From Smart Grid to Smart City Business ecosystem: strategy to define the proper legitimacy for an Energy Utility Firm

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Abstract

DEVER RESEARCH has developed analytical and prospective tools based on the latest research outcomes to decipher, analyze and highlight relationships, environment and strategic opportunities for actors and stakeholders of the electric mobility and energy industry. The aim of this paper is to present the first results of an on-going research related to the impact of smart grid development on the Utility/Energy service providers legitimacy on Smart territories (Smart cities), therefore the required evolutions of company to move from a keystone firm position inserted into a complex but well-known ecosystem (smart grid) to a legitimate actor (and thus potential keystone) in the Smart cities ecosystem. After a comprehensive presentation of the concepts of legitimacy and business ecosystem, this article will present and validate analysis grids and recommendations based on examples and illustrations such as the Pecan Street project in Texas and highlight: the changes in "Smart" ecosystems, the type of legitimacy a firm can mobilize and the conditions that lead the Utility Company to evolve in order to ensure a central legitimate role in Smart cities.

1 Introduction

This article presents some results of our research in the field of strategy management for Energy industry. DEVER RESEARCH has developed analytical and prospective tools based on the latest research outcomes to decipher, analyze and highlight relationships, environment and strategic opportunities for actors and stakeholders of the electric mobility and energy industry.

In a previous research, we showed how to mobilize the Business Ecosystem theory to the electric mobility field.[1]. Considering the changes and acceleration in technologies development, legal requirements, but also local government expectations, this paper investigates the impacts of these modifications on actors roles and mainly on major Utility Company role and legitimacy. Moreover, we define methodologies and tools in order to

  i)   ensure legitimacy of Utility in Smart cities project

  ii) guarantee symbiotic project between the local authority and its stakeholders

iii) and pave the way for long-term actions and partnership required for long-terms projects such as Smart Cities .

After a theoretical presentation of the ongoing scholar discussions, we will propose definitions and present two analytical grids

i) to represent and understand gaps and overlaps
ii) to explore the stakeholders nature and relationships changes
iii) to analyze energy provider company legitimacy and role in the 2 ecosystems [7]
iv) to elaborate a referential to guide Utility companies into a strategic policy for smart cities [6]

Recommendations are presented

i) to understand the evolution of the Utility companies, from natural legitimate actors when talking about Smart Grids, to mere partners when related to Smart Cities.
ii) to redefine positioning strategies for Energy services providers in order to be able to act as keystone firm in the emerging Smart cities business ecosystem.

2 Theoretical background

2.1 Concept of legitimacy

Legitimacy can be understood as the social acceptance of actions or institutions and is ascribed to corporations in processes of social construction [2][3]. Legitimacy is vital to corporations as it is a precondition for the continuous flow of resources and for securing the sustained support of the organization's constituencies [4].

Legitimacy is defined as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions"[5]
Suchman (1995)[6] argues that organizational legitimacy can either rest on the benefits that are perceived to spring from the organization's existence or behavior (pragmatic legitimacy), or on the subconscious acceptance of the organization, its structures, and processes, as representative of a 'normal' status quo (cognitive legitimacy), or on an explicit moral discourse

about the acceptability of the organization and its activities (moral legitimacy).

Moral, cognitive, and pragmatic strategies have been analyzed in the relevant literature as three alternative approaches to gaining, maintaining, and repairing legitimacy [7][6]. The key difference between the three legitimacy strategies lies in their respective assumptions about the locus of control. While the pragmatic view puts forward that the corporation can influence how its key constituencies perceive its legitimacy, the cognitive view builds on the assumption that the corporation is under the control of surrounding institutional pressures and routines. The moral legitimacy view, in turn, argues that legitimacy results from the discourses that connect organizations with their environment.

Under conditions of low complexity, corporations might sustain their legitimacy by presenting an image of compliance with the social norms, values and expectations of the community. These norms are mainly determined by the regulations of the city and the moral expectations of the social community in which a corporation operates. Compliance with these rules and expectations, or at least the appearance of compliance, is a precondition for the corporation's legitimacy.

As firms' attributes and actions are not constant over time nor are the norms with which they should be congruent [8], we have to consider two aspect : First, because multiple norms coexist within fields, we should not only acknowledge the multiplicity of stakeholder groups or audiences [9] but also the existence of different dimensions of legitimacy. Second, perceptions are heterogeneously distributed across space and time.

Whenever established organizational routines fail and what was previously taken for granted is questioned, the legitimacy of the corporation is at stake. The challenge for the corporation is to either adapt to the expectations of the community or to actively influence, or even manipulate, the perceptions and normative demands of the social context, so that its corporate practices (i.e., structures, processes and outcomes) are perceived to fit with societal expectations [10][6].
As long as these taken-for-granted institutions and processes do not fail and are not questioned, they build upon cognitive legitimacy[6]. This legitimacy is disputed only if social actors perceive a mismatch between the corporation's status-quo

or behaviour and societal expectations. This mismatch may be the result of changing social expectations, changing organizational practices or changes in their impact on society and the environment, or of new actors entering the scene – these might be either new companies with new practices or new societal actors such as NGOs or civil society groups with a new (and critical) perspective [11].

Corporations have to justify their involvement in public policy and the production of public goods, since their managers are neither democratically elected nor controlled by state mechanisms and thus have no mandate to take over functions that are within the remit of public authorities [12][13][14].

The common assumption is that corporations maintain their legitimacy by focusing on the creation of economic value, while addressing the externalities of private production is the task of institutional institutions [15][16]. However, in situations where corporations see their legitimacy challenged and their access to resources from key constituencies potentially threatened, they may opt for either of two strategies, according to the instrumental view: they may either provide economic benefits to their constituencies or engage in impression management and other manipulation strategies in order to maintain or repair their legitimacy. Institutional theorists, in turn, focus directly on corporate legitimacy. It is suggested that corporations strive for societal approval and respond to institutional pressures by adapting to sustainable development principles in order to maintain their license to operate [17][18]. Conformity – as bolstering legitimacy – is another strategy, central focus of institutional research [19] and has generally been approached through metrics of similarity, with organizations following various sources of isomorphism to secure legitimacy by accomplishing identical actions to those of their peers. [30]
The successful management of legitimacy by either passive isomorphic adaptation or by active strategic manipulation of social expectations was previously regarded as one of the preconditions for the long-term survival of organizations, especially under conditions of low complexity [20]. Today, however, the situation has changed dramatically [14]. Corporations face conditions of increasing complexity in their social environment [21][22].

In reference to the postnational constellation[23], the social environment has become highly ambiguous and corporations have difficulties in maintaining their legitimacy. The common strategies of simply adapting to the environment or manipulating the perceptions of the most important social constituencies do not work as smoothly as they once did [14]. Corporation often has to engage in a process of mutual adaptation and social learning where it is not clear from the outset of whether the corporation or the societal expectations will dominate the resolution or whether a new position is commonly created.

At the same time, "different subunits […] find heterodox ways of responding to the accountability demands of [their] environment" [24]". The paradox approach is a direct response to the shortcomings of the contingency approach.

2.2   Concept of Business ecosystem

Business ecosystem is «made up of customers, market intermediaries (…), suppliers, and, of course, oneself. These might be thought of as the primary species of the ecosystem. But a business ecosystem also includes the owners and other stakeholders of these primary species, as well as powerful species who may be relevant in a given situation, including government agencies and regulators, and associations and standards bodies representing customers or suppliers ».[25].

The constant feature in the various visions on ecosystem is the network aspect:
1. The "global" approach is based primarily on innovation, diversity, operation. [26]: "community of organizations, institutions, and individuals that impact the enterprise and the enterprise's customers and supplies. The relevant community therefore includes complementors, suppliers, regulatory authorities, standard-setting bodies, the judiciary, and educational and research institutions. It is a framework that recognizes that innovation and its supporting infrastructure have major impacts on competition."
2. The "technical" approach holds especially operating systems information, performance. [27] : "A service ecosystem can be considered a value co-creation configuration of people, technology, shared information, and value propositions

connecting internal and external service systems"

3. The "networked" approach considering the complexity, diversity and performance.[28]: "Business is more and more based on networks of firms or business ecosystems in which successful firms such as Microsoft collaborate within their network and thereby improve their own performance significantly."

4. The "co-evolutionary" approach is characterized by an appeal to the themes of co-evolution, diversity, functioning. [29] : "Indeed, a key characteristic of a modern business system is the extensive interdependence of the numerous participants that typically make up a system, with service and product markets often intertwined by extensive multimarket contact and competition"

Ecosystem differs from other organizational forms such as the market or hierarchy, the first of which aims to facilitate transactions, the second to ensure the control of productive operations. The ecosystem is not intended to replace these forms of organizations, but subsumed in an arrangement designed to foster collective innovation process. The first feature of the organizational arrangement of the ecosystem is its modularity which promotes the proliferation of contributors and the competition between them.[30]

The second dimension is of managerial nature: the future of the ecosystem depends on its ability to attract and retain contributors, mostly firms on the basis of a project. Like any collaborative project business ecosystem is operated by the dialogic collective value creation and a separate appropriation. Ideally, the management of this dynamic is performed by a democratic management style able to hold together contradictory principles such as common fate and modularity .

In business ecosystem, organized groups of actors are formed and design their actions according to each other. These actors are relevant in the sense of Giddens and come to induce cooperation and build coalitions social skills. To achieve their ends, these actors mobilize various forms of capital: social (networks), physical (resources) and symbolic (cultural). When ecosystems are being established, institutional entrepreneurs provide the vision to build coalitions able to structure the field. Once the fields are stabilized, installed actors strive to maintain their power and privileges at the same time they are trying to define the place of their challengers.

Properties of the business ecosystems rely on the competence of actors, the societal skill which can build coalitions, the importance of institutional entrepreneurs and their visions.

The issue of spatio-temporal coordination of heterogeneous actors (resources and skills) interdependent within innovation networks orchestrated by a keystone firm (supported by a platform or platform-mediated network) is at the heart of the notion of business ecosystem. This issue must be linked with one hand, the development of strategies and platform, on the other hand, the development of logical open innovation or open innovation [32].

In an ecosystem, companies should strive to take advantage of all available skills and resources which means of course access. How to access these resources are extremely important. As pointed[33], in many ecosystems platforms are tools that allow access to these resources. This is also the position of [34]: "Those software platforms are at the heart of "economies" or " ecosystems " that consist of mutually dependent communities of businesses and consumers that have symbiotic relationship with the platform"

The nature of these platforms (open vs. closed) determine the likely value to be created within the ecosystem. Companies with such platforms play a crucial role in ensuring the coordination of stakeholders and promoting the creation of value through a dynamic collective innovation [35]. From this point of view, keystones or platform leaders help to ensure the productivity of the ecosystem and to develop new services or products. Thus, for [33]: "Keystones can increase ecosystem productivity by simplifying the complex task of connecting network participants to plans blew gold by making the establishment of new products by third party more efficient." These platforms are used to facilitate interaction between the different partners or groups of actors - like eBay, Amazon, Google - and standardize access to certain resources. Members of the ecosystem can then connect to these platforms (TSMC, Nvidia, Android, Samsung Bada, iTunes, SalesForce) to develop new products and services from the resources available to them. In doing so, they are

then able to increase not only their own but also the proposal of the platform itself.

In many cases[34], platform strategies led to profound changes in the market structure and the approximation of entire sections of some industries (convergence). This phenomenon is reflected precisely by the concept of business ecosystem. From this point of view, it is possible to consider the development of strategies platform as history of business ecosystems, or at least that these strategies lead to the development or the emergence of some business ecosystems including the field of information technology [36]

Strategies platforms can emerge in markets with the following three characteristics [34]:

1) There are at least two distinct groups of actors (multi-sided market)

2) There are benefits from coordination or linking (connection) members of different groups (indirect externalities)

3) An intermediary may improve the situation of different groups coordinating their needs (benefits to the internalisation of externalities).

3   Development of analysis grids and referential

In order to decipher the shift in legitimacy nd the required strategy to be taken in a complex environment such as ecosystems, we have built analytic grids.

These grids will be put into action for Energy Utilities in the context of Smart ecosystems:

- i)   to represent and understand gaps and overlaps
- ii)   to explore the stakeholders nature and relationships changes
- iii)   to analyze energy provider company legitimacy and role in the 2 ecosystems – Smart Grids and Smart Cities [38]
- iv)   to elaborate a referential to guide Utility companies into a strategic policy for smart cities [37]

The analysis will be documented with examples and illustrations and a special focus is made on the

Pecan Street Project in Austin, Texas, and PlanIT Valley in Paredes, Portugal.

3.1   Legitimacy analysis framework

In order to characterize legitimacy and to support Energy Utilities into their positioning, we developed a 2 step approach.

1. To analyse the Type of legitimacy, which can be either Pragmatic, or Cognitive or Moral

> Pragmatic and Cognitive legitimacy
> *AE has been recognized as one of the leading electric utility companies in marketing clean energy to its customers through its Green Choice® Program and investing in cost and environmental-saving conservation and energy efficiency programs. General Manager Roger Duncan was recognized in 2005 by Business Week as one of the Top 20 leaders of the decade in the fight against global warming.*

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2. As demonstrated previously, legitimacy is likely to be questioned, as a result of:
- changing social expectations,
- changing organizational practices
- changes in their impact on society and the environment
- new actors entering the scene

> *An example of the utility legitimacy questioning by new actors entering the scene is the takeover of technology enterprises in the field of SmartCities. Technology giant Cisco is interested in the ecocity realm. Cisco sees its entire Smart+Connected Communities initiative as a potential $30 billion opportunity, including revenues from installation of infrastructure—notably highways, bridges, railroads, airports, utilities, and dams—and "selling the consumer-facing hardware as well as the services layered on top of that hardware.*

3.2   Business   ecosystem   analysis framework

The proposed scheme to decipher complex environment and ecosystem is a descriptive approach based on the evaluation of the following items:
- Keystone company
- Legitimacy of the Keystone
- Size of the keystone
- Number of actors in the ecosystems

- Networks (technological, environmental, societal, business, cultural, political)
- Influence of local policies
- Influence of community
- Research implication
- Organisational scheme
- Platform existence
- Platform sponsor
- Open innovation project

4 Smart ecosystems: models proposal

4.1.1 Smart grid ecosystem

Smart Grid is defined as "an electricity network that incorporates a suite of information, communication and other advanced technologies to monitor and manage the transport of electricity from all generation sources to meet the varying electricity demands of end- users"[39].

Presentation of the project Pecan Street Project

The Pecan Street Project (PSP) is a public-private initiative that seeks to establish the City of Austin and its electric utility, Austin Energy (AE), as leaders in developing the electric utility system of the future and clean energy economy. The four main components of the project are to: 1) develop a local, public-private consortium dedicated to research and development of clean energy technologies and distributed power generation; 2) open the city's electric grid to act as a lab to test emerging clean energy technologies; 3) develop a new business model to ensure AE's continued profitability; and 4) show how the new business and systems model can work.

The Keystone company is the Pecan Street project *public-private initiative that seeks to establish the City of Austin and its electric utility, Austin Energy (AE), as leaders in developing the electric utility system of the future and clean energy economy*

Legitimacy of the keystone is based on one hand the cognitive legitimacy of the local authority and the pragmatic one of AE. *The active involvement of AE is critical in the development of PSP as it provides the electric system to integrate clean energy technologies and programs and provides a major source for* *expertise and funding (through Council approval)*

Size of the Keystone company. *PSP which is a non profit organization is composed of AE, the US 8th largest public utility, providing electrical power to more than 420,000 customers and a population of almost one million and City of Austin, the second largest state capital in the United States*

The actors in the ecosystems are numerous. *PSP brings together AE, the City of Austin, Environmental Defense Fund (EDF), Chamber of Commerce, researchers at The University of Texas at Austin (UT-Austin) and other universities and organizations, and a host of private companies such as General Electric and IBM. Named partners include Applied Materials, Cisco, Dell, GE Energy, Gridpoint, Freescale, IBM, Intel, Microsoft, Oracle, and SEMATECH*

Networks are mainly technical, business and political. *The Austin Chamber of Commerce is providing support for the project by ensuring that the collaboration among the public and private entities involved will bring economic development to Austin*

Influence of local policies is major *as the local authority is the founder of the PSP project.*

Research implication is high considering that *dozens of professors, researchers, and students from UT-Austin and Austin Community College are lending their expertise in the identification and evaluation of project ideas and may provide research support for projects identified by PSP*

The organization scheme is a public-private partnership, is established as a non-profit entity. *PSP has greater flexibility in pursuing projects that may not be cost-effective for AE and each participating entity has a say in the establishment of goals and pursue of different projects. It allows all stakeholders to bring together their broad perspectives by providing a formal forum to discuss the testing, implementation, and promotion of clean energy and advanced energy technologies.*

A platform exists developed by AE. *The Smart Grid 2.0 concept envisioned by AE would implement the necessary set of technologies needed to integrate the next generation of clean energy technologies.*

The open innovation purpose is clearly defined. *The four main components of the project are to: 1) develop a local, public-private consortium dedicated to research and development of clean energy technologies and distributed power generation; 2) open the city's electric grid to act as a lab to test emerging clean energy technologies; 3) develop a new business model to ensure AE's continued profitability; and 4) show how the new business and systems model can work.*

The concept of business ecosystem is well-adapted to decipher Smartgrid project and show how the utility is legitimate to be the keystone or strong leading member of the keystone company.

In the previous paragraphs, SmartGrids was considered as a whole ecosystem. But in order to take into account the real complexity and evolution of cities, it is necessary to shift to a larger business ecosystem which is the Smart City ecosystem.

4.1.2   Smartcity ecosytem

Smart Cities are defined as "A "city" that uses information and communications technologies to make the critical infrastructure components and services of a city — administration, education, healthcare, public safety, real estate, transportation, and utilities— more aware, interactive, and efficient [3]

Project presentation

PlanIT Valley is being built on 17 square kilometres of land in the municipality of Paredes, Portugal, which is near Porto, Portugal"s second largest city. PlanIT Valley is intended to provide a proving ground, demonstration facility, and living laboratory for Living PlanIT and its partners to continue to build subsequent generations of smart urban technology. Technologies and approaches proven at scale in PlanIT Valley can be replicated elsewhere.
The first wave of PlanIT Valley provides homes for around 10,000 people, and is expected to start construction in 1Q12, with land acquisition currently under way. Ultimate capacity is expected to be in the region of 230,000 inhabitants.

Company is Living PlanIT, *a former start-up in high technology, a Swiss registered entity. a start-up high technology company. There are a number of subsidiaries responsible for delivering specific services, IP licensing, regional and joint ventures. The principal corporate activity is centered in Paredes, Portugal for planning and execution of the PlanIT Valley project.*

Legitimacy of the keystone switched from a moral legitimacy at its start in 2006 to a pragmatic ones nowadays, *thanks to the development of an important business ecosystem and several endorsements. World Economic Forum Technology Pioneer 2012 ; World Investment Conference – Best Foreign Investment in Europe in High Tech 2009 ;UK – Technology Strategy Board; Mayor's office in London; (Olympic) Borough of Newham ;Two Harvard Business School Case Studies*

Size of the Keystone company. *Living PlanIT has around 100 employees*

The actors in the keystone ecosystems are numerous. *Living PlanIT has over 1000 partners in its current pipeline and is closing on average 10 new partner deals a month with this rate increasing. Notable partners include Cisco, Microsoft, McLaren Electronics, Buro Happold, Gehry Technologies, Philips Lighting Systems, Fibersensing.*
The actors involved into the *PlanIT Valley project are Cisco, Accenture, U.K. engineering firm Buro Happold, and McLaren Electronic Systems, which manufactures sensors.*

Networks are mainly technical and business.

Platinum Partners have a global brand and presence, possess critical mass in platform technology, employ partner channels and supporting services, participate in joint ventures, and share implementation-based revenue. They are primary beneficiaries of Living PlanIT marketing and communications and assist in the certification of other Living PlanIT partners.
Gold Partners possess unique intellectual property or domain expertise and promote recognized brands in their market segments. They benefit from market momentum in key areas of differentiation.
Silver Partners have a value-added focus and are generally small- and medium- size enterprises (SMEs) and institutions. They provide custom development, integration, and domain-expertise services. [43]

Influence of local policies is high. *Living PlanIT is running the project, which received special investment status from the Portuguese government*

as a "Project of National Interest," with strong support from all levels of the Portuguese government including the Municipality of Paredes and various national agencies in Lisbon.[42]

Research implication is involved. *University of Porto.*

The organization scheme is a based on a business model. *PlanIT Valley's business model depends on "creating an ecosystem of large and small company partners that will focus on creating products and services for sustainable urbanization.3[45]*

Platform is central to the project. *The company and its partners develops the Urban Operating System (UOS™) which provides the essential platform for Machine to Machine Communication (the "M2M market"), which is estimated to expand to 24 billion smart sensors and connected devices by 2020 and to be worth US$1.2 trillion by 2020. This process is the industrialization of the Internet, its third stage, and is facilitated by the UOS™, enabling an unlimited number of devices to be interrogated, analyzed and controlled, and in turn harvesting useful intelligence and also enabling management, control and greater efficiency for many city services.*
The M2M integration of services provides the technology solution for creating sustainable Living Cities (aka Smart or Intelligent) cities, improving energy management, transportation, health services, education and many others aspects of daily life. The UOS™ provides that platform; and like Windows or Apple's IOS, it also enables apps to be developed independently by large and small companies, as well as public sector agencies, to deliver innovative services and new opportunities that enhance the experience of urban living for all. .[44]

The open innovation is clearly defined in the frame of the company business ecosystem but not in the project itself. *"Our business model is based on our integrated ecosystem of partners which leverages the UOS™ to extend its value while providing new services to their customers. We bring these partners together to integrate their technologies on the UOS™ to offer real estate and other sectors an integrated range of services and opportunities, replacing the siloed solutions that have traditionally been on offer.*

We also continuously seek to secure early customer adoption, and to capture initial customer projects ("Design wins") that demonstrate and deploy the UOS™ at scale."[45]

A first comment to be made is that no Utility is involved in the project. It confirmed the importance of the platform in the frame of an expanding ecosystem.
The second comment is related to the legitimacy of the keystone which started from scratch and imposed itself as a major actor and moreover as an equal partner with Cisco and McLaren for instance, and not as a competitor.
It shows that building a legitimacy in SmartCity doesn't necessary implies to cooperate directly with the local authority, as seen for Smart Grids, as long as the project meets societal (political) expectations.

On SmartCity, the standard PPP models common in traditional infrastructure projects, where the authority recruits private companies that contribute to project development, may not work well for SmartCities, as: ecocity projects require a unique type of public acceptance to entice residents and businesses in the long-term; a completed city will require high levels of maintenance; and it is difficult to bind developers and end-users to the desired regulations for sustainability features and standards. Government-led projects may be ill-equipped to face these challenges. Such initiatives are also threatened by mismatched expectations, poor communication, and misunderstandings between the private and public entities.
This votes for the Business ecosystem development, aiming at new governance structures and frameworks for coordination, as the challenge is to coordinate networks of private companies without the institutional authority of a governmental entity at the center

5 Recommendations and conclusions

There are frequently paradoxical situations where the different societal and environmental demands remain unresolved as no stable solution can be found. As a consequence, companies are likely to employ several different legitimacy strategies in parallel despite the (latent) conflict between them. Among legitimacy strategies, the paradox approach seems to be the most appropriate one in the context of Smart Cities.

The emergence of many business ecosystems result from coupling a platform strategy in a logical way of open innovation (+ outside-in inside-out). Both can be considered vectors of development, especially in high-tech industries.

Companies should switch from a closed innovation model in which they control their own R & D and commercialization of new products / services, to an open model, exploiting the sources of innovation (ideas, knowledge and competencies) available in their environment (outside-in) and making better use of the output of their own R & D (inside-out).

To maintain leading role and legitimacy, importance of platforms have been stressed.
Companies with such platforms play a crucial role in ensuring the coordination of stakeholders and promoting the creation of value through dynamic collective innovation.

Sources of intermediation gain (for the focal firm owns the platform or platform sponsor) may originate either from:

- the inability of actors to achieve an effective solution by direct negotiations
- the existence of an excessive number of actors and related possible amount of exchanges
- the geographic / temporal dispersion of actors
- Prohibitive transaction costs (research, information, negotiations)

In the context of pure Smartgrid business ecosystem, the Energy Utility can maintain its cognitive legitimacy thanks to a strong PPP with the local authority, serving general interest and developing a specific business model to ensure financial security. Bus this remains a business as usual for the utility, whose legitimacy can be questioned mainly by new players.

On the contrary, as demonstrated earlier, in the context of high complexity such as SmartCity business ecosystem, other approaches should be set up to guarantee a leading role in those projects.
Considering the importance of networks in ecosystems, Utility legitimacy, in this ocontext, will depend on innovative partnerships among various parties, such as: a trusted technological partner(s) to implement and fund (in part or in whole) the deployment of the network; a combination of federal, regional, and local governmental and regulatory bodies (to drive the establishment of an open broadband regulatory framework); and local businesses and civic organizations that can access the network and create the framework necessary for smart cities.

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