monitoring and managing stakeholder engagement helps ensure the design process maintains momentum toward meaningful outcomes.</p>
<b>Role Myopia and Role Uncertainty</b>	<p>Stakeholders' level of resource investment reflects their intentionality in creating role value, particularly their reflection on future systemic role value (cf. Vink, Koskela-Huotari, et al., 2021; Hollebeek et al., 2022). Our findings reveal that stakeholders demonstrating systemic reflection exhibited higher resource investment levels than those primarily focused on their current role, indicating role myopia.</p> <p>Role myopia suggests that stakeholders concentrate solely on their current role value, neglecting potential future role value due to either reflexive limitations or intentional disengagement (Lehtinen, Aaltonen, &amp; Rajala, 2019)</p> <p>. This lack of reflexivity can also breed role uncertainty in the design process, leading to hesitancy in resource investment and stakeholder disengagement. These findings enrich service ecosystem design literature by shedding light on why stakeholders may refrain from engaging or disengage from reformation processes over time.</p>	<p>Service ecosystem designers need to actively promote a long-term perspective among stakeholders to mitigate role myopia and address role uncertainty. Encouraging stakeholders to consider future systemic role value alongside their current role value can lead to more sustainable and forward-thinking design outcomes. Lack of clarity around current and future roles breeds uncertainty and hesitation in investing resources and engaging in the design process. Implementing strategies like ecosystem mapping, role articulation, and visioning exercises can reduce this uncertainty by clarifying stakeholder roles and expectations within the evolving service ecosystem.</p> <p>Creating an environment that supports ongoing reflexivity processes is vital. This involves providing stakeholders with the tools, resources, and support structures to facilitate continuous reflection and adaptation throughout the design process (Vink &amp; Koskela-Huotari, 2022). Designers should support stakeholders in recognizing the role value opportunities offered by the new service ecosystem and help them look beyond immediate roles to envision future systemic roles.</p>

When stakeholders struggle to determine their potential role in the emerging system, they often hesitate to invest resources and may eventually disengage from the design process entirely. These findings contribute to service ecosystem design literature by providing insights into why stakeholders do not engage or disengage over time from reformation processes. Together, role myopia and role uncertainty emerge as key barriers to achieving higher degrees of reflexivity in service ecosystem design. These concepts help explain variations in stakeholders' resource investments and engagement levels throughout the design process, advancing our understanding of how reflexivity shapes design-oriented stakeholder engagement.

## 5.2. Practical implications

The heterogeneity of stakeholders brings about a variety of institutional contexts and reflexive capabilities that can render a service ecosystem design process fruitless. Reflexive capabilities become essential to ensure that stakeholders interested in designing a service ecosystem invest resources in the reformation process and avoid unnecessary resource expenses in the reproduction process. As seen in our case study, the degree and outcome of reflexivity determines the level of DOSE, which means that reflexivity becomes crucial for successfully designing a service ecosystem. Service ecosystem designers should

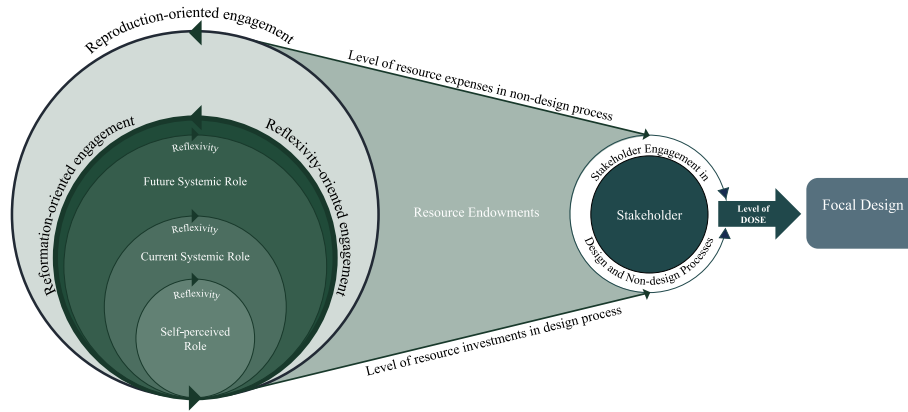


Fig. 2. Visualization of Design-Oriented Stakeholder Engagement (DOSE).

implement regular reflexivity workshops focused on evaluating the self-perceived role, analyzing the current systemic role, and envisioning the future systemic role. Here, Vink and Koskela-Huotari (2022) provided an overview of methods and approaches that can be implemented to build reflexivity. For example, developing personas can facilitate systemic reflexivity, and designing scenarios can foster future systemic role reflexivity. Through these workshops, role myopia and role uncertainty can also be prevented and mitigated.

Moreover, service ecosystem designers should introduce and establish clear accountability measures to deter stakeholders from disengaging from the design process. Documenting role expectations established in some of the reflexivity workshops and agreed-upon resource commitments (in the form of time or money, for example) provides service ecosystem designers with documentation that helps to better evaluate the respective stakeholders' levels of DOSE. Thereby, it also provides designers with concrete metrics to evaluate stakeholders' DOSE levels and enables timely interventions when engagement levels decline. For this to be effective, service ecosystem designers must establish regular review cycles in which the level of DOSE is compared against documented agreements. For example, regular reflexivity-oriented workshops enable service ecosystem designers to map out how the degree of reflexivity and the roles of the different stakeholders evolve over time and identify sudden changes that require intervention. Such mapping also enables the identification of dependencies between stakeholders, such as dependency on technological capabilities in our case, that allows service ecosystem designers to monitor and address potential issues before they lead to stakeholder disengagement. Early identification and management of these dependencies can help ensure continuous levels of DOSE throughout the design process.

### 5.3. Limitations and future research Directions

As with all case studies, our findings are limited to the context in which they are embedded. While we present the findings here in a generalized fashion, they apply to our specific case and might not be evidenced in other service ecosystem design processes. Considering that the design process of a service ecosystem constitutes a multi-stakeholder system, myriad states of mind, agendas, and objectives will encounter each other and potentially generate tensions and conflicts (Alexander

et al., 2018; Lievens & Blažević, 2021; Verleye et al., 2023). In other words, stakeholders may have differing intentions, resulting in conflicting design and non-design processes (cf. Vink, Koskela-Huotari, et al., 2021; Hollebeek et al., 2022). While these dynamics may arise due to other conflicting and interfering design and non-design processes, they can also arise between stakeholders in the focal design context due to differing intentions and, thus, levels of resource investments. Future research should further explore the dynamics between stakeholders in different service ecosystem design contexts to provide a better understanding of whether such engagement dynamics are context-specific or generalizable to all service ecosystem design processes.

Most research on stakeholder engagement has taken a qualitative approach, whereas quantitative inquiries have largely been concerned with the instrumental perspective, specifically its effects on financial performance (Kujala et al., 2022). However, the recent developments toward more systemic stakeholder engagement (Brodie et al., 2019; Hollebeek et al., 2022; Hollebeek et al., 2023) have not received much attention from quantitative studies. Future research could develop measurement scales of DOSE and investigate the relationships between DOSE and the influence on the design outcomes of service ecosystems. While the distinction between resource investments and resource expenses may assist this undertaking, further classifications, such as engagement intensity (Wang et al., 2023), can provide a foundation for quantitative studies.

### CRedit authorship contribution statement

**Alexander Flaig:** Writing – original draft, Writing – review & editing, Conceptualization, Formal analysis, Visualization, Data curation, Methodology, Investigation. **Hugo Guyader:** Investigation, Methodology, Writing – review & editing, Formal analysis, Data curation. **Mikael Ottosson:** Data curation, Investigation, Formal analysis, Writing – review & editing.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Coding Table

Aggregated Themes	Second-Order Themes	Illustrative Quotes
Reflexivity-oriented engagement	Self-perceived role myopia	“But for the public actors, such as PubTransport, it will be a bit like this: we have a monopoly, why... but if you can buy your ticket here, you can buy it from us instead. ... As they have a monopolistic view. ... Why should I be somewhere else? Why should I be in this MaaS? What’s in it for me?” (MaaS consultant, MaaS Consultancy)
	Self-perceived role uncertainty	“It was the same with PubTransport. With [the market strategist] it was all in and a lot of ideas and curiosity about the project, and then we got another person at PubTransport who was like, ‘Oh no, I don’t think that’s our role.’” (Middletown MaaS project leader, RealEstateCo)
	Current systemic role uncertainty	“The role of MaaSSTech in this context wasn’t clear for anyone and everyone didn’t have the same picture of what role they were going to play in this project. Not clear. And then I think MaaSSTech was also a bit confused about their role.” (MaaS consultant, MaaS Consultancy)
	Lack of systemic reflexivity	“We have been very attached to MaaSSTech and their competence and we have to suffer a little from that now. It hasn’t been transparent enough, and it’s clear that you have to have someone develop this, but it’s also important to ensure that you don’t end up in a lock-in effect with one company.” (Head of administrative development, ApartmentsCo)
	Current systemic role myopia	“I have a clear vision and the definition of the municipality’s needs. ... I am the basic need definer so that is why I really can push this forward and I am trying to remain strongly opinionated because we need this kind of service.” (Middletown MaaS project coordinator, Municipality)
	Future systemic role uncertainty	“They don’t want to lower their pricing too much, so they can easily say, ‘well we don’t want to do anything’ and then you have to go down the classic office politics where people have their own agenda to make as much money or look after their own self interests.” (MaaS consultant, MaaS Consultancy)
	Future systemic role myopia	“What is our responsibility? Should we stick only to public transport and let others. ... We don’t involve ourselves more than we agree to collaborate. ... Or should we actually take a more active part?” (Sustainable mobility strategist, PubTransport) “Now it is a different player taking a larger role and I’m not really sure where that is going, so that is one of the things we have to find out, if we can continue the project with PubTransport as the main partner.” (Middletown MaaS project coordinator, Municipality)
Reformation-oriented engagement	Impact on current role value influences resource investments	“So far all actors have their own little target picture, which they try to fix their role to. That’s the biggest hurdle we have to get over right now. We are working on that right now.” (Market strategist, PubTransport) “I think that some of the larger players might feel that they don’t want to be a part of it because they want their users on their own app and not in other apps, so you lose kind of control of the customer journey.” (Chief Executive Officer, CarP2P). “There is no way that we can compromise: for example, regarding bundles, discounts, or free rides or something like that. We can’t do that”, (Sustainable mobility strategist, PubTransport) “It’s kind of like it threatens the official public transport provider and it is a problem, but it should be like the idea that it just adds services and improves the mobility possibilities for the people.” (Research program coordinator, Swedish Energy Agency).
	Future role value influences resource investments	“[Middletown MaaS Project Coordinator] and the rest of the stakeholders were actually envisioning as many mobility services as possible. [...] But we need to be realistic: not everything in a client’s vision can be realized. And be careful that we have clear criteria for what we will deliver and what will require an additional budget, so that no one is disappointed or doing work for free.” (Business development director, MaaSSTech) “I think that if we can’t provide good services and enough, there is no reason for us to start in the first place. It can’t be parking and public transport – then you might just as well use PubTransport’s app, and ParkingCo’s app. We need five perhaps, good services. If not, there is no point.” (Mobility manager, ParkingCo) “Of course this revenue sharing is a thing that needs to be agreed and I think that there will be huge complications.” (MaaS consultant, MaaS Consultancy) “There are a lot of issues involved with who gets the money and from where and when.” (Chief marketing officer, PubTransport)
	Collective resource investments towards focal design object necessary to move design process forward	“There was a different view of how that service should work and what it should provide to the business model [...] PubTransport and MaaSSTech had the same picture [of] what it was going to provide in terms of service design and customer satisfaction and business model. But the project management had another view of it. They just saw it as an add on, not as something that was supposed to finance a lot of the other services, the Middletown MaaS.” (Market strategist, PubTransport) “We have seen that this is very tricky, and it is much about the technical solutions and the biggest question that we realized in the beginning but became clearer is that we need the project to generate revenue and be profitable. We decided that the municipality could support it for a couple of years, but we cannot support it forever.” (Traffic planner, Municipality) “The MaaS platform costs about USD 550.000 a year, and that is a lot of money. But neither the users are really ready to pay for that service nor the mobility service providers. So who is?” (Middletown MaaS project leader, RealEstateCo) “Right now we don’t have the platform provider, supplier, so we need to have somebody to actually build this. That is quite important. we have come far, but we need someone to actually do it, build it and supply the app.” (Chief marketing officer, PubTransport)
		“And Middletown municipality has in the recent years been run by the right-wing politicians who embrace the car and don’t want to do any bit in reducing car traffic.” (Traffic planner, Municipality)
		Also, we have politicians who have a different ideology on how things should be done and run, whether the municipality should take a large role or an explorative role, so it is connected to the political opinion as well. (Middletown MaaS project coordinator, Municipality)

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Aggregated Themes	Second-Order Themes	Illustrative Quotes
	Involuntary resource expenses due to current institutions	<p>“We as a company, being owned by the region, are only allowed to do so much. And, how we are financed and what we can do based on that.” (Chief marketing officer, PubTransport)</p> <p>“But of course it is, it is an open, open market and I think there are even some rules for the municipalities that they need to – possibly for a continuation of this kind of a platform agreement – that they need to open it for competition.” (Project leader, SW Municipality)</p> <p>“When the budget was set for this project, marketing and communication were forgotten. So I have a very small budget... it became a priority issues for me.” (Communication manager, ParkingCo)</p> <p>“It is not legally possible. So, we have had to make it clear that it does not work to package it as a service that you pay for with your rent when you rent a home from us. To include [mobility] services in the rent is illegal according to the Rental Act. The legislation puts a stop to us.” (Head of administrative development, ApartmentsCo)</p> <p>“Volvo cars, which is a highly relevant player. Because you must not forget the car in this. I am very careful that even if we talk about services that involve cycling, RealEstateCo’s ebike pool, bus, and so on, I think the car will be part of the combined trip for very many, and especially in Middletown! In big cities like Stockholm, Gothenburg, Malmö, you have other conditions.” (Communication manager, ParkingCo)</p> <p>“People in small towns in Sweden are used to the fact that you can go anywhere by car; you can drive right into the city center and park almost for free, and it takes a very long time to change people’s minds about this.” (Traffic planner, Municipality)</p>
	Involuntary expenses due to other stakeholder’s lack of resource investments	<p>“For an e-scooter company that establishes itself in Middletown... they have to make money this summer.” (Middletown MaaS project leader, RealEstateCo)</p> <p>“I have been disappointed in the engagement and development and organizations taking their responsibilities and trying to find different solutions. They have been waiting for directives rather than trying to innovate and push it within the organization, and that is tiresome sometimes.” (Middletown MaaS project coordinator, Municipality)</p> <p>“Because PubTransport at that moment had a very closed ticketing environment, like technically, you can compare it with a safe in a basement: it is very hard to get to it.” (Middletown MaaS project coordinator, Municipality)</p> <p>“[Middletown MaaS project leader] has struggled a bit to find the proper people from the other organizations to really push things forward [...] there should have been more enthusiastic people from the other organizations who really have the mandate to work things forward”. (Middletown MaaS project coordinator, Municipality)</p> <p>“I guess there have been some significant challenges in getting the mobility service providers on board, or to have the capabilities that are required to participate here. Like the APIs for ParkingCo.” (Business development director, MaaSTech)</p> <p>“The challenging part comes to actually get people to commit to doing work.” (Business development director, MaaSTech)</p>

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