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Ofe, Hosea A.; Sandberg, Johan

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RESEARCH ARTICLE

The emergence of digital ecosystem governance: An investigation of responses to disrupted resource control in the Swedish public transport sector

Hosea A. Ofe[1] | Johan Sandberg[2]

[1]Department of Engineering Systems and Services (ESS), Delft University of Technology, Delft, The Netherlands

[2]Swedish Center for Digital Innovation, Department of Informatics, Umeå University, Umeå, Sweden

Correspondence
Hosea A. Ofe, Department of Engineering Systems and Services (ESS), Delft University of Technology, Jaffalaan 5, 2628 BX Delft, The Netherlands.
Email: h.a.ofe@tudelft.nl

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Abstract

Digital ecosystem governance entails the management of complex, dynamic power relationships. As entrant platform providers seek to cultivate an ecosystem, they must carefully navigate these power relationships when dealing with governance tensions. Providers generally seek to leverage the ecosystem's generative potential by facilitating a variety of interactions and distributing design rights. Simultaneously, they need to ensure stability and order by imposing rules that resolve contentious matters and restrict ecosystem participants' degrees of freedom. This study explores how and why providers can induce ecosystem actors to engage in collaborative negotiation regarding such governance tensions through a case study of the introduction of an open data platform in the Swedish public transport sector. Our analysis offers three main contributions. First, it provides an empirical demonstration that entrepreneurial threats, as well as opportunities, can trigger platform launches and drive collaborative negotiation of digital ecosystem governance. Second, it extends conceptualizations of boundary resources beyond the current focus on transactional elements by demonstrating the role of interactive boundary resources in the negotiation of governance

grounded in both social and systemic power relationships. Third, it shows how positive reinforcement can complement punitive measures to increase acceptance of design rules.

KEYWORDS
boundary resources, digital ecosystem, ecosystem emergence, governance, open data, platform, power, resource control

1 | INTRODUCTION

Digital platforms govern, to varying degrees, myriads of activities in ecosystems by providing organizational infrastructure that enables or inhibits specific interactions among individuals and organizations (Gawer & Cusumano, 2014). Due to the scale and scope of interactions facilitated by platforms, digital ecosystem governance may substantially affect socio-economic processes (e.g., Cutolo & Kenney, 2019; Nadler & Cicilline, 2020). Governance refers to processes of social organization and coordination (Bevir, 2012) intended to create the conditions required "for ordered rule and collective action" (Stoker, 1998, p.17). Governance processes are political and, from the platform provider's perspective, involve seeking to further its interests and steer the ecosystems' trajectory in a favourable direction. Digital ecosystem governance thus entails the exercise of power to alter undesirable outcomes and promote desired ones, change the course of actions, resolve conflicts and accommodate diverging interests among complex webs of actors (Gorwa, 2019). For example, Twitter's and Facebook's exclusion of prominent actors who do not adhere to rules clearly illustrates incumbent platform providers' political balance acts and use of power in relationships with ecosystem participants.

The literature emphasizes that incumbent platform providers derive the power to uphold governance in digital ecosystems from resource control (Busch et al., 2021; Gawer & Cusumano, 2008) and "the ability to control the supply of resources to others" (Astley & Sachdeva, 1984, p. 106). Platform providers here refer to the organization providing the technology facilitating "a digital multi-sided marketplace that enables service providers and their customers to directly interact and co-create service, fuelled by data/information" (Beverungen et al., 2021). A platform provider's ability to govern is strongly related to establishing, modifying and maintaining boundaries surrounding platform resources and the associated ecosystem (e.g., Boudreau, 2017; Eaton et al., 2015; Gawer, 2021). Incumbent platform providers have strong bargaining positions due to their ability to prescribe conditions and boundaries for exclusion or participation since they control access to valuable ecosystems (Strahilevitz, 2005). For example, failure to adhere to Apple's rules will likely lead to restricted access to its App Store, a vital source of persuasion due to the vast available customer base.

However, limited attention has been paid to specific features of governance and power relationships during the launch of digital platforms when the associated ecosystem is shaped, which is unfortunate as they will have significant implications for the future ecosystem trajectory and platform success. For entrants, leveraging resource control for instituting governance is problematic and, in some cases, impossible. In an emerging digital platform ecosystem, the lack of a large customer base, network effects and uncertainty regarding the platform's value limit the effects of resource control and network centrality, and thus the provider's influence (Dattée et al., 2018). Moreover, digital content and service resources are highly malleable, so boundaries that enable the exercise of power from resource control are susceptible to circumvention (Eaton et al., 2015; Nambisan et al., 2017; Yoo et al., 2010). Platform entrants generally seek to ignite network effects and leverage the ecosystem's generative potential by facilitating a variety of interactions and distributing design rights, causing potential tensions between openness and control (Cennamo & Santaló, 2019; Wareham et al., 2014). Counteracting breaches of boundaries thus involves challenging

trade-offs between upholding governance while avoiding actions that deter actors from participating in the ecosystem.

Previous studies have explored incumbent product manufacturing firms' transitions from governance centred on internal product platforms towards digital platform ecosystems (e.g., Sandberg et al., 2020; Svahn et al., 2017). However, we argue that the rallying of actors, resolution of conflicts and use of power are likely to differ for platforms that are born digital and thus lack an established customer base for which the provider can enforce boundaries. In particular, we posit that such platforms are likely to engage in a higher degree of collective sensemaking and collaborative negotiations regarding fundamental governance properties. We draw upon Clegg's (1989) circuit of power framework to explore multiple forms of relationships in which persuasion and politics unfold in digital platform ecosystem governance. Specifically, we address the following research question: How and why can providers induce ecosystem actors to engage in collaborative negotiation regarding the ecosystem's fundamental governance properties, such as values, meanings, and rules?

We do so through a case study of a multi-organizational effort in the Swedish public transport industry that emerged in response to the disruption of innovation processes caused by external developers scraping data from websites and developing services. These practices circumvented the established channels for access to resources and hence the dominant logic of firm-centric governance and internal service development. Drawing on the circuit of power framework (Clegg, 1989), we explore how Swedish public transport operators (PTOs) sought to address the disruption of power structures and resource control by fostering ecosystem-centric governance through the platform: Trafiklab. We identify triggers, emphasis (nudging actors, instituting interactive boundary resources, reinforcing desired practices and pivoting value propositions), and specific tactics for negotiating governance processes. In the following sections, we first review the literature on digital platform ecosystem governance, explore specific aspects of governance and resource control in emerging ecosystems, and theorize governance through the circuit of power framework. We then present the research design and an analysis of the findings. Finally, we discuss the implications of the results and present our conclusions.

2 | RELATED RESEARCH

2.1 | Digital platform ecosystem governance

In a digital platform ecosystem, the central digital technology provides services (collectively called a platform) that can coordinate and federate autonomous actors, enabling them to create value by using its resources for innovation and transactions (Cusumano et al., 2020; Gawer & Cusumano, 2014; Jacobides et al., 2018). The goals and actions of these actors (organizations and individuals) may be anywhere in the spectrum from conflicting to synergistic and massively affect digital ecosystems' evolutionary trajectories (Eaton et al., 2015; Ghazawneh & Henfridsson, 2013; Oborn et al., 2019). Governing digital ecosystems is, therefore, a delicate task. The platform provider must address tensions as actors materialize and seek to achieve goals not necessarily aligned with the platform's objectives. These tensions are often related to balancing centralization or distribution of control through mechanisms that "appropriately bound participant behaviour without excessively constraining the desired level of generativity" (Wareham et al., 2014, p. 1195–1196). The platform governs interactions in the ecosystem through rules that define rights and duties (Jingyao et al., 2022; Tiwana et al., 2010; Wareham et al., 2014), and values that indicate key aims and modes of collaboration (Huber et al., 2017). The platform provider regulates access through user interfaces and boundary resources, such as application programming interfaces (APIs) and software development kits (SDKs) (Ghazawneh & Henfridsson, 2013).

Previous research has highlighted three key dimensions of platform governance: *output*, *actors* and levels of *identification* (Wareham et al., 2014). Governance addressing *output* involves the specification of criteria for evaluating and including/excluding contributions (e.g., an app, song or social media post) and the associated rewards or

penalties (Tiwana et al., 2010). Governance addressing *actors* refers to the prescription of methods and procedures that influence, coordinate and federate the behaviour and actions of organizations and individuals participating in the ecosystem (Gawer, 2014; Tiwana et al., 2010; Wareham et al., 2014). Examples include methods and procedures addressing numbers and types of contributions, frequencies of updates and business conduct. Governance targeting *identification* refers to efforts to influence the extent to which actors identify themselves as participants in the ecosystem's collective value creation. While participants are autonomous actors pursuing individual goals, ecosystem value creation also involves collective efforts and benefits. Investments by one actor can create reusable resources, positive externalities and complementary contributions. Thus, fostering norms and values that balance collective and individual identifications can stimulate further investments, participation and responses to entrepreneurial opportunities that contribute to the overall ecosystem (Huber et al., 2017).

2.2 | Governance and resource control in emerging platform ecosystems

Resource control enables incumbent platform providers to establish and enact ecosystem governance by prescribing conditions and boundaries for participation or exclusion in a valuable ecosystem (Strahilevitz, 2005). Designing appropriate boundaries is essential for navigating trade-offs between internal control and competitive advantages from openness (Boudreau, 2017; De Reuver et al., 2018). Such boundary design includes the specification of social elements such as regulations and technical elements such as APIs. Examples of the role of boundaries in ecosystem governance include the specification of boundary resources to balance platform control and external contributions in third-party development (Eaton et al., 2015; Ghazawneh & Henfridsson, 2013), the use of control points to exercise dynamic control over value creation in ecosystems (Dattée et al., 2018), and strategic exploitation of shared resources (Jacobides et al., 2018).

Through control over vital resources, incumbent platform providers can exercise disproportionate power in the governance of a mature ecosystem. For example, in negotiations regarding value appropriation, Oh et al. (2015) found that power asymmetry enabled a platform provider to capture 75% of the value created in a focal ecosystem while developers collectively received 25%. As digital ecosystems scale in size and mediate growing numbers of interactions, network effects further reinforce the power asymmetries between platform providers and complementors (e.g., Rochet & Tirole, 2003; Van Alstyne et al., 2016). Network effects (i.e., positive externalities arising from other users) increase the value of ecosystem participation and thus the value of the ability to prescribe conditions and boundaries for exclusion or participation associated with resource control.

While extant research provides detailed insights regarding resource control and boundary choices in mature ecosystems, governance in emerging digital platform ecosystems has received limited attention. These ecosystems in the birth and expansion stages have uncertain value propositions still under significant negotiation, and they have not yet reached the critical mass required to ignite positive network effects (Evans & Schmalensee, 2010; Moore, 1993). In emerging ecosystems, two interrelated problems limit the effectiveness of governance grounded in resource control. One is the highly uncertain value of ecosystem participation, and the other is the fragile nature of platform resources and boundaries that enable the establishment and maintenance of control points.

The first of these problems, the highly uncertain value of ecosystem participation, impedes the platform provider's ability to establish and enact governance mechanisms. The net cost or benefit of ecosystem membership and compliance is highly dependent on the expected benefits of interacting with other ecosystem participants. For a mature ecosystem, access to the network of actors has proven and easily discernible value, while it is highly uncertain for an emerging ecosystem. Positive externalities related to network effects are still unverified due to a lack of critical mass (Evans & Schmalensee, 2010), and the value proposition emerges over time because of the vast set of possible combinatorial options and distributed agency (Sandberg et al., 2020). The platform provider must narrow the broad range of alternative futures to identify the value proposition, while overly restrictive designs hamper flexibility and the ability to keep up with internal and external dynamics (Dattée et al., 2018).

Furthermore, an ecosystem's value proposition is often negotiated and contested after platform release since it must align with a relevant problem for multiple actors (Eaton et al., 2015; Gawer & Cusumano, 2008). These actors might have varying goals, interests, importance, and identities (Lindgren et al., 2015). So intense translation and negotiation processes are involved in emergent practices (Marabelli & Galliers, 2017). In addition, the uncertainty regarding the value of ecosystem participation may constrain actual and prospective users' willingness to accept governance rules and values that deviate from their agenda.

Regarding the second problem, value creation in a digital ecosystem is relational and temporary since it relies on digital resources that are highly dynamic, and value can be greatly enhanced by their combination and recombination (Lusch & Nambisan, 2015). The ability to recombine them in use and design is often highly distributed (Henfridsson et al., 2018; Lyytinen et al., 2016). The conversion of information into digital format enables the separation of resource functionality from physical binding (Yoo et al., 2010). Control over resources is often fluid and challenging to maintain since this separation enables destabilization of power relationships through, for example, ease of access or hacking. While incumbents can redesign architectural control points (i.e., key components conferring architectural control over other components) to restabilize relationships (Eaton et al., 2015; Woodard, 2008), uncertainties in the value of participation raise requirements for a more delicate balancing act in emerging ecosystems. For new platforms, digital artefacts' malleability also introduces high risks of substantial differences among actors in the understanding of the technology (Orlikowski & Gash, 1994), levels of identification with the ecosystem (Wareham et al., 2014) and values (Selander & Jarvenpaa, 2016). Such processes are highly ambiguous, complex, interactive and rapidly changeable (Faraj et al., 2011). Since agency is distributed among many actors, digital platform ecosystems emerge in arenas full of potential resource control contestations and conflicts, in which governance entails the need to manage multiple forms of power relationships (Gorwa, 2019).

2.3 | Governance and forms of power

Governance processes are highly political and involve the exercise of power (Hurni et al., 2021). We draw on the circuit of power framework presented by Clegg (1989) to understand how and why providers can induce ecosystem actors to engage in collaborative negotiation regarding ecosystems' fundamental governance properties (such as values, meanings, and rules). This framework metaphorically depicts relationships between different forms of power that are continuously enacted and flow, like a current in a complex electronic circuit board. The framework depicts how power flows and is involved in changes in social systems through three circuits of power: episodic, social integration and systemic integration. We use this framework as it enables analyses of complex socio-technical systems (Backhouse et al., 2006; Silva & Backhouse, 2003), encompasses forms of power involved in the governance aspects of interest here (i.e., output, actors, and identification), and facilitates exploration of the dynamics of structure and action. In the following, we describe the framework's components and translate them to the context of digital ecosystem governance.

The episodic circuit involves actions, agencies, 'power over' and resistance. Power in this circuit is derived from agents' capacities to control resources (Clegg, 1989) that agents can deploy or deny access to in order to influence outcomes (Hardy, 1996). This results in episodes where "agent A gets another agent B to do something that B would not otherwise have done" (Clegg, 1989, p. 217). For example, when Apple blocked Fortnite from its Appstore, it sought to get the video game developer to refrain from circumventing Apple's 30% revenue cut.

In the social circuit, power operates through formal and informal rules of meaning and membership (Clegg, 1989). It differs from the episodic circuit in that it is not vested in individuals' discrete actions but in rules, norms and culture that orient actions (Hardy, 1996; Lawrence et al., 2012). For example, Twitter and Facebook publish rules for behaviour and participation on their platforms, which are not necessarily tightly prescriptive or strictly upheld, but enable them to exercise power and intervene if they wish (or are obliged to by external pressures). By setting rules for meaning and membership, these providers affect users' norms, values and identification with the

associated ecosystems. They form institutionalized rules and values that gradually become widely accepted as norms that guide interaction and participation in the ecosystems.

In the systemic circuit, power is exercised through techniques of discipline and production (Clegg, 1989), that is, 'material conditions' providing empowering and disempowering pathways that facilitate interactions or restrict what actors can do (Lawrence et al., 2001). In digital platform ecosystems, techniques of discipline and production are inscribed in platform design rules (Baldwin & Clark, 2000) that serve as contours for actions and operational procedures specifying how the ecosystems operate. Examples include methods and procedures regarding who can participate, what platform resources are accessible and how the output is evaluated (Tiwana et al., 2010; Wareham et al., 2014). For example, using accreditation and code acceptance techniques, platform providers can specify who can contribute to the platform (input control) and acceptable outputs (Ho & Rai, 2017; Tiwana et al., 2010; Wareham et al., 2014). We next explore how the three circuits of power relate to platform governance (as illustrated in Figure 1) during the establishment of a platform.

Changes in digital ecosystem governance can be triggered either exogenously or endogenously. Changes triggered by exogenous contingencies must be sufficiently substantial to disrupt the stabilizing effects of either the social or systemic circuit (Clegg, 1989). Whether or not such impact occurs depends on "a highly complex interrelationship between the exogenous influence of innovations and the receptivity or otherwise of the endogenous unit in question" (Holton, 1985, p. 212). In digital ecosystems, resource malleability may increase the complexity of both stimuli from innovations and the ability to adapt and respond, causing more transient and temporary circuits than in non-digital ecosystems (Sandberg et al., 2020). However, an exogenous contingency triggering change does not automatically lead to a change in the rules of meaning or techniques of discipline and production constituting governance. Fruitful establishment and enactment of governance require stabilizing appropriate relationships between episodic, social and systemic circuits through obligatory passage points (nodes that circuits in the system pass through, and thus interactions must too). The interplay between the social and systemic circuits at the obligatory passage points (i.e., intricate interactions among governance rules for norms, values and processes) sets the stage for acts of episodic power to secure outcomes (e.g., cutting off an actor from a platform's app distribution system). The position

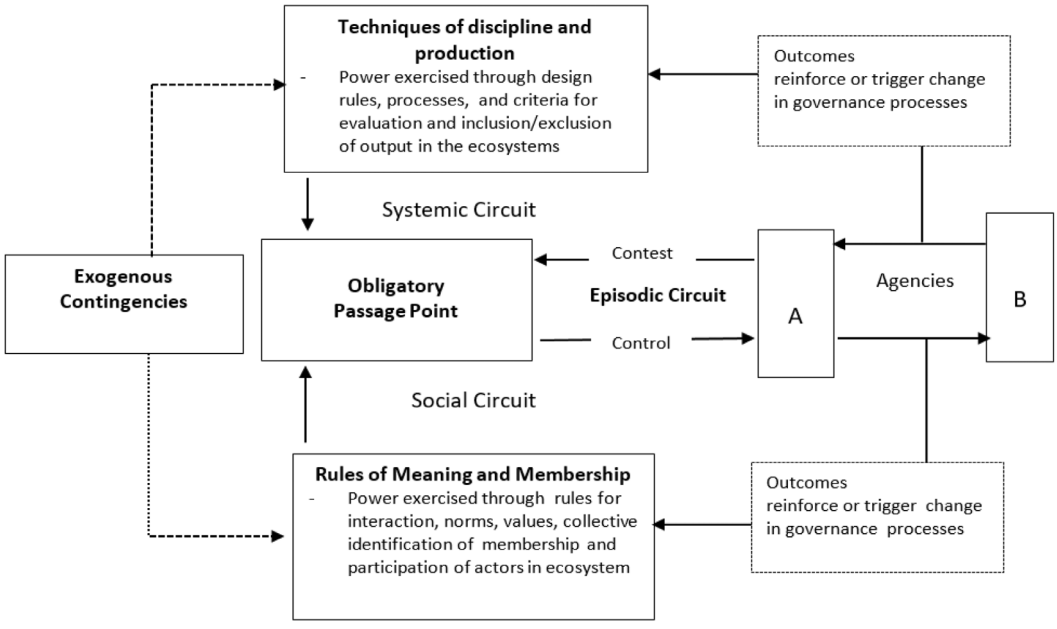

FIGURE 1 Circuits of power (adapted from Clegg, 1989)

of digital platforms as an obligatory passage point (or, more frequently, set of passage points) for interactions in the associated ecosystem enables governance of output, identification, and actors through the exploitation of the systemic, social and episodic circuits, respectively (Wareham et al., 2014).

Changes in digital ecosystem governance can also be triggered endogenously by episodic power outcomes arising from contestation, tensions or resistance among agencies that cause changes in the rules of the game (social and systemic circuits). For example, changes in the rules of meaning or techniques of production instituted through an obligatory point of passage can create imbalances among actors. Differences in control of resources can be strategically exploited to induce other actors, say B, to refrain from taking reasonable and expected actions in response to A (Clegg, 1989). However, digital resources' distributed nature and malleability (Faulkner & Runde, 2019: Kallinikos et al., 2013) provide ecosystem actors with the means to challenge power relationships, for example, through hacking or innovative circumventions of technical and social rules (Eaton et al., 2015).

We consider governance in digital ecosystems as an inherently political process imbued with expressions of power since it affects actors' behaviour, beliefs and opportunities (Lawrence et al., 2012). To identify important actions and events in such processes, we examine the emergence of the Trafiklab ecosystem, focusing on governance changes related to outputs, actors and identification that we seek to explain through the circuit of power framework.

3 | RESEARCH DESIGN

We adopted a qualitative research approach since it is suitable for researchers seeking to understand issues related to "people and the social and cultural contexts" Myers (1997, p. 3). Since the power relationships and acts involved in the evolution of ecosystem governance are elusive, we adopted an interpretive stance, viewing knowledge as socially constructed through "the subjective meaning of social action" (Bryman & Bell, 2011, p. 17). We focused on events, actions and processes to identify the actors involved, what happened and when (Langley, 1999).

3.1 | Research site

The context of this study is the public transportation sector in Sweden in the 9 years following its deregulation in 2010 and a shift towards digital service development involving external developers. Previously, Swedish PTOs heavily relied on internal development teams and decided which services to develop since they controlled access to the data. The focal period (2011–2019) followed increased interest among the public in leveraging public datasets (open data) for innovative digital services. A vital player in this context was Samtrafiken, an association of 36 PTOs formed to handle shared challenges and opportunities related to data, standards and travel coordination. A vital function of Samtrafiken is to ensure that travellers can have smooth cross-region journeys via multiple transport modes.

We focused on efforts to govern the ecosystems of actors (PTOs and public entities providing data, and third-party developers, including both individuals and organizations) and services that commenced with launching a platform called Trafiklab. Thus, our unit of analysis is Trafiklab and its provider's (Samtrafiken) measures to institute and evolve governance in response to disrupted resource control. Motives for establishing Trafiklab were diverse, but a major one was recognition of a need to coordinate and govern external developers who had disrupted and circumvented established resource control channels by scraping data to develop digital services. Trafiklab is yet to attain sustainability, and many of its structures and processes are open for negotiation. The shifting configurations and diverse sets of actors provide fertile ground for political acts, negotiations, and power expressions related to governance. Thus, we consider it an ideal case for examining power dynamics as actors seek to establish and enact governance mechanisms in an emerging ecosystem.

3.2 | Data collection

We collected data during a period covering more than 5 years (March 2014–Dec 2019) from multiple sources through which actions, events and processes in the ecosystem were traced. An initial round of interviews focused on historical developments in the Swedish public transport sector. During this round, interviewees included managers and employees in critical roles with relevant knowledge of events before and after Trafiklab's launch. We extended later rounds of interviews to include representatives of selected PTOs, for example, SL (the local transport authority in Stockholm), Trafikverket (the Swedish Transport Administration) and Västrafiken (public transport provider in Västra Götaland). These were open-ended interviews (Yin, 2012) focused on capturing actions initiated by the platform provider to govern, influence or alter the course of activities (e.g., conflicts in the ecosystem). We focused on interviewing and collecting data from actors in decision-making positions to gain insights into rationales for changes during the ecosystem emergence process. In doing so, we gained a rich understanding of processes, resources and procedures in different actors' operational contexts. We also used Trafiklab's weblogs to trace historical changes in rules guiding developers in service development, data formats, rules for accessing APIs, new APIs and incentives. In later rounds of data collection, the first author participated in various events organized by Trafiklab, including hackathons, innovation contests and meetups. In addition to observations of practices, these events provided further opportunities to interview key actors and gain additional insights into the rationales for organizing the events. Our understanding of the historical change process and events was enhanced by information from other sources, such as the timestamps from weblogs, documents and interviews (Yin, 2012). The interviews helped us to develop an understanding of the reasons for organizing certain events, the actors involved, their responses, and thus "the interpretation that participants have regarding the actions and events which have or are taking place, and the views and aspirations of themselves and other participants" (Walsham, 1995, p. 78). Table 2 provides a summary of our data sources and the collected data.

3.3 | Data analysis

We engaged in a four-step analytical process to understand the negotiation of fundamental governance properties. First, we read and familiarized ourselves with the transcripts (Braun & Clarke, 2006), then subjected them to line-by-line coding (Charmaz, 2006), that is, assignment of codes (first-order descriptive concepts) to each pertinent comment of the interviewees. The intention was to keep the descriptive first-order concepts grounded in the data to help us capture and understand the context of events and actions. This approach is consistent with the principle of contextualization presented by Klein and Myers (1999), which emphasizes the importance of understanding the social and historical background of the setting in qualitative research. We identified events such as meetups with developers, rules for participation, API updates, regulations and guidelines for API requests through descriptive coding. We also sought to reduce overlaps by generating mutually exclusive concepts.

Second, through temporal bracketing, we structured the analysis around periods of continuity and discontinuity in Trafiklab's governance emphasis to theorize the nature of change and its triggers (Langley, 1999). We identified changes in governance through an iterative process, moving back and forth in analysing the data and sequence of events. The outcome of this step of our analysis was a chronological timeline of events and the identification of four distinct phases. To enable confirmatory triangulation and minimize risks of either missing rival explanations of the data (Yin, 2012) or omitting critical events or changes, we asked Trafiklab's management to verify the chronological sequence of events we obtained.

Third, we generated initial second-order concepts (later referred to as tactics). In line with the recommendations of Gioia et al. (2013), we iterated between the literature on digital platform ecosystems and the descriptive concepts generated in step 1 to identify salient themes in how the emphasis of governance and the actors involved in its negotiation changed between phases. We used governance constructs (including concepts such as decision rights, rules, control mechanisms, output, actors and identification) as "sensitizing concepts" (Bowen, 2006) to categorize the

events identified in step 1. We focused on discrete actions (Lawrence, 2008, p. 174) initiated by Trafiklab's management and intended to influence actors, outcomes and identification in the ecosystem (Gawer & Cusumano, 2014; Tiwana et al., 2010; Wareham et al., 2014). For example, when we identified concerns related to output (e.g., service quality), we traced actions and micro-level changes in governance initiated to alter undesirable practices or strengthen desired ones. We also examined actions taken by ecosystem actors (e.g., data providers and external developers) in response to changes in governance instituted by Trafiklab. Following Gioia et al. (2013), p. 20, once our analysis had produced "a workable set of themes and concepts," we combined the identified second-order concepts (conceptualized as tactics) into an aggregated dimension capturing changes in governance emphasis in each phase (see Figure 2 and Appendix 1).

Fourth, our interest in why governance and the actors involved in its negotiation change, and the salience of political struggles, led us to examine expressions of power. Drawing on the circuit of power framework (Clegg, 1989), we analysed the interactions and sequences of episodic, social and systemic power underlying governance changes. Through the operationalization of Clegg's (1989) 'circuit of power framework' (see Figure 1 and Table 1), we explored the triggers and intentions behind changes in governance. These constructs informed our analysis of why the change occurred in governance emphasis and tactics in the following four phases(summarized in Table 3).

- Phase 1: "Adapting to disruption by Igniting the Circuits of Power." This phase encompassed the initial actions taken in response to the exogenous contingency that external developers circumvented established channels for control and access to resources. It involved PTOs responding to the disruption by seeking to nudge developers away from scraping and instead using Trafiklab as the new passage point for accessing resources.
- Phase 2: "Fostering Rules of Meaning and Membership through Interactive Boundary Resources." Rather than attempting to secure control of resources, the primary objective in this phase was to legitimize the new digital ecosystem for diverse stakeholders and communities of actors with varying identities, practices and interests in Trafiklab's perceived value. This involved use of social aspects of power, mediated through rules, meanings, interactions and identification of actors in the ecosystem.
- Phase 3: "Strengthening Rules of Discipline and Production by Reinforcing Desired Practices." This involved the exercise of systemic power through changes in design rules, methods, procedures, the platform resources actors could access and output evaluation. There was a shift towards procedures and methods intended to provide contours for actions and specify how the ecosystem operates, accompanied by persisting PTOs' perceptions of risks associated with the services' reliability and output quality.
- Phase 4: "Pivoting the Value Proposition in Response to Lack of Episodic Power." This phase was characterized by the lack of an obligatory passage point and value proposition that could consolidate the power of the platform provider *vis-a-vis* actors in the ecosystem. Pivoting of the platform's value proposition was triggered by contestation of the platform's value offer and the lack of a clear business case that could provide mutual benefits for all actors.

4 | GOVERNANCE IN THE TRAFIKLAB ECOSYSTEM

4.1 | Circumventing the obligatory passage point for data access

Before smartphones were widely adopted in Sweden in the early 2010s, most PTOs developed digital services internally. IT solutions and applications (e.g., trip planners) remained within the control of internal development teams in an industry that was not oriented towards customer-facing information needs. PTOs often provided travel

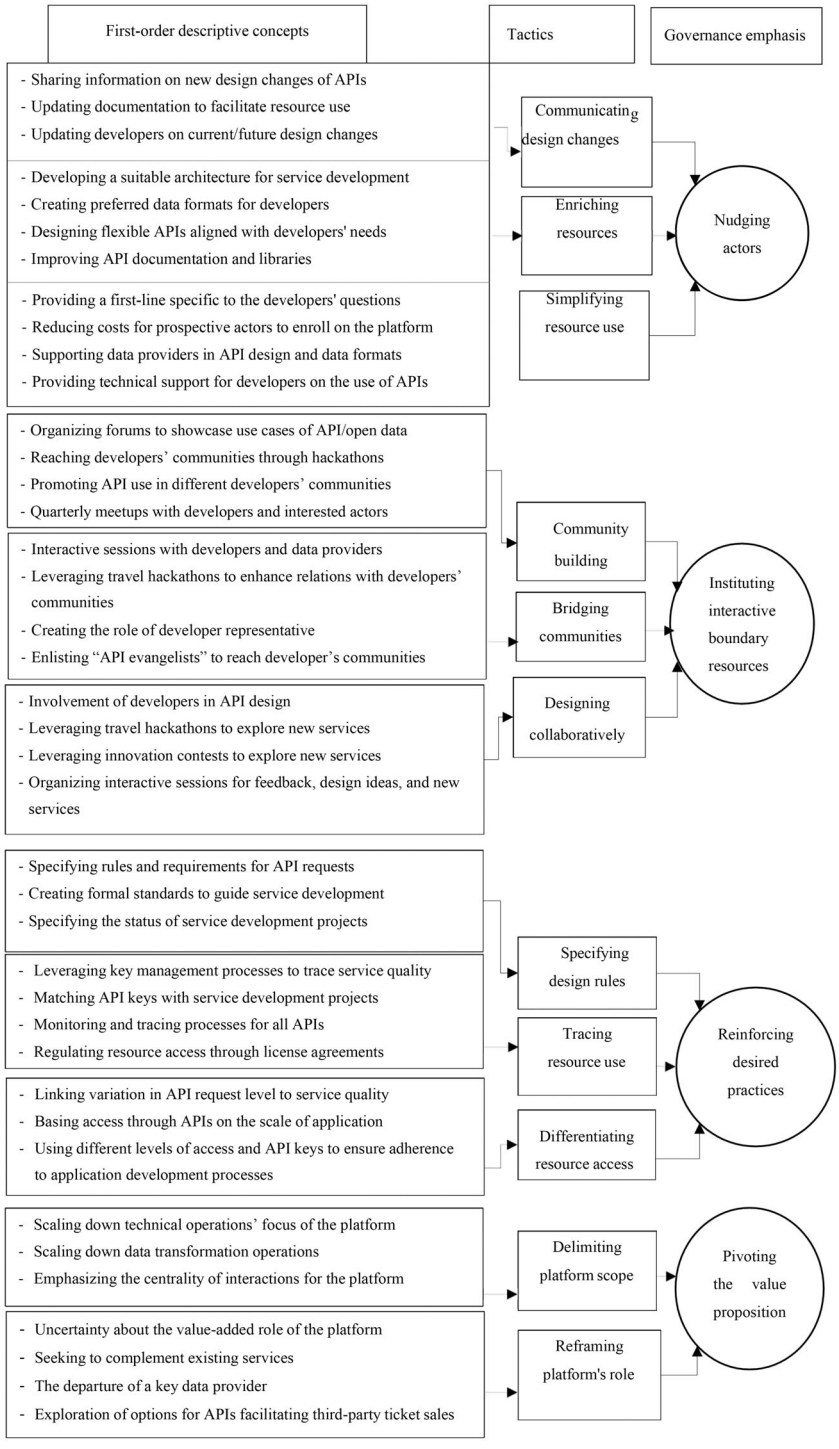

FIGURE 2 Data structure

information through their web portals in static time schedules showing basic information, such as scheduled departure and arrival times for buses and trains. However, as digitalization progressed, the PTOs were starting to feel pressure to adapt:

TABLE 1 Key constructs and their operationalization in platform ecosystem governance

Construct	Description from Clegg (1989)	Operationalization in platform ecosystems	Manifestation in the context of platform ecosystems
Episodic circuit	Enables A to make B do something B would not otherwise do.	Actions of self- interested actors that cause other ecosystem actors to change their behaviour.	Power is enacted as actors (e.g., platform providers) utilize means to leverage controlled resources in persuasive ways to create outcomes in which other actors (e.g., third-party developers) align their actions with the interests of the originator (Eaton et al., 2015).
Systemic circuit	Techniques of discipline and production.	Procedures, routines, processes.	Power is inscribed in design rules that serve as contours for actions and specify how the ecosystem operates (e.g., methods and procedures regarding aspects such as who can participate, what platform resources can be accessed, and how output is evaluated (Baldwin & Clark, 2000; Tiwana et al., 2010; Wareham et al., 2014)
Social circuit	Rules of meaning and membership.	Rules governing interactions and participation.	Power flows through rules that guide social norms, values, behaviour and identification in the ecosystem. These rules of meaning and membership include statements about goals and the nature of collaboration in terms of, for example, communication, partnership management, value appropriation and knowledge sharing (Huber et al., 2017).
Obligatory passage points	Potent sources of resistance stabilize rules, meanings and techniques of innovation.	Key nodes and gateways in the ecosystem that operate as de facto standards and resource access points.	Power is enforced through a platform's ability to function as a bottleneck or gateway for entry into the associated ecosystem (Tiwana et al., 2010).

> We communicated using various old means like timetables with our customers, then platforms like iPhone and Facebook emerged. People were kind of expecting our data to be part of their lives in these ecosystems. It was a bit complex to relate to that situation for this industry. [Business Strategist, Samtrafiken]

Samtrafiken made efforts to provide seamless services that combined data across PTOs and modes of transport to facilitate smoother travel experiences, such as launching single tickets for travel via multiple transport modes. Although Samtrafiken strove to provide services across modes of transportation, the individual PTOs had the overriding authority to decide what data to publish and how it was done since they controlled and regulated access across a wide range of transport services in their respective regions.

> Historically, it has been a closed system. We had a few companies. They oversaw almost all travel. They had unique positions, each having its own solutions and exercising control over those services [Trafiklab Manager]

TABLE 2 Summary of the data sources and collected data

Data sources and periods	Data collected	Use in analysis
Interviews with Trafiklab and Samtrafiken's management [Mar 2015-Dec 2019]	35 interviews collectively lasting ca. 50 hrs.	Complemented data from online sources to acquire insights regarding rationales for identified actions and events.
Interviews with data providers [Mar 2015- Dec2018]	12 interviews collectively lasting ca. 11 hrs.	Provided insights into perspectives and rationales of different PTOs for participating in the network.
Online sources: Trafiklab.se, BloggTrafiklab, Trafiklab/ Nyheter, support forum	Timeline of events Sept 2011–Dec 2019	Provided traces of the online actions of Trafiklab and information on what and when events occurred.
Archival data	Internal documents, reports and presentations.	Additional sources illuminating decisions or changes before, during and after transformations induced by innovation processes.

The result was a multitude of isolated web portals and data formats that were not interoperable. PTOs' continued ability to exercise control over service development processes created dissatisfaction among users seeking to develop services across different platforms. Accordingly, external developers circumvented the obligatory passage point for data access by scraping data from PTOs' websites to create services:

> We were hijacked by some services created by third parties without our knowledge. There were many discussions that those services had to be shut down and eliminated because they were destroying our trademark. They were using our data in a way we had not authorized. [Business Strategist, Samtrafiken]

4.2 | Phase 1 [2010–2012]: Adapting to disruption by igniting the circuits of power

4.2.1 | Triggers

The launch of the Trafiklab platform was triggered by an exogenous contingency in the form of disruption of innovation processes as external developers circumvented established channels for accessing resources by engaging in unsanctioned data scraping practices. This challenged the PTOs' power to determine who could be granted access to data and regulate innovation outcomes in terms of services' quality. Responses of Samtrafiken members included opening some of their data, hoping to change external developers' courses of action. However, this was a reluctant move, and discussions were simultaneously held within Samtrafiken on crafting rules to eliminate third-party services. Initial efforts mostly revolved around ways for Samtrafiken's members to strengthen their control over third-party developers' services by opening data while instituting regulatory measures. Many external developers were not enticed by the offering and instead reinforced new data scraping practices. Samtrafiken realized that exercising episodic power by shutting down the services could trigger a public backlash as significant (and increasing) numbers of travellers had switched to using those services as complements to the PTOs' official web services. As one interviewee involved in the development of APIs noted:

> "Developers had used our data without us knowing. They had developed services. We got a lot of requests and traffic from these services to our back-end systems. It was like a virus attack. We could not shut down the services entirely because people appreciated them and started using

TABLE 3 Summary of the process flow of events, activities, actions and actors

Time	Flow	Events	Aims of change and triggering actors
[2008–2010]	Contextual background	• Digitalization and homogenization of data • Heavy focus on internal service development • Discontent among PTOs about external • Collaboration with developers due to cost and quality concerns	• Emphasis by PTOs on the internal focus of service development with restrictive control of service • Development processes
Phase 1 [2011–2012]	Trigger: Exogenous Contingency	Circumvention of established channels [obligatory passage point] for resource control and access	• External developers
	Governance emphasis	Nudging actors	• Trafiklab management
	Examples of activities in the tactics: • Communicating design changes • Enriching resources • Simplifying resource use	• First meetings with developers • Design of more flexible APIs • Customized control and access to APIs • Implementation of transformational layer • Development of API libraries • Support for new data formats to aid innovation	Emphasis on coordinating and regaining control over unsanctioned practices of self-interested external developers
Phase 2 [2012–2013	Trigger: Perceived need to strengthen the social circuit	Diversity in aims, resource base, interest and understanding of Trafiklab	• Data providers • External developers
	Governance emphasis:	Instituting interactive boundary resource	Trafiklab management
	Examples of activities in the tactics: • Community building • Bridging • Designing collaboratively	• Travel hackathons, innovation contests • Support forum for development • Meetups and enlistment of API evangelists • Introduction of a developer representative role • Release of Python module • Library to aid innovation, API changes • New status for service development projects: testing, launching and completed application	Emphasis on rules, meaning, interactions and identification to legitimize the new digital ecosystem across stakeholders and communities
Phase 3 [2013–2014]	Triggers: Perceived need to strengthen the systemic circuit	Discontent about quality and quantity of output and quality of services, preference to keep services within their respective organizations	Data providers
	Governance emphasis	Reinforcing desired practices	Trafiklab management

TABLE 3 (Continued)

Time	Flow	Events	Aims of change and triggering actors
	Examples of activities in the tactics: • Specifying design rules • Tracing resource use • Differentiating resource access	• Rules for output control • Development of APIs with developers • Implementation of a progressive access system regulating API requests • Matching access/API requests with service quality • API keys matching developers' projects	Emphasis on design rules, methods, procedures, guiding actors, resource access and institutionalization of output evaluation
Phase 4 [2014–2018]	Triggers: Inability to function as an obligatory passage point	• Lack of clear business case and unified strategy regarding Trafiklab's strategic direction • Departure of key data provider	Key data provider (SL)
	Governance emphasis	Pivoting the value proposition	Trafiklab management
	Examples of activities in the tactics: Delimiting platform scope Reframing the platform's role	• Refocusing on facilitation of interactions among developers through social events and structures • Creation of new roles, relationships, and rebranding of identity • Exploration of options to enable ticketing • Downsizing of technical operations of platform • Removal of the architectural control and transformation layer to scale down technical operations.	• Emphasis on reframing • Platform's scope and role to adapt to weak institutionalization of obligatory passage point
Epilogue [2019]	Trigger: Implementation of EU legislation makes Trafiklab an obligatory passage point for PTOs	New legislation and directives on open data publishing	Government intervention: legislation regarding design and provision

them. We had no choice but to engage [with developers] in service development." [Project leader, Samtrafiken]

4.2.2 | Nudging actors

In response to external developers' engagement in unacceptable practices (data scraping) that strongly conflicted with the PTOs' norms and desired practices, Samtrafiken launched the Trafiklab platform. The idea was that a platform for publishing data from multiple sources would provide an attractive, enriched environment for service development. By providing a more attractive option than data scraping, Samtrafiken sought to funnel interactions to the platform and establish relationships in which they could exercise governance, influence service quality and ensure that developers followed acceptable practices and rules for accessing data. In Clegg's (1989) framework, this can be understood as an attempt to ignite the circuits of power by nudging developers towards

Trafiklab as a new obligatory passage point. Our analysis reveals three tactics used for nudging onboard developers (see Figure 2). First, Samtrafiken strove to provide an attractive environment for developers by *simplifying* resource use by facilitating access and provision of data in different formats and first-line support. Second, to enhance the platform's attractiveness relative to data scraping, it was enriched with various resources, including flexible APIs aligned with developers' needs, better API libraries and better documentation. The idea was that *enriching resources* to make them attractive to developers and providing them in a manner acceptable to PTOs could reduce data scraping practices and hopefully convince developers to design services aligned with the PTOs' interests.

> Trafiklab does not have much bargaining power. We need to provide boundary resources that are more attractive than scraping as an option […]. If you want people to use your official interface, you have to provide data or open APIs in a way that makes them more attractive than scraping because, with scraping, third parties have the autonomy to do whatever they want with the data or APIs. [Systems Engineer]

Third, to ensure that developers were familiar with changes in rules for service development processes and available resources, design changes, planned developments in migration paths, and amendments to resource documentation were *communicated* to developers through a single-entry information point.

> As we have previously written about with changes in APIs in Trafiklab, there will be some minor changes for all Trafiklab's APIs, and we recommend that anyone using these APIs thoroughly test that everything will work in the future. We give the users 3 months to move their applications to the new API to find if there is an error or test it. After that, we close the old API. [Technical support team member]

The aim was to provide a structured environment that would entice developers while allowing PTOs to exercise certain degrees of influence over outputs, processes and specific APIs used in application development processes. Furthermore, to encourage innovation processes in a well-structured and ordered environment rather than using scraped data with less predictable quality or outcomes, the involvement of external parties in service development also had to be appealing to the PTOs. Thus, there was a need to establish and maintain a suitable level of governance. Efforts to do so included tying access to the data to a minimal level of influence over the content of services. For example, unlike previous configurations in which developers went through the individual web portals of different PTOs, a minimum requirement was for developers to agree to "appropriate" use of APIs and file a brief description of their intended projects. This basic process provided developers access to a wide range of useful APIs for their applications or services while enabling Trafiklab to retain control over the output of services.

> Theoretically, we can demand anything in a licence agreement because it is a form of contract between the providers and users. One way of making sure people use data is to have as few conditions as possible to ensure that they can use the data as freely as possible rather than ensuring too much control. We try to keep the conditions to a minimum. [Technical support team member]

By creating an access point for APIs and developers, Trafiklab instituted a flexible governance structure that bypassed cumbersome procedures and routines within the PTOs. Rather than mandating what was to be designed or how innovation processes were to be performed, initial governance measures were intended to steer developers towards 'appropriate' use of data in innovation. The hope was that developers would align with the Trafiklab mode of governance rather than actively opposing the formal control of the PTOs they detested. This would enable Trafiklab to serve as a venue for future innovative transport services.

4.3 | Phase 2 [2012–2013]: Fostering rules of meaning and membership through interactive boundary resources

4.3.1 | Trigger

A varied set of competencies in the developer community offered clear synergistic innovation potential, but establishing a sense of identification with the new platform as a legitimate avenue for service development posed substantial challenges for Trafiklab. Due to the diversity in factors such as actor characteristics, interests, norms and competencies, there were significant differences in the understanding of Trafiklab, reasons for its existence, and how it should operate. For example, Trafiklab staff quickly realized that service development involving external developers could not be merely a technical activity, but many of the PTOs developed such awareness more slowly. Thus, establishing a common identity, shared understanding of Trafiklab, and standards acceptable to the stakeholders involved navigating differences in aims, resource bases, culture, etc. In addition to the technical interoperability of digital resources, Trafiklab recognized the importance of agreeing on common standards for publishing APIs and sharing knowledge among the ecosystem actors. However, this was difficult to achieve as different PTOs varied significantly in size, emphasis on innovation and goals.

> First, it was a political process. Right now, we need to agree with everyone before we design new data formats, and it is a complex process to get everyone to agree on a common standard for the data. [System engineer]

The diversity among actors posed substantial challenges in recruiting actors into the ecosystems and rallying them around the identity and commonly shared values of the ecosystem. An important socio- cultural factor is that the PTOs were hierarchical and routine-based organizations accustomed to well- bounded and standardized internal innovation processes. At the same time, developers were a heterogeneous group of actors who acted outside of the PTOs' strict command and control structures. Moreover, the PTOs were heterogeneous with varied interests and enjoyed considerable autonomy within their respective operational regions. External developers ranged from individual developers to large companies, with significant variations in their use of data. In addition, Trafiklab's architectural boundaries towards resources (techniques of discipline and production funnelling actors through the obligatory passage point) were not very beneficial since the resources they could restrict access to still lacked obvious value:

> Third-party developers are a very eclectic set. Google is a third-party developer; John in the basement is a third-party developer. Expecting a single governance system to work for all those actors is not realistic. Compared with a more controlled ecosystem, like Apple's, we do not have the types of resources or bottlenecks they use to exert control. [Manager, Trafiklab]

4.3.2 | Instituting interactive boundary resources

To reduce variety in understandings, increased levels of identification with the platform, and build a shared sense of purpose, Trafiklab shifted efforts towards instituting what we refer to as interactive boundary resources (see Figure 2), that is, resources that facilitated knowledge sharing, translation and generation across community boundaries, rather than mere transactions. These efforts were aimed at enhancing the exercise of power through what Clegg (1989) refers to as the social circuit (rules of meaning and membership). Due to Trafiklab's weak power relationships with developers and PTOs, by necessity, the emphasis was on bottom-up processes, in which engaged actors actively participated in meaning creation rather than merely attempting to impose meaning on them. The institution of interactive boundary resources involved the introduction of *community-building* meetups (including external

developers and representatives of PTOs), innovation contests and travel hackathons. The aims were to establish a shared knowledge base to help *bridge differences in communities'* interests and understandings, and encourage developers to *design collaboratively*. For example, the meetups provided opportunities to listen to different actors, manage expectations, and provide information about the purposes and orientation of Trafiklab's activities.

> We have meetups for developers interested in what is going on with the platform [...] Typically, every third month, we invite end-users for an evening to discuss what is going on in the platform and their expectations regarding the kinds of information we can provide them. [Trafiklab technical support team member]

Meetups were complemented with the introduction of hackathons (called Travel hacks). Unlike meetups, which tended to attract developers with prior knowledge of Trafiklab, hackathons involved many participants in building broad developer communities around the vision of creating innovative services for public transport. They provided opportunities to meet new developers, inspire service development and broaden Trafiklab's relationships with a diverse set of communities:

> Those travel hack[athon]s provide a way of inspiring and creating better relations with third parties focused on creating public transport services. Another aspect is the community-building spirit. I think everyone will have loved to create sustainable services during the travel hack[athon]s. [Manager, Trafiklab]

Furthermore, since the public transport industry did not have a track record of openness, Trafiklab lacked legitimacy and credibility in external developers' communities. To promote its brand within developers' communities and PTOs, Trafiklab identified a need to *'evangelize'* by spreading the message of open APIs and branding itself in different communities as the new face of the Swedish public transport industry. Thus, several people (who were typically familiar with the developers' culture and had numerous followers on multiple social networks) were recruited as evangelists, with marketing functions and roles in fostering alignment with developers' attitudes.

> We used a digital public relations agency to spread the word and get the right people to tweet about it. They played the role of API evangelists… to build momentum around APIs, build the brand and boost our relevance in the community of third-party developers. [Business strategist]

In addition, Trafiklab also organized events bringing different actors together to foster closer relations among ecosystem participants, build ties between PTOs and developers, and stimulate innovation. These events were informal and served as forums for mingling and interacting. For Trafiklab, they also provided opportunities to showcase success stories to inspire developers and provide PTOs with proof of concept for the platform:

> We are planning events where developers will meet the owners of SL, bus and train companies. In this setting, developers can show the public transport companies what they are doing with the data they get from Trafiklab. This is intended to inspire public transport companies, to get them to know that Trafiklab is generating services for public transport. [Head of marketing, Trafiklab]

Efforts to establish a shared identity in the ecosystem were further reinforced by introducing a support forum for developers to enhance communication and solicit ideas from developers. Previously, developers did not have a separate digital interface for communicating with and about Trafiklab. As developers had detailed questions about specific APIs, they often did not get adequate or timely responses. The support forum was initially intended as a

channel for Trafiklab to provide feedback and resolve issues developers raised, but it became increasingly valuable for soliciting innovative ideas:

> We want to meet you! - now we want to invite you to be seen. We have a lot of exciting things going on that we want to talk about, and most of all we are interested in knowing more about what you think and what you want us to do in the future. [Developer support Forum]

Over time Trafiklab staff realized that the forum provided opportunities to enable developers to interact with each other. Developers who had encountered problems could obtain and provide feedback from others who had dealt with similar issues. Recurrent issues and those considered relevant to a broader audience were assigned to the frequently asked questions section of the support forum, and Trafiklab provided detailed responses. For Trafiklab, the forum also offered opportunities to improve the identification of aspects that they could enhance.

> They [developers] find out that we have a problem in the forum. We sometimes find that out ourselves, but not always. There is a very competent group of people out there. It is very different from the other channels that were available before we created Trafiklab. Before that, all third-party developers had to go to the regular customer support site where ordinary customers called or emailed. It was not a good way to handle those third parties because you tend not to respond to, or even see, the interesting questions they ask. [Manager, Trafiklab]

Another follow-up change was the introduction of third-party representatives, who were heavily involved in the developer community, active in travel hackathons and typically seen as role models. By incorporating the developers' views, APIs and other platform functionalities became more aligned with the third-party community's needs.

4.4 | Phase 3 [2013–2014]: Strengthening rules of discipline and production through reinforcing desired practices

4.4.1 | Triggers

Trafiklab recognized a need for key actors to see the network's potential value *to enhance the ecosystem's sustainability*. As the technical functionality and governance measures to facilitate interactions improved, developers' adoption and use of the platform increased. However, PTOs had persisting concerns regarding perceived risks associated with the services' reliability and output quality:

> We have had many discussions with the public transport operators about the potential risks of third-party developers working on our data. We are mainly facing risks arising from customers using services we cannot control, so if one of these third parties shuts down, for example, or does not want to update their services for end-users, it becomes tricky for us to take care of all the customers depending on the service. [Manager, Trafiklab]

Since resources and political mandate were distributed among diverse actors, Trafiklab could not single-handedly decide how output should be evaluated and correspondingly rewarded or restricted. Trafiklab also believed that punitive measures or techniques, such as limiting access to platform resources for services that did not comply with output control criteria or processes, would be counter-productive. At least in the short run, since Trafiklab lacked bargaining power to sanction developers if they resorted to data scraping.

4.4.2 | Reinforcing desired practices

To address PTOs' concerns, Trafiklab considered measures intended to enhance output quality, application development processes, and criteria for evaluating contributions and the associated rewards or penalties. These efforts were aimed at governance measures targeting the systemic circuit of power (Clegg, 1989), including *specification of design rules* for output control (e.g., technical requirements, standards for service development and procedures for API requests). The rules introduced by Trafiklab focused on promoting desired behaviour and practices rather than penalizing undesired behaviour. In previous phases, the focus was on quantitative goals (i.e., encouraging as many developers as possible to utilize the data) rather than the services' quality. Trafiklab started *differentiating resource access* (through distinct limitations on API requests) to address increasing concerns related to quality. In simple terms, better technical design was rewarded through positive feedback such as enhanced API request levels and access to support.

> The bronze level is about 10,000 requests a month and about 30 requests a minute. The silver is about 100,000 requests a month and 60 requests a minute for our APIs. For SL's APIs, it is about 500,000 requests a month and 60 requests per minute. The gold level is mostly limited, but it is like 10 to 12 million requests per month. So, it's a big step from silver to gold. [Technical Support team member]

Furthermore, Trafiklab sought to institute routines to ensure at least acceptable output quality. For example, developers had to sign agreements before working on APIs. Trafiklab leveraged a key management system that connected the design and use of digital resources to API keys, thereby enabling the identification of developers and services that needed upgrades. This system allowed Trafiklab to *trace resource use* and address improper service design before more complex problems could arise through integration in different applications and widespread use:

> We have a key management system, so third parties that want to use our data need to sign up in this community[…] They need to sign up for keys for different APIs and agree with allowed uses of the data and services from a technical perspective. In this way, we can shut down users if they create services that break those terms and conditions. [Trafiklab Manager]

4.5 | Phase 4 [2014–2018]: Pivoting the value proposition in response to lack of episodic power

4.5.1 | Triggers

In 2014, three years after Trafiklab's inception, many of its stakeholders still had not perceived a relevant business case for it in terms of possibilities to benefit from the platform. Moreover, Trafiklab had not established itself as an obligatory passage point for accessing APIs in the public transport industry. Data providers still wielded vast power in their respective regions to determine standards and criteria regarding acceptable services. For their part, developers were still searching for commercially viable business models. Many PTOs felt that their specific needs were not met because of significant differences among them (for example, between those operating in urban and sparsely populated regions), leading PTOs in the large urban regions to consider taking a more active approach:

> We're still struggling to identify the best possible solution to meet everyone's needs on the public transport side, and developers that need to make money out of this […] some actors want to handle this [coordinating third-party development of digital services] on their own. [Business strategist]

Trafiklab's position was further complicated by the departure of a key actor (SL, the Stockholm region's largest PTO), who decided to develop a proprietary platform for publishing data and coordinating innovation with external developers. This made it difficult for Trafiklab to become the de facto point of contact for advancing digital innovation activities in the public transport industry. Moreover, as the platform was not established as an obligatory point of passage for interacting with resources and actors in the ecosystem, Trafiklab had little chance to exercise episodic power to persuade actors to comply:

> They have their platform for providing APIs and keys. And we're not stressing that issue; they need to see the benefits of shifting to this common platform rather than having their own. [Systems Manager]

4.5.2 | Pivoting the value proposition

Following SL's departure and the uncertainty surrounding the platform's role in the ecosystem, Trafiklab's management made two strategic moves: *delimiting the platform's scope* and *reframing its role*. In delimiting its scope, Trafiklab sought to reduce the costs of managing technical elements. For instance, the transformational layer was abandoned, although it played a valuable role in influencing the development of APIs and coordinating technical requirements with actors. Thus, significant elements of the platform's value proposition, such as data integration and harmonization of APIs from different resource providers, were lost. However, the layer was costly to maintain since the enrolment of new actors and providers on the platform that would create efficiency from scale was lower than expected. The changes in functionality and SL's departure also contributed to the rationale for reframing the platform's role in the ecosystem. Initially, the various public transport actors had been expected to welcome third-party developers' involvement and Trafiklab's engagement with them. However, the numerous PTOs did not believe that the benefits matched the cost of the data transformation, which impaired interest for obvious reasons. Thus, Trafiklab started exploring new value propositions, such as providing an API for third-party ticket sales, strengthening its position as a community platform provider, and focusing more on knowledge-sharing activities. Thus, Trafiklab pivoted towards emphasizing social interactions and access to the developer community as its primary value proposition:

> Trafiklab has changed from one thing to another. In the beginning, we transformed the data to make it easier and available for third parties. Now, Trafiklab is more or less a marketing place or community where all operators can make their data available to developers or whoever wants to use their data. [Business Manager, Trafiklab]

By the end of 2018, it had become clear to Trafiklab's management that governmental legislative intervention was required for further progress in the creation of an ecosystem leveraging the creativity of external developers and reducing fragmentation along the PTOs' regional borders. The PTOs had become hesitant to commit resources to sustain Trafiklab's involvement and activities. Instead, they started to refocus their strategies regarding third parties' participation in digital services and innovation. The initial hype had dissipated, and Trafiklab was now at the mercy of external pressure in terms of new legislation, which it hoped would revive and provide legitimacy for Trafiklab.

> The legislation is an essential aspect of this field. We have legislation, and probably there will be a new act soon. They are very much considering those standardization questions. They would like to make this legislation much stronger to allow the actors to provide the data, including real-time and disturbance data. There will certainly be some change soon. So right now, everyone is like waiting. [Systems Manager]

Luckily for Trafiklab, from December 1st, 2019, new EU legislation (2017/1926) required all public transport industry actors to deliver data in formats that third parties can efficiently use through one national access point. In Sweden, traffic data for public transportation will be made available via Trafiklab. For Trafiklab, the legislative requirement provides an opportunity to cultivate the ecosystem and potentially alters the balance in power relationships with PTOs. A key aspect of this process is the development of Trafiklab 2.0, which serves as a national portal for developers interested in using public transport data. New developments include the provision of real-time datasets such as the number of passengers on the train.

5 | DISCUSSION

Previous research has shown that the emergence of generative ecosystems revolving around platforms with unbounded value propositions requires providers to dynamically adapt governance while seeking acceptance (Dattée et al., 2018; Eaton et al., 2015). Our study extends this perspective by illuminating how and why platform providers can induce ecosystem actors to engage in collaborative negotiation regarding the ecosystem's fundamental governance properties, such as values, meanings, and rules. Our analysis identifies triggers, emphasis (nudging, instituting, reinforcing and pivoting), and specific tactics for governance negotiation in emerging ecosystems (summarized in Figure 2 and Table 3). Below we discuss the theoretical and practical implications of our analysis.

5.1 | Exogenous contingencies breeding collaborative negotiation

Extant platform literature typically focuses on entrepreneurial opportunities and suggests digital platform ecosystems emerge from a need to solve a business problem or perform a function essential for a technological system or multiple industry actors (Gawer, 2009; Gawer & Cusumano, 2008; Sandberg et al., 2020; Tan et al., 2015). Thus, previous studies portray the transition towards ecosystem-centric governance (as opposed to firm-centric) as opportunity-driven (e.g., Karhu et al., 2018; Karhu & Ritala, 2021; Rietveld & Schilling, 2021). Our research extends this perspective by demonstrating that entrepreneurial threats in the form of disruptions of power relationships may also trigger the launch of a platform and ecosystem governance. Trafiklab did not emerge with an apparent value proposition attractive to all firms in the industry. Instead, the main trigger was the circumvention of the resource control that enabled the previous firm-centric governance structures and a resultant perceived need to reclaim influence over digital service innovations.

However, launching a new digital platform is not sufficient for governance measures to have an effect; users must also adopt the new way of interacting. Incumbents seeking to establish ecosystems around a new platform can draw on established customer relationships or offer subsidizations to ignite the ecosystem (Cusumano, 2020). For an organization disrupted by weakening resource control and thus have lost its position as an obligatory point of passage (Clegg, 1989), such options are not necessarily available as users can access the resources through other channels. Our analysis shows that nudging developers to interact with the platforms by developing value-adding services can be a valuable strategy. For example, through tactics such as communicating design changes, enriching resources and simplifying resource use, Trafiklab nudged developers towards accessing resources through the platform, which provided the basis for igniting the circuits of power. To further develop and gain acceptance of measures in the social circuit and the systemic circuit among developers and PTOs, Trafiklab engaged in collaborative negotiation of vital governance properties. These findings illustrate that the blurring of boundaries and weakening of resource control associated with digital innovation processes (Nambisan et al., 2017), together with a heterogeneous set of ecosystem actors, are contingencies that can spur collaborative negotiation of fundamental governance properties.

The analysis leads us to suggest that platform providers that have not yet established themselves as an obligatory passage point can engage in collaborative negotiation regarding governance properties to facilitate learning, enable acceptance of design rules and social norms, and increase participants' identification with the ecosystem.

5.2 | Negotiating design rules and values through interactive boundary resources

Design rules grounded in the systemic circuit (e.g., procedures, processes specifications and evaluation criteria), and values grounded in the social circuit (e.g., norms, behaviour and identification with the ecosystem) (Eaton et al., 2015; Ghazawneh & Henfridsson, 2013; Huber et al., 2017) are central components in ecosystem governance. Extant literature often assumes rules and values to be actively and deliberately instilled by platform owners in their ecosystems (e.g., Huber et al., 2017). In contrast, our analysis demonstrates how rules and values were collaboratively negotiated through what we call interactive boundary resources. Interactive boundary resources (e.g., hackathons, innovation contests, support forums for development, meetups) enable actors to co-create values and meaning by facilitating knowledge creation and sharing. At Trafiklab, this negotiation was triggered by diversity in aims, resource base, interest and understanding. It was instituted through tactics such as community building, bridging communities and leveraging the community by designing collaboratively. These tactics brought together a diverse group of actors to collaboratively co-create design rules and values.

Prior platform literature has examined boundary resources from a transaction perspective (e.g., Eaton et al., 2015; Ghazawneh & Henfridsson, 2013; Karhu et al., 2018), assuming that they enable the exchange of fixed resources or retain control over resources privy to the platform. We extend this perspective by demonstrating that interactive boundary resources can be vital for entrant platform providers to build a common frame of understanding among ecosystem participants and increase shared digital resources' quality. We expect interactive boundary resources to be more valuable in emerging platform ecosystems than incumbent ones for at least two reasons. First, in emerging digital ecosystems, the rules for meaning and values for interactions remain ill-defined and fragile since they are yet to be institutionalized. Second, entrant platforms have fewer path dependencies meaning narrowing down possible future use of shared resources is a more uncertain process involving higher degrees of cognitive and social translations (Dattée et al., 2018; Lyytinen et al., 2016). These aspects suggest a higher need for collaborative negotiations, a process that interactive boundary resources can facilitate.

5.3 | Instituting governance of output and processes

Acceptance of governance measures aimed at output and processes among ecosystem actors is essential in emerging digital ecosystems since decision rights (Tiwana et al., 2010) over boundary resources do not necessarily translate into substantial episodic 'power over' actors. Incumbents can use boundary resources to enact power in relationships with other actors to punish non-compliance since the platform often constitute an 'obligatory passage point' (Backhouse et al., 2006). However, episodic power for a platform provider in an emerging ecosystem is limited by uncertainty regarding the value of both platform resources and the ecosystem itself (Dattée et al., 2018). Our analysis suggests that in the absence of persuasive power grounded in resource control, strategies to reinforce desired practices can facilitate the acceptance of techniques for discipline and rules such as governance of output and processes (exercise of power through the systemic circuit) by enabling acceptance. Trafiklab reinforced desired practices through tactics involving incentives rather than punishments, such as specifying design rules, tracing resource use and differentiating resource access. For example, adherence to the application development process gave increased access to Trafiklab's resources.

The idea of traceability could be understood as an indirect power mechanism (in the vein of a panopticon). It conveys to actors in associated ecosystems that inappropriate ways of using resources can always be monitored and

result in adverse consequences, thus preventing them from taking actions they may otherwise have contemplated. However, lack of control over critical resources and strong network effects makes the provider highly vulnerable when instituting negative feedback. Thus, reinforcing desired practices is an attractive alternative while a provider still struggles to establish a platform as a de facto obligatory passage point. However, as illustrated by our case, resources in the content layer of the digital architecture are often highly distributed (Kallinikos et al., 2013; Yoo et al., 2010), making it hard to establish an obligatory passage point and enact episodic power. Providers might thus have to pivot the platform's value proposition when faced with challenges from the ecosystem.

5.4 | Limitations and future research

The implications of our study must be considered considering several limitations. First, specific features of the setting in our case study might limit the generalizability of findings. Trafiklab is owned by the PTOs' alliance, which might have affected power dynamics. Second, Trafiklab is still in a fragile phase. Its deep involvement in social interactions, geographical anchorage and adaptability to stakeholder interests might be temporary and have generated vastly different dynamics from those associated with a platform provider seeking to scale an ecosystem across larger geographical regions. It should be noted that during the timeframe of our study Trafiklab had not yet been established as an obligatory passage point for interactions among groups of actors, partly because of weak resource control. The interactions between user groups did not involve monetary transactions, potentially mitigating conflicting goals related to value appropriation. Future research might explore links between power dynamics and both monetary flows and business models in emerging digital ecosystems. Finally, the outward shift of organizations towards involving a collective of actors in negotiating rules and values for governance may be indicative of increasing and competing demands that prospective platform providers are likely to face in any negotiation efforts. While we highlight delimitation of the platform scope and reframing of platform roles as tactical aspects in the absence of strong bargaining power and resource control, future studies could address issues of identity formation or framing as actors with weak resource control seek to negotiate and gain legitimacy of incumbents while protecting their identity or core value proposition.

6 | CONCLUSION

Different interests typically guide actors in digital ecosystems. Consequently, social organization and coordination involve the exercise of power to resolve conflicting goal-seeking and viewpoints. Such power enactments typically revolve around architecture and governance regulating actors' digital ecosystems' behaviour. While extant literature provides essential insights regarding incumbent platforms and how they coordinate and address conflicting goals, little attention has been paid to power dynamics in the emergence of ecosystems associated with new digital platforms. Our case study of a process of negotiations related to power relationships in an embryonic digital ecosystem shows that loss of episodic power through circumvention of resource control is one potential trigger for platform launch and collaborative negotiation of digital ecosystem governance. Our primary aim was to illuminate conditions that trigger governance change and how platform providers engage critical actors in collaborative sensemaking and design. A significant conclusion is that entrepreneurial threats related to disrupted resource control are important drivers that have received limited attention. As digitalization progresses, it is likely to generate further opportunities for disruption by entrants or through expansion of incumbent platforms' scope. We complement previous research on the processes by highlighting the importance of power relationships as core elements of different governance emphasis and tactics for implementing them. Since new power relationships arise and evolve through connections, an essential function of boundary resources is to facilitate both transactions of static resources and interactions that enable knowledge creation and sharing. Thus, we extend the literature on power in digital platform ecosystems by

identifying the salience of interaction boundary resources for the negotiation of conflicting goals, norms, identities and rules. We advocate further attention to boundary resources to enrich our understanding of their vital role in digital ecosystem governance. Finally, we conclude that reinforcing desired practices through positive feedback loops is a viable alternative to punitive measures for platforms not yet established as obligatory passage points.

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DATA AVAILABILITY STATEMENT

Data available in the article's supplementary material. The data that supports the findings of this study are available in the supplementary material of this article(see appendix).

ORCID

Hosea A. Ofe https://orcid.org/0000-0002-5924-2296
Johan Sandberg https://orcid.org/0000-0003-0602-5404

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AUTHOR BIOGRAPHIES

Hosea A. Ofe is a postdoctoral researcher at the Delft University of Technology, Faculty of Technology Policy and Management. His research focuses on digital platforms, with a specific interest in the governance of digital ecosystems. His current research, funded by the Horizon 2020 project TRUSTS (Trusted Secure Data Sharing Space), focuses on business models for data platforms. Parallel to doing research, he also taught courses on business models, digital platforms, IT Strategy and organizational change. He is also a guest editor for a special issue in Electronic Markets that focuses on Data Economy. He is also co-chair of the mini-track on Privacy, Trust and Governance in the Data-driven Economy for the HICSS 56th Conference in Hawaii.

Johan Sandberg is associate professor at the Swedish Center for Digital Innovation at the Department of Informatics, Umeå University. His research interests relate broadly to the transformative effects of digital innovation on organizing, with a particular emphasis on digital platforms and ecosystems. He is serving at the editorial board of the Communications of the Association for Information Systems. His research has been accepted for publication in journals such as Business and Information Systems Engineering, European Journal of Innovation Management, Journal of the Association for Information Systems, MIS Quarterly Executive, and MIS Quarterly.

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APPENDIX 1: Coding extracts

Phase 1: Adapting to exogenous contingencies by nudging developers into the ecosystem Governance emphasis: Nudging actors		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
It's not difficult for us to grow if new actors want to join us. It's easy for them to connect with the transformation layer [.....] with the transformation layer, new actors would incur very little cost to join Trafiklab. [Technical engineer]	Reducing costs for prospective actors to enrol on the platform	Simplifying resource use
We supply these keys and APIs to central systems for the end-users and data providers, to enable them to easily access and create applications that use these APIs from Trafikverket, SL, to create different kinds of projects. [Technical support team member, Trafiklab]	Supporting data providers in API design and data formats	
We also provide first-line support to third parties if they have questions or comments about how those APIs are designed. We can support them and give them answers through those services we offer through Trafiklab. [Technical support team member, Trafiklab]	Providing first-line support to third parties on APIs design	
New actors can easily connect their internal systems to the transformation layer. This would have been very difficult with the old system before changes were made. So, the more companies we get joining the platform, the better it will be for us and the end-users who will be able to get new and interesting APIs to work with. [Technical engineer]	Providing technical support to developers on using APIs	
If it's really a technical question concerning SL's APIs, we will directly answer the technical question. But things that we can answer, we do it ourselves without needing help from SL. [Technical support team member, Trafiklab]		
Meetups have been quite a successful way of communicating new kinds of services that can be developed and keeping the industry and various stakeholders [PTOs] informed about the things we're doing with open data and new ways of creating different kinds of services for end-users. [Trafiklab manager]	Sharing information on new design changes of APIs and services	Communicating design change

(Continues)

Phase 1: Adapting to exogenous contingencies by nudging developers into the ecosystem Governance emphasis: Nudging actors		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
Things do change and we keep developers updated about what is going on. We also keep them updated on any anticipated future plans. For example, informing them that some new APIs will be released in 6 months to replace the old ones. [Developer support team member]	Updating developers on current/future design changes	
As we have previously written about changes in APIs in Trafiklab, there will be some minor changes for all Trafiklab's APIs, and we recommend that anyone using these APIs thoroughly check that everything will work in the future. In this blog entry we describe all the changes that the upgrade means and how the trial will work. We give the users 3 months to be able to move their application to the new API to find if there is an error or test it. After that we close the old API. [Developer support team member]	Updating developers on future design changes	
Sometimes, we even get to think that Samtrafiken could have many channels that could be spamming them. We also have meetups for those developers who strongly want to know what is going on with the platform. [Marketing team member]		
We need to inform them well ahead of time that some of the APIs would run in parallel. It is very important to communicate any development of the APIs, what future changes are coming, why we are changing the APIs in different ways. The life history of an API is associated with changes. For example, new parameters and functions are added. A lot of things change, and we keep the end-users updated about what is going on. Now we are writing new information for our own APIs. We have to replace old information and documentation we once had with the new information and documentation. [Technical support team member, Trafiklab]	Updating documentation to facilitate resource use	
Most of the developers want to have JSON in their requests. Normally for us here, we provide SQL (Structured Query Language), so we must transform it to JSON since developers want that. [Systems engineer]	Creating preferred data formats for developers	Enriching resources

Phase 1: Adapting to exogenous contingencies by nudging developers into the ecosystem Governance emphasis: Nudging actors		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
We had the transformation part, which was a way of creating attractive APIs for third parties because they wanted JSON or some other technologies for those APIs […] so we had a complex transformation to make those internal APIs understandable from the perspective of third parties. [System engineer] We provide keys, the framework for them (developers) to create projects where they can ask for the keys for API and we provide them the interface for the users. [System engineer]	Developing a suitable architecture for service development	
Trafiklab does not have much bargaining power. We need to provide boundary resources that are more attractive than scraping as an option [...] If you want people to use your official interface, you have to provide data or open APIs in a way that makes them more attractive than scraping because with scraping third parties have the autonomy to do whatever they wish with the data or APIs. [Systems engineer]	Designing flexible APIs aligned with developer needs	
We are always looking out for ways to provide developers with better APIs, documentation and layouts of Trafiklab itself. For example, updating information on documentation. [Developer support team member] Now we are writing new information for our own APIs. We have to replace old information and documentation we once had with the new information and documentation. This is documentation for end-users who are mostly third-party developers [Technical support team member]	Improving API documentation and libraries	
Phase 2: Fostering rules of meaning and membership through interactive boundary resources **Governance emphasis: Instituting interactive boundary resources**		
Illustrative example from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
We have a meetup on Thursdays that lasts for about 2 h. During these meetups, developers meet with APIs' owners. They talk and inspire each other about the possibilities of using APIs. It's like a face- to-face event where they have the opportunity to inspire each other […] it's more a relaxed and after-work setting. [Manager, Trafiklab]	Quarterly meetups with developers and interested actors	Community building

(Continues)

Phase 2: Fostering rules of meaning and membership through interactive boundary resources
Governance emphasis: Instituting interactive boundary resources

Illustrative example from data	First-order descriptive concepts	Second-order concepts [Tactics]
During the workshops and meetups, we invite different public transport operators to get their views on how we can move forward with this collaboration. [Business strategist, Trafiklab]	Sharing experiences and knowledge through meetups and workshops	
You often meet someone who has developed something you may have come across. You have the opportunity during such meetings to talk to various developers to know their motivation and ideas behind the services or applications they developed. [Manager, Trafiklab]	Leveraging meetups to explore motivations of actors in the ecosystem	
We want to meet you! - now we want to invite you to be seen. We have a lot of exciting things going on that we want to talk about, and most of all we are interested in knowing more about what you think and what you want us to do in the future. [Developer support Forum]	Reaching developers' communities through hackathons	
We need to inform them well ahead of time that some of the APIs would run in parallel. It is very important to communicate any development of the APIs, what future changes are coming, why we are changing the APIs in different ways. Also, we listen to them to understand what they need or what they would like to have to enable them with better APIs or facilitate the development of better services. [Systems Engineer]	Involvement of developers in development and design of APIs	Designing collaboratively
We also provide support to third parties if they have questions or comments about how those APIs are designed. We can support them and give them answers through those services we offer through Trafiklab. [Developer support staff]	Organizing interactive sessions for feedback, design ideas, and new services	
We are always looking out for ways to provide developers with more APIs improve APIs, documentation and the layouts of Trafiklab itself. Most of the developers want to have JSON in their requests. Normally for us here, we provide SQL (Structured Query Language), so we have to transform it to JSON since developers want that. [Systems engineer]	Involvement of developers in development and design of APIs	
Over the years, we have used different ways of attracting third-party developers. We've used travel hackathons to gain attention for new APIs. [Manager, Trafiklab]	Leveraging travel hackathons to explore new services	
I have regular meetings with SL where we try to build good relationships as far as possible to keep our cooperation moving forward. During such meetings, we take questions that arise, for example, the problems that could arise when replacing old APIs with new ones. We try to solve problems that arise with such changes. [Developer support team member]	Leveraging regular meetings to build relationships to sustain cooperation among actors	

Phase 2: Fostering rules of meaning and membership through interactive boundary resources Governance emphasis: Instituting interactive boundary resources		
Illustrative example from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
Also, one aspect is the community-building spirit through those travel hack[athon]s that we have had in the history of Trafiklab. They are very much a way of inspiring and creating better relations with third parties. Those travel hack [athon]s are very much focused on creating services for the public transport. [Manager, Trafiklab]	Creating better relations with third parties through travel hackathons	
We try to let them know what open data are and to inform them that open data are the new future of service development. We do not talk about it in that way. We plan events where developers will meet the owners of SL, bus and train companies. In this setting, developers can show the public transport companies what they are doing with the data they get from Trafiklab. This is intended to really inspire the public transport companies to know that Trafiklab is developing services for public transport. [Communication staff member].	Showcasing benefits of data through interactive sessions and events across stakeholders	Bridging communities
Phase 3 Strengthening rules of discipline and production through reinforcing desired practices **Governance emphasis: Reinforcing desired practices**		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
You can control anything in a licence's agreement because it's a form of contract between the providers and users. I think they have all the tools to control. I think one way of making sure people use data is to have a few conditions as possible to ensure that people can use it as freely as possible, not ensuring too much control. This issue of initial fear of what people can do with the data is common. [Technical support team member]	Regulating resource access through licence agreements	Tracing resource use
The API key is matched to the user and user level. So, it' s checking out how many requests you make per month or minute, and it shows which users are making the requests. So, the APIs are actually matched with the users' projects. [Systems engineer]	Matching API keys with service development projects	
We have monitoring processes for all APIs that we think are important. From these monitoring processes we from Trafiklab can see whether or not the APIs are up and running or down. We can see all that, but we do not know more than that. [Systems engineer]	Monitoring and tracking processes for all APIs	

(Continues)

Phase 3 Strengthening rules of discipline and production through reinforcing desired practices Governance emphasis: Reinforcing desired practices		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
We have what we call levels of API that range from the basic level to the higher level. If you are a big user, you need to request a high level of the key. The bronze level is about 10 thousand requests a month and about 30 requests a minute. The silver is about 100,000 requests a month and 60 requests a minute for our APIs. For SL's APIs, it is about 500,000 requests a month and 60 requests per minute. The gold level is mostly limited, but its like 10 to 12 million requests per month. [Technical support team member]	Leverages key management processes to trace service quality	
So, it's a big step from silver to gold. if they want a higher level of the key in the system, they have to write an explanation. For example, the end-user could explain that s/he has a large number of users of the application, we need so and so number of screens, we have so many codes. I think it's a good way for us to ensure that they write their applications correctly and use the data in a good way. [Technical support team member]	Specifying rules, and requirements, for API requests	Specifying design rules
I am working on putting the raw data in a standard format. GTFS is the most common standard now. Having a common standard enables app developers and operators to develop services for the raw data that is valuable to more operators, users of the public transport. So, making these formal standards enables the apps in one city to still work if you travel to another city, since they can use the data from that city as they use the same publishing tool. [Technical support team member]	Creating formal standards to guide service development	
We also have different levels for the keys. The basic version of an API key has limitation. So, you can only ask a certain number of queries every minute, every 24 h. That is also a way of ensuring that people are not creating a lot of traffic in the system for services that are not being used. People can apply for a higher level of the key if their service is being used sufficiently. We are quite generous with that. [Systems engineer]	Specifying status of service development projects	
Within Trafiklab we have some kind of elements to control those third parties. We have a key management system, so that third parties who want to work with our	Linking variation in API request levels to service quality	

Phase 3 Strengthening rules of discipline and production through reinforcing desired practices Governance emphasis: Reinforcing desired practices		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
data need to join this community. They (third parties) need to sign up for keys for different APIs. They also need to agree with conditions about how they will be allowed to use the data and use the services from a technical point of view. In this way, we can shutdown users if they are creating services that are against those terms and conditions. [Technical support]		
One way to exercise control is through the use of those API keys. We also have different levels of the keys. The basic version of an API key has limitations. So, you can only ask a certain number of queries every minute, every 24 h. That is also a way of ensuring that people are not creating a lot of traffic in the system for services that are not being used. [Technical support]	Granting access to APIs based on the scale of application	Differentiating resource access
We have a key management system, so third parties that want to use our data need to join this community[.] They need to sign up for keys for different APIs and agree with conditions about allowed uses of the data and services from a technical perspective. In this way, we can shut down users if they create services that break those terms and conditions. [Manager, Trafiklab]	Using different levels of access and API keys to ensure adherence to application development processes	
Phase 4: Responding to lack of episodic power through pivoting value proposition **Governance emphasis: Pivoting the value proposition**		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
Trafiklab has changed from one thing to another thing. In the beginning, we transformed the data to make it easier and available for third parties. Now, Trafiklab is more or less a marketing place or community, where all operators can make their data available to developers or whoever wants to use their data So I will say Trafiklab is a marketing place or a community. [Business strategist, Trafiklab]	Emphasizing the centrality of interactions for the platform	Delimiting platform scope
We wanted to make Trafiklab a portal for all the selling of tickets and make a little money through all the tickets sold. Just to avoid all the standardization in that way if there is standardization. It was a huge project in terms of resources to make the project possible. [Manager, Trafiklab]	Scaling down the platform's focus on technical operations	
Because we did not see any future, we did not understand why we should be working with open data if we could not develop. We need to move forward all the time. We did not think that we should provide simply APIs. Why	Scaling down data transformation operations	

(Continues)

Phase 4: Responding to lack of episodic power through pivoting value proposition Governance emphasis: Pivoting the value proposition		
Illustrative examples from data	**First-order descriptive concepts**	**Second-order concepts [Tactics]**
should we provide the data when someone else could do it, if it was no more than just a platform for making APIs available? We do not do anything more than just having a community. [Business Strategist, Trafiklab]		
First of all, it was a political process; you had to talk to all operators to ensure that they really wanted the project. After that, it involved technical issues such as how shall you pay for the tickets, how shall you validate the tickets. Lots of questions had to be addressed before the project could be possible. So, we removed the transformation layer. [Manager, Trafiklab]		
There will be lots of consequences; we have been waiting for directions regarding the possibility of having an option for third parties to be involved in selling tickets. We have been waiting for input and directives from the industry. What would the industry do, for example what is their strategy for selling tickets? We are just waiting for these two things to happen. For example, they are discussing how transport actors can sell each other's tickets. [Business strategist, Trafiklab]	Exploring options for APIs to facilitate third party ticket sales	Reframing the platform's role
SL and Västrafiken have different strategies. SL does not want to provide any services at all. They would actually, if it was possible, just shut down all information services to the customers and let the developers do everything for them. Västrafiken has another strategy. They want to provide good services to their customers. They think that their brand is important, they want to have relations with the customers. So, they (Västrafiken) do not really care about open data in that way. They have different ways of getting information to their end-user, travellers. [Business strategist, Trafiklab]	Departure of key actors' data providers	
Because we did not see any future, we did not understand why we should be working with open data if we could not develop. We need to move forward all the time. We did not think that we should provide simply APIs. Why should we provide the data when someone else could do it, if it was no more than just a platform for making API available? We do not do anything more than just have a community. [Business strategist, Trafiklab]	Uncertainty about value-added role of platform	
We wanted to get to the next step, that is, developing APIs that could be used by third party developers to develop apps that could sell tickets for the transport operators. Actually, we did not see that much result in just making that data open. [Business strategist, Trafiklab]	Seeking to complement existing services	