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UNDERSTANDING VALUE CO-CREATION IN A MOBILE ECOSYSTEM – A CASE STUDY

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Abstract

The establishment of partnerships and interoperability networks between organizations has resulted in new areas of mutually built value and innovation. These relationships have greatly benefited from the development of Information and Communication Technologies (ICT), particularly with the development of technological platforms that allow the promotion and management of these partnerships. This dynamic between organizations to create and provide their products and services, is consistent with the notion of an ecosystem. The mobile ecosystem is a practical example of a system development based on partnerships. In particular, the Machine-to-Machine (M2M) has been evolving tremendously over the past few years, making it an ideal setting to study the dynamics of value and/or innovation co-creation.

The present study was conducted with a European telecommunications company and one of its business partners based on a M2M platform. Semi-structured interviews were conducted with key informants of both companies in order to determine the existence of the above mentioned co-creation dynamics. Findings show that, at the partner side, the platform has allowed the development of procedural innovations and cost reduction and at the platform owner's side, the capture of part of the value obtained by these benefit. Future studies could monitor the platform's evolution and extend the study to other entities operating in this ecosystem in order to complement and confirm those results.

Keywords: Co-creation of Value; Co-creation of Innovation; Technological Platforms; Mobile Ecosystems; M2M.

1. Introduction

Historically, the success of organizations has always been associated with their individual ability to develop new solutions and innovate in products or services, operating as isolated units that only interact with each other on a customer/supplier basis. Currently, the increased level of specialization and the shortened innovation and development cycles that are demanded mean that it is more and more difficult for organizations to act in alone. Companies are more likely to look for partnerships and collaborative ventures with the objective of jointly creating new and innovative solutions.

The mobile ecosystem has been one such system that has stood out and benefitted from collaboration, creating value and innovation using technological platforms. This work seeks to study the mobile ecosystem dynamic, focusing on the Machine-to Machine (M2M) segment. The study uses a methodology for analysing ecosystems known as Network Value Analysis (NVA) (Peppard and Rylander, 2006), drawing on information gathered in semi-structured interviews with organizations operating in the M2M arena. As such, this study posits the following research questions: How the necessary conditions for co-creation of value and/or innovation in a platform based mobile ecosystem are created? And which are the main benefits for integrating such an ecosystem?

In order to answer these research questions, we developed a case study to accomplish the following objectives:

- a) To identify what the benefits are of entering into a relationship with another ecosystem member, from the viewpoint of the various stakeholders, and what sort of relationships are established (for example: partnerships, joint ventures, or others).
- b) To understand the conditions that lead to a partnership, as regards the proposed value and/or innovation to be developed.
- c) In what way is the control and decision making power shared (or not) regarding the direction to follow for the platform and identifying who has the leading role in creating value/innovation.
- d) To gauge the compatibility of the objectives for the different actors in the ecosystem studied.
- e) To identify the type of innovation (incremental vs. radical, product/service vs. process) created using the platform.

This paper is structured as following: The second chapter presents a literature review, covering co-creation of value and innovation, interoperability networks, ecosystems and technology platforms. In the third chapter, the method used in the case study is presented while the fourth chapter analyses and presents the results found in the case study. The fifth chapter details the main contributions of this work while also discussing the main limitations and proposing ideas for future research.

2. Literature review

This chapter presents a review of the literature to understand the way in which the relationships are forged among the different organizations that make up the mobile ecosystem regarding their interaction, objectives; type of control, decision making structure and the type of innovation created.

2.1. Interoperability Networks and Ecosystems

The current environment characterized by its high complexity in product and service development and the disintegration of vertical and horizontal market barriers forces increased competition, coordination and cooperation among the diverse elements that operate and coexist in the business universe (Basole, 2009; Basole et al., 2012). This relationship between different entities is particularly notorious in markets where the products and services are highly complex and dependent on resources which complement each other (Basole, 2009; Zainuddin and Gonzalez, 2011). Mobile technologies, with expanding services and new and diverse participants joining this business, demand a more complex type of relationship that can bridge multiple types of industries (Jing and Xiong-Jian, 2011).

According to Basole (2009), relationships between companies can take various forms, such as: “alliances, partnerships, joint ventures, consortia, supply agreements, technology licensing, manufacturing

collaborations, and marketing agreements” (Basole, 2009: 145). This type of interoperability is mainly due to the possibility of reducing the costs associated with transactions, resource dependencies and moreover, the possibility of gaining new organizational knowledge (Basole, 2009). This dynamic of interdependence and interoperability between companies as a way to create and bring their products and services to market is consistent with the notion of an ecosystem (Basole et al., 2012). The term ecosystem is used to refer to “a networked system that contains a set of objects (e.g., actors, nodes, etc.) that are tied to each other” (Basole and Karla, 2011: 314).

For Basole (2009), the analogy with biological ecosystems allows a better understanding and analysis of the concept of company interoperability, given that the observed dynamic is identical to that seen in nature: different species, which are subject to different external forces, coexist and mutually affect the evolution of each other, with behaviours that are in every way analogous to those seen in economic activities and relationships between companies such as “competition, cooperation, specialization, exploitation, learning, growth, and others” (Basole, 2009:146). As such, this is a concept where the companies are just one part of a wider structure, the ecosystem, contributing to different roles and establishing symbiotic relationships with customers, suppliers, competitors and other entities, such as government agencies or regulators (Basole and Karla, 2011; Jing and Xiong-Jian, 2011; Zainuddin and Gonzalez, 2011).

This concept of a thinking, interoperable, relating ecosystem evolved from the traditional value chain model presented by Michael Porter (Porter and Miller, 1985). However, the current state implies a wider definition and understanding of networked business models, and a different business strategy. On the one hand, a type of relationship behaviour is required that allows maximum value to be obtained, but on the other hand, it is necessary to implement and maintain a type of relationship that allows other members of the ecosystem to achieve success in their businesses (Basole, 2009; Iansiti and Levien, 2004; Jing and Xiong-Jian, 2011; Selander et. al., 2010).

Peppard and Rylander (2006) added that the notion of an interoperability network allows an alternative perspective to the traditional model of the value chain, which is better adapted to the new ways of doing business, in particular those where the products or services, demand and supply models are electronic. These authors propose an approach named Network Value Analysis (NVA), which allows ecosystems to be analysed by looking at the value co-created by the actors while also providing a complete description of where that value can be found and how it is created. This approach comprises the following five steps:

- **Defining the Ecosystem:** The objectives and limits of the analysis are defined, considering the central focus of the ecosystem, or in other words, from the perspective of those organizations whose business model depends on the ecosystem under analysis;
- **Identifying the Actors in the Ecosystem:** Starting from the central focus of the ecosystem, this phase identifies all the participants that are able to influence the creation of value in the system;
- **Identifying the Value Dimensions for the Participants:** Identifying what the value proposals are that are associated with each of the members of the ecosystem, revealing what each participant receives from their involvement;
- **Defining the Value of the Relationships:** Identifying the type and nature of the relationships and the main interactions that occur in the ecosystem (exchange of products/services, information and sharing of knowledge, influence and power);
- **Analysis and Design:** Mapping of the ecosystem, with its participants and relationships, obtaining a “photograph” of the reality, complemented by the analysis of the perceived behaviour.

2.2. Healthy Ecosystems and Strategies Employed in Ecosystems

The literature surveyed covering interoperability and business networks that draws on the concept of ecosystems records a number of different definitions for a business ecosystem (mobile or other). While various definitions of an ecosystem are employed by different authors in the literature, no general consensus yet exists (e.g., Campbell and Ahmed, 2011; Basole, 2009; Selander et. al., 2010; Yamakami, 2010; Basole et al., 2012). However, according to Jing and Xiong-Jian (2011), some key aspects exist which are common to all these definitions, which can be summarised in the following way: (i) it covers a large number of organizations; (ii) with relationships of interdependency and interlinking; (iii) leading to a dynamic of co-evolution. Taking these aspects into account, it is possible to refine the definition of an ecosystem given

above and apply it to a business ecosystem: “a networked system that contains a set of objects (e.g., actors, nodes, etc.) that are tied to each other” (Basole and Karla, 2011: 314), where these objects are essentially companies and where the links or relationships can be of customer-supplier, alliances, partnerships, or others and, where the individual objectives of each are placed first, without prejudicing the global interests of the system as a whole (Basole, 2009; Iansiti and Levien, 2004).

“Like an individual species in a biological ecosystem, each member of a business ecosystem ultimately shares the fate of the network as a whole, regardless of that member’s apparent strength.” (Iansiti and Levien, 2004: 1). The notion that the chain is only as strong as the weakest link is highly applicable to business ecosystems. This idea is defended by Iansiti and Levien (2004) when they state that an ecosystem can only function effectively if all of its segments which are critical for value creation are healthy and productive. For example, in a mobile ecosystem, the ability to transmit data will only be of value if the existing mobile equipment is able to fully make use of it (Basole et al., 2012). The study carried out by Iansiti and Levien (2004) posits that the health of an ecosystem can be gauged by analysing its productivity, robustness and ability to create niches. Just as in a biological ecosystem, not all of the elements that make up the system play the same role or follow the same strategy (Basole, 2009). In business ecosystems, the actors can opt to follow different strategies as a way to achieve their objectives. Iansiti and Levien (2004) and Jing and Xiong-Jian (2011) identify five distinct types of strategy that can be followed by ecosystem participants:

- **Keystone:** organizations that are characterized by the dominant role that they play in the ecosystem, creating and sharing value through platforms (Basole, 2009);
- **Landlord:** organizations that control important pathways in the ecosystem and whose main activity is to extract the maximum value from their presence in the ecosystem (Jing and Xiong-Jian, 2011);
- **Dominator:** organizations that control a large part of the business area and their interoperability networks, ensuring, above all else, that they extract maximum return and value from the ecosystem, leaving little for other companies and creating no additional value (Basole, 2009; Iansiti and Levien, 2004; Jing and Xiong-Jian, 2011);
- **Niche:** organizations that represent the largest group in the ecosystem while at the same time focusing on specific areas, developing capabilities and resources that are more specialized than the other members (Jiang and Xiong-Jian, 2011);
- **Commodity:** organizations that are looking to differentiate themselves from the others, using a strategy of cost leadership (Jing and Xiong-Jian, 2011).

The type of strategy followed by an organization may be as dynamic as the ecosystem or industry itself, possibly undergoing a number of different changes over time. The majority of organizations are actors in ecosystems which are much more extensive than the industry where they are based (Iansiti and Levien, 2004) and which, as a rule, overlap with other ecosystems (Jing and Xiong-Jian, 2011). As such, it is expected that the same type of strategy may not be equally applicable or practicable in all ecosystems; organizations should, as such, follow that model which delivers the best results for them (Iansiti and Levien, 2004; Jing and Xiong-Jian, 2011).

2.3. Mobile Ecosystems

For Basole (2009), the mobile industry fits perfectly with the analogy of a business ecosystem analysed above. However, the mobile ecosystem, as a source of development and a provider of voice and data services, is relatively recent. Alongside the evolution and growth of the ecosystem is the complexity of the relationships formed between the different actors. In this way, the interactions and the ability of the ecosystem to generate value for all actors becomes more and more complex and fragmented (Reuver et al., 2008a). Thus, organizations that wish to integrate and compete in this ecosystem should be particularly attentive to the need to create and manage a network of sustainable partnerships, which, as discussed above, implies taking into account the interests of all participants so they can extract value and contribute to the diversity of the ecosystem (Camponovo and Pigneur, 2003).

Those companies, generally perceived as part of the mobile ecosystem, include mobile telecommunications operators, mobile phone manufacturers and content suppliers and application programmers. However, the variety of organizations is much wider, including among others, manufacturers of components and infrastructures, systems integration specialists, virtual operators, software companies, mobile

platform/operating system companies and the consumers that benefit from and use the products and services (Basole, 2009; Basole and Karla, 2011; Camponovo and Pigneur, 2003; Reuver et al., 2008a; Yamakami, 2010). In fact, the mobile ecosystem as it stands goes further than simple communications between human beings, having expanded into areas known as “intelligent objects” (Lelah et al., 2011). The interactions and networks built by these objects are known as Machine-to-Machine (M2M) communication, or simply M2M (Lelah et al., 2011). Essentially, M2M results in information exchange originating from equipment and terminating with a central receiving infrastructure, which then organizes and acts on the information. Figure 1 uses a schematic diagram to summarize the way M2M works.

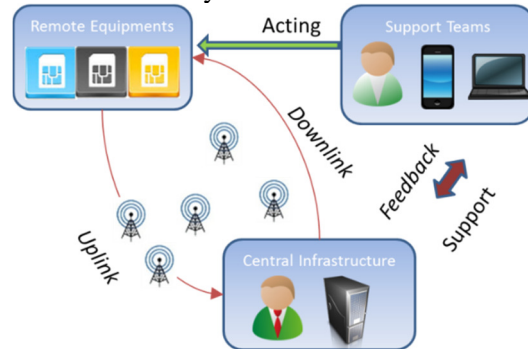


Figure 1: M2M Architecture

Typically, these uplinks and downlinks can be physically implemented on a physical communication infrastructure (e.g., fibre optics or copper) or by using mobile technology (e.g., Wi-Fi or GPRS modem and a SIM – Subscriber Identity Module card). According to the GSM industry association, the number of active and connected M2M devices in the network should reach seven billion by the year 2015. This will represent around half of all existing mobile devices in the market. By 2020, the number of M2M devices are expected to exceed fifty percent of all mobile devices connected to the network.

An ecosystem based on technological platforms is the main driver for co-creating business value among companies which are the owners or creators of the platforms and others which are stimulated into developing components or modules (Ceccagnoli et al., 2012) which complement those included as part of the platform itself (Eaton et al., 2011). In the literature, the term platform encompasses a diverse set of definitions, and appears connected with a panoply of things: products, industries, services, technologies, operating systems, credit cards, video games, and social networking, among others (Tilson et al, 2012). However, the main idea behind the term platform is that it represents a type of foundation or base, on top of which any number of developments can be built by employing a set of well-defined rules (Tilson et al., 2012).

2.4. Co-creating Value and Innovation

Recent studies have shown the relationship between the success of companies in terms of their growth, value, income and innovation and the type of relationship and coordination that exists between themselves and their clients (Ahuja et al., 2000; Eaton et al., 2011; Rosenkopf and Schilling, 2007). These interoperability networks, as discussed above, allow companies to receive several benefits, such as the collection and sharing of resources, knowledge, capabilities and skills; access to relevant information regarding technical and technological advances; new approaches for resolving problems; and lessons learnt as a result of previous failures (Rosenkopf and Schilling, 2007).

In this context, value creation should be understood as the interactive process between the diverse actors that seek to contribute incrementally and within their capabilities and skills set to be able to generate and obtain maximum benefit, both for themselves and for their customers (Zainuddin and Gonzalez, 2011). This process of value co-creation, resulting from the sharing of knowledge and experience from different entities and business areas, also sustains the ability for co-creating innovation by bringing together capabilities and scientific and technological knowledge that otherwise would not exist (Rosenkopf and Padula, 2008).

The basis behind the concept of co-creation is the fact that the resources necessary to respond to the demands of the organization are not uniformly distributed and it is not possible to easily transfer these resources between the different entities (Reuver et al., 2008a). This means that the organizations can only take on a

certain number of research lines and incorporate a limited number of technologies (Basole, 2009; Reuver et al., 2008a). This situation can be mitigated and overcome by using interoperability networks built-up in the ecosystem (Ahuja et al., 2000). According to Basole (2009) and Reuver (2008a), this situation is particularly evident in mobile ecosystems, where it is of primary importance that the actors (mobile operators, content suppliers, application programmers and other interested companies) work together, drawing on the interoperability networks that have been created.

Ahuja et al. (2000) state that these interconnections between companies affect the capacity to co-create value and innovation by providing three benefits: (i) knowledge sharing, (ii) complementarity and (iii) economies of scale. Ahuja et al. (2000) further argue that, as a result of the partnerships between those companies directly involved, it is possible to have access to new information and knowledge as well as new contacts and future direct relationships. These indirect sources of knowledge can show themselves to be important in the innovation and value creation process by making a positive and significant contribution (Ahuja et al., 2000) to new business opportunities. Co-creation of value along with its evaluation and analysis should not just be limited to organizations or industries and the ecosystem and the interoperability networks should be analysed globally, including all the actors involved (Zainuddin and Gonzalez, 2011). As such, it is equally important that the participation and involvement of consumers in the process of co-creating value and innovation should be taken into account.

3. Methodology

In order to answer the research question, “What are the necessary conditions for co-creation of value and/or innovation in a platform based mobile ecosystem?” a single case study (Yin, 2002) was conducted. To conduct this research, a leader in the M2M platform development was chosen to be the focus of this case study. This European Telecommunications Group has developed an M2M platform called Smart M2M, which is a mobile ecosystem upon which partners and the telecommunication group can develop new applications.

Four semi-structured interviews were carried out so as to be able to collect the necessary material to develop the research work. The interviews ran over the period between April and May of 2013, within a European Telecommunications Group (ETG – a fictitious name) and a partner that belongs to the utilities sector which is also an entity with which ETG maintains a relationship within the mobile ecosystem and M2M. We interviewed the Product Director, the M2M Project Director (partner), the Director of Project Management, and the Director of the M2M Product Management Department. Each interview was recorded and later transcribed, lasting between 45 and 60 minutes. An interview protocol and an interview guide were developed (Yin, 2002). Complementary information was sought from other sources, such as (1) the internet, where relevant data was collected about the companies studied and in relation to the M2M phenomenon and (2) additional documentation supplied and collected from the entities interviewed. The information collected was analysed with reference to the five phases of the NVA methodology (Peppard and Rylander, 2006), so as to be able to obtain a complete description of how and in what way the value or the innovation is co-created in this ecosystem. All the procedures carried out were described in detail in a data collection protocol, as suggested by Yin (2002).

4. Case Analysis and Discussion

4.1. Definition of the M2M Ecosystem

Drawing on the studies and analyses developed in the course of this work, it can be stated that M2M, with its products and services, is used in the most diverse types of economic activities. These sectors include Manufacturing, Transport and Logistics, Health, Retail, Banking and Insurance and Utilities, along with others that can be seen in Figure 2.

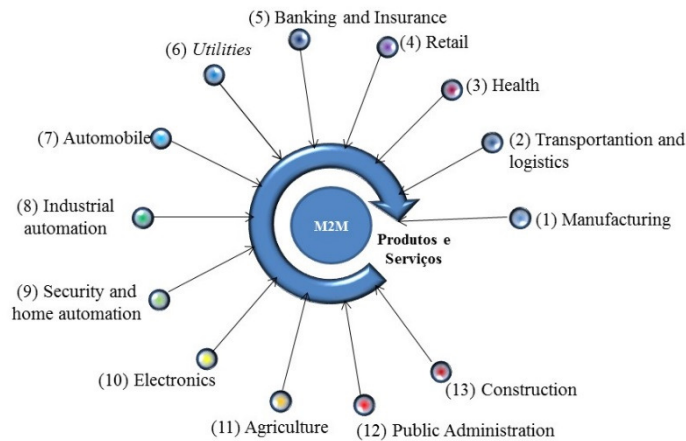


Figure 2: M2M Sectors (adapted from Basole (2009))

During the interviews, different sectors were mentioned, including Banking, Automotive, Transport and Logistics and the area of Domotics. However, it was the Utilities sector that stood out as being particularly relevant in the responses given, with street illumination and water highlighted as being the most important activities in the interviewees' opinion. According to the Director of the M2M Product Management Department, SmartM2M is currently at a stage of development where the following are top priorities: "We are betting on [...] two. One is street illumination, which we are looking at with local municipalities and other players with the same needs, and the other is telemetry linked to water, also with the local municipalities". The area of public illumination has taken on particular relevance, since, as noted by one of the partners active in this area, "a Government directive was issued in 2011 stating that all public illumination would have to use smart metering".

4.2. Identification and Design of the Ecosystem Actors

One of the objectives of using interviews and additional research material to collect information covering different areas of economic activity and partner companies was the construction of a "photograph" of the actual M2M ecosystem that exists in this European country (Figure 3). This covers the three main telecommunications operators and their respective current partners. Future/possible partners were also accounted for in those cases where the technology employed in the development of M2M platforms possesses an Application Programming Interface (API), allowing development by entities outside of the organization. Besides this, the entity responsible for regulating the activities within the realm of this ecosystem is also included.

The development of this ecosystem's image is primarily concerned with identifying the ecosystem actors and supporting the understanding of what sort of relationships exist between them, what sort of dynamics are in play, and which are the different roles that each one takes on. Here, we are particularly concerned with the image of the SmartM2M platform and the partners visible in Figure 3. The interviews given made it possible to determine the types of relationship that exist, shown in Figure 3 by the lines that connect each of the nodes in the ecosystem. These links can be one of a number of different types, as noted by Basole (2009) who identified the possible types of relationship between companies: partners, contract suppliers, consortia, licensing agreements, service provision contracts, and strategic alliances – including legally recognized forms such as Complementary Company Groupings. It was particularly notable from the interviews that the establishment of consortia was key to the core development phases of the M2M platforms, both on the side of ETG and that of the partner itself, subsequently evolving to include other types of relationship in later development stages.

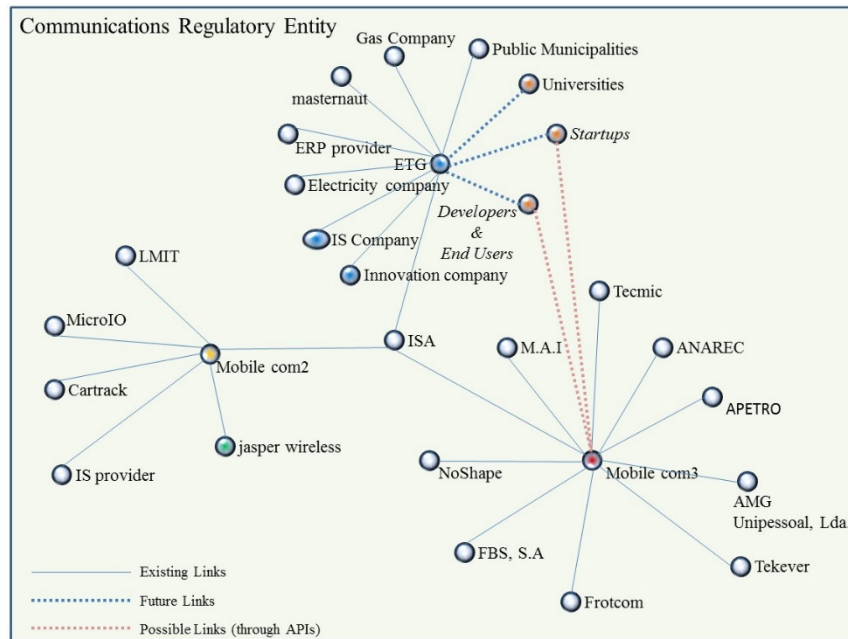


Figure 3: M2M Ecosystem

4.3. Definition of the Value of Relationships

According to the literature, building these interoperability relationships between partners in an ecosystem is primarily concerned with the possibility of being able to reduce costs associated with transactions, resource dependencies, and the need to acquire new operational knowledge (Basole, 2009). In addition, this environment of interrelating and interoperability helps bring new products to market, to complement capabilities and to innovate, expanding beyond the traditional knowledge boundaries of the companies (Ahuja et al., 2000; Selander et al., 2010). By analysing the information collected in this study it has become clear that, in practice, the main objective of building partnerships is fundamentally centred on the need to acquire the necessary and complementary knowledge essential to developing the desired solutions, enabling to maximize the value and innovation generated. According to the Director of the M2M Product Management Department, it is essential to capture and incorporate the knowledge of the partners in the development of the platform and its solutions: *“the idea is to count on them (partners) to help fill the gaps that we have in terms of skills and integration abilities. As such, we count on them to add value to the whole solution [...], to give us inputs and to improve”*. This view is reinforced by the Director of Project Management from the Innovation Management department by confirming how important it is for partners to achieve the objectives set for them: *“[...] We can neither cover all the points on the value chain, nor can we be specialists in everything. It is because of this that we need partners that allow us to complete our value chain [...] it makes sense that we would partner-up with specialists, with people that actually know how to do it”*. These partnership solutions are supported by the partners themselves who confirm the reciprocal benefits: *“it is not just our company that benefits from the developments of ETG, but it is ETG itself that also benefits from our needs”*.

Something which is visible here, and also noted by Reuver et al. (2008b), is that partner selection is one of the fundamental points towards achieving access to the resources, capabilities and competencies necessary to develop the best products or services. However, it is important that a culture of confidence pervades and is built-up between the partners (Barrett and Velu, 2011), to guarantee that there exists *“... the willingness to believe in a fellow collaborator when the actions taken by one partner could make the others vulnerable”* (Perrons, 2009:1301). This issue was highlighted by the interviewees when they stressed the importance of choosing the best and most trustworthy partners to cooperate with. The Director of the M2M Product Management Department additionally states that without good partners the success of the platform itself and the products or services on offer can be put in jeopardy: *“It is important that the operational partner has a service level in line with that which we provide to the end customer. If one of the links fails, the whole service*

fails [...] and as we want to represent all parties, the partnership is highly important for maintaining the SLA (Service Level Agreement) that we want to have”.

This question will, however, have to be carefully weighed-up against the innovation needs, given that, in accordance with Rosenkopf and Padula (2008), to be able to gain access to new information and innovation sources, working relationships will have to be extended to partnerships where the level of trustworthiness is unknown. For the Project Management Director and the Director of Products for a Connected Society, the solution is to arrange partnerships in areas where ETG is not a leader, by opening up the platform to the outside or analysing new partnerships in the business sector: *“One of the things that we are doing at present is opening-up the platform to the outside [...] allowing others to start developing solutions based on the platform”.* These actions are then complemented by calling more *“companies into the consortium to leverage new business models and new applications”.*

Allowing the expansion of business partnerships and opening-up the platform to external development raises an extremely important question: what sort of guarantees will exist, if any, regarding control over the uses which the platform is put to, that is, what level of openness, in as regards control, should be defined? The platform owners’ answer to this question is unanimous and dependent on the type of venture under consideration: business or external customer or developer. In the first case, only one example was under development at the time, with control always residing with ETG, including the priorities, which will always be analysed according to the vision set out by ETG: *“If [...] they say that they want to develop a particular application, we talk to them. But we will not go out of our way and diverge from our strategy in the area in which we want to work because of an innovation project with partners. There are resources in play that are scarce and we have to allocate them according to what we consider to be the priority”.*

As such, this is representative of a closed model where ETG, as platform owner, maintains total control. In the second case, dealing with the external customer/developer, the level of control should be completely distinct from the one at the business segment. Interestingly, the interviewees were not completely in agreement with respect to the level of openness. Different models were outlined, varying between total openness and a partial relaxing of control. Although was unanimously agreed that the partners should autonomously develop their projects, less agreement was found regarding the level of control to be maintained over the development projects. The incoherence detected in the responses of the interviewees regarding the model to be implemented could be a reflection of the fact that development on the platform of this type is still only at an embryonic stage.

The questions of openness and the level of control exerted over the platform have, according to Eaton et al. (2011) and Tilson et al. (2012), an impact on the ability to generate innovation and value from the partnerships established. As has been seen, the importance of partnerships is fundamental for redressing the existing insufficiencies in terms of knowledge in the platform’s proposed application sectors. This importance and the fact that the development would always be dependent on the partners’ contribution, in reality makes them one of the drivers of platform innovation. In this respect, the Director of Products for a Connected Society states that *“the more partners that we can get together the better our responsiveness will be”*, concluding that without them leveraging off the platform would be compromised.

However, given the level of control that is placed over the platform, it is evident that the main driver of development and innovation, at this stage, is ETG. The Project Manager from the Department of Innovation Management was decisive in stating that *“The driver in this case should be whoever the product owner is”.* Adding: *“[The owner] should manage the product and decide what sort of product will be developed”.* This idea had already been made clear when analysing the type of openness and control exerted over the platform. At that stage it was seen that whether innovation is implemented or not is determined by the department that manages the platform’s commercialization.

Managing the relationships between different entities towards jointly developing new solutions and overcome limitations are crucial for co-creating value and innovation. The ideas analysed in this point indicate that consortia, as a way of partners interrelating, allows the sort of relationship to develop and grow that help enable these objectives to be achieved. Therefore we put forward the following proposition:

P1: The consortia, as a type of relationship, helps partners in understanding each other, enabling knowledge sharing and the development of new solutions.

4.4. Identifying the Value Dimensions for Participants

Besides the innovation co-creation, it is equally important to understand in what way co-creation of value between ecosystem partners appears, that is, what enables the interoperability relationships. By analysing the information collected it can be seen that there exist two distinct types of proposed value associated with the partnerships identified: one for the platform owner and another for the partners involved in its development. For the first, given that it is a telecommunications company, the benefits come from being able to capture value outside of that which is the core business of any telecommunications operator, “4% of the normal M2M market”, according to the Commercial Manager for the platform. All interviewees agree that the largest benefit in terms of value comes from capturing part of the partners’ business value, developing and offering solutions that go beyond simple data transmission.

The idea, according to the Director of Products for a Connected Society is “to try to have a set of OTT (Over The Top) services, to give benefits over the network. Or in other words [...] try to have benefits and have supply in the service area.” This idea is reinforced by the Commercial Manager who states: “If we want to push beyond this (4%) we have to start providing something valuable, or in other words, vertically integrated areas [...] trying to capture that extra something on top of that which is reserved for us as a telecommunications operator”.

On the other hand, according to the same person, when the platform starts to be opened up to development by external entities, the proposed value model can be complemented with “part of the value of these new developments from using the platform services and the sale of new products and services or a licensing fee for the use of APIs (Application Programming Interface)”. As can be observed, this combination of creating and supplying new services and opening up the platform will be one of the possible paths for the operators to be able to attain benefits which are additional to their core business. Therefore, we put forward the following proposition:

P2: Making complementary services available and creating the conditions for external developments to occur based on their technological platforms allows the telecommunications operators to diversify their benefits to go beyond their core business.

The main value proposal identified for the partners comes from the reduction in their operational costs, complemented by the benefits generated by the supply or provision of innovative products or services to their customers. This is aligned with the functionality of managed connectivity which the platform enables. Functionality which, according to the partner interviewed, allows the operating model used to be radically changed (reducing the number of service providers and site visits, helping detect faults and measure resource usage) and the time cut needed for decision making – in some cases down to 1/6 of the normal level (due to simplicity and rapidity of information access).

4.5. Analysing the Ecosystem

The questions of co-creation of innovation and value analysed up to now are important to be able to evaluate the functionality, “vitality” and real objectives for the ecosystem under study. Analysing the responses from the interviewees as a whole, it can be seen that they are notably coherent with respect of these points. The idea that ETG transmits, in the words of the Project manager for the Innovation Management Department, is that the objective is to be “The great enabler of this type of solutions” (M2M), contributing to the development of the ecosystem. The logic, according to the Commercial Manager, is to make a solution available that would have the maximum amount of value based on the shared and combined efforts of different partners. A viewpoint exists that the main role to be played should entail sharing value through the development of the platform, increasing the productivity, robustness and the creation of niches within the ecosystem – or in other words, act as the keystone. This idea is shared by the partner interviewed who confirmed the objective of working towards a healthy ecosystem, capable of creating more value enabled by partnerships where everybody wins.

However, it is equally understandable that, depending on the type of economic activity and its maturity, the objectives and the type of role played in the ecosystem may have to adapt to models that provide better results. In fact, the Director of Products for a Connected Society warns that there will be sectors where the role played will have to be that of a dominator, niche or even commodity. This view is in line with the ideas

laid down by Iansiti and Levien (2004) and Jing and Xiong-Jian (2011) that suggest that the same strategy will not always work or be practicable in all sectors of economic activity that make up the ecosystem. Instead, what can be seen is that at this stage the main role played by ETG in the ecosystem is one of a niche, given that it is focused on two vertical areas which are very specialized (water telemetry and public illumination), at the same time developing very specialized capabilities and resources so as to be able to address and comply with the inputs from the partners operating in the area.

One of the aspects highlighted over the course of the interviews was the question of the type of innovation that is generated in the ecosystem. Kim et al. (2012) state that innovation can be analysed using a perspective of a change index and also its type. Looking at the transcribed data from interviews, it can be seen that it is at the level of process innovation that change is most significant. As pointed out above, reductions in operating costs were reported, resulting from a reduction in the number of service providers and site visits, the ease of detecting faults and measuring resource usage, and a reduction in the decision making time to 1/6 of the original, linked to the ease and rapidity of accessing information. These changes were classified as being disruptive and radical when compared to the previously existing logic, while they may be subject to incremental improvements as the platform develops. Another idea worth noting, is that the size of the mobile ecosystem and the possibilities for further developments in the area of M2M, mean that innovation in terms of new products and services will depend upon a mixture of incremental and radical solutions, where radical solutions are more closely associated with new domains that can come to include the M2M segment.

5. Conclusions

This research allows to answer the research question: “What are the necessary conditions for co-creation of value and/or innovation in a platform based mobile ecosystem?” It has been seen that two distinct types of proposed value exist associated with the partnerships identified, partnerships that also act as enablers. The first resides with the platform owner and the second with the partners involved in the development. In the first case, the benefit comes from being able to capture part of the value inherent in the business of the partners, with solutions that go beyond simple data transmission. In the future, those benefits can be added to value resulting from partnerships with external customers and developers. In the second case, partners benefit essentially from a reduction in their operational costs, improvements in the decision making processes and by making new and differentiating services/products available to their clients. Interestingly, the main advantage in embarking on partnerships with other entities in the ecosystem is fundamentally centred on the need to acquire the necessary and complementary knowledge and resources for developing the desired solutions, as such maximizing the value and innovation generated.

The main types of relationship established between the partners of the ecosystem were: partnerships, contract suppliers, consortia, licensing agreements, service provision contracts, and strategic alliances – including legally recognized forms such as Complementary Company Groupings. The most common type of relationship for the initial development phase was found to be the consortia. Control over platform related decisions and the level of openness was found to be completely dominated by the platform owner. There may be changes in this respect in the future, namely regarding the openness of the platform to external partners that make use of APIs. This question of control also implies that the main focus of creation, innovation and value is centred on the platform owner. Partners have their contribution to make, but the main driver of this phase is truly the platform owner. This situation greatly restricts the ability to develop and grow the platform, given that it is largely dependent on the resources and capacity that the owner makes available. Opening the platform up to other partners, with more development freedom, should allow an increase in the ability to use it for creating value and innovation. It was found that the type of innovation created using the platform, in the initial phase, is essentially procedural, with disruptive and radical innovations when compared with the past, evolving in an incremental way. Given the possibilities that exist in diverse sectors that are still offline, innovation in products and services is equally facing an outlook that favours a break with the past, both in terms of the platform, with new products coming to market, and in terms of the partners, with the possibility of making new services available to their customers. Among the actors studied in the ecosystem, this study also found the involved stakeholders acknowledge that creating partnerships and collaboration bring mutual benefits that enable the creation of value and innovation for both parties.

One of the main limitations of this study is that the platform was still in an early phase of openness for other partnership entities. This question meant that the analysis of the areas related to openness models and

platform control, value sharing and innovation creation would always be limited to the partners. The other possible partnership models were based on the opinions of the interviewees and not on already established business models. Another limitation is the fact that only one partner was available for participate in this study, and additional interviews with other partners could have enhance the understanding of value creation in this ecosystem. As such, it would be interesting to carry out additional interviews and to undertake a complementary study when the APIs are made fully available and external partners are developing new solutions using the platform. Another limitation is that the study only collected the viewpoint of the different entities associated with one of the platforms that exist in the mobile ecosystem in the M2M area.

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