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Business ecosystem model applied to the electric vehicle market

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Abstract

In an environment of hyper-competitiveness (globalization, ICT, environmental issues and CSR ...), companies have no choice but to continuously innovate. This continued pace of innovation challenges traditional models of strategic analysis, especially the theories of Porter on competitive advantage (importance of leadership and market share, strategy at one single industry level, struggle against its direct competitors, strategy cost leadership or differentiation). Actually, this new rhythm makes it difficult for one single company (importance of R & D budgets involved, nature of the skills to mobilize, complexity of the offers building) to ensure satisfactory long-term competitive position in its market.

As such, a new approach is emerging in recent years, both in consulting firms and in strategic management academic literature. This approach is based on the concept of business ecosystem (BE). It can be defined as a heterogeneous coalition of enterprises in different sectors and forming a strategic community of interests or values in a network structured around a leader. This leader is characterized by its ability to impose or to share its developing business strategy or its technological standard in a disruptive business model, profitable to all participants. The structuring of a collective strategy as business ecosystem is based on the idea that to be successful (also on a new marker), a "so called" core company has to achieve a coalition with its partners, combining their different assets and complementary skills, to offer a valuable "differentiating" solution to its customers. Based on an intensive and continuous scientific screening and a set of competitive intelligence means, DEVER RESEARCH has developed a comprehensive tool to elaborate thematic ecosystems, mainly for the energy and industrial market. According to specific firm questionings, a business ecosystem is elaborated with this firm, set as keystone or leading firm.

The paper will present:1 : the theoretical background; 2) the methodology; 3) the process applied to the two above situations.

Keywords: Market, policy, business model

1 Introduction

The Business eco-system (BE) concept has been popularized by de James Moore (1993 and 1996)[1] then by Marco Iansiti and Roy Levien (2004a / 2004b)[2]. (All concepts quoted in this introduction are précised and developed into the document).

Ecosystem concept allows to visualize the coopetition between actors in a complex environment and to measure impacts on different actors links while adjusting stakeholders quality. The aim is to offer a frame of analysis for strategic action for any structure (either private or public) disruptive with the traditional theories such as Porter or Competences and Resources theory.

Based on an intensive and continuous scientific screening and a set of competitive intelligence means, DEVER RESEARCH has developed a comprehensive tool to elaborate thematic ecosystems, mainly for the energy and industrial market. According to specific firm questionings, a business ecosystem is elaborated with this firm, set as keystone or leading firm. Links are redefined according to its position. New events or changes (such as new comers) are integrated. The business ecosystem thus gives the opportunity to highlight domains or chains that should be investigated by the keystone firm.

The thematic ecosystem is useful to decipher, analyze and highlight relationships, environment and strategic opportunities for the keystone firm.

Considering our current research trend on sustainable mobility and the prevailing uncertainty in the changes and evolution of the Electric vehicle environment, we have been developing the Electric vehicle thematic ecosystem for the past ten months. The objective is not to find solutions or to determine any kind of strategic actions on the behalf of the company, but in the frame of the coopetition, it is to offer a fast process to identify "to-be-" investigated or followed domains according to the given problem. As the response delay to a new event and the impacts measurement are crucial, sparing time is primordial.

For instance, the business ecosystem allows 1) firms to identify actors and signals for a specific marker or competitor area, to investigate strategic options and alliances, 2) decisions makers to focus their actions on a specific segment in a precise and defined ecosystem in a continuously changing environment.

The purpose of this paper is to present the method that Dever Research has been developing to adapt the eco-system concept to the EV field and will present two examples based on two theoretical questionings:

- The entrance of a new car manufacture (firm 1)
- A local authority willing to develop its clean vehicles program (Firm 2).

The paper will present:1 : the theoretical background; 2) the methodology; 3) the process applied to the two above situations.

2 Theoretical background

Beyond the mere rejection of the "industry" concept, instead of focusing on the company, the reflection is centered on the set of relationships that a firm maintains.

The concepts of keystone, architecture, networks, information technology, innovation, shared destiny, co-evolution are the central elements in the ecosystem theory.[3]

The business ecosystem appears as a structure encompassing business (as an industry may be) and/or as profitable relationships that will establish a specific company (as the set of partnerships that create a firm). Moore believes the company is only part of a larger ecosystem, Iansiti and Levien considering the business ecosystem as an aggregation of different business areas which include companies engaged in similar activities but set an example of a business ecosystem centered on a company. If this might appear as a lack of consensus on the concept and as a consequence, a blur theory, it mainly gives space to develop a wide frame for analysis and to create an innovative research referential.

The viability or health of the eco-system can be analyzed thanks to two dynamics: on one hand, productivity, robustness and niches creation ability; on the other hand, stakeholders (from various spheres and not necessary other companies) and social values which animate the business eco-system.

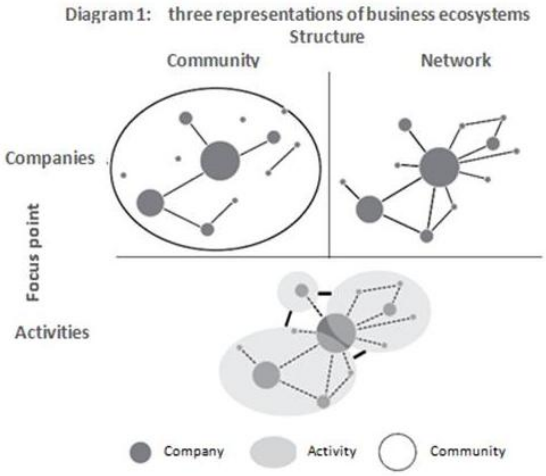
The approach in terms of business ecosystem challenges the traditional view of competition centered on an offer on a given market. Although it keeps growing, competition turns and leaves its traditional focus on the company to involve its community of allies.

The crucial battle is no longer about the rivalry between firms, but competition between firm's networks. These networks and related technologies are in constant competition.

The leader of the business ecosystem has a major role. There is always a leader in any business ecosystem and contingency actions to take will depend only on the BE life cycle.[4]
The main role of the leader is to create a participative framework for its stakeholders and allies in order to create innovation capabilities where values are collectively recreated. Innovative capability has been defined as "the internal driving energy to generate and explore radical, new ideas and concepts, to experiment with solutions for potential opportunity patterns detected in the market's whitespace and to develop them into marketable and effective innovations" (Assink, 2006:219). Developing this capability is to enhance the absorptive capacity, i.e. the capacity to recognize and understand external knowledge, assimilate and apply it internally.

A company has clear and obvious interests to provide leadership but it takes different forms: firm "Keystone", the traditional rulers, the rulers of value ('hub landlord ") and niche players.
A "keystone" role will be to coordinate a business ecosystem by developing platforms that will enable innovation. These platforms are seen as solutions available to ecosystem members through a set of access points or interfaces. Therefore, the architecture of the business ecosystem will involve concomitantly technologies, products and organizations.
There will be an "economic community animated by interactions between organizations and individuals." This community includes clients, suppliers, producers, competitors and other stakeholders. Then there will be a co-evolution of capabilities and roles under the leadership of a leader. For Iansiti and Levien (2004a), a business ecosystem is formed by "large networks of connected entities." Firms interact with each other in complex ways and the success of each company will depend on the success of the whole.
Two major points are thus: the importance of the leader role and the connection mechanisms between the different actors. [5]
A business eco-system is both a community to group actors considering common characteristics and a more structured network with a functional dimension: community highlights the importance of shared values; network is related to interconnect nods set.

Business ecosystem is then a structure which encompasses firms and stakeholders and a structure emerging from firm's strategies.



3 Process

Dever Research Ecosystem framework includes the following three dimensions:

1 Taking into account the diversity of actors and strategies
2 Monitoring changes over time in areas, perimeters of activities, organizations and influence variables
3 Establishing a consistent mapping of the actors, taking into account both their links (networks of common interests, communities of practices, relations of interdependence) and specificities (business culture, values system, legal structures, governance models, ...)

The framework requires defining and deciphering:

- Partners: ("complement", "Producers", "suppliers", "customers"). These partners are included in the community and are complementary with a shared aim being value creation. Thus, Kodama (2009) considers that companies inserted into an economic community (eco-system) composed of multiple actors produce value for customers and, as result, these customers become members of this community.
- Links and nods: a business strategy based on the networking of a complex set of actors. This focuses on a management cooperation to internalize external relations ("relation", "partner", "include", "integrate", "interdependent", "internal").

Hence the central role of cooperation between the various stakeholders. Co-evolution, coopetition (cooperation and competition) and cooperation define the evolution of competition to a more profitable strategy in the frame of ecosystem

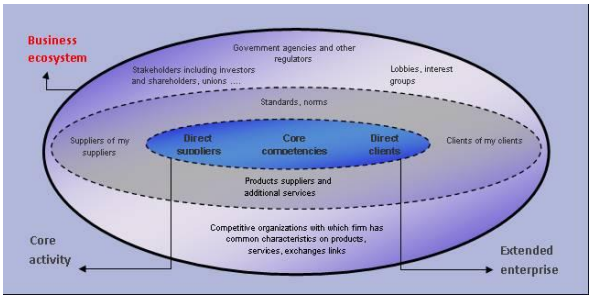
3.1 Stakeholders involvement and innovation process

3.1.1 Customer involvement

It is important to involve consumers in product development through lead-user involvement or toolkits used for innovation and mass customization.[6]
This mechanism is gaining importance when the concepts introduced are so disruptive that a market experiment is necessary to give a value for which classical marketing tools are not adapted.

3.2 Partnerships

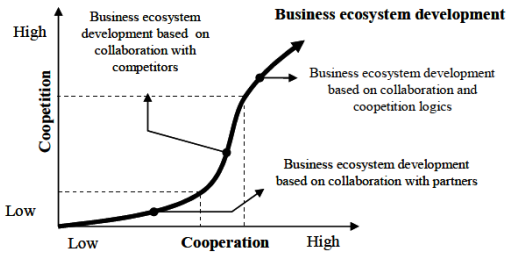
Different works have demonstrated how partnering (building alliances, networks and inter-firm relationships) can be key-issues in the building of innovative capabilities (Segrestin, 2005). Collaborations with external partners, in both research and development projects, is a well known mechanism to both share risk, create economies of scale and learn.
It is necessary to integrate all the stakeholders, pressure groups, unions, associations, … which, by their behavior, will impact the development of core competence and thus the future of the business ecosystem.
The following chart representation the association of the different actors.



3.3 Logics within Business eco-system

It is possible to identify different logics within business ecosystems:

- A standard, norm or know-how is used by several companies. This will help to develop one or more core competencies.
- Companies using these skills will form a common destiny on the strategic principle of co-evolution.
- One (or more) company will have the leading role.
- The Keystone firm must develop a vision shared by other members of the business ecosystem.
- Founded on the basis of contributions and critical embedded (Moore, 1996), the power of the leader will guide the evolution of core competencies.
- The leader place can evolve and its behaviour is crucial in the evolution of the business ecosystem.
- The actors that make up the business ecosystems are heterogeneous (companies, institutions, trade unions, pressure groups ...)
- The players in the business ecosystem come from different industries. There is a convergence of industries.
- There is not necessarily an exclusive membership to one business ecosystem.
- Business ecosystems are driven by significant competitive dynamics at the intra-ecosystem (to acquire the leading position);
- The competitive processes exist at inter-ecosystems (competition of several business ecosystems);
- A business ecosystem combines cooperation and competition and thus corresponds to the logic of coopetition.



3.4 Links

A firm evolves within an environment where it will create different types of relationships.

Vertical relationships: Links between supplier and clients for the direct creation of a product or a service. [7]
Horizontal relationships: Links between companies which produce the same type of goods. If this relationship is related to the acquisition of the same type of resources (customers for instance), this is competition. If this relationship is about cooperation between competitors, this is called coopetition.
Transversal relationships: Links between companies that are neither in the same segment, nor same market, nor same industrial chain. Because of a potential shared interest, different companies create associations.
Diffuse relationships, such as culture or identity: Set of informal links to share a common believing regarding what has to be done within a group.
The company is in the heart of dense and complex relationships combining vertical, horizontal, transverse, and diffuse. However, the mere association of these four types of relationships is insufficient to understand the totality of relations maintained by a company.
Assuming that the sum of parts is not sufficient, it is imperative to comprehensively consider all of these relationships. The combination of these different relations can develop strong synergies and critical pathways.

4 Method

4.1 DEVER Research process

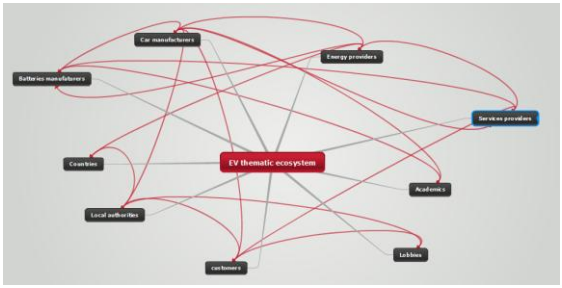
1) Describing the project in terms of strategic issues, risks, key skills, growth opportunities, etc…
2) Identification of actors in business ecosystem based on three levels:
    a) Level 1 from the "core business": i.e., direct suppliers, core competencies of strategic project and direct customers. (value chain).
    b) Level 2 from the "extended enterprise": analysis of indirect relationships, or relationships via an interface, i.e. providers, suppliers, customers, clients, service provider, etc..
    c) Level 3 from the business ecosystem (holistic and dynamic) analysis of relationships of influence, lobbying, institutional requirements or scientific guarantees, etc..
3) Mapping of the business ecosystem.
4) Iterative research and scientific screening.
5) Detection of weak, paradoxical, alerts etc.., and breakdown of the different signals on the mapping of the business ecosystem.
6) Update the mapping of the business ecosystem.

4.2 Method applied to the Electric Vehicle environment

4.2.1 Hypothesis for the demonstration

Firm 1 is an actor of the car industry. Its questioning is related to the potential development of alliances with one of its current competitor. Firm 1 is the keystone of the business ecosystem A.
Firm 2 is a local authority which has defined a clean vehicles program and wish to investigate the different actors (and their environment) that could be of interest to set up and to develop the project. Firm 2 is the keystone firm of business ecosystem B.

4.2.2 Thematic ecosystem: the Electric vehicle environment

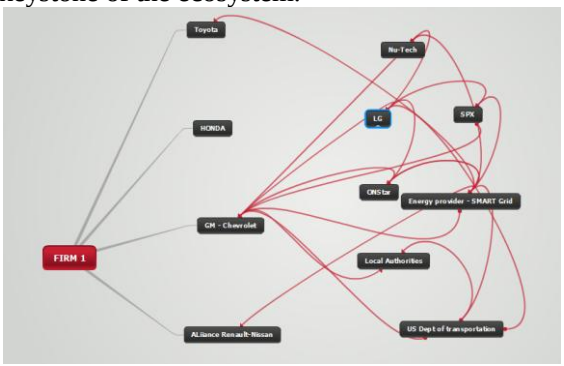


The EV ecosystem encompasses the actors and stakeholders involved into the deployment of electric vehicles, either as promoters or as critics and as such, various profiles, competing technologies, mature and emerging products or services, and the related industrial, research and lobbying structures. Customers play a central role into the development and health of the ecosystem.
Based on a detailed breakdown, it is possible to investigate precise links and segment of the thematic ecosystem, depending on the questioning and fields of investigation for a specific actor, which becomes the keystone or the leading firm of

the created business eco-system. For the thematic approach, the EV sphere is leading force of the dynamics. But still, this Ev sphere can be split in sub-group to highlight the batteries electric vehicle, the hybrid electric vehicle or the plug-in hybrid ones. This technical split is of relevance as long as an obvious competition between the technologies is recognized.
The eco-system relying on biological principals and organism, analogies can be made, mainly in terms of evolution and adaptive strategies. The thematic ecosystem changes and must be adapted to consider the evolution of roles and position, nature, strength and weakness of the various links.

4.2.3 Ecosystem A

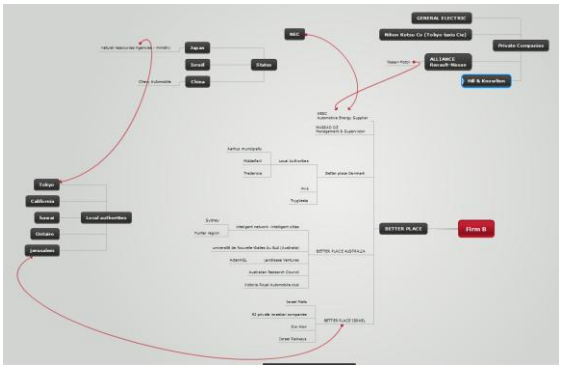
Firm 1 is an actor of the car industry. In order to refine its strategy in terms of positioning and hybrid vehicles deployment, it needs to understand the mechanisms, roles and organisations of the market. Its questioning is thus related to the potential development of alliance with one of its competitor. Its product and target are similar to GM Volt one's. Based on this characteristic, the Firm1 business ecosystem is created and highlights the existing network and the potential interactions with the various stakeholders and actors. Firm 1 is the keystone of the ecosystem.



The EV1, Chevrolet's electric car in 1996, was Chevrolet's first attempt at breaking an industry boundary. There were many factors that kept the EV1 from complete success, but main contributing factors were timing and establishing a frame of reference.
The Volt is establishing a frame of reference, leveraging points of parity, and tying in compelling differences with current competitors' hybrid models. These are keys to establishing product and brand success (Keller et al. 2002). Unlike the EV1, the Volt is being developed at the right time, when there are other vehicles setting the foundation and paving the way for its market feasibility.
Chevrolet is establishing a market that completely identifies with hybrid electric vehicles. Society is adapting to plug-in vehicles that may be more convenient for consumers, now is a prime opportunity to make Plug-in Hybrid Electric Vehicles (PHEV) available on the market. Also, Chevrolet is setting the foundation for fully pluggable vehicles to reach the market as soon as it meets its own requirements and the consumers' needs.
This type of strategy and innovation ensures longer lasting return on investment. The Volt can serve as the perfect short-term solution to a long term problem for Chevrolet, while taking a "namesake in fashionable and stylish
Vehicles" that promote gas-efficiency and future use of solely electric vehicles.
This is the primary growth strategy for Chevrolet. To expand Chevrolet's view in the marketplace as more than merely an American classic, gas-guzzling and nostalgic brand, Chevrolet is going to have to continue to invest in innovation. To become a market leader the company must be able to sustain performance above competitors in one or more disciplines or to create coopetition in order to ensure robustness and long term strategy considering added-value for and created by the consumers..

4.2.4 Ecosystem B

Firm 2 is a local authority which has defined a clean vehicles program and wishes to investigate the different actors (and their environment) that could be of interest to set up, develop and operate the project. Considering the interest of Firm2 in BEV, its questioning is related to customers awareness and trust, complementary services and infrastructures deployment. Better Place projects and profile are thus investigated in order to decipher states/cities/regions partnership and exploratory partnerships, organisation and services reliability.



Rather than aiming at a technological breakthrough for mass markets based on a "research-push" approach, some car manufacturers have started to experiment with more progressive learning approaches based on partnerships with energy providers and "market-pull" experiments in local markets confronted to specific usages. Renault provides a good example of such a strategic shift with their "Project Better Place" based on the concept of "quick exchangeability" for batteries.
The Better Place project is a limited, initially small scale experiment very different from previous attempts with large scale public-private partnerships for electric vehicles in the 70's in France. Building a subscriber based ownership model this project is challenging one of the dominant logics of the car industry. The main role of the car company is the role of integration both for the physical product and the software – designing the best compromise between performance and consumption.

The case of the Better Place is an exploratory partnership – in the initial stages.[8] Renault could not define in the initial stages what the outcome would look like, but they are developing the value to offer and reinventing ownership models and thus also their own role in the mobility system. the partners' interests and the common purpose are discovered in the course of action, instead of defined initially. The more exploratory the partnership is, the more reciprocal commitments and contractual arrangements have to be managed to guide the learning process.

5 Conclusion

The concept of eco-system allows to decipher environment, games and links between actors and to focus on the most pertinent axis for a dedicated firm (either private or public), without aiming at being exhaustive. The primary aim of the method is to give a clear picture of a multi-parameters and variables environment, in a fast way. It doesn't provide solutions, but it sustains strategic reflections, allowing creations of scenario according to the definition and parameterization of the different components. The necessary iterative process required to keep a relevant ecosystem can lead to several options relying on the identification of risks, opportunities, strengths and weaknesses. For instance: alliances between industrial partners, financial incentives plan decided by government or local authorities...Following the eco-system investigation, the selection of strategies/scenario is carried with the traditional strategic exploratory tools.

6 Referencing

Referencing sources in the paper shall be done with sequential numerical references, between square brackets.
Examples of citing references are given in the references section, for both books [1], journal articles [2] and websites [3].

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