Ecosystem well-being and platform survival in the current energy transition: A case study on the evolution of an EV-charging platform*

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Abstract. This paper aims to identify the capabilities required for electrical energy service platforms to survive and sustain in the ongoing energy transition. The paper contributes to two fields: Information systems in the domain of platforms ecosystems and digital services innovation through the usage of service-dominant logic and the value co-creation lens, and energy informatics in the domain of digital business models and service innovation. Using a case study, we investigate the case of an EV (Electrical vehicles) charging platform and how the platform owner is building capabilities for platform ecosystem survival in a new and dynamic market context. Through semi-structured interviews, the study managed to identify several activities related to each capability which are: System orchestration, Ecosystem preservation, system reformation, and ecosystem diversification, and then classified them into sub-capabilities and identified activities related to each sub-capability. The paper concludes with managerial implications for practitioners and initiates an empirical extension for the service dominant logic and value co-creation theoretical lens.

Keywords: Platforms Ecosystems · Value co-creation · service-dominant logic · Electrical Vehicles · Energy informatics

1 Introduction

Digital platforms are increasingly facing environmental and organizational challenges provided by their surrounding ecosystem as corporate rivalry intensifies and social change accelerates, making it more difficult to build, administer, and sustain platform-based business models. Electric energy services are shifting toward service innovation and a business strategy based on platforms. The modifications include the integration of renewable resources and distribution lines

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into platforms, making EV (Electrical Vehicles) charging smarter and more scalable, allowing it to respond and adapt to client demands and boost consumer involvement. In the transition to electro-mobility to improve the sustainability of transportation, it is important to have ICT (Information and Communication Technology) solutions to support flexible, scalable, and reliable solutions for EV-charging These changes to the service have far-reaching consequences that can only be addressed if it is platformized; therefore, value co-creation by the use of EV charging platforms is critical.

Because of the involvement of a large number of actors in the EV charging ecosystem, digital platform success and sustained evolution are heavily reliant on the digital platform's ability to simultaneously allow for structural stability to reliably serve networked business activities — as well as change and innovation — to make the ecosystem appealing and open to new actors. Thus, for digital platforms to prosper in the long run, a careful balance of control by an owner and autonomy among the other independent players is required [10].

According to [20], integrating numerous EVs into the electric power grid is a comprehensive task that needs a complete investigation in terms of economic consequences, operation, and control advantages under ideal conditions. Additionally, large-scale integration of EVs and EV charging points into the platform ecosystem may bring a series of problems if the EV charging points are not integrated carefully into the platform. Additional barriers to EV charging station integration include the high cost of integration owing to insufficient charging infrastructure and competition from other energy-storage technologies.

Another major driving element is the strategies used by energy businesses to flourish in markets with rapidly developing technological, social, and market contexts while others fail. The use of service-dominant logic (SDL) and value creation will aid in explaining this phenomenon, as indicated in our previously published work. Our search for such skills is based on the assumption that third-party communities (for example, digital platform partners) transcend traditional ideas of value generation in enterprises. That is, although digital platform owners must continue to carefully manage the value they produce internally, they must also carefully acquire capabilities to control external value generation.

However, to realize value creation for service innovation, various players in the ecosystem cannot successfully engage in generative innovation without boundary resources held by dominant enterprises (e.g., software development kits, application programming interfaces). As a result, service innovation in new sectors (for example EV charging) depends not only on the generative processes of digital infrastructures but also on the orchestration of social institutions and local resources within a service platform or ecosystem [3].

Overall, this study builds on, integrates, and expands on previous research on digital platform ecosystems and energy informatics [4,15]. We explore the survival of digital platforms (Ex. EV charging platforms) primarily via the theoretical lenses of value co-creation and service dominant logic (SDL). To address the research question (RQ) *"What digital platform capabilities and value creation are necessary for the survival of a digital platform in the area of electrical energy*

services (EV charging as an example)?", we investigate an existing EV Charging digital platform that has prospered in Europe over the previous two years. To that purpose, we present a full empirical description and analysis of the essential capacities of a digital platform (See Table 1). The next section outlines the important background and main concepts used in this article. In Section 3, we present the case in more detail. Our case method is described in Section 4 before we present the findings in Section 5. Discussion and Conclusion then follows in Section 6 and 7, respectively.

2 Background

In this section, we first provide an overview of digital platforms and ecosystems. We then introduce service-dominant logic and value co-creation, which serves as the study's conceptual foundation for investigating the survival and sustainability of EV charging platforms.

2.1 Digital Platforms Ecosystems

Digital platforms enable the integration of resources among many, diverse, and interdependent players in various roles by leveraging digital technology [4]. There are several definitions in the literature for the word "service platforms," which is the basis of the term "platformization." A service platform, according to researchers, is a modular framework that comprises both real and intangible resources that simplify and enhance interaction between actors and resources [6]. However, this is not far from [9] definition "A building component that provides a vital function to a technical system and serves as a platform for other companies to develop related goods, technologies, or services". Also, digital platform ecosystem is defined as "a complex network of actor-to-actor interaction mediated by a digital platform (owned and offered by the platform owner) and becoming increasingly accessible to a wide range of end users through complementary research.

A platform owner creates the platform architecture, which describes how a relatively stable platform core, with specific design rules and a diverse set of complementary modules, enables other organizations to orchestrate data collection, storage, flow, aggregation, and commercialization [12,19,23]. As a result, a major worry for platform owners operating in the B2B (Business-to-Business) or B2C (Business-to-Consumer) (in the case of electrical energy services) environment is how the platform design will survive, adapt, and expand its functional scope to efficiently serve emerging future services.

Multi-sided platforms like Deftpower and Nordpool in the energy industry, are recognized for their service platform design because they can manage a large volume of transactions between multiple actors. As a result, service platforms use a multifaceted approach in which the platform operates as an intermediary, bringing together many companies and actors to contribute to the platform with their products or services. All of this action adds value to the platform.

A major challenge for the adoption of electric vehicles is its charging needs. Charging involves that the electrical power from the grid at an appropriate power level is made available through the charging stations. Charging times depends on battery and power level of the charger. As such, such coordination necessitates that a proper business models need to be developed to warrant profitable operation for mobility providers at all levels [1].

2.2 Service Dominant Logic (SDL) and Value Co-Creation

According to [13], service dominant logic (SDL) enables the inventor, entrepreneur, and innovator to see service as a transcending mental model for all sorts and forms of creativity. Indeed, the distinction between "service innovation" and "product innovation" may no longer be meaningful, because all product innovations are service innovations from the SDL perspective. [13], discussed two main value constructs from the SDL perspective which are service ecosystem and value co-creation. Value co-creation refers to the processes and activities that underpin *resource* integration and include many actors in the service ecosystem, while the service ecosystem is a self-contained, self-adjusting system of primarily loosely interconnected social and economic (resource-integrating) players linked by shared institutional logics (*Institutional arrangements*) and reciprocal value generation through service exchange. SDL stimulates the investigation not only of the actor organizations (ecosystem) and the venue for service exchange (platform) but also of the process of value co-creation and service innovation itself. Also, Actors can actively promote the process of *value* co-creation by creating new *institutional arrangements* and modifying their internal procedures.

Service dominant logic symbolizes a transition from a focus on the exchange of operand resources, which are generally physical, inactive materials, to a focus on operant resources, which are dynamic resources that operate on other resources. Service dominant logic (SDL) is founded on the following: The belief that all social and economic players are resource integrators, the effective and efficient mobilization of contextually appropriate knowledge, and the decoupling of information from its corresponding physical form or instrument, and an actor-to-actor generalization based on a network [22].

The essential concepts of service-dominant logic are expressed in eleven foundational premises, which may alternatively be viewed as a highly compact depiction of SDL. Five of them have been recognized as SDL axioms, from which the remaining basic beliefs derive [22]. All social and economic players (producers, partners or complementors, consumers, etc.) are resource integrators, value is always uniquely and phenomenologically established by the beneficiary, and value co-creation is managed through actor-generated institutions and institutional arrangements [2]. Services are based on people, human behavior, human intellect, human emotions, and human needs, and they prioritize organizational and human capital aspects above physical assets. As a consequence, a service ecosystem is defined as a "socio-technical system that enables value co-creation guided by a value proposition," and it includes "not only data and physical components, but also layers of knowledge, communication channels, and networked actors." [16].

During the present evolution of service systems to service ecosystem evolution, the perspective on service systems has moved from viewing them as a way of creating value to perceiving them as service businesses and conceiving them as sets of interactions . A service ecosystem is a self-contained, self-adjusting network of resource-integrating actors linked by common institutional arrangements and mutual value generation through service exchange [22].

According to [4], the service ecosystem provides a significant portion of its value in the digital platforms. That is, digital platforms become more valuable when more players join the ecosystem to co-create value with their complementary commercial and technology capabilities. They can develop sustainably, indicating many resources are involved in between.

The process of value co-creation occurs in service ecosystems that are coordinated by actor-generated institutions and institutional structures. Institutional arrangements, in a broad sense, consider culture, traditions, customs, norms, formal laws, policies, regulations, informal conventions, and agreements as mechanisms for cooperation and coordination that influence and can hinder or support resource integration and the value co-creation process.

Because platform ecosystem actors and their relationships evolve in varying patterns and rates of change over time [18], the survival of digital platforms is heavily reliant on how the relationships between different actors with various roles (e.g., owner, partner, end user) are dynamically configured to jointly create value for very specific needs of specific end users [4]. Therefore, some capabilities are critical for platform ecosystem survival (See Table 1). We will return in section 5 on how these capabilities is observed in the case.

The next section outlines the case description and the targeted platform.

Table 1. Platform Capabilities for survival [4]

Capability	Definition
System Orchestration	The ability of a digital platform to continually coordinate the integration of distributed resources in order to boost a service system's capacity for serving the requirements of a specific subset of platform users at any given moment.
System Reformation	The ability of a digital platform to constantly remodel given actor-to-actor constellations in order to boost a service system's capacity for continuously satisfying growing platform requirements throughout time.
Ecosystem Preservation	The ability of a digital platform to maintain solid relationships with its participants in order to boost the capacity of its service ecosystem to utilize the given network at a particular moment in time.
Ecosystem Diversification	The ability of a digital platform to constantly diversify its set of limited resources in order to boost its service ecosystem's capacity for investigating and developing avenues of resource integration through time.

3 Case Description

Deftpower was launched in 2020 with the goal of creating a long-lasting charging solution. Their Automotive Charging Platform connects charging station networks, automobile manufacturers, and utilities in a scalable and cost-effective manner for all participants. The platform delivers services in 500,000 charging points in 7 countries across Europe including Norway. Deftpower managed to provide access to various charging points across Europe for Norwegian drivers through the Ladekubben app, which is built on top of the Deftpower platform, allowing EV drivers to start charging anywhere in Europe using a single service [7].

The platform is a SaaS (Software As A Service) platform, managed by the Deftpower as the platform owner. The platform owner collaborates through a large digital ecosystem, with more than 300k+ charging points across Europe and partners includes TSO's (Transmission Service Operators), DSO's (Distribution Service Operators), charging points operators, car organizations and other expected partners (Ex. insurance companies). so, the platform is offering B2B2C (Business - to - Business - to - Consumer) services [7].

The platform positions itself to take advantage of opportunities in new renewable technologies, new business models and accessing new markets, partners, and segments for EV charging through market activities. However, the nature of EV charging platforms is complex due to the interdependent networks of actors and aggregators. Deftpower is one of many integrators on this level, with new players on this and the level of charging station networks appearing every year. The next sub-section outlines the research method used to investigate the existing platform capabilities for survival.

4 Method and Research Design

4.1 Research Design

We employ an exploratory case study research approach that is influenced and driven by [4,22,24].In the context of electrical energy service, service dominating logic and value generation are critical to the platform ecosystem's survival and well-being. This is an ongoing study into the assessment and theorization of the sustainability of electrical energy service platforms.

Informed by [24] We concentrated on sample selection based on (a) the EU context of an electrical energy service platform (b) the context of the electrical energy value network , and (c) the successful emergence of a digital platform ecosystem which has actor-to-actor interaction mediated by a digital platform (owned and offered by the platform owner).

4.2 Data Collection

We gathered information through semi-structured interviews performed in the end of 2022. We collected information in three stages:

Table 2. Interviewees Profiles

Interviewee	Position	Overall career experience (in years)	Duration
I1	Industry expert	15	46
I2	Software Developer	7	30
I3	CEO	10	29
I4	CPO (Chief Product Officer and Co-founder	17	30

- Step 1 : Identifying potential firms: Look at the different implementation for digital platforms in the context of the electrical energy value chain (Ex. Flexiblity and EV charging)
- Step 2: Industry Expert Interview. Conducting interviews with experts to understand the current context of the business transcribe it and then evaluate the interview outcomes.
- Step 3: Interview the targeted persons. Focus on the platform owner side, and that's the main reason for selecting this group, the employees who are concerned with decision-making and strategy from the platform owner side.

As a result, we were able to conduct interviews with platform owner staff who are concerned with technology and strategy (See Table 2 that shows the interviewees profiles).

4.3 Data Analysis

This is an exploratory case study where we draw on the interviewees' perspectives and platform owner perspectives to derive the necessary capabilities for platform survival [4,3]. In addition, we used codebook thematic analysis guided by [17]. Using a deductive approach, this sort of theme analysis employs organized codebooks with well-defined, preset codes. Typically, these codes are derived from a combination of current theoretical ideas, empirical investigations, and previous knowledge of the scenario.

We evaluated the interview data material one by one. We spoke about the new discoveries and how the corporation (platform owner) interacts with the platform ecosystem participants. We identified activities linked to platform capacities for survival based on the interviews. We based activities (for example, system orchestration, ecosystem preservation, system reformation, and ecosystem diversification) from table 1 and fundamental premises of SDL (Value, actors, resources and institutional arrangements) as major units of analysis [22].

5 Findings

This section presents the analysis of the case study. In the following pages, we will analyze the interview findings; these findings are viewed and discussed from the perspectives of the service dominant logic theoretical lens. The findings are discussed from the platform owner's perspective.

5.1 System Orchestration

Technical and ICT capabilities given by platform owners operate as a multiplier of value in platform ecosystems by influencing platform participants' ability to co-create value within and across sides. Digitalization enables various ecosystem players to cooperate and supports the continual evolution of ecosystem actors. Also, platform ecosystems cannot be managed in a goal-oriented manner since the number of participants, transactions, and interactions exceeds the capacity of the platform owner. Platform ecosystems can instead be orchestrated by creating processes that take place among players [19].

In the case of an EV charging platform, invitations to engage through value propositions in a digital world have few or no sector or geographic boundaries and increasingly come from firms operating outside of their own marketplaces. Thus, IT must assist players (e.g., partners and charging station operators) in developing and expressing various value propositions to possible exchange partners. Digital infrastructures can enable the dynamic creation of value propositions and their widespread distribution across various participants. Digital infrastructures may also aid in the search for and identification of acceptable value propositions, all of which serve to build and reinforce links among ecosystem actors [22]. In addition, the future value chain of the distributed energy ecosystem (for example, EV charging) will be more networked than before, producing an integrated ecosystem of highly interconnected unique parts.

" almost all existing companies, always thinking vertical integration. We only think in horizontal integration. So, we never try to get one vertical..." (I3).

Efficient and successful value co-creation processes on platforms need specialized integration and control of service systems, which include the owner, partners (such as municipalities and charging point operators), a diverse collection of users, and a specific subset of end-user organizations (cars manufacturers and other expected users). Therefore, the platform owner is using horizontal integration to integrate distributed resources into the platform ecosystem. Once a service system is developed to serve a particular subset of end-user organizations [4], a unique subset of all available resource sets is required rapidly for this subset of end-user organizations.

"Expected price changes in the future. Market dynamics as well.... So the companies are focusing on partnerships rather than providing services. " (I1).

Orchestration roles, on the other hand, include defining the norms of integration, interaction/exchange, articulating the ecosystem's boundaries as well as the focal firm and the complements, governing the synergies and complementarities among the various actors, and managing the three paradoxes—of standards and variety; control and autonomy; and individual and collective identities.

5.2 Ecosystem Preservation

An important component observable in an ecosystem approach is value co-creation and sharing. Multiple companies collaborate to combine resources to

develop a new solution that provides a compelling value proposition to the user. Firms that are willing to collaborate will do well in this environment. Platform businesses must guarantee that partners may utilize complimentors throughout the whole ecosystem without having to construct them from scratch. As a result, value co-creation on digital platforms necessitates the constant and balanced presence of many loosely related players with access to a large number of easily available tiny resource sets [19,4]. The overarching idea behind platforms is to facilitate the integration of various stable and dynamic elements in a way that is carefully coordinated by design rules, platforms can achieve a higher level of innovative dexterity in some areas of interest while maintaining economies of scale in others [21].

""**Expected price changes in the future. Market dynamics as well. We provide services, we bid on prices.so the companies are focusing on partnerships rather than providing services".** (I1).

The selection, nurturing, and dissolution of individual relationships to operationally co-create value (knowledge mobility, innovation appropriability, and service system stability) entail managing the local logic of ecosystem operations [4].

"We both (platform owner and CPO) take a role in onboarding. So, we need to register them with a license to become ESP (E-Mobility Service Provider) and charging app operators..... That's very important; we need to check how they want to do the invoicing and if they do it correctly..." (I3).

Service ecosystem well-being is a holistic, dynamic, positive state that is determined by context and is characterized by: practices that achieve aligned configurational fit; institutional arrangements that are purposefully guided by a shared worldview; and levels of the ecosystem that are well-functioning are self-reinforcing.

In the context of EV charging, the platform owner found a partner who supports value chain growth. The capacity to preserve ecosystems ensures favorable network effects and long-term advantages for all player roles. Furthermore, institutional frameworks are essential for establishing such capability (Ex.regulations and standards) [13,22]. Another challenge is how collaboration between actors will be managed through contractual technologies because there is a lack of standards to regulate actors' interactions so that the business model is profitable and dynamic which helps in value co-creation which also requires a balanced availability of thousands of loosely coupled actors (Ex. charging point operators) that offer access to thousands of readily available diminutive resource sets (Ex. EV's).

5.3 System Reformation

With the current trends of digitalization and platformization in electrical energy and mobility domain,there is a barrier in that the requirements of end user organizations (for example, governments and charging point operators) change over time, requiring service systems to rearrange their organizational and technological resources. As a result, end-users (for example, MSPs (Mobility Service

Providers) and charging point operators) must follow particular rules for service system configuration and adjustment. This is to make sure that all the systems are compatible with each other in order to provide innovative service. For instance, the platform owner (Deftpower) has a set of requirements need to be followed by the MSP's and charging points operators in terms of technological infrastructure and specification and these requirements. Also, the platform owner infrastructure must ease and facilitate onboarding of end users to the platform ecosystem. Therefore, system reformation capability is a must. Also, due to ecosystem complexity, the value co-creation network composed of networks of individuals that reorganize in order to reconfigure themselves as service recipients [5].

'When we have 30 million vehicles in Europe, by 2030 and we would have a market share of maybe 10 percent, It would mean at least three million transactions a day. Which needs to be processed,..... So, the scalability and the connects /connectivity to that, the resiliency and reliability of our platform, that's the main challenge.' (I4).

Deftpower, has a certain system reformation capability through imposing fewer standards compared to competitors. Deftpower (As platform owner) stresses the generative characteristics of service systems by allowing for unexpected resource re-combinations. In context of electrical energy services and EV charging platforms, contractual flexibility includes the ability to change the subscription model, charging point operator, and charging service provider. As a result, such capacity necessitates a level of technological competency that includes scalability and interoperability, necessitating modular platform design.

5.4 Ecosystem Diversification

"Roughly 1000 charge point operators throughout Europe and to the energy market, so, the DSO and the TSO and those are connected to our platform sometimes with a platform in between because it's not possible to directly communicate with TSO and DSO, and then you need to put a trading platform in between..." (I4).

In the context of EV charging and mobility service platforms, the diversity of ecosystem actors allows mobility platforms to diversify even more. As a result, reforming service systems is only possible if a sufficient number of complementary partners are present [8]. Also. the modular architecture of mobility platforms (for example, Deftpower) has enabled non-platform enterprises to extend or reconfigure existing platform services in the context of the current energy transition.

For example, because platformization is new in the electrical energy service market, Deftpower lacks resources such as extensive industry expertise, partner-specific knowledge, industry specs, and tight contacts with client organizations. To that purpose, ecosystem diversity promotes the continued enrichment and sustainability of the digital platform through complementary resources given by partners (Ex. DSO and TSO).

" And, with the electrical vehicles, we can make a significant impact there,.... which means we bring a lot of flexibility there due to DSO's so and that's where our platform kicks in" (I4)

The owner must be able to deploy various touch points within its digital ecosystem in order to gain a comprehensive understanding of end-users (EV's, Charging points operators etc.) and, eventually, recruit and activate suitable partners to meet developing demands. For example, Deftpower, has formed partnerships with DSOs in order to recruit a broad variety of partners into their platform ecosystem diversification, which permits emergent recombination of current available resources to eventually adapt to forthcoming market developments.

End-user businesses (Ex. Charging points operators and DSO's) gain from expanding access to the ecosystem's resources to meet their divergent and ever-changing needs, which helps them cope with market challenges. This cyclical process of platform owner and complementor trading dominance and subjectification occurred repeatedly as the relationships matured. As complementors pondered climbing to higher partner levels, they were confronted with the features of the corresponding tier of the ecosystem framework, which offered access to increasingly rich resources while implying increasingly rigorous obligations and constraints [11].

6 Discussion

This study's research question (RQ) seeks to ascertain how platform ecosystems will survive and sustain and how the platform owners build capabilities for their ecosystems in order to survive in a new and dynamic kind of business. Our interviews indicated that platform survival is dependent on the competencies of the platform owner. These competencies must be able to respond to market changes and evolving demand. As a result, such skills need dynamic mobilization of available resources at various levels of actors[14].

Digital platforms have quickly emerged as significant phenomena among electrical energy service suppliers. We utilized our example to define the characteristics necessary for platform ecosystem survival and well-being, in which the platform owner plays an active role, as informed by [24,4]. Additionally, our findings demonstrate how the platform ecosystem is thriving in a market with complex ecosystem dynamics and a lack of clear rules and regulations.

We evaluated the survival of the discussed case through the lenses of [4] and [22]. Aside from providing empirical evidences on value co-creation processes, we specifically demonstrate the pivotal role of platform owner in platform survival and designing a specific service for any given end-user and ecosystem player in the context of EV charging platforms, in accordance with theoretical premises of value co-creation.

The discussions on energy informatics within information systems (IS) research are rare. Therefore, this study contributes through understanding the requirements of digital platforms' survival in the context of electrical energy services, focusing on EV charging. This paper contributes to the domain of energy

informatics by extending the work of [15] by discussing EV charging from the service ecosystem and SDL perspective. Platformization in the electrical energy sector is thought to be novel. As a result, we show that the longevity of digital platforms is dependent on their owners' ability to dynamically mobilize and reconfigure all actors' resources to meet the ever-changing needs of all impacted players. Therefore, our primary focus in this paper is the platform owner [18].

Existing research on platforms in the context of EV's illustrate the design and structure of a business ecosystem in that actors create values (value proposition) [15]. Our research brings a platform owner perspective to research service innovation in energy informatics. Also, Platform governance and design of the service system play a crucial role in enhancing service exchange possibilities during the platform's value co-creation process; it helps to understand how the service-pricing and value-in-use are decided. From the platform governance perspective, value is co-created through the optimal pricing schemes and revenue model [21].

Since platforms and associated ecosystems are a new phenomena in the electrical energy business, they force electrical energy suppliers to compete and create more dynamic marketplaces through collaborations with mobility providers (Ex. EV charging), and that was clear in the interview scripts, it demonstrates how the platform owner is concentrating on multilateral relationships that include numerous actors that construct fluid networks of service systems in one digital environment [11].

In addition to providing empirical evidence on value co-creation processes, we specifically demonstrate the pivotal role of the platform owner and its partnerships in innovating and designing a specific service for any given end-user organization's unique context, in accordance with theoretical premises of value co-creation and service-dominant logic [4,22]. We show how digital platforms are reshaping the electrical energy service industry (Ex. EV charging). and how they function as a means for value co-creation in digital ecosystems, and how their sustainability is dependent on value co-creation among its constituent players.

Nevertheless, the decision and selection of any capacity varies from one actor to the next (for example, it may differ among TSOs) and is also influenced by many contextual elements. In addition, we disclose in the interviews that collaboration with other actors is critical for platform longevity. Moreover, it is advised that more emphasis be placed on horizontal integration methods in platformization since processes must be matched with a new digitalization scenario. To summarize, the platformization process requires the establishment of a new contextual setting for electrical energy service providers (for example, DSO, TSO, and EV charging).

7 Conclusion and Future Directions

The main limitation in this study is the number of interviewees; due to the narrow scope of the study, we targeted those who were concerned with strategy, technology, and digitalization, and since the platform ecosystem is still new

(Approximately three years old), we focused on the platform owner perspective. As digitalization and platformization are transforming electrical energy from a commodity to an experience, platforms and their ecosystems may become the next competitive elements deciding the success or failure of electrical energy services (for example, EV charging). We must study the dynamic capabilities necessary for the development and maintenance of digital platforms.As a result, more study is prompted to investigate the essential capacities to assure survival and sustainability from various theoretical lenses and diverse actors' perspectives (Ex. Dynamic capabilities).

Yet, the term "platform owner" is not entirely defined because the position may vary depending on the nature of the platform and delivered service. It's a deliberate choice, and we're working hard to obtain feedback from other ecosystem players. The control-generativity balance, on the other hand, may play out differently (Ex. in case of load balancing or flexibility). As a result, more study is prompted to investigate the essential capacities to assure survival and sustainability from various theoretical lenses and diverse actors' perspectives (Ex. Dynamic capabilities).

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