

Connected community - a new approach to business strategy

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"...battles in the future will be waged between ecosystems or between ecosystem domains."

Marco Iansiti and Roy Levien. *Strategy as Ecology*

ABSTRACT

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Last 50 years have been witness significant changes in production processes fuelled by rapid technological advances, easy access to information and an ongoing trend towards globalization. As the level of commercial exchanges between countries grew, competition between firms became more intense, concurring to increased and improved product offers and need for continuous innovation. Most firms faced the dilemma of either becoming global players or vanish. In their endeavours to survive or gain supremacy on the market, firms further developed not only their product offering, but also worked out new business models and strategies that helped them to use their resources at their best and strengthen market position. Consequently, last decades have been witness significant shifts from traditional strategic approaches, based on vertical integration, towards promotion of collaboration and innovation in inter-firm relationships, and also visible trends towards diversifying firms' business strategies. As prestigious scholars had noticed correlations between company's success rate and its business model, the study of strategies employed by modern businesses became more wide-spread than before.

The present thesis tries to bring into light one strategic approach that is becoming more and more popular among firms: connected community, also know as open business ecosystem strategy. It involves collaboration between business partners and competitors, for the research and development of innovative products and services that suits best customer's needs. By fostering collaboration and sharing principles, the strategy changes somehow the paradigm that implies the fact that only fierce competition can increase a firm' market share, showing that cooperation and fair practices have potential to play a significant role in an enterprise success.

Using methods specific to case study research, the thesis make the reader understand what is a connected community strategy, how the strategy is applied in real-life situations, what are its benefits, and what kind of challenges could be meet when applying it. Aiming to offer an easy to understand guide about connected community strategy, the thesis combines a wide range of theoretical sources acquired from the works of well-acknowledged scholars, with practical examples from ARM Corp, the case-study company. By being able to offer a comprehensive image about the strategy, the thesis can be used as a stating point for the study of connected community concept, or for the ones willing to adopt an connected community approach in their business environment.

Keywords:

business models, collaboration, community of partners, innovation, knowledge sharing, ecosystems, strategy, partnerships, networks, open business ecosystems.

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1	Introduction.....	8
1.1	Research topic.....	9
1.2	Motivation	10
1.3	Research methods.....	12
1.4	Thesis structure	14
1.5	Company background.....	14
2	Theory	16
2.1	Definition of terms.....	16
2.2	Open business ecosystems.....	20
2.2.1	Origins.....	24
2.2.2	Business ecosystem description	27
2.2.3	Context.....	28
2.2.4	Strategic assessment	29
2.2.5	Why?	30
2.2.6	Capabilities at start.....	31
2.2.7	How?	32
2.2.8	Stages	33
2.2.9	Roles	35
2.2.10	Ecosystem health.....	41
2.2.11	How value is created in an ecosystem.....	44
2.2.12	How to manage an ecosystem.....	45
2.2.13	Challenges that can be meet when applying a business ecosystem strategy	50
3	Case Study ARM Corp	52
3.1	Conditions and capabilities at start	52
3.2	Semiconductor industry overview	53

3.3	ARM business model.....	54
3.4	How ARM manages its ecosystem	56
3.5	ARM's ecosystem characteristics	68
3.6	Conclusions	71
4	Results, Conclusions and Discussions	73
5	References	74

1 Introduction

The last thirty years have been witness rapid developments in communication and computing technology. Those facts have contributed to a fast rate of innovation that has never been met in human history. This aspect was brought considerable improvements and influenced most domains of activities.

Better and rapid communication channels have played an important role in the development of more open and relaxed trading regimes between countries. Together with fuelling commercial exchanges, competition among firms increased significantly, and most companies faced the reality of either becoming global players, rethink their strategies or vanish.

In front of competitors from around the world, businesses had had not only to lower prices, but to bring products that are innovative and best fit consumer needs, respectively to re-evaluate their entire value propositions. Consequently, in modern days there have been major shifts from the traditional ways of doing business, based on demand/supply side, to new customer-centric strategies, in which innovation have to be continuously pursued. Experience has shown that at the core of a successful company resides a cleverly built business model - that synthesizes and capture the way the company is building a sustainable competitive advantage. Businesses of our days are striving to develop new and ingenious business models that will allow them to outstrip competitors (Teece 2009 172). Consequently, strategists and scholars are confronted with new and innovative management techniques. The last twenty years have seen a resurgence in theories and analysis regarding inter-firm relationships, under various names as: firms networks, collective strategies, business ecosystem, alliances or community of practice.

The present report aims to present and offer an understanding about one of the newest and relatively little known business approach: Connected communities in business, also known as Open business ecosystem.

Let's take a look at the following companies: Yahoo, MSN, Google, Ikea, Walmart, Amazon, ARM, 99Designs, Shutterstock, Apple, oDesk, Innovation Exchange, Microsoft, Procter&Gamble, EMV, Siemens, Bosh, Intel, Freescale, MechanicalTurk, Caffepress, uTest, BookSurge, Lulu, Beta Test, Crowd Spring, Eclipse. The list can continue with hundreds other names. What does this list of eclectic firms have in common? The answer resides in the fact

that each of them is part of or has established a complex network of relations with businesses across their domain, the so called business ecosystem. The term business ecosystem is relatively new in business science and refers to a modern approach of doing business. It is about groups of complementary business entities that collaborate and share information with the aim of improving competitive advantage for themselves and their partners.

Networked economy has existed since the emergence of commercial relations. With the advent of fast communication channels, the opening of global markets and globalization it started to become a widespread business practice. Regardless of what the business practice is titled, a Networked economy, Community of Practice, or Open Business Ecosystem, it describes a reality of our days in business environment. Ignoring it will result in missing important elements of the actual business climate that will result in strategic mistakes. The reason for that is that most business entities are more or less involved in a network of suppliers, customers, service providers, stakeholders and many others. Even without knowing, most of us are either customers or contributors to entities that are parts of a business ecosystem. As an example, when buying furniture from Ikea we use the services of an endless list of independent designers, suppliers, logistic providers, all involved in a complex business network. As lansiti and Levien 2004 point out: "a firm that takes an action without understanding the impact on its many neighbouring business domains, or on the ecosystem as a whole, is ignoring the reality of the networked environment in which it operates." For this reason, developing and understanding the "networked way of doing business" is an important aspect of business studies.

In the first part of the thesis the reader will become familiar with the study's research topic, together with motivation, aims, objectives, research methods and basic literature review.

1.1 Research topic

Open business ecosystems also called connected community, refers to a strategic approach that involves collaboration between business partners and (in some situations) competitors, for the research and development of certain products, for the good of customers and all partners involved.

Unlike previously known business practices, where a high level of secrecy is maintained especially during Research and Development stage, the concept requires a deep level of

openness, collaboration and knowledge sharing between partners, and in some situations between business enterprises and general public.

According to James F. Moore 2013, open business ecosystem concept shows characteristics never met before in business organizations. Its features includes: an overall atmosphere that encourages differentiation and variety, flexibility in fundamental elements, tools and programs, free access for all members to common resources and a set of self-adjusting regulations build as platforms for variety and flexibility.

Despite strategy's various challenges, the Open business ecosystem approach seems to be effective in situations when there is a high level of competition on the market. The reason for that resides in the fact that close collaboration between partners conducts to better knowledge about market needs and future developments, concur to an increased level of mutual trust among partners and a high level of interdependence between network's members (Moore 2013).

As communication channels are continuously developing, more and more successful companies use it at least for some projects, while other business, like ARM Corp.- the thesis case study, based their entire strategy on open collaboration and building of a strong network of partners.

1.2 Motivation

This thesis started as an attempt to understand the concept of open business ecosystems, how the strategy is applied in real business situations, why a company should choose it and what are its benefits and challenges.

The author learnt about the concept during professional training stage at ARM Oulu, while getting familiar with firms' activities, from an e-book published on the company site: **Shared Purpose**, by James F. Moore.

At that time the notion of open business ecosystem was totally new to author, and, at first glance, too idealistic to bear results in real-life business environment. Despite that, ARM Corp. success story has proved to the contrary.

Studying it further, it became clear that Open Business Ecosystem is not only a strategic approach, but it is a different analysis framework that is not very well known or taught in business schools.

What made the concept interesting is the fact that it seemed to offer a different yet comprehensive approach for business analysis and strategy building than the "traditional" economic framework (Porter) that see business environment as consisting of competitors, customers and suppliers. Business ecosystem concept offers a larger perspective, including the infrastructure in which the company operates, complementary product producers, competitors, business partners, employees. It seemed to be an up-to-date tool in analysing modern business environment that is characterised by fast flow of information, a higher than before level of complexity and strong interconnectedness between industries.

During documentation stage it became clear that the subject is wider and it has deeper roots than first thought. As its origins rely in business theories starting from the beginning of the 20th century, it showed that the networked way of doing business is not a development of our days, yet in the 21st century new methods are used for old principles.

The research process revealed also that during last 30 years, different schools of thought used different names for closely associated concepts, like: firms' networks, alliances, open business ecosystems, and connected community, community of practice, open innovation, collective strategies, co-opetition, and business ecology. This fact had been quite confusing at the beginning of the research process, but had the benefit of offering a wealth of information about the subject. It is also a proof of scientific community's continuous concern about the networked relationships in business practices, and about the persisting idea that a business entity cannot be analysed outside its environment.

Because of the wide array of concepts describing the same phenomena, relevant information is quite scattered. Beside initial aims of the paper, the first part will provide definitions for the above-mentioned concepts in order to show similarities and differences between notions and made understandable theories that seems difficult at the first glance.

This thesis focus is on how ARM use open business ecosystems as a strategic approach and how the company manages its extended network of partners.

By explaining the concept, its roots, its structure/model, implementation process, benefits and challenges, by showing real-life examples of a highly successful company that have open business ecosystem at its strategic roots, this paper aims to offer a step-by step approach to the newcomers into open business ecosystems.

1.3 Research methods

The thesis aims to offer some insights about:

- What is an open business ecosystem?
- How the strategy is applied in real business situations?
- What are the reasons for a company to choose it as a strategic approach?
- What benefits it might bring to a business entity?
- What kind of challenges can be met when applying it.

The thesis employs qualitative research methods, particularly case study research, as it seems to be the most appropriate approach for using information acquired by observing ARM Oulu's operations.

As Yin 2003 points out, case study is the method of choice when study's research questions are **How** or **Why**, in situations in which the researcher cannot control the conditions, and when a contemporary phenomenon is studied. This kind of research approach is mostly used in psychology, sociology, political science, social work, business and community planning. In business studies it proves useful especially when the researcher's purpose is to investigate the structure of a specific industry or economy of a city or region, processes in an organization, management's strategic choices or industry stages (Yin 2003, 2).

The networked economy, based on a wide, fast and open exchange of information is a relatively new occurring process with original and specific developments arising day after day. Being an ongoing phenomenon most theories about it are based on direct observations and case studies.

As thesis main research questions are **How** the business ecosystem strategy is applied in real business situations? It tries to offer an understanding of **Why** the strategy should be applied in certain conditions, it is quite obvious that the most appropriate investigation method for it is case study research.

According with their purpose and research questions, case studies can be either **explanatory**, **descriptive** or **exploratory**. An explanatory case study is employed when the research is trying to find patterns in certain phenomenon and offer a model to interpret the data. Typical research questions for explanatory case studies are "what" questions.

A development of the explanatory case study, is the **descriptive** model - in which the researcher investigates the specific features of the topic. The research question is the same as in explanatory case studies, but with further implications, with a focus on the effects of the phenomenon.

Exploratory case studies are meant to find the reasons behind the events and explain why or how something occurs. Consequently, in this type of studies, the research questions are How or Why (Yin 2003, 1-6).

Taking into consideration study's main purpose, to offer an understanding of how the business ecosystem approach is applied and why it should be used, the thesis belongs to exploratory case studies.

A wide range of sources can be used in a case study inquiry, like: library research, interviews, questionnaires, observation, diaries, historical documents, or collection of current documents (Genres in academic writing: Case studies. Cited 4.09.2014). In the present study, the most used ones are: library research, interviews, direct observation and collection of current documents.

The theoretical background of the study had been built on a wide range of scientific articles and books written by recognised scholars, to name a few: James F. Moore, Marco lansiti, Henry W. Chesbrough, Carl Shapiro and Hal L. Varian. During research stage a large quantity of theoretical material covering a wide range of related topics, as business networks, open-source movement, open innovation, knowledge sharing had been collected. One of this work's challenges had been to sort-out and decide on what kind of sources to base its theoretical framework. Even though meaningful best-practices can be drawn from related topics, for the sake of systematization and comprehensibility, mostly materials referring to open business ecosystems had been used, with an emphasis on the works of the most accomplished theoreticians of the domain: James F. Moore and Marco lansiti and Roy Levien.

Valuable information about firm's management and best practices in managing a wide network of partners have been retrieved from company's web portal and wiki, case studies, financial reports, articles and interviews available on the internet, email communication with ARM's key persons and various web portals linked with ARM's products and activities.

1.4 Thesis structure

The first part of the work will try to offer insights about What is an open business ecosystem? with the help of scientific literature. The most relevant definitions and theories will be reviewed while having a glance at the origins of the concept. Business ecosystems models, creation, stages and maintaining will be explained in detail with the contribution of the most relevant theories.

The second part of the study is dedicated to lessons learnt from ARM experience with open business ecosystem approach. As a company that have creation and maintaining of a wide network of partners as their core strategy, experiences and observations from ARM Corp. will offer meaningful insights about real-life situations in which the strategy is applied, its benefits and challenges and about validity/invalidity of certain hypothesis.

The study tries to synthesize the most important theoretical approaches and illustrates them with practical examples, offering an easy-to-follow guide to open business ecosystem practices.

1.5 Company background

ARM Holdings is a British semiconductor IP company that designs and licenses scalable, energy-efficient processors and other technology products that prestigious semiconductor companies are incorporating into their silicon chips. These chips are vital components in the production of a broad range of mobile, consumer and embedded electronics products that are becoming more and more important in people's everyday lives (ARM annual report 2013).

The company had been established in 1990, as a joint venture between Acorn Computers, Apple Computes and VLSI Technology that aimed to develop a new processor type, the so called RISC (Poeter 2013).

Fuelled by a culture of continuous development and innovation and the establishment of a vast range of partnership with companies that are playing keystone roles in technology development, the company managed to become the world's leading semiconductor intellectual property (IP) supplier, with more than 50 billion ARM based chips used by companies around the world, and over 1100 licenses signed with about 300 companies (ARM web site. Company profile).

ARM's business model consists in designing and licensing of Intellectual Property, aka semiconductor chips and other technology products, to chipset manufacturers, that include their products (based on ARM's designs) on commodity or industrial goods. Chipset companies pay ARM a license fee for original IP and a royalty on every chip or wafer produced. Complementary to processor IP, the company offers support under the form of a large range of tools, physical and systems IP to enable optimized system-on-chip designs (ARM web site. Company profile).

ARM's designs can be found in a wide range of products, from mobile phones, to car braking systems and network routes. Company's business model is based on several principles, like: constant efforts to offer the best possible solution to customers, continuous innovation, close collaboration and partnerships and the idea that customer's success will be also beneficial to ARM. Consequently, ARM is striving to understand partner's needs and possible trends on the market in order to be able offer up-to date technology. To do so, in many situations ARM employees are closely collaborating with customers in product design and development. An important element in ARM's strategy is the development and maintaining of a wide network of Partners, the so called Connected Community, that together form ARM's business ecosystem (ARM web site. Company profile).

Because it is widely acknowledged that at the core of its strategy resides the open business ecosystem model, ARM experience in managing a wide range of partners, offers valuable insights regarding some of thesis research questions, like: How the strategy is applied in real business situations?, What are the reasons for a company to choose it as a strategic approach?, What benefits it might bring to a business entity.

2 Theory

2.1 Definition of terms

Open business ecosystem concept cannot be properly understood without a plethora of closely related notions. Almost each term presented below is a study domain in itself and provides valuable insights for those who want to get an understanding of "networked business relations". The theories behind those concepts are complementary to open business ecosystem and might be an interesting and useful project for someone to extract main findings from all those theories. Unfortunately this is not the subject of this thesis, so they are only mentioned there in order to demonstrate the amplitude of the subject, and increase the understandability of the text, since some of them are going to be mentioned or used in the rest of the work. The wide range of terms used to describe the "networked economy" are also a proof of a preminent trend in business strategy, and shows a constant concern in the academic circles for analysing it.

Business model and Strategy. Although the terms are more and more used in business circles, there is a no general agreement about the meaning and hierarchy of the above mentioned notions (Seddon&Lewis 2003). While some researchers see a clear difference between terms, some use them interchangeably. There are also researchers that see strategy subsequent to business model (Teece 2010) while others affirm the contrary. There is extensive literature written about the subject, but as a deep analysis of the subject is beyond the scope of this paper, the following paragraphs will present the most comprehensive definitions.

Strategy is defined as "the long-term direction of an organization" (Johnson, Whittington, Scholes 2008) or as "the determination of the long run goals and objectives of an enterprise and the adoption of courses of action and the allocation of resource necessary for carrying out these goals" (Chandler, 1963).

In the article "Business models, business strategy and innovation", published in 2010, David J. Teece describes in detail business models features and offer an comprehensive definition:: "A business model describes the design or architecture of the value creation, delivery and capture mechanisms employed. The essence of a business model is that it crystallizes customer needs and ability to pay, defines the manner by which the business enterprise responds to and

delivers value to customers, entices customers to pay for value, and converts those payments to profit through the proper design and operation of the various elements of the value chain."

Thus closely related, Zott, Amitt and Massa 2010 are emphasizing the difference between strategy and business model concepts, by pointing out that strategy of a firm is concerned mostly with value capture and gaining competitive advantage, while business models put a focus on partnerships, joint value creation and cooperation.

Networked organizations, are defined by Lipnack and Stamps 1994 as a constructs "where independent people and groups act as independent nodes, link across boundaries, to work together for a common purpose; it has multiple leaders, lots of voluntary links and interacting levels." "All networks and virtual teams are hierarchical in the scientific sense. Even the simplest ones are made up of interacting parts that are themselves complex - people or groups." Lipnack, JL, and Stamps, JS, A system science for networked organizations

Markets as networks concept has roots in economic sociology and had been mostly developed by the Swedish economists in 1980's. It came out with the assumptions that economic action is a form of social action and firms are seen as social constructions (Mattsson 1985).

Value network is the phenomenon in which a group of economic entities are collaborating and taking responsibility for the entire group, with the scope of delivering value to the end customer (Pagani 2013 cited Barnes 2002, Bitran et al. 2003; Pigneur 2000; Sabat 2002).

According with Gerald G. Marten 2001, an **ecosystem** is comprised by everything in a specific area, like microorganisms, plants, animals and humans. Another definition offered by Oxford dictionary says: "A biological community of interacting organisms and their physical environment."

Promotion and development of **Digital ecosystems** seems to be an important issue for European Union and other key institutions since it has a special portal dedicated: <http://www.digital-ecosystems.org>. According to it, a digital ecosystem contains self-organised digital infrastructures used by networked organizations with the scope of cooperation, knowledge sharing and development of new and innovative technologies.

Open Business Ecosystems. According with James F. Moore, that introduced the concept in the article "Predators and Prey: A New Ecology of Competition" published in 1993, an open business ecosystem is "An economic community supported by a foundation of interacting

organizations and individuals—the organisms of the business world. The economic community produces goods and services of value to customers, who are themselves members of the ecosystem. The member organisms also include suppliers, lead producers, competitors, and other stakeholders. Over time, they co-evolve their capabilities and roles, and tend to align themselves with the directions set by one or more central companies. Those companies holding leadership roles may change over time, but the function of ecosystem leader is valued by the community because it enables members to move toward shared visions to align their investments, and to find mutually supportive roles.”

Digital business ecosystems are usually known as business services and relationships between firms that takes place and are maintained with the help of an ubiquitous software environment (European Commission 2007).

Communities of practice are usually made by groups of people/workers that share knowledge (insights, lessons learned, hand-on expertise) about a certain subject. The practice is a trigger for innovation and it is becoming a necessity in modern enterprises (Fontaine, &Millen 2004) .

Open innovation. According with concept’s”father”, Henry Chesbrough, “Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology.” The subject is widely studied in our days, being seen as the engine of future technological and economic development, with prestigious institutions, like Berkely, having a study program in Open Innovation, and European Union with its Open Innovation Platform, to mention only few.

Collective strategies. Gueguen et all 2006, cited Astley and Fomburn 1983, consider collective strategies as: "the joint mobilization of resources and formulations of actions within collectivises of organizations".

Co-opetition refers to the finding that companies can be engaged simultaneously in competition and collaboration relationships. The concept, developed in mid-1990 by Harvard and Yale professors Adam Brandenburger and Barry Nalebuff, have roots in game theory and support the necessity of collaboration and cooperation in business relationships (Bengtsson et all 2000).

Shared Value is a concept developed by worldwide recognised authorities in competitive strategy Michael Porter and Mark R. Kramer. The concept emphasize the role of corporation in meeting the needs of society, and recommends a new strategic approach in which companies should pay closer attention to all stakeholders (Porter & Kramer 2011).

2.2 Open business ecosystems

Collaboration, open exchange of information, and trade, are not novelties. The entire past of humanity is about collaboration and free information flow since it is seen as an indispensable condition of evolution for human beings. Trade is almost as old as the existence of humans.

It is impossible to separate "contacts and collaboration" from people, since, as social animals, we seek contact with others and inevitably exchange info, compete, and learn from each other (Moore 1993).

There is not much information about how Assyrians were engaged in "networked economy", but it is well known and documented that since 14th century, in Italy, in Prato region, the entire textile production was based on close collaboration between a wide range of craftsmen: a tightly knit "ecosystem". It had been made by tiny companies, sometimes made by only 1 person, who were involved in weaving, carding, spinning, fulling, dyeing, merchants and intermediaries, in total about 24.000 people. It was a highly interrelated system, mostly based on unwritten rules and agreements and family relations, but several formal partnerships and contracts were also recorded. The system survived until modern days and it stays at the core of Italian supremacy in fashion and textile industry (Lansiti & Levien 2004).

The story can continue with the common-land administration in medieval Britain in which members were working together for a common benefit. The system was flexible enough to accommodate people with different skills while encouraging collaboration, partnerships and initiative (Williamson & De Meyer 2012).

Triggered by technological advances, a major shift in production methods and trade occurred with the advent of Industrial Revolution, when companies focused on economies of scale and vertical integration. Even in that age there were existing networks of firms, because every firm had its group of suppliers, service providers, and customers. To give an example, producer of automobiles Ford, with its network of suppliers and distributors. The difference consists in the fact that in those companies most innovations took place "in house" and collaboration and open exchange of information between business entities or stakeholders weren't the part of business strategies.

Today we are witnessing again major changes in production methods generated by the pervasiveness of information technology in our lives, globalization, opening of new markets and trade. The principles that governed 19th and 20th centuries economies become too narrow

and don't fit actual market's needs. Business people and scholars are testing and trying to offer solutions to the new situations.

It is also generally acknowledged that markets of our days are becoming more and more unpredictable. In their attempt to understand them, researchers found out that their "behaviour" is similar with the one that govern complex adaptive systems' reactions. Complex systems are made of many interacting components. Among them can be mentioned: insect colonies, ecosystems, brain, galaxies and internet. Even at the first glance they seem to be very different, studies had shown that complex systems show similar behaviour patterns, the so called "emergent properties". Because today's markets show an increased level of complexity, researchers in economic science suggested a "complex system approach" for studying markets and business strategy (Beinhocker 1999). As it can be understood from above, comparing a business ecosystem with a biology ecosystem is not a mere metaphor, as there are certain similarities between them, like self-organization, stability domains, and complex system cycles.

A high level of competition in the markets determined companies to pay closer attention to their stakeholders needs. A survey done by Economist Intelligence Unit among 660 senior executives around the world, showed that more than half considered that better engagement with stakeholders is good for the company. Among the benefits were mentioned: better research and development, improved sustainability, effective regulatory compliance and significant improvements in company's business model. Being closely involved with stakeholders is not simple, as their interests are not always similar. The relationship is a combination of partnership and confrontation, and must be maintained with care, since a single sag with even one stakeholder might cause considerable damage (Stern 2010).

Development of fast communication channels facilitated the emergence of new and innovative ways to produce value that mostly imply collaboration and free flow of information. To mention few: Peer-to-peer production, Open Platforms, Ideagoras, and Prosumer Communities (Erickson 2009).

Business communities kept pace with those trends and there are abundant examples of corporations that put partnerships and collaboration at the core of their strategies. Most of them already embedded the above-mentioned production methods into their operating models.

Scholars also had spent considerable amount of time describing and analysing the "information/networked economy" phenomenon.

As early as 1960's-1970's a research currently known as **Industrial Marketing and Purchasing**, or as **Markets as Networks** emphasized the importance of inter-firm relationships. The theory states that business relationships happen when firms interact between each other, and that companies are embedded within networks sometimes beyond their will (Ballardi 2008).

In the article "*The organization of industry*", published in 1972, George B. Richardson notices the tendency of firms to integrate when they need complementary capabilities that are close enough to be managed under common management and the fact that companies are engaging in cooperation relationships when they pose complementary capabilities that are dissimilar and need distinct management skills (Duguid cited Richardson).

Almost ten years later, in 1985, Granovetter states that social relations based on mutual trust are an essential part of economic relations (Ballardi 2008 cited Granovetter).

Although not necessary a book about business, Margaret Wheatley in the book "*Leadership and the new science*" published in 1992, acknowledges the importance of information sharing in organizations (Kane cited Wheatley 1992).

Carl Shapiro and Hal R. Varian in the book "*Information rules*" that appeared in 1999, offer a detailed description and strategic solutions for the modern days economic relations, that are based on fast and consistent exchange of information between business entities and stakeholders. Until a certain degree, their models and conclusions are consistent with theories about business ecosystems developed by James F. Moore and further described by lansiti and Levien. In fact, Shapiro and Varian's findings are complementary with existing ecosystem theories. That fact demonstrates that, even under different names, the authors describe similar phenomena and their findings are convergent.

Closer to our days, in 2011, Michael Porter and Mark R. Kramer, world's leading authorities in competitive strategy, developed the concept of **shared value**, in an attempt to redefine capitalism. Their thesis main lesson consist in the fact that companies can be profitable while bringing benefits to the society (Porter & Kramer 2011). To do so, firms have to maintain close relationships with their stakeholders, pursue innovation and embrace Corporate Social Responsibility. The concept is highly regarded in business circles, to the extent that **Shared Value** is part of curricula at Harvard Business School.

Organizational ecosystem concept goes well beyond economic area. There are well-known organizational ecosystems, like a country's health system, with its complex network of health centres, laboratories, hospitals, and research institutions, in which all "nodes" are involved in collaboration, information and service sharing. There are situations in which the network exceeds country's physical boundaries since major hospitals and research bodies are parts of even wider, multinational networks, in which information, technology and even personnel are exchanged.

Another example might be Interpol, second-largest intergovernmental organization after United Nations, with its huge network of members, to whom it intermediates communications and provides database assistance.

Inter-organizational collaboration is a vast domain in itself with valuable findings. Most of its best-practice methods can be easily transferred to business environment and successfully applied, since, at the core are human relationships and interactions.

The subject of this thesis is an analysis of connected community/open business ecosystem concept, a theory developed in 1993 by Harvard professor James F. Moore, that offers an human interaction perspective in analysing business strategy and performance. The author use biological ecosystem metaphor to illustrate the intricate complexity of links, interactions and relationships that take place between business entities. As in biological networks they interact with each other and their well-being is highly dependent of their counterpart's health (Heikkilä& Kuivaniemi 2012).

Open business ecosystem is seen as a network of firms that engage in relations of collaboration and information sharing with the scope to create value for their customers and increase their competitive advantage. The concept extract its roots from social sciences, biology, and game-theory and emerge in a well-defined hypothesis, meant to offer solutions to most problems encountered by modern-day enterprises and give also insights about future development of business/social enterprises.

Open business ecosystems construct offers also a modern/updated way to view and analyse business performance and strategy thinking, by seeing a firm from an outside angle that includes the social system in which it evolves, including partners, customers, service providers, and competitors. It emphasize the complex nature of relationships in which a company is involved, that can go to collaboration and competition simultaneously with the same firm, or to

very different roles that a company can play depending on circumstances and/or the nature of network it is involved in.

The theory emphasize that institutions have to collaborate and seek continuously improvement in their offering if they want to survive in a competitive and ever-changing environment. As information is the main commodity of our days, and it is exchanged at a tremendously rate, companies have to learn how to use it at its best.

2.2.1 Origins

As previously said, human history shows that any major technological advance has consequences in changes in production modes. The cause of Industrial Revolution resides in the development of steam engine and access to cheap and powerful energy, like coal and oil. After several decades in which companies focused on volume and economies of scale, another shift in production modes came together with the mass creation and access to information.

Production of information has characteristics that are not met in the manufacturing of other goods. According to Shapiro and Varian 1999, the creation of the first copy of an information good is expensive - large fixed costs of production, while marginal costs are low - e.g distribution costs. On the other hand, information goods are usually complex, needing more than "brute force" and well-established processes. Knowledge, creativity, innovation, and collaboration are essential ingredients in production of a successful information product. In the same time, information gets easily outdated or unnoticed in the informational avalanche of modern days. The different nature of the product called for distinct strategic approaches: the old good principles of focus on competitors-suppliers-and customers weren't enough: companies turned to look for complementors, forming partnership and establishing compatible line of products (Shapiro& Varian 1999).

The following paragraphs are going to show few milestones in the development of open business ecosystem as firm's strategic approach, as it had been presented by James F. Moore in the article " Business ecosystems and the view from the firm" in 2006.

The first signs of new business models development were already visible at the dawn of Information Technology era. In the late 1960's, IBM developed IBM/360, the first computer system based on modular architecture. Distinct tasks that made the system were divided into modules build by separate teams. The modules were "glued" together by a simple interface, that was easily understood by anyone and that allowed to add, interchange or extend parts to

the system. The result was one of the most performing computer system of that time. Few months later, a group of engineers who worked in the project, started a company that designed, produced and sold disk and tape drivers compatible with System/ 360. That was one of the first hints of the economy based on clusters of firms that was to come (Moore 2006).

In the same time, significant changes in Silicon Valley's business culture appeared, pioneered by Hewlett-Packard: the company assigned its projects to small teams of engineers unified by a culture of openness and collaboration (Moore 2006).

Another major step forward came ten years later, when Hewlett-Packard trained Steve Wozniak and his collaborators created the personal computer, inspired by IBM in its modularity. Apple corp. adopted best practices from the above-mentioned companies, while having an almost religious trust in their product. Their vision made several other companies to join in, creating a long-lasting base of collaborators and fans. As James F. Moore 2006 says: "marketing and visionary ideas are what attract contributors, including customers, to a business ecosystem."

In the late 1980's, first business ecosystem ideas were used for product development by two companies. In order to overcome their main competitors, IBM, Digital Equipment Corporation and Hewlett-Packard, that used only proprietary software operating systems, AT&T, together with Sun Microsystems decided to collaborate and create a new and interoperable hardware based on the Unix operating software system. Because Unix was widely licensed to Universities and has potentially many users, their plan was to contribute to the development of a community of small companies that offered interchangeable hardware. The strategic approach of AT&T and Sun Microsystems was that, instead to challenge the big players on their own field, to try to "change the game" and offer open alternative solutions to proprietary systems.

The outcome didn't go exactly according with the plan, as overall AT&T and Sun didn't fare as well as desired, but the open systems promoted by them convinced customers about the potential of open systems and forced IBM, Digital Equipment and Hewlett-Packard to bring out "open" alternatives to their product offer.

Even the establishment of the case study company, ARM Corp. is a pixel in a ever-changing picture of strategic movements in ICT industry.

The company had been established in 1990 as a joint venture between Acorn Computers, Apple Computer, and VLSI technology with the aim to develop a new type of processors, the so called Advanced RISC Machines (Poeter 2013). The new component was based on a product developed by Acorn Computers (ARM3) and that was already used on computers produced by the company. At that time Apple were willing to use ARM3 processors for its PDA's, but demanded to collaborate with a separate company from Acorn. Consequently the above-mentioned joint venture was established.

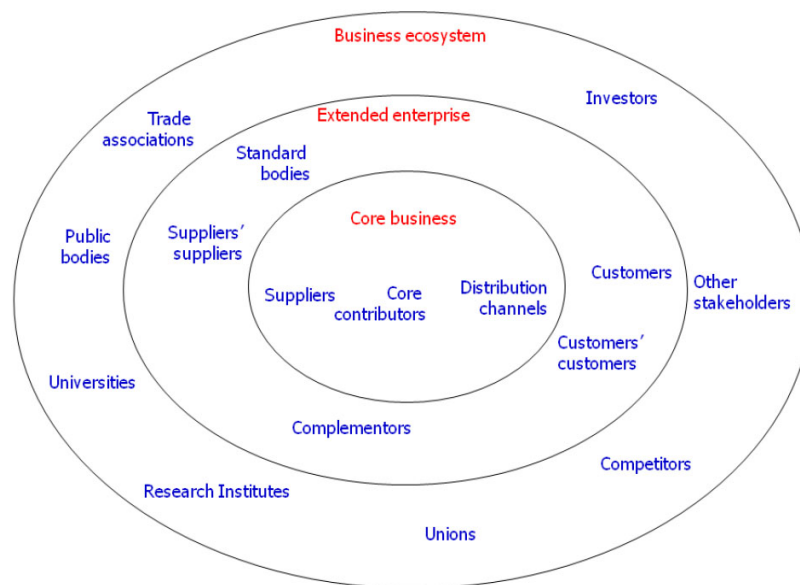
According with its CEO, Sir Robin Saxby, the goal of ARM was to "address and attack the growing market for low cost, low power, high-performance 32-bit RISC chips." At the beginning, the company was confronted with several strategic decisions, like to merge with a semiconductor company or one of the established computer producers, or to found a semiconductor company that will design and market chips and subcontract manufacturing. The winning alternative was to design a base technology and license the intellectual property rights. In order to secure its survival on the market, ARM established an "Partnership Model" that helped it to promote the creation of global standards. The "Partnership Model" stays at the base of company's IP Licensing model used today (Markus Levy The history of the ARM architecture: from inception to IPO).

The story shows an "ecosystem pattern". Three companies with a common purpose establish a firm with the aim to serve their needs and expand their ecosystem. At the beginning, the start-up is a niche player in the ecosystem, but it develops further the "ecosystem culture" and slowly starts to become a keystone player in its own ecosystem.

Business ecosystem's pioneers appeared in the information technology industry, but, as Teece 2009, page 179, says, successful business models adopted by one company are usually replicated by other firms. Consequently, the practice spread to other industries, fuelled by the incremental improvements in computer and mobile devices technology, fast speed of information and the wide use of social media, which happened in 2000's. Those facts made collaboration between people and firms easier than before. It became a usual practice of our days for companies to establish communication channels for their partners and customers, like intranets, forums, social media and web portals. Business ecosystems structures are wide-spread across global economy, from ICT, bio-technologies and pharmacy, to retail, automotive and maritime industry. In the following chapters we will present models, roles and practices in a business ecosystem.

2.2.2 Business ecosystem description

According with James F. Moore, who coined the concept in 1993, business ecosystem refers to "intentional communities of economic actors whose individual business activities share in some large measures the fate of the whole community" (Moore, 2006). It involves partners, collaborators, contractors, customers, complementors, investors, public administration bodies, research institutions and universities (Heikkilä& Kuivaniemi, 2012 cited Moore,1998).



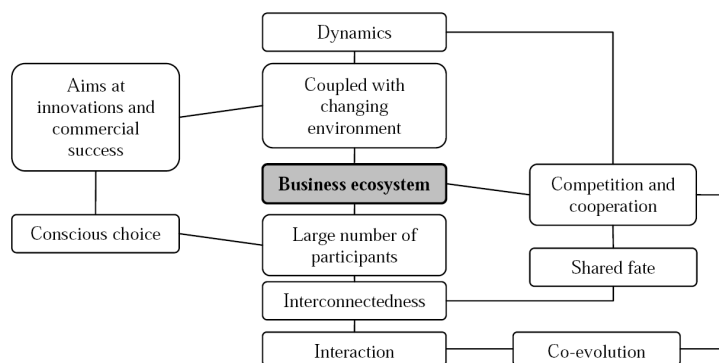
*Adapted from Moore (1993; tinyurl.com/cygyz6o)

Picture source: Heikkilä, Marikka and Kuivaniemi, Leni. 2012: The layers of a business ecosystem (Adapted from Moore, 1993)

The picture above offers a glance about a business ecosystem layout using the metaphor of a concentric structure of layers. The first one consist of the core business - in which the base business proposal and the most important contributors are involved. Second layer - the extended enterprise, is formed by standard-setting organizations, customers and their partners, complementors and a suppliers' suppliers. The outer layer is made by investors, competitors, public bodies, unions and trade associations, research institutions and universities (Heikkilä& Kuivaniemi, 2012).

The inner-forces that govern the birth and evolution of an ecosystem are self-organization, co-evolution, emergence - that combined make the system adaptable and resilient; and also competition and cooperation (Peltoniemi, Vuori, Laihonen, 2005).

A business ecosystem is the organizational answer to a changing environment, in which "head-to-head" competition proved inefficient (Moore, 1996). As its definition says, it is made by a large number of firms that deliberately engage into cooperation in order to foster innovation and gain benefits. As they cooperate and jointly develop products, their fate is highly dependent of their partner's well-being, mutual actions and the overall health of the network. Even though some ecosystem's members are competing for supremacy in the network, by the rules of cooperation, partners inherently shape each other and co-evolve. Also the external environment (social, political, legal) influence the ecosystem, and it is affected by it (Peltoniemi, Vuori, Laihonen, 2005). The picture bellow describes the main features and forces that take place in a business ecosystem.



Picture source: Peltoniemi, Vuori, Laihonen, 2005. Business ecosystem as a tool for the conceptualization of the external diversity of an organization

As characteristics of a business ecosystem have been described, in the following paragraphs the specific context in which adopting an ecosystem strategy might be beneficial for the company, together with reasons for being part in a business ecosystem are going to be examined. Then, the reader will learn about capabilities/qualities that a company has to possess in order to be able to be part or establish a business ecosystem and what are the necessary steps/stages for successful establishment of a community of practice. Valuable information about various roles played by ecosystem members and ecosystem evolution are going to be offered further.

2.2.3 Context

Ecosystem building is not "a one solution fits all" for guaranteeing success in business. Even James F. Moore, that wrote extensively about the concept, points out that the strategy can be seen mostly as an addition to the established strategy approaches, not a substitute (Moore

1998). There are several market contexts in which the traditional model of firm's organization works well and brings significant benefits, but also certain situations (most of which had been already exposed) in which the flexible, modular ecosystem type is better suited for the well-being of firm. Consequently, before adopting any type of strategy, managers have to thoroughly assess market and company's situation.

As Eric G. Beinhoker assesses in the article "Rules for surviving in a challenging business landscape", published in 1999, "in an uncertain world strategy is about really creating options and opening up new choices, not shutting them down." In order to do so, a company should look all the time for better solutions and never cease to evolve, have to be able to generate large numbers of new ideas and try them out in the market, to "invest in diversity"- seen as the act to pursue a wide portfolio of strategies, various experiences, diversity of people, and continuously stress-test its strategies.

A strategy based on ecosystem principles seems to be the right choice for the above-mentioned issues. Consequently, it is recommended in highly competitive industries, with an increased demand for complex, integrated solutions that require multiple technologies and competences. There are also domains in which knowledge is a critical resource and usually it is spread among various organizations and places across the world. Predominant in those areas are the so called "knowledge workers" that need to collaborate in order to use at its full potential the tacit or uncodified expertise that does exist in any enterprise. It is also the strategy of choice in highly uncertain business environments that requires versatility regarding value creation (Williamson&De Meyer 2012).

2.2.4 Strategic assessment

It is recommended for any company that wishes to join an ecosystem or improve its position in it, to try to understand the functioning mechanisms of an ecosystem, and particularly of the network it belongs to and assess own position within it. Visnjic Kastalli and Neely in their report "Collaborate to innovate", suggest that first, the organization should **map the ecosystem** by identifying the existing players, figure-out their business models, understand overall challenges in the network, break them down into smaller problems and figure out how partners' business models address them. Second step is to **analyse the ecosystem** by identifying the roles played in it, together with relationships established between members and their flow. Third step consists in **identification and implementation of innovation opportunities** by finding and

offering improvement solution within the network, or either support existing solutions or disrupt them if a better choice is available. Last step is **review and react** in which the firm should analyze possibilities for success and react to ecosystem's change.

2.2.5 Why?

It is widely acknowledged that companies that maintain close relationships with their partners are more likely to succeed in a uncertain business environment (McCann&Selsky 2012, page 1). The benefits of being part of a network are quite obvious, and in the following paragraphs the assessment will be further developed.

A company involved in a network has the possibility to market-test ideas or concepts even before starting to develop it. If at least some members of the community are interested, then, the concept might prove successful on the wide-world market. Besides that, in the interior of the network might be potential customers that eventually will contribute to product development with ideas or testing.

The most used mantra in business is: "Know thy customers." Close relationships with partners provides a fairly good level of knowledge about customer needs, since it imply a continuous flow of information between partners, to the extent that some products are jointly developed.

Membership in an ecosystem implies less risks (even if it is proved not to bring high short-term rewards) and brings benefits on the long run. In the above paragraphs it is shown that there is a higher probability to find customers inside the network for products developed with and for partners. Since similar companies generally have similar needs, the probability to find customers outside the network also increases.

In case of one ecosystem's keystones distress, other members can help the company to overcome the situation. By being member in several ecosystems (in which an enterprise can play different roles), the firm minimizes the probability to perish, since even it becomes irrelevant in one domain, it still can gain benefits from other ecosystems in which it is involved. As an example, well-known firms, like Microsoft are known that continuously scan the business landscape looking for high-potential ecosystems (Moore 1998).

Partnerships are cheaper. It allows the company to focus on its core capabilities while relying on other members for complementary aspects of its product. Then, collaboration is a trigger for innovation, since it offers platforms for all types of diversity. It is generally known that doesn't

matter how big the R&D budgets are, some good idea might "flow" outside the company's knowledge base. Ecosystem membership plays the role of putting together several companies' "knowledge banks" and usually, the whole is bigger than sum of its parts. Consequently, a networked company doesn't have to invest in R&D as much as a "traditional firm", since to some extent it can benefit from its partner's expertise. The company doesn't have to invest too much money in new product development or risky projects, since it is always possible to form joint ventures with its partners. The downside of this circumstance is that, in case of success, the benefits are not as high as in single-enterprise situation. By tacking part in other companies' product development, the firm can discover and "fill" niches it wasn't aware of. Because business relationships are already built, the sales calls and paperwork within ecosystem members are faster and cheaper. Ecosystem membership saves money in market creation, since other members are either part of it or are directly involved in market expansion (Moore 2006, page 69). The concerted efforts of a significant group of partners might concur to establishment of certain standards and practices. This fact saves time and money regarding product development, makes it more difficult market penetration by competitors with "un-standard" products, and decreases the probability for customers to adopt other solutions (Moore 1993, 1998).

2.2.6 Capabilities at start

As benefits of being part of an ecosystem have been explained, it is important to analyze what kind of capabilities firms should have in order to be able to function well in a network.

A company willing to be part or establish an ecosystem have to have a coherent strategic vision based on long-term goals. It is known that ecosystem and relationships building takes time, and the strategy itself doesn't bring big benefits in the short run. A company adopting an ecosystem strategy must have a future-oriented vision, meaning long-term survival and the will to play a role in shaping the markets of future. The vision have to be consistent enough to convince others about its viability and benefits and create a common vision. The company must have an internal culture on fairness and knowledge sharing - characteristics that are vital aspects for a well-functioning ecosystem. The management has to accept the fact that benefits will be more or less divided among ecosystem members and the idea that an ecosystem is jointly managed by its members (Moore 1993, 1999, 2006). Those assumptions match well with the "adaptive capacity" concept, developed by McCann&Selsky in 2012. In authors opinion, companies that have been able to cope well in turbulent business environments have what

scientist call "adaptive capacity"- seen as the capacity to adapt to or take advantage of new situations (Green Facts). It means that firms have to demonstrate agility and resilience in operating their businesses. Posing those qualities increase significantly company's competitiveness and profitability. It had been demonstrated that organizations with high adaptive capacity share certain characteristics. They are: purposeful, aware, action-oriented, resourceful and networked (McCann&Selsky 2012, page 29).

On the same line of thought, lansiti and Levien 2004 expose three closely bound concepts as: integration, innovation and adaptation as essential capabilities for the well-being of enterprises of our days. Authors state that integration capability, seen as a firm's ability to combine various old and new, internal and external competences, as an essential ingredient in pursuing innovation, while adaptive capacity is necessary to adjust new technology and business practices to firm's structure.

2.2.7 How?

In "The rise of a new corporate form" 1998, James F Moore provides a simplified scenario for ecosystem's birth. The author's assumption starts with a company that possess effective core competences which allow it to offer a highly-valued product to its customers. The success and high potential of the item attracts other companies to offer complementary goods. Customers receive an "enhanced" product, thanks to the complementary offers. Companies involved reinvest profits in further capabilities and/or in developing a new generation of the good, starting what Moore call a "continuous innovation trajectory". In the meantime, the firm's outcome is improved because of economies of scale. Because the product has been successfully on the market for a while, customers and partners became confident about the viability of the core proposition and the future benefits that it is going to bring. The "mother company" starts to invest some of its profits in leadership and support for the ecosystem, under the forms of establishing standards, acting as a arbiter in conflicts between community members and evangelizing activities. Consequently, members of the network and their stakeholders start to have a group identity and common vision.

Practicalities about how to build a collaboration network, are offered also by Darren Cambridge, Soren Kaplan, and Vicki Suter in their "Community of practice design guide". The brochure is based on valuable insights from several American higher education organizations involved in organization of communities of practice. Even though the guide is meant for non-profit entities,

it offers useful step-by-step advice that can be used also in the early stage of a business ecosystem building.

2.2.8 Stages

Ecosystem theoreticians agree that development of business ecosystems pass certain stages, each with specific features and challenges. Gaining knowledge about them, can help managers to get a better image about a company's position in business environment, and avoid most typically strategic mistakes. One of the most comprehensive description of ecosystem phases were given by James F Moore in several articles during more than two decades of research (1993, 2006, 2013). In his publications, the author give details about four periods in ecosystem evolution: birth, expansion, leadership, and self-renewal.

Ecosystem inception is seen by author as **birth**, in which a company with an innovative product is trying to define its new value proposition using feedback from suppliers and customers. The enterprise will be successful if it manages to define and put into practice the best value proposition for its customers. Collaboration with partners is important at this stage, since it can enhance the initial offer with some complementary assets. Now, the first steps in co-evolving partnerships are emerging. In the same time, some leadership initiatives might take place. Those could be the seeds for innovation and fast improvements, aspects that can put the entire ecosystem in an ascending path. Also in this stage, the firm is trying to acquire key customers and suppliers and secure significant channels. Even if the phase seems quite chaotic, the technological proposition is rather unsophisticated and relationships between firms are simple, with clear defined roles. Financing is rather difficult to obtain, and money is provided usually by entrepreneurs themselves, angel networks and early-stage venture capital organizations, or from universities, foundations and government. This is a critical point for an enterprise, in which it should protect its ideas from other firms that pursue similar offers (Moore 1993, 2006).

In the **expansion** stage, the company is already managing to draw attention about its value proposition to a significant number of customers and partners, and it is trying to increase supply in order to cover the market at its maximum potential. The network of partners is continuously increasing, becoming an important aspect of market coverage. In the attempt to stimulate demand, complementary products are developed and partnerships with other firms are sought. The challenge is to be able to meet orders, while looking forward to create future needs. As growth capital is needed, companies obtain funds from private equity firms or institutional

venture capital. The company is trying to keep its product on the market against alternative implementations of similar concept by trying to set-up and impose its product as standard in the market. Aggressive marketing and sales campaigns used by strong companies might concur to the fall of smaller ecosystems (Moore 1993, 2006).

When reaching the **leadership** phase, usually the company has established a thriving ecosystem around its value proposition and it enjoys a stable position on the market together with its benefits. Its bargaining power resides in the fact that it is the only one who possess something that the ecosystem needs. As alternative propositions continuously appear, it is vital to permanently pursue innovation and improvements in performance and price. By being a vital contributor to the ecosystem the firm can gain a higher market share from the total ecosystem value. It is the stage in which a company can become very profitable if it manages to play an important role in ecosystem's architecture. The firm can focus on creating a common vision and organizing the ecosystem, by stimulating the partners to work together in development of new products or complementary propositions and in improving the present offer. In some situations, the most successful companies can provide funding to less profitable ecosystem members that show potential or play a significant role in ecosystem's economy. Funding can take the form of cooperative marketing programs, technical, sales, and service assistance, sales incentives. Those practices are also used as incentives to join/remain in the network for distributors, resellers and retailers. There is always the danger that, in their attempt to gain strong bargaining power over the market, potent players can impose their vision/range of product in the ecosystem, sometimes blocking other companies that are seen as offering competing core products, or challengers in ecosystem's hierarchy (Moore 1993, 2006).

At **self-renewal** stage of a business ecosystem, usually the growth rate is slower and the threat of obsolescence does appear. Some companies concentrate their efforts in gaining a larger slice of the total profits of the ecosystem, sometimes reducing partner's profits. Powerful players are trying to eliminate or buy out rivals that occupy the same niche. Struggles for market and abuse of market power does appear at this evolution phase. Sometimes, new innovations and their afferent ecosystems put the network's existence at risk. Now is the time for ecosystem members to collaborate and put their innovation powers at work in order to track new trends, generate new ideas and renew their ecosystem. Occasionally, fundamental changes at ecosystem and organizational levels are needed in order to align the network with the new reality.

2.2.9 Roles

Business ecosystem's description will be incomplete without offering details about the roles or functions that firms assume when acting in an ecosystem. Being able to understand and properly assess own and various players' roles in the network, might offer valuable information about company's position at a certain time, and help in development of future strategy.

Ecosystem's development stages, together with roles and health assessment criteria have potential to offer an comprehensive matrix about company's position and might be useful tools in strategy building.

Most scholars that studied business ecosystems agree about leadership as an intrinsic condition for ecosystem development. A business network is usually started by a manager or a company with a comprehensive vision and valuable offer. This is the seed that starts disruption, change old paradigms and brings together new currents. The establishing vision has to be strong enough to attract collaborators, bring profits to all members and show potential in the future. A leadership position in an ecosystem can bring substantial benefits, but it is a challenging position since it has to set-up a general structure, establish key interfaces, manage a vast network of relationships and needs, in such a way that will allow self-organization in the future (Moore 2006, Williamson&De Meyer 2012). As a firm can be part of various ecosystems, it is not necessary that it has to be a leader in all of them. It can play a niche player role, in one, and it can be a keystone in other or even a dominator (Iansiti&Levien 2004).

In his works, James F. Moore gives details mostly about leadership: niche players/complementors roles in business ecosystem's organization, while in 1995, Power and Mills further developed the subject, adding dominator/landlord role to their theories (Göthlich&Wenzek 2004 cited Power&Mills 1995). Other researchers adopted the framework offered by the above-mentioned authors, developing further the concepts. As an example, Marco Iansiti and Roy Levien in the article "Strategy as Ecology", published by Harvard Business Review in 2004, offer one of the most complete foundations in discussing various functions that a company might play in a network of firms. Then the authors developed the concepts further in one of the most praised books about strategy, "The keystone advantage".

In their construct, the authors adopt the same ecological metaphor used by James F. Moore at the development of the concept, and use it for describing roles played by ecosystem's members. As leadership is an important aspect in business ecosystem's economy, the author's

debate extensively central figures: **keystone player** - on the positive side, and **landlord/dominator** - on the negative role, while offering detailed description of the most numerous type found in ecosystem economy, the **niche player**.

Keystone

The most important function in an ecosystem is called **keystone**, and as its name says, it is the element that keeps together other pieces of a construct. It is not necessarily the most powerful member of the community, but its position as a hub in the ecosystem's geography make it important for the survival of other members. As in natural ecosystem, a business network's keystone plays a crucial role in group's health and survival, because of its abilities in maintaining and improving network's stability. It can do so by mediating and regulating relationships among network's members. A keystone can increase the overall productivity of the network and actively contribute to the further development and well-being of other members, by providing platforms from which its complementors can evolve, encouraging collaboration and information sharing among members and providing fair intellectual property policies. In order to do so, the keystone has to be able to create and share value with the entire network, acting as a hub in it, while taking care to occupy only a small part of the network. A keystone position shows great potential for innovation enhancement, by facilitating connections between network participants, and continuous promotion and adoption of new technologies in the ecosystem. Overall, together with the focus on its core business, the keystone is highly involved in the management of internal and external resources and plays a central role in shaping the structure of the network.

The keys to a successful keystone strategy resides firstly in the ability to **create value within the network** - in order to motivate collaborators to remain within it, and secondly, in the capacity to **share value with ecosystem members**. The following success factors in creating a keystone strategy can be read also as insights about how to effectively manage a business ecosystem.

Regarding **value creation** in a business ecosystem, lansiti and Levien 2004, recommend building of operating leverage- seen as high-value assets that can be divided among members. They can take the form of either intellectual (e.g. commonly used software platforms) or physical (e.g. common manufacturing network) assets, or financial contributions - under the form of venture-investments. Very important in creating operating leverage is to be sure that the value of it, divided by the cost of creating, managing and sharing, increases with the

number of network members that use them. Only in this way the keystone player can be sure that it generates more value than he needs, consequently being able to obtain a surplus that can be shared with other members. There had been many situations in which the failure in calculating real operating leverage costs played a significant role in several ecosystems fiascos.

Value-creation can be enhanced by an effective management of physical and information centres and by influencing direct contacts to customer network. Those aspects are valuable not only for the firm itself but also for its community of suppliers. The same role can be undertaken regarding communication among group's members. Keystone's role in facilitating, centralizing and simplifying communication inside the network will reduce information gaps and market uncertainty for the companies involved.

Ecosystem's value can be increased by simply offering a centralized, uniform and simple way of storing and sharing information. It can take the form of API's, orders, purchase histories databases available to common use by ecosystem members. Among other advantages it increases network efficiency and offers incentives to remain in the network. By motivating partners to adopt specific information storing standards, the keystone player discourage network players to leave the network, because they will have to re-organize their entire information standards.

Value in the network can be increased by creating and providing platforms that reduce the complexity of the system, by offering simple, structured nodes/interfaces from where the collaborators can start to develop their add-ons. Platform creation have the potential to become an efficient and clear way to communicate how to employ keystone's technology and what is expected about it.

The keystone player has to be able to produce, package and distribute state-of the art tools and platforms for maintaining and promoting innovation in the ecosystem. If the ecosystem is able to remain competitive as a whole by offering innovative products, its productivity will increase, making it attractive to other members and increase fidelity among old ones.

System's productivity can be maintained also by the establishment and management of common performance standards. Consequently, the overall quality of ecosystem's products will be retained and a general good image for entire group will be established.

As important to **value creation** in ecosystem success is the aspect of **value sharing**. It is the feature that differentiates the keystone for a dominator. It is generally known that the strength of the network resides in keystone willingness/capacity to share benefits. If it fails to do so, some partners will collapse, while others will switch to other/competing ecosystems. Value sharing can take the form of creation of commonly used platforms, software, intellectual property or information licensing, or joint sales and marketing campaigns. Special attention has to be paid in assessing the real cost of value sharing with each individual partner. In order to bring benefits, it has to be very low and must decrease with the size of the network.

Landlords and Dominators

To remain consistent with ecology's metaphor, it can be said that **landlords** and **dominators** are "business ecosystem's predators", or "failed keystones". Those instances understand network's potential, but use it for their own good only, making the entire group unsustainable and finally causing its collapse. Initially their start is similar to keystones: they create a network and maintain competitive advantage by placing themselves at strategic hubs in the network. The failure point came when they don't show willingness to administrate the ecosystem and in creating and sharing value with their counterparts. Landlords and dominators have several characteristics in common but there are also aspects in their behaviour that arose the need to place them in different categories.

What is specific for a **landlord** is the fact that, placed at a significant hub in the ecosystem, it doesn't show the aim to integrate forward to control a bigger part of it. The landlord extracts so much value from the network that on the long run it will make other members business unprofitable. Consequently, some of them will leave the group or will go bankrupt, leaving the landlord without revenue sources and concurring to its failure.

Motivated by the purpose to maximize value creation and value capture, the **dominator** is trying to control the ecosystem by tight vertical and horizontal integration, and by creation of closed architectures that don't allow complementors to create or extend their products. As keystones and landlords, the dominators are occupying vital niches in the network, but they have the tendency to expand aggressively into other markets and eliminate other companies. On the long run, its behaviour will reduce the diversity of the ecosystem and have repercussions regarding its robustness, making it vulnerable to threats from other ecosystems.

Ansari and Levien argue that although the landlord role is mostly toxic to ecosystem's health, a dominator is still able to play a constructive role. Their positive side resides in their capabilities in value creation and ecosystem management, while their downside stays in the fact, by their attempt to control everything in the network, they reduce diversity, collaboration and possibility for innovation.

Niche players

Niche players, also called by other theoreticians complementors, are highly specialised companies that provide products or services to keystones/dominators and/or other ecosystem's members, taking advantage of platforms and other benefits provided by the network. They form the bulk of the ecosystem (in ICT industry the ratio between niche players and other type of companies are more than one to ten) and, despite their vulnerabilities, play an important factor in network health and evolution.

In our days in which complex products are rarely built by a single company, niche players provide the "bricks", each with an unique scope and specialization, that are incorporated in the wide structure that is provided by the keystone, and which, entangled together, form a finished product. As in a building, the overall quality and success of the product depends on each component's superiority, while at the same time, a high level of dependence between partners, especially between niche player and keystone does exist.

Niche players are usually engaged in symbiotic relationships with other ecosystem members that possess complementary features. This fact provides several advantages, as the possibility to focus on its core competence, while other functions, like sales or marketing are provided by other companies; or to continuously pursue innovation and excellence in a narrow field, aspect that, in itself is a strength, because it makes the company irreplaceable. In the same time, symbiosis with a strong firm makes niche player quite vulnerable in front of technological changes or dominant behaviour.

The complementor faces a strategic dilemma between strong relationships and collaboration with a powerful company - fact that is known that have potential to bring economies of scale together with various other advantages, and the risk of being "hijacked" by the dominator, or share its fate if the company is taken over by a competitor. The right answer to the above-mentioned challenge is to adopt a strategy which will allow to take advantage of the efficiencies

offered by close relationships with several partners in the ecosystem, while wisely controlling the dependencies created between firms. The task is made easier in our days by the emergence of loose coupling technologies - interfaces that permit interconnection of various systems in ways that they depend on each other on least extent practicable (TechTarget 2014).

The need to differentiate themselves among other firms, combined with the antagonistic requirement of building complementary products and support other companies, had resulted in successful niche players developing strongly differentiated and innovative core contributions to their ecosystem.

There are few aspects that characterize a successful niche strategy: **value creation**, **value sharing** and **risk management**. As previously stated, **value creation** is among the most critical one.

A niche player can create value by finding and mastering an unique and sustainable specialization, one that is needed by other firms and cannot easily replicated, while taking advantages by the opportunities offered by the ecosystem. It can choose to be focused and lightweight while using state-of the art tools, services or technologies offered by ecosystem's complementors.

Most products are easily replicated in our days, and competition among niche players is also high. In order to remain the company of choice for its partners, the firm have to continuously pursue innovation, pushing technological advances towards the edges. The ecosystem paradigm offers unique conditions to achieve innovation, since it offers possibilities for putting together brain power, competences and diversity of views from a wide range of business entities. A company that use efficiently ecosystem's innovation potential is more likely to reach unknown boundaries in its domain, thus develop new product propositions that will concur to ecosystem's development and perhaps became a keystone in itself.

While value creation makes the company cost efficient and reliable to its partners, it cannot overlook to take into consideration the fact that it should also **extract** and **share value** with its partners and wisely **manage risks**. A niche player faces always the danger of domination from keystones and dominators/landlords. Those companies can extract too much value from the niche player while offering little, or tend to make the complementor dependent on their platform in a unsustainable way. Even if seems beneficial in medium-term, too strong relationships between a dominant company and a niche player is the main cause of niche player's failures.

As much as offering value to the network, the complementor has to be sure that it extract/benefits from it, otherwise its business model becomes inefficient. The answer to those challenges might stay in pursuing collaboration with several companies/keystones at the same time, and not building all its capabilities for one single platform. In this way the firm can remain flexible and have the chance to easily turn to other keystones. This strategy might be beneficial not only for the niche player itself, but for the entire health of the ecosystem, since in this way, the dominant tendencies of keystones can be kept at bay, and the mass of nice players can exercise power/influence ecosystem evolution.

Visnjic Kastalli and Neely provide a more elaborate classification of roles played by members of an ecosystem. The researchers found no less than ten roles placed in four categories, according with the contribution of the player.

In a network can be met **providers of resources** for ecosystem's problems. Among them are: talent (universities, colleges) and capital players (private investors). Players that are **solvers of ecosystem's challenges**. To name few: scales aka big companies, niches - small firms and innovators - represented by entrepreneurs. **Constructors of complex solutions** embodied by infrastructure providers, connectors and facilitators. The last category, **architects** is personified by the **hub**, that, together with **promoters** and **influencers** are involved in running the entire ecosystem.

It can be noticed that lansiti and Levien and Visnjic Kastalli and Neely classifications have much in common and further developments regarding ecosystem's classification can be found, since, as in natural sciences, there is no network alike, and each have its particularities and roles.

The sensitive aspects of ecosystem's health will be covered in the following section. As in the previous one, the main source for this part is "Keystone advantage" written by Marco lansiti and Roy Levien, since it offers the most detailed analysis of business network's health assessment.

2.2.10 Ecosystem health

No company can function in a vacuum. Its performance is determined not only by its competences, but also by its interactions with the environment. Moreover, its actions/strategies influences the network. In order to understand the impact that each network's component can have on each other, the whole complexity of an ecosystem has to be taken into consideration

and accept that each domain that it is made of must be healthy. Only in this way the ecosystem has premises to function properly.

Keeping in mind the intricate structure of a business ecosystem, developing health assessment criteria is a sensitive process. By analyzing several ecosystem with hundreds companies involved, Marco lansiti and Roy Levien had developed three main analysis criteria: **productivity, robustness and niche creation.**

Productivity. It is known that productivity is also a criteria for measuring biological ecosystem's health. The same measure can be used in assessing business ecosystem vitality, but adapted to domain-specific criteria. Productivity in business should quantify the efficiency of the network in converting innovation into reduced costs, new services, products and functions. Inasiti and Levien 2004 identify three business-related criteria for evaluating a firm's performance.

The first one factor for productivity has much in common with traditional profit measurements, as ROIC. It refers to the **capacity of ecosystem's members to convert factors of production into valuable work.**

Another important aspect is to understand **how the productivity changes over time.** As not all industry areas show the same level of profitability, business networks display significant differences in productivity across time. A strong correlation between network member's ability to gain sustainable profits over time and ecosystem's sustainability have been found. Changes in productivity offers insights about ecosystem's potential to adapt to changes in environment.

Third aspect refers to **ecosystem's capacity to share and promote innovations.** If the network is built in such a way that it easily allows collaboration and free flow of ideas among members, then innovative products or services will appear, together with efficiencies and economies of scale. These facts will concur to an increased overall productivity and sustainability for the entire ecosystem

Robustness of a business network is seen as a capability to endure environmental changes and disruptions while maintaining its basic structure. The benefits offered by a robust ecosystem are many and quite obvious, among them being the fact that it offers stability and a predictable environment to companies involved.

Ecosystem's robustness can be analysed using several metrics, as **survival rates** - seen as the capacity to nurture the thriving of various types of firms that fill a large range of niches and are able to go thru several disruptions.

Another factor that offers insights about ecosystem's robustness is the **persistence of ecosystem structure** - the capability of network structure's to remain stable despite external shocks. Even though that links inside the network are continually changing, its inner structure remains stable and foreseeable.

Ecosystem's capacity to re-use built-in capacity and adapt its functions when technological changes occurs is called **limited obsolescence** and it is another factor that increases network's robustness.

The last but not least, factor in assessing robustness in an ecosystem is to figure out if it carries on in **offering consistent and continue user experiences and use cases to its customers**. Even through technology continually evolves, users enjoy finding the same conceptual models/interfaces metaphors they are used to in the new products and services. A robust network is well organised enough to provide over time a coherent conceptual models to its customers.

The above-mentioned criteria are not bullet-proof evidences for an robust ecosystem in any circumstances. They can be taken mostly as guidelines in analysing network/company position at a certain time. Moreover there is strong evidence that ecosystems in which stable hubs/keystones exist, enjoy enduring structure and predictability, and are more able to fare well in uncertain conditions. Hence, ecosystem robustness is enhanced by the coherence and structure that one or more effective keystones are able to provide.

Niche creation Although diversity is considered in scientific literature the sign of a thriving biological ecosystem, it is not exactly the same situation with business ecosystems. There were well-known circumstances in which highly diverse business networks were not properly performing. In order to thrive, business ecosystems should maintain over time a fair level of meaningful diversity by creating new and useful functions, aka niche creation.

Niche creation can be measured by two parameters that are also linked with productivity measures. First one is **growth in firm variety** - seen as the number of new enterprises created in the ecosystem during a certain period of time, or said in other way: how many innovations are materialised into new business entities during a given time frame. The second parameter measures the number of latest product developments, technological improvements process efficiencies during a given period of time and is known as **growth in product and technical variety**.

Despite the fact that thriving ecosystems should display a wide range of niches over time it is not necessary that their number to grow continuously. As technology advances, some niches will perish while others will endure. As with biological ecosystems, reduced diversity in one domain might concur to creation of new options in others.

2.2.11 How value is created in an ecosystem

Previous sections had offered also valuable insights about value creation in a business ecosystem. To summarise and add up, in the following part main value creation sources in a business ecosystem will be presented.

Borgh, Cloudt, Romme, 2012, inspired by Amit and Zott 2001, identify four sources of value creation on business networks: **novelty**, **complementarities**, **efficiency**, and **lock-in**. It can be seen that they match quite well and complement lansiti and Levien theories about ecosystem health criteria and firms roles. Value creation is seen as an indispensable ingredient in ecosystem' success. Innovation, niche creation, collaboration and value sharing are praised as key components.

Novelty means the ability to produce value by bringing out new/innovative products, services, production processes, interactions, firms or even business models (Borgh et al., 2012 cited Amit and Zott 2001). It is usually enhanced by ecosystem's overall culture of joint collaboration because it does have potential to create right conditions for starting up new enterprises (Borgh et al., 2012 cited Dettwiler et al., 2006), and facilitate partnerships between ecosystem members. Proper management of property rights, finding ways for tracking innovation capabilities and performance inside the network, can increase chances for novelty creation (Borgh et al., 2012).

Complementarities. Value is created when ecosystem's partners join complementary resources resulting in vertical and horizontal integration, economies of scale, increased efficiencies. The phenomenon is facilitated by the existence in the network of commonly used platforms, direct communication channels and unrestricted, easy and fast flow of information between members. Those facilities have the role to increase ecosystem's reputation as value-enhancing tool, thus attracting more participants (Borgh et al., 2012).

Efficiency. According with Borgh et al., 2012 cited Williamson, 1985, "Transaction efficiency increases when the cost per transaction decreases." Firstly, transaction costs can be reduced by access to shared resources provided by the ecosystem. Secondly, as information is the key

to increased efficiency in our days, a network can be seen as a tool that enables better access to information. In an ecosystem it is enhanced by the existence of build-in information channels, platforms, databases, wikis, that allow access to a wide range of knowledge, contacts, and data, facilitate relationships between members and result in reduced search and bargaining costs. In order to improve efficiency, information asymmetry between members can be reduced by offering comprehensive information about network's activities, resources, and contributions and by transparent access to info to all members (Borgh et al., 2012).

Lock-in. In ecosystem' metaphor, lock-in is understood as partners' propensity to stay in the network and take part in transactions using group's facilities. Usually, a stable, trustful network, attract other members, consequently lowering transaction costs for all (Borgh et al., 2012 cited Katz and Shapiro, 1985, Amit and Zott, 2001). Fair and trustful practices among ecosystem members are another factor that motivates firms to remain inside the network (Moore 1998, Borgh et al., 2012 cited Fichter, 2009). If firms are offered the opportunity to use ecosystem's services according to their needs, they are more willing to remain within its limits. Internationalization, by giving access to wider markets, suppliers, and info is another factor that makes especially small firms to stay within the ecosystem (Borgh et al 2012).

2.2.12 How to manage an ecosystem

Although in previous sections various insights about business ecosystem management can be found and the next section of the thesis, Case Study ARM, is going to pay special attention to ecosystem management issues, the following part is going to synthesize some directions to which companies should pay special attention, together with best management practices recommended by several scholars.

Göthlich and Wenzek 2004 asses that in order to successfully adapt a keystone strategy, firms must adopt appropriate culture. Therefore, Williamson and DeMeyer 2012 point out several **core cultural characteristics** that companies successfully involved in a business ecosystem share, and made them to behave in a different way than other firms: Those entities gained an understanding that knowledge is abundant and it is dispersed both inside and outside the company - and can be increased by collaboration with others. They also grasped the idea that the path to success is by creating value for the customers - and it can be done efficiently by

joint collaboration, or, as Moore 2013, points out, "a culture of shared learning, shared work and shared products".

The important role played by ecosystem's leader is emphasised by most theoreticians. Even so network management is not solely the task of the ecosystem's figurehead - niche players playing a crucial role in shaping its destiny, the leader is the one that provides the "growing seeds" of the network, by offering the initial value proposition, visions and platforms for further development, and plays a crucial role in managing it (Moore 1993, 1996, 2013, lansiti et al 2004). As a business ecosystem can have several keystones/dominators, they should share a common vision regarding network's future and jointly manage it.

Another key point resides in **creating and maintaining a shared vision/purpose for ecosystem partners**. James F. Moore in all his writings about business ecosystems is almost an evangelist of this idea, but many other scholars share it. When companies involved are able to develop a common vision, assume it, and try to put it into practice, then the ecosystem as a whole and most involved partners have good chances to be successful.

Moore 2006 emphasise the need for **continuous dialogue between companies and customers** in order to be able to grasp customer needs and provide successful products.

Borgh et al 2012 asses that ecosystem management require **creation and support of an environment in which collaboration between various firms can take place and evolve**. As lansiti and Levien 2004 offer an comprehensive structure for understanding ecosystem environment, in the following paragraphs their framework will be used, together with conclusions from other scholars. Author's findings show that network management is be based on three pillars. First one is **architecture, platforms and standards**. Second one is **integration** while the third one resides in **market management**.

Together with creation of successful core product (Moore 1993), another significant condition for creation and proper management of an business ecosystem, consist in the conceptualization, creation, delivery and management of **architectures, platforms and standards** to other members of the network (lansiti& Levien 2004, Moore 2006, Williamson&DeMeyer 2012, Pagani 2012). **Platforms** are understood as a base of common components, solutions or interfaces (that provides solution to existing problems) produced by the "core company" and put at the disposal of all ecosystem partners for the development of complementary products or services (lansiti& Levien 2004, Moore 2006, Cusumano 2010,

Borgh et al 2012). **Architecture** refers to the structure and operating logic of the platforms. The crucial role played by platforms in an ecosystem are obvious, since they provide the structures and premises for value creation, value capture and network development (Iansiti & Levien 2004, Williamson & DeMeyer 2012). As **platforms** have the potential to shape and control the ecosystem, their management provides significant advantages to the keystone but pose also several challenges. Because of their flexibility and value creation potential, well build platforms attract various types of new partners and increase lock-in potential for existing ones - the so called "network effect" - making the network stronger and healthier (Iansiti & Levien 2004, Cusumano 2010).

At their base, **standards** are interfaces that enable interoperability between organizations or between tools or technologies. Beside their usefulness inside the network (allow members to efficiently interact, simplify common tasks and increase interoperability - contributing at increased efficiency inside the network), creation, promotion and establishment of standards across the ecosystem provides significant competitive advantages to the entire ecosystem. This is the reason why modern-days corporations engage quite often in "standards wars" (Iansiti & Levien 2004).

Ecosystem management is reinforced also by **integration**, **innovation** and **adaptation**. As a business ecosystem is usually made of tens or sometimes hundreds of companies, **integration capability** is the "glue" that keeps all parts together. It is the leader's ability to combine internal and external competences, harnessing collaboration, together with a rapid and efficient flow of information inside the network (Moore 1993, 1996, 2013, Iansiti et al 2004, Williamson et al. 2013). Perhaps it is one of the most important aspects that differentiate open business ecosystem strategy from other business tactics and it is offering competitive advantages to the ones that adopt it.

Mastering integration capability plays a tremendous role in fostering **innovation** inside the network by putting together existing expertise with new ideas (Iansiti & al 2004, Borgh et al 2012). It helps to gain across-the-network capabilities, bring-out new products and improve performance, inherently contributing to value creation and to ecosystem's well-being (Iansiti et al 2004, Moore 1993, 2006). Properly implemented, it allows the ecosystem to be continuously enriched with new concepts and technologies. It also enhance modularity, making the ecosystem adaptable to environment challenges and increase chances for the continuous renewal of business proposals (Iansiti et al 2004, Moore, 2006). Borgh et al 2012 mention that

the proper management of intellectual property rights and proper ways to track innovation and performance can significantly improve ecosystem performance and renewal capabilities.

If ecosystem leaders are able to provide fast, convenient, and fair access to information to all network members, communication between partners is going to be improved, processes can go faster and significant reduction in transaction costs can be achieved (Borgh et al 2012).

Market creation. As Moore 2006 emphasises, one of the ecosystem members' priorities is to develop and expand existing markets in which their present capacities and future potential to be properly exploited. On the other hand, ecosystem establishment is one of the recommended tools in managing complex markets (Moore 2006). There are firms whose domain of activities involves the aspect of establishing connections with tens or hundreds of partners. Therefore, those companies are challenged to play in more complex markets than before globalization era. Especially, being part in one or more ecosystems requires a good understanding of forces that shape markets and their management. Typical for ecosystems are the so called "N-sided" markets - that have the role in realizing connections between two or more different groups of customers to sellers. Those markets are usually more difficult to rule, because of the complexity of interactions that take place inside them. Typically, keystones are involved in the design and management of ecosystem's marketplaces, while niche players are heavily influencing them. In order to bring benefits to the network, continuous investments, management effort and improved operational capabilities are required (Iansiti et al 2004). On the other hand, configuration of the behaviour of groups and organizations outside the company limits, aka market creation is proved to bring considerable benefits (Moore 2006).

The following paragraphs will try to offer some insights about best practices in designing and running out markets in efficient ways.

Complex markets are sustainable only if they **create value at a reasonable cost** (Moore 2006). In order to do so market transactions must be realized with minimal internal manageable costs and maximum scalability. This fact again emphasizes the importance of common used tools and platforms design in attaining transaction efficiencies (Iansiti et al 2004).

Gaining liquidity at a satisfactory operating costs is another factor that helps to add value within the ecosystem. It should be done when the market is underdeveloped and it is easy to manage. Successful companies have managed to achieve liquidity first while maintaining a low level of investments. When the market showed its real potential, they scaled up. One of the

most efficient ways to achieve liquidity is by adopting proper pricing policies. In fact, it is well acknowledged that pricing for complex markets is a challenging task and requires advanced pricing policies (Iansiti et al 2004).

In order to be able to capture value, the leader company must **offer a product or service valued by customers** - one that is difficult to be replicated by others in and outside the network, and develop mechanisms to gain benefits from it, like license fees, royalties, increased margins or sales volumes (Williamson et al 2012).

Availability of a diverse range of applications and hardware configurations is known to be an important factor in the administration of market relationships (Iansiti et al 2004, Moore 2006).

Plan a flexible market, with modularized contributions in a way that it will be able to sustain significant changes (Iansiti et al 2004, Moore 2006).

In order to increase ecosystem resilience, network leaders should be aware/look after experimental markets, estimate their sustainability and show eagerness to adopt them (Iansiti et al 2004).

Ecosystem leaders have to establish a **coherent, clearly defined market governance structure** and policies designed in such a way that it should function independent of specific network members. It must allow a **equitable participation and market shaping for all members involved** (Iansiti et al 2004, Moore 2006). If ecosystem's parts are well defined and documented, if it provides unrestrictive business contracts, the network is open to new entrants and have potential to be precompetitive and pro-innovative (Moore 2006).

The previous aspect goes hand in hand with **creation and management of trust** - that is seen as an essential ingredient in the development and feasibility of an ecosystem. It plays an important role in lowering operating costs and risks, attract partnerships, concur to less effort in managing relationships. (Iansiti et al 2004, Borgh et al 2012, Moore 2013). It is generally known that trust levels increase with the number of continued interactions between firms (Borgh et al 2012 cited Nooteboom et al., 1997).

2.2.13 Challenges that can be met when applying a business ecosystem strategy

Despite its various benefits, being involved in an open business ecosystem is not a challenge-free task. With the help of contributions from acknowledged scholars, the following paragraphs are going to bring under reader's eye the most well-known difficulties met by companies that base their strategy on networks and collaboration .

James F. Moore 2006 admits that the main challenge of operating in a business ecosystem, especially for a ecosystem leader, resides in the **management of a complex, multi-contributors systems**. Other scholars share the same opinion acknowledging that: "project success depends on the ability of the partnering organisations to assess the absorptive capacity of a firm; balance internal and external investment; make forward-looking decisions; communicate project goals to avoid inefficiencies and misunderstandings; overcome the "not invented here syndrome; and rationalise management accounting systems to provide consistent data (Kleyn et al cited Cohen and Levinthal, 1990; Damanpour, 1991; Brown, 1991; Ali et al., 1993; Fiol, 1996; Kamien and Zang, 2000; Hargadon, 2003).

On the same line of thinking comes the issue of **managing cooperation** that is sometimes jeopardised by internal competition between firms. Moore 2006 assess as the only way to outcome this challenge is to make all involved companies to establish and accept a common vision. The necessity of creating a common group vision is acknowledged by Williamson et al 2012, when, keeping in mind the high diversity inside the network, is pointing out the **risk of uncertainty about partners intentions**.

Another related issue consists on niche **players' overlapping capabilities inside the ecosystem** that have the potential to decrease network's performance and increase competition and frictions among partners. In order to avoid these kind of situations, the leader should organize and manage the community in such a way that each ecosystem's value-creation capability is clearly delineated from the next (Williamson et al 2012).

The much praised close collaboration between partners come also with a less desirable effect: **knowledge spill over** is a major source of concern for companies involved (Kleyn et al cited Richardson and Evangelista, 2002; Oxley and Sampson, 2004, Ceccagnoli et al).

Too thigh integration between partners might make the niche players dependent on keystone and reduce ecosystem diversity (Iansiti et al 2004). Moore 1993 recommends that

ecosystem leaders might abstain from extorting power against others, while Williamson et al 2012 suggest the promotion of transparency in interactions and sanctions to firms that doesn't play fair.

Ecosystem leaders, the ones that shaped the ecosystem, could easily have **tendencies to dominate the ecosystem**, have hidden agendas or impose their visions to other (perhaps dependent) partners (Moore 1993, Levien et al 2004, Williamson et al 2012).

In order to maintain their competitive advantage and to stay relevant in the market, the niche players face **the challenge to continuously innovate and keep up with others** (Moore 2006).

Managing markets is another sensitive issue in ecosystem management, because there is always the danger that maintaining a wide range of relationships will concur to unmanageable transaction costs, making the company unprofitable (Williamson et al 2012). Levien et al 2004 point out also that a common mistake made by many companies is to make **large investments in technology and operations in the early life of a market**, before being sure that it offers premises for covering costs and profits. **Properly setting prices** for such complex products that bundle contributions from many partners is known to be a difficult task (Levien et al 2004).

Complex relationships and product proposals make **difficult to define partners responsibilities and measure their performance level** (Williamson et al 2012) a fact that can have serious consequences regarding the level of mutual trust among partners.

3 Case Study ARM Corp

ARM Corp. success story in developing and applying the open business ecosystem strategy offers a meaningful example of how an innovative and coherent strategic choice can set the path to success. Although the choice of case study company was mostly determined by student's chance to complete her professional training stage at the firm's premises, ARM's experience in creating and maintaining an open business ecosystem strategy offered the opportunity to learn about a new and more used approach in business management.

The following chapter will try to explain ARM Corp.'s strategic choice, how it manages to develop and maintain a wide community of partners and how the chosen strategy played a significant role in company's bottom line. Main sources of information are ARM's annual reports (available online from 1997 to 2013), company's portals and wikis, newspaper articles and presentations retrieved from Internet, together with valuable information provided by ARM key persons at student's request.

3.1 Conditions and capabilities at start

There are consistent reasons to affirm that ARM' strategic choice was influenced by specific conditions that determined the company to choose an innovative and flexible business model. The company was born in the 1990's, an age in which collaboration between IT companies became a much more common practice than before (Moore 2006). The birth of the company was a result of collaboration between three companies (Acorn, Apple and VLSI) that decided to form a joint-venture in order to further develop a new type of processor characterized by simplicity and low-power consumption, the RISC chip, and use it in their product offerings (Williamson&DeMeyer 2009, Markus Levy, The history of ARM architecture from inception to IPO). In order to do so, those companies had to collaborate and share information at a deep level. Accordingly, the newly established company got knowledge sharing and innovation as core principles since its birth.

As Williamson and DeMeyer 2009, said, at its inception, ARM had a firm technology platform that was developed by Acorn during several years, two major customers, limited resources in terms of personnel and funds, and a culture that encouraged free flow of information and

innovation. Those facts influenced the firm's early strategic choices, putting it on a path never tried by other firms. The above-mentioned aspects confirm existing theories (Moore 1993,1999, 2006) about certain cultural traits shared by companies that adopt business ecosystem strategies.

In order to avoid direct competition from already established firms, an incipient strategic choice was to further develop an existing trend, the "fab-less chip company" that was already used by several companies, and to become a "chip-less, fab-less company" (Williamson&DeMeyer 2009). Consequently, ARM chose not to produce any chips by itself, but to focus on its core competence, aka the design of technology for energy-efficient chips and license its IP rights to semiconductor companies (Markus Levy, The history of ARM architecture from inception to IPO).

With a high level of competition on the market at that time, determined ARM managers to look for innovative business models, ones that offered premises for the company to use its core competences to their best potential, while using limited resources (Gifford 2012), proving the validity of Teece 2009 theory about the emergence of new business models. In addition, creation and promotion of global standards with the help of a network of partners, (setting-up and development of the "Partnership Model") was among first's strategic choices of the new-established firm (Williamson&DeMeyer 2009, Markus Levy, The history of ARM architecture from inception to IPO).

An auspicious condition that occurred in 1990's, was the incipient development of mobile devices (PDA's) that raised the need for low-power processors, a domain in which ARM was one of the few experts of that time, and was eager to collaborate and provide technology needed by its partners.

3.2 Semiconductor industry overview

In order to allow an easy understanding of ARM activities and business model, and before going into further details about how ARM creates and manages its network of partners, some insights about how semiconductor industry works and ARM's role in it will be offered.

A semiconductor, named also a silicon chip, is an electronic controller that command most of digital devices used in our days, from computers and mobile phones to complex industrial applications.

A processor is the "brain" of the chip, and it is controlling not only the operation of the chip but also the operation of the product that contains the chip. Not all silicon chips contain a processor, but a large percentage do (ARM Annual report 2012).

Basically, the semiconductor industry is divided in four main parts, organized by product categories it is specialized: Memory, Microprocessors, Commodity Integrated Circuit, Complex SOC ("System on a Chip") (Investopedia 2014). Because of ever increasing complexity of its offering, the industry is made of a large range of expert companies that each concentrate into specific stage/s of chip production like: chip design, creation of essential IP components for specific designs, development of tools necessary for chip production, fabrication of chips, and software development. The nature of the goods determines the companies to collaborate and jointly develop products, thus organizing themselves into networks of partners (ARM Annual report 2012).

3.3 ARM business model

During the years the ARM enlarged its product offering (e.g. graphics processors and physical IP components), the firm's core expertise resides in the design of semiconductor IP components that are part of several essential elements within System-on-Chip designs (ARM Annual report 2012). The firm itself doesn't produce the chips. Its business model consist in licensing its technology to semiconductor manufacturers that integrate it with their own, creating smart, low-energy chips that are used in most modern electronic devices (ARM Annual report 2010).

With the aim to play an important role in the market, ARM puts considerable effort in creating designs that meet its customer needs. To do so, it closely collaborates with semiconductor companies in order to assure that its technology is compatible with their products, and to be able to meet future developments in the industry (ARM Annual report 2012). Therefore, ARM developed a vast network of partners also known as Connected Community, that number more than 1000 companies, to whom the firm closely collaborates, shares knowledge, experience,

and provides support, with the scope to create innovative products with a high rate of commercial success.

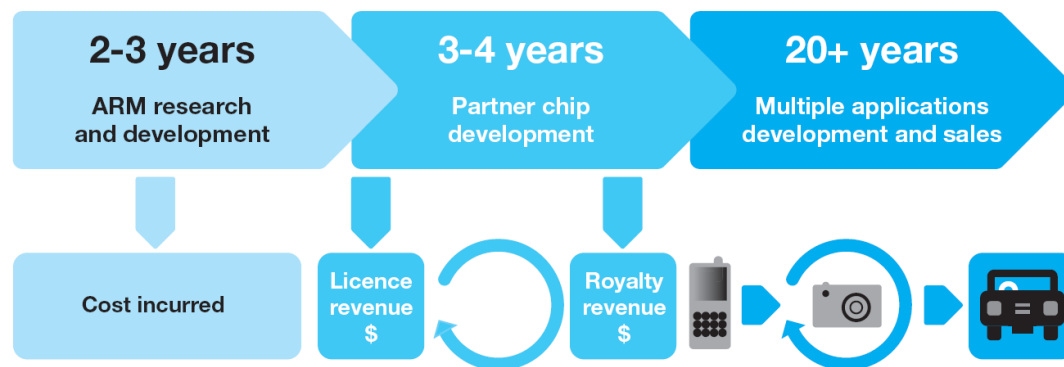


Illustration: ARM business model. Source: ARM Annual report 2010

ARM develops every processor in ways that chip designers can rapidly build a low-power, high-performance chip that can be also used in a wide range of end-markets in order to increase the number of possible licensees (ARM Annual reports 2010, 2012). Companies that decide to use ARM technology are requested to pay an up-front license fee for getting access to the design. The design is incorporated into their chip. When the chip is starting to be sold, ARM receives royalty on every chip that uses its design. Usually, royalty is based on the price of the chip. Typically, ARM designs can be used in a wide range of products, thus allowing it to be reused in various chip families, during a long time frame (about 20 years), each new family generating a new flow of royalties (ARM Annual report 2010).

This type of business model concurs to the fact that ARM is directly interested in its partners well-being, because commercial success of their products based on ARM architecture are increasing cash-flow resulted from paid royalties, as company acknowledges in the Annual report 2008: " ARM is continually developing complementary technology which lends itself to a licensing and royalty business model, such as physical IP, graphics IP and video IP. Enabling innovation in a broad range of end markets and technologies, combined with the operating leverage in ARM's business model, creates the opportunity for creating shareholder value and has resulted in growing revenues, profitability and free cash flow."

3.4 How ARM manages its ecosystem

The following paragraphs will try to explain how ARM implements its strategy, and how it creates and manages its community of partners.

A careful study of ARM's annual reports (1997 to 2013) reveals how company management consistently pursued several strategic principles since its establishment to our days. Those directions offer valuable insights about how open business ecosystem strategy can be pursued and confirm most of the theories about the subject. Despite structural changes and enrichment of company's offerings over the years, those issues appear in almost every annual report. The above mentioned aspects give support of James F. Moore theories (1993, 1999, 2006) regarding firm's strategies and ecosystem building.

ARM strategy is composed of several fundamental directions, that complement and enforce each-other as: secure a leading place on the market by offering an innovative, high-quality product that meets customer's needs; develop and maintain a network of partners; establish standards in the industry based on ARM technology; continuous evolution and adaptation to market needs. From those initial principles other supportive directions derivate, conducting to the development of a coherent strategy over the years. Company strategy is mostly focused on long-term planning while trying to meet short-term needs: *"...robustness and flexibility of ARM's business model, which has enabled the Company to respond to customer needs in the short term, while investing in technology that will provide them with products for the future."* (ARM Annual Reports 2008, 2010). The company also constantly tries to enlarge its product range (ARM Annual Report 2009), the fact that explains many strategic decisions that will be discussed later. In order to offer a comprehensive, although simplified image of ARM's approach, in the next pages each strategic direction will be discussed, together with "derivative/aferent" and other strategies.

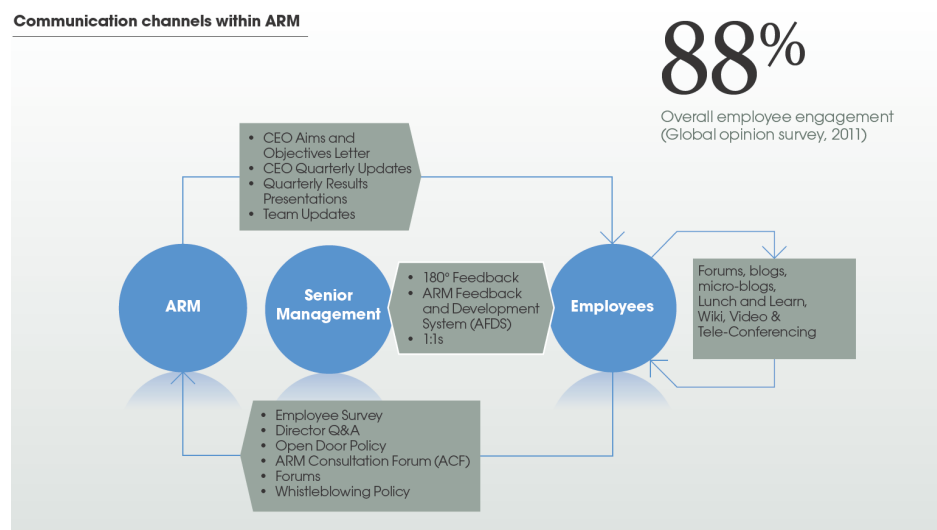
Offer an innovative, high-quality product that meets customers' needs

One of tools used by ARM to maintain the high level of its offerings is by its **human resources policies**. The company tries to recruit the best university graduates together with experienced engineers, help them to develop and offer a supportive culture that allows them to use their capabilities at maximum potential (ARM Annual statements 2002, 2008, 2010, 2011,2013, Cottell 2012). Together with professional competence, the company is looking for creative

people that continuously pursue self-development. A proper ARM employee is an altruistic person that show partner and customer focus and responsiveness, and also is a good team player. (Annual report 2013, Cottell 2012, Strategic HCM blog 2011).

As the company acknowledges the contribution of its employees in the firms performance, (ARM Annual statements 2010, 2011,2012, 2013), it pays close attention to employees self-development and training needs, through feedback and development processes, on-the job and formal training, coaching and mentoring (ARM Annual statements 2001, 2002, 2003, 2005, 2007, 2008, 2010, 2011,2012,2013, Strategic HCM blog 2011). *"Training needs are tracked, delivered and progress is monitored through our Learning and Development team, ensuring that the Group's skills base is increased in line with business needs and personal aspirations."* (ARM Annual statement 2008). The company provide training for employees at all levels: two-week Global Graduate Conference that is available for all employees and the ARM Leadership Programme for top managers (ARM Annual statement 2008).

Employee involvement is another important issue on ARM HR agenda (ARM Annual statements 2001, 2005, 2006, 2007, 2008, 2011, 2013). It is accomplished thru formal and informal communication practices across all offices around the world, consultation groups, an internal opinion survey conducted every two years, Director Q&A, open-door policy, and with the help of various digital communication channels, like: Skype, LinkedIn and Facebook - for external use, and blogs, forums, wikis, an internal Youtube called ARM TV, videoconferences, Yammer- for internal communications (ARM Annual statement 2011, Strategic HCM blog 2011).



Communication channels within ARM. Photo source: ARM Annual report 2011

Together with Lunch-and-Learn (voluntary presentations about various subjects prepared by ARM employees and presented during lunch break), the above-mentioned channels play also a significant role in knowledge sharing among company's personnel.

Rewards are significant ingredients in staff motivation. In order to offer a sense of ownership towards the company they are working for, ARM employees are encouraged to own shares on ARM Corp. On top of that they enjoy private healthcare; travel and life insurance; pensions; sabbaticals; flexible working; stock options; and a save-as-you-earn share scheme (ARM Annual statements 2001, 2003, 2004, 2005, 2006, 2007, 2008, 2012, 2013).

The company also continuously promote equal opportunities policies (ARM Annual statements 2003, 2004, 2005, 2006,2007,2012,2013).

Company organization

Company organization reflects its strategic directions. About two-thirds of employees are engineers that are involved in research and development of technology that have to be licensed. The other one-third is formed by non-engineering personnel that is concerned with spreading-out ARM's technology; marketing and sales teams that take care of relationships with company's partners; legal and licensing teams are involved in offering assistance during negotiations and when conflicts arise; infrastructure teams take care of the delivery mechanisms; finance teams administer the money and HR teams oversee the development of the whole team (Annual statement 2010).

Culture

As previously acknowledged by renowned scholars like James F. Moore (Moore 1993, 1999, 2006), **company culture** plays an significant role in achieving its strategic objectives. Together with a constant concern regarding partners needs and well-being: *"...we will continue to create innovative business models to enable us to take advantage of new opportunities as well as to provide access to our technology for an entirely new generation of companies. We have a "can do" culture and have always been prepared to find ways to deliver what our Partners need. "*

(Annual statement 2002), ARM promotes respect, fair practices and tolerance for all cultures (Annual statements 2001, 2003, 2012, 2013).

As building trust is an essential ingredient in maintaining a business ecosystem (Williamson&DeMeyer 2009), the company employs a clear code of conduct and all employees are required to be aware of, understand it, and put it into practice: *"All directors and employees are required to act fairly, honestly and with integrity and to demonstrate that they have read and understand ARM's Code of Business Conduct and Ethics."* (Annual statement 2013).

The company also promotes a culture of open and honest communication both at ecosystem and internal level (Annual statement 2013). Conferences, seminars and meetings around the year, together with ARM staff with special attributions in maintaining relations with partners ensure proper flow of information inside the ecosystem. Internal communication is established with the help of employee engagement tools and various internal conferences - 38 internal conferences in 2013, involving a high percentage of ARM' staff (Annual statement 2013).

ARM managers are essential ingredients in combining employees' power together with company purposes into financial performance (Annual statement 2013).

The following image synthesizes ARM's culture and its implications.



Illustration: ARM's shared principles and behaviours. Source: ARM strategic report 2013.

This section can be concluded with the following sentence from one of firm's annual statements: *"ARM team is kept together by a set of common principles and behaviours that evolved as the company was formed"* (Annual report 2010).

Strategies- Research and development

As previously stated by Iansiti and Levien 2004, integration, innovation and adaptation are important capabilities for the well being of a company. ARM is pursuing innovation and development of high-level products by **putting more efforts in research and development that in acquiring material assets** (ARM Annual statements 1999, 2004, 2005, 2006, 2007, 2008, 2010). R&D can be done either in house, by ARM employees; with the help of joint projects with ARM's partners (ARM Annual statements 1999, 2002, 2007, 2008, 2009, 2010); or by collaboration with renowned Universities and research groups (ARM Annual statements 2000, 2001, 2003, 2004, 2005, 2006, 2007, 2008).

As the topic of developing joint projects with partners is going to be extensively covered in the part about maintaining the network of partners, in this section are some details about ARM's **involvement in collaboration with Universities** will be offered.

ARM is providing a broad range of support to educational institutions willing to engage in research or teaching ARM-related topics, under the form of development platforms, tools, licenses to use ARM' designs and architectures, course materials, and by offering technical seminars, equipment, software and assistance to students. Together with sponsoring promising students at a number of universities around the world, starting from 2003, ARM is financing a four-year MEng degree at Loughborough University (ARM Annual statements 2000, 2001, 2003, 2004, 2005, 2006, 2007, 2008). *"ARM's University Programme directly engages with universities worldwide, designing course material, providing technical seminars, donating equipment and software and offering assistance to students. ARM has now engaged with universities in nearly every region of the world, including the EU, North and South America, Australia, China and Japan. With a growing demand in India for engineers, ARM has recently hired a university programme manager for the region."*(ARM Annual statement 2007).

Even so collaboration with research and educational bodies might be motivated to a certain level by Corporate Responsibility issues, the main reasons for collaboration with research and educational is to increase ARM's knowledge base with fresh ideas from Universities, to familiarize and train future ARM's and ARM's partners' employees with a widely used technology and to create awareness about ARM and its partners offerings, thus increasing goodwill toward the company and contributing to future sales.

Another method for developing top-level products and supporting platforms - thus creating value inside the ecosystem and increasing its attractiveness (Iansiti&Levien 2004), expand into new geographical areas and recruit HR talent, is by **acquiring small companies that possess complementary products or knowledge base** (Annual statements 1999, 2000, 2001, 2002, 2004, 2005,2008, 2011, 2013). Consequently, over the years ARM purchased Micrologic Solutions Limited (Annual statement 1999), Artisan and Axys (Annual statement 2004), Keil with offices in Germany and USA (Annual statement 2005), Falanx Microsystems and Soisic, (Annual statement 2006), Obsidian Inc., and Prolific Inc., (Annual statement 2011), Sensinode and Geomerics (Annual statement 2013). The company also opened several design centers and sales offices in key locations around the world, such as: sales office in India and China in 2004 and a design centre in Taiwan in 2011 (Annual statements 2004, 2011). By the end of 2005 ARM had 11 design centres across the world (Annual statement 2005) and actual data shows 29 ARM offices scattered across the globe (Company website).

Develop and maintain an ecosystem

One of the most important aspects of ARM' strategy, that perhaps differentiate the company from its competitors and might provide the answer to its success, consist in the **permanent development and maintaining of its network of partners.**

Business ecosystem theoreticians widely acknowledged the central role played by the keystone company, and the complexity of ecosystem leadership (Iansiti& Levien 2004, 2006). ARM Corp.' experience provide an almost a book example of ecosystem evolution and proper management. The following paragraphs will try to bring light into some practices extracted from the firm's annual reports, magazine articles and studies about the company.

Although at its establishment ARM was supposed to act as a niche player in Acorn's ecosystem - its role was to design processors for Acorn, VLSI and Apple needs, (Markus Levy, The history of ARM architecture from inception to IPO) - the firm's management of that time aimed to secure higher survival chances for their company and decided to create a network of partners around ARM's product offering (Williamson&DeMeyer 2009, Gifford 2012) therefore assuming the role of a keystone and its strategic benefits (Annual statements 2008- 2013).

Consequently, the idea of the **permanent development of partnerships** can be found in almost all ARM annual reports and it is one of the company' fundamental strategic directions.

Although its benefits are going to be discussed also in other parts of the essay, the main advantage of partnerships in business consists in the fact that it plays an significant role in increasing bottom line and reducing risks produced by dependence of few customers (Annual reports 1998-2013, Levy, The history of ARM architecture from inception to IPO).

The company is fully aware of the importance of long-term relationships with its partners and plays a proactive role in maintaining it. Its strategy is a rather long-term build, with today's efforts being meant to bring benefits on the long-run: *"ARM's business model is based upon long-term relationships that bear fruit in the form of product sales and revenues years after initial agreements with customers."* (Annual statement 2008). That aspect reinforces Moore's opinions regarding the firm's coherent long-term goals explained in the theory part of the thesis.

Confirming the theories about the subject, the company acknowledges the fact that the **ecosystem will function well if all partners see premises for success**. Well-managed partnerships bring benefits to all members involved. ARM is building its long-term success based on its partners'/ecosystem success, because strong partnership help ARM to improve its competitive position (Annual reports 2001, 2010, 2011, 2012).

Continuous investments in research and development, innovation (Annual statement 1997, 1998, 1999, 2004, 2005, 2006, 2007,2008, 2010) and concern regarding **meeting partner's needs and their well-being** (Annual report 2008, 2009), are enduring topics in ARM's strategy over the years.

Support partners by developing platforms and facilitation of communication and collaboration

Although ARM started by only providing an innovative product, around which it started to create its network of partners, soon after its establishment, the company started the process of leading the ecosystem, creating value inside of it by **developing platforms** thus increasing network's attractiveness (ARM annual statements 1998, 2001, 2002, 2004, 2007, 2008). This fact confirms the writings of Iansiti& Levien 2004, Moore 2006, Williamson&DeMeyer 2012, Pagani 2012 that emphasized the importance of value and platform creation in ecosystem management.

Consequently, since its early years, the company became involved in complementary platform and tools development. In 1998, **ARM Technology Access Program** was launched. It allowed

design houses that managed to pass ARM's qualification process to have access to ARM based designs for product development. It was soon followed by other tools, like: PrimeXsysTM Platform, PrimeXsys Dual Core Platform, RealView family of development tools, AMBA technology in 2002 (ARM Annual statement 2002), and the creation of Embedded Software group in 2004 (ARM Annual statement 2004).

Launched in 1993, the **Annual ARM technology** conference is another important tool in facilitating communication among ecosystem members, assessing partners needs and developing future support tools, since it usually brings together about 5,000 engineers and developers, from all over the ARM ecosystem. The conference plays also a significant role in sharing knowledge and experience across ARM ecosystem and in maintaining its identity (ARM web portal 2010).

Besides that, ARM's partners are supported by the development of the **Electronic Design Automation (EDA) Partnership** programme that allows reductions in costs and time-to-market by allowing designers to verify circuits before launching production (Annual statement 2001).

As previously mentioned, development of platforms can be achieved also by companies with complementary capabilities.

Platform development not only creates value inside the ecosystem, thus increasing its attractiveness, but it requires for ARM to collaborate and make efforts to deeply understand its partner's needs. Consequently the relationships between ARM and its partners became stronger and offer valuable insights about future trends in the market. That fact fueled innovation inside the firm and further helped the enterprise to remain highly competitive in product development (Williamson&DeMeyer 2009).

Having the possibility to obtain ARM's high-end technology, is bringing considerable savings to semiconductor companies - that otherwise had to spend between 50-100 million \$ every year on research and development (Williamson&DeMeyer 2009), and offers access to a stable development platform. As ARM acknowledges in its Annual statement 2001: *"A feature of our business is that all ARM Powered products are based on the same architecture and platform, ensuring full compatibility as the product range expands. This means that software written for ARM core-based products in the 1990s can be reused in the future – a big benefit in today's digital marketplace, where software development is becoming a key factor in system costs."* Instead of spending precious resources in adapting to changing platforms, ARM partners had

the chance to focus on their competence, using at its best platforms created and maintained by the keystone.

As various theoreticians acknowledged (Borgh et al., 2012 cited Katz and Shapiro, 1985, Amit and Zott, 2001), **stability of the platform** is an important aspect that increases network's attractiveness and motivates membership. Characteristics for ARM platforms and products is the fact that they are based on the same architecture, and are somehow modular, allowing new solutions to be built on old structures, thus enabling significant savings in time, money and R&D for its partners, that don't have to make big investments when developing every new product: "*A feature of our business is that all ARM Powered products are based on the same architecture and platform, ensuring full compatibility as the product range expands. This means that software written for ARM core-based products in the 1990s can be reused in the future – a big benefit in today's digital marketplace, where software development is becoming a key factor in system costs.*" (Annual statement 2001).

As ecosystem membership offers access to a wide range of contacts, it is beneficial for a firm to have the possibility to choose from a variety of complementary enterprises that are using the same technology, assuring a high level of compatibility.

In order to increase its partner's commitment towards the network, ARM started to build a comprehensive **distribution network** for itself and its partners (Annual statement 2001), confirming Borgh et al 2012 theory about ecosystem attractiveness factors.

Organizing and formalizing relationships with partners is another key task in which a keystone is involved (see Inasiti&Levien 2004, 2006 theories), and ARM's involvement can be analysed at internal organizational level and at ecosystem level.

Ecosystem level

Since its early years, ARM managers sensed the need to make distinctions between partners and adopt special tactics according with their characteristics and needs (Annual statement 1999). Accordingly, firms collaborators were categorized into four main groups: Systems Software partners, Design partners, Development Tools partners, Semiconductor and Systems partners (Annual statement 1999)- categories being further developed according with firm's product diversification and ecosystem enlargement.

ARM aims also to provide a wide range of solutions in order to best meet its partner's needs (Annual statement 2002). Therefore, in 2002 it established **ARM Technology Access**

Programme (ATAP) that is a qualification process that involves design flow audit, training on implementing designs with ARM cores, tools, AMBA™ interface peripherals and development techniques (ARM portal, 2003), and **Approved Training Centre (ATC) program** (Annual statement 2002). The project continued with the establishment in 2003 of the **Connected Community** portal that became one of main ARM's platforms for maintaining and developing relationships with partners. The portal offers a wide range of services for its members, including training, support, last-minute information regarding ARM technology and events, the possibility to find contacts, collaborate and get solutions across the ecosystem (Annual statement 2003, ARM portal).

Beside establishing contacts, and increasing the sense of community across ARM ecosystem, **ARM annual Developers' Conferences** provide possibilities for private meetings between partners and initiation of new agreements (Annual statement 2004). **ARM Partner meeting** is an invitation-only gathering for ARM's partners that is held every summer in Cambridge during which company's roadmap is presented and discussed, together with other topics of common interest (Annual statement 2012, Williamson&DeMeyer 2009).

Internal level

In its attempt to continuously evolve and adapt to market needs, since its establishment, ARM went through several reorganizations (the last one happened in 2013). Currently, the company structure consists in a single product development team that is divided in seven product groups (Architecture, CPU, Physical design, Media Processing, Systems and Software, Development Solutions, Partner Enablement), that match ARM partners categories and are in accordance with firm's main directions for development. All product groups report to one manager that is responsible with product development and their alignment with company's objectives. The same person is supervising also two cross functional teams that are involved with alignment, roadmaps and execution between product groups (Annual statement 2013).

In its attempts to support partners and increase ecosystem's attractiveness, ARM is trying to increase partner's commitment towards ARM architecture by constantly trying to **renew** not only its product range, but also its **licensing models**. Therefore, over the years its license agreements offers had been updated in ways that allowed a wider range of firms to have access to ARM technology. For example, in 2000 the **per use' license model** - that permit

small companies to take on ARM technology had been adopted. In the same year, **ARM Foundry Programme** had been put into practice (Annual statement 2000). Next year, the basic licensing model had been adapted in order to allow ARM's niche players - some companies that don't have the capacity to produce chips, to use ARM technology. This fact allowed them to implement their ideas quickly and cost-effectively, thus to adapt more quickly to market needs (Annual statement 2001). Novelties brought by 2002 regarding ARM license agreements were the **Approved Licensing Programme** that allowed ARM's partners to sublicense its technology, and the possibility to license hardware platforms, application software, models and peripherals. Overall, ARM's partners are encouraged to take "upgrade" and "derivative" licenses and most of them do (Annual statement 2000).

Another strategic direction in supporting the ecosystem and maintaining its market position is by **developing relationships with firms involved in strategic/key directions**, (software, design methodology, operating systems and mainstream design tools) and manufacturing products together (ARM Annual statement 1999). That trend had been followed during the years. Consequently, in 2002 a strategic alliance had been established with National Semiconductor (USA), and with Synopsys Inc (ARM Annual statement 2002). The development of MID ecosystem had been achieved with the help of collaboration with Broadcom, Marvell, Qualcomm, Samsung, Texas Instruments, Adobe, Microsoft, Disney, Google and Electronic Arts (ARM Annual statement 2007).

Creation of a physical IP design platform that supports the Common Platform and facilitates advanced semiconductor manufacturing processes had been carried out with the contribution of other several renowned partners, like: IBM, Chartered Semiconductor Manufacturing Ltd. and Samsung Electronics Co. Ltd. (ARM Annual statement 2008).

In 2009 ARM had established partnerships with Globalfoundries and several other EDA companies and the trend continued with foundation of long-term partnerships with Freescale, Fujitsu, Microsoft, NVIDIA, Texas Instruments and Samsung in 2010 (ARM Annual statements 2009, 2010).

Ecosystem development is nurtured also by **ARM' investments in companies that have potential to further expand its architecture** (Annual statements 2000, 2005).

Promotion and establishment of industry standards

Since firm's early days, its managers understood that the key to success consist in ARM's products becoming widely used by companies in the industry, thus becoming global standards (Annual report 2010, Davidson 2000). Consequently, **the promotion and establishment of industry standards based on ARM technology** were constantly pursued (Annual reports 1998, 1999, 2000, 2001, 2002, 2008, 2009, 2010). The process involved a large array of strategic decisions with global focus. To mention few: opening of offices around the world, ecosystem development and strategic alliances with key players in the industry.

In order to achieve its objectives, since its establishment, the company closely collaborates with central companies in its domain, and became involved in various steering groups and organizations in order to play a significant role in the setting-up of industry standards. In addition the company is playing an active role in creation of open standards and specifications on which its partners can further build platforms (Tozzi 2014). Accordingly, in 1998, ARM became a member of Virtual Component Exchange (VCX) - organization that aimed to launch a structured marketplace for buying and selling semiconductor intellectual property, and a founding member of Virtual Socket Interface (VSI) Alliance - an alliance between various firms in the industry with the scope of creating interconnectivity standards among intellectual property components in the semiconductor industry to allow the move to System on Chip solutions (Annual report 1998). In 2002, an ARM' developed technology became a global standard (Annual report 2002) while one of company's objectives for 2008, was to "establish a global standard for its RISC architecture, physical IP and other products in the embedded microprocessor and semiconductor markets" (Annual report 2008). In 2013 the company was involved in the foundation of Internet of Things Architecture Forum - an organization that aims to facilitate building and setting-up of connected products and internet of things applications (Evrythng 2013. Press release).

Continuous evolution of its business proposal

Careful reading of ARM' annual reports shows how the company deliberately chose the path of **continuous evolution**, adapting its business practices according with market and customer's needs (Annual reports 2001, 2002, 2005), putting in practice what Eric G. Beinhoker said in 1999: *"in an uncertain world, strategy is about really creating options and opening up new*

choices, not shutting them down.". The practice confirms also the theory developed by McCann&Selsky 2012 that says that firms have to develop agility and resilience in order to successfully operate their businesses and is in line also with Iansiti and Levien 2004 thesis about integration capability's role in firm well-being.

Over the years company strategy evolved from providing processor designs to offering complete solutions to customers - from beginning to end of the design process (Annual statement 2008). The firm adapted to market demands by diversifying its value proposal for other technologies, towards microcontrollers embedded into intelligent consumer products (Annual statements 2005, 2007, 2009, 2010, 2011, 2012, 2013).

The development of the firm's business proposal can be also seen in the evolution of its relationships: from being a supplier towards playing a central role in its industry, developing a vast network of partnerships and being involved in several ecosystems (Williamson&DeMeyer 2009). Continuous evolution can be noticed also in its partnership business model (Annual statement 1999) and in company growth -followed by several internal re-organizations, which allowed it to deal properly with market realities (Annual statement 2000).

3.5 ARM's ecosystem characteristics

There are several **characteristics** of ARM's **ecosystem**. One of the most important is **trust**. Management of confidentiality issues are a major concern for the company (Williamson&DeMeyer 2009). The firm employs a **Code of Conduct** to whom its employees are requested to adhere and the company enforces strict procedures when handling its partners IP. The legal department take care of agreements, offer support to ARM staff when dealing with its partners and takes care that legislation is firmly followed. The firm's partners are aware that ARM is using knowledge gathered from them only to develop technology that will improve their products, while it pays close attention to information security issues. There is also a common understanding that the company is not going to become a competitor in its partners business areas, since ARM employs a policy in which deliberately is avoiding to expand into business areas covered by its partners (Annual report 2011, Williamson&DeMeyer 2009).

ARM continuously **collaborates and shares knowledge** with its partners in order to foster innovation, get insights about partner's needs, future trends and technology developments,

thus contributing to value creation inside the ecosystem (Annual reports 2011, 2012,2013, Williamson&DeMeyer 2009). This characteristic is facilitated by company's culture that encourage willingness to learn and sensitivity to partner's needs. Typical for its keystone role, as lansiti&Levien 2004 state, are its abilities in maintaining ecosystem stability, encourage collaboration and information sharing between members. ARM plays an important role in facilitation of contacts between its partners and creating an environment favourable for idea exchange and agreement closing (Annual report 2012, Gifford 2012, Williamson&DeMeyer 2009).

Partners are aware that the ecosystem build around ARM is in continuous expansion and evolution, thus bringing potential for new opportunities. The company is permanently pursuing relationships with future-looking key companies in order to **develop new ecosystems** that will enhance ARM position on the long-term. Sometimes it makes investments in promising start-ups that will develop products that show the validity of ARM solutions (Annual report 2011). Once the ecosystem is growing, a larger number of semiconductor and software providers manufacture products based on ARM technology join. Consequently, the OEMs start to have a wider technology sources to develop their offerings and they incur benefits from lower structural costs. Some of them will encourage their suppliers to develop ARM based products, therefore creating a virtuous and sustainable circle. Consequently, ARM ecosystem is becoming wider and more complex since existing partners enlarge their product offering based on ARM technology and more types of companies join it, to the extent that in our days, 8 out 10 top semiconductor manufacturers use ARM technology (Annual report 2011).

This section of the thesis offered some insights about the evolution of a company, from its inception, as a niche player in a growing industry - high tech components design and production, towards becoming a keystone player in an ecosystem that is mostly created, shaped and managed by it.

ARM Corp. experiences, extracted mostly from its annual reports, confirms James F. Moore statements regarding the existence of certain features for a successful ecosystem strategy. Those reports demonstrate that the company had had an articulate, long-term strategy since its inception, and how it managed to build its Community of Partners. The case study showed that, over the years, the partnership in itself has potential to become an important asset for the company, strengthening its market position.

During the years, the firm had been able to develop capabilities that allowed it to adapt or take advantage with relative ease to new situations, qualities that McCann&Selsky 2012, assume as being important aspects for firm's competitiveness and profitability. ARM successful efforts in building, and managing its ecosystem, by platform creation, intermediating relationships between members, maintaining trust and fair practices, together with firm's ability to transform and permanently upgrade its competences, demonstrate that the company possess integration capabilities - seen by lansity and Levien 2004 as essential features for a firm's well-being.

According with ecosystem development stages theories, (Moore 1993, 2006), ARM had reached the leadership phase, in which the company has established a solid ecosystem around its value proposition and plays a vital role on it, as a keystone. Its actions, as a critical hub on the network, corroborate lansiti and Levien 2004 statements about keystones and their crucial role in ecosystem's well-being.

4 Results, Conclusions and Discussions

The present thesis deals with one of newest approaches in business strategy: connected community also known as open business ecosystems. Despite the fact that it have potential to offer proper answers to several issues faced by companies in our days, like increased competition, globalization, need for highly differentiated products and demanding consumers, the strategy is little known by general public.

With the help of a comprehensive theoretical background and meaningful lessons extracted from the case study section, the essay manages to offer an understanding about what is a connected community strategy, its origins, ecosystem types, development stages and best practices in maintaining an extended community of partners. Because, during research stage the author had meet a rather wide range of analogous notions, a section of the thesis is dedicated to explanations of their meanings and to pointing out differences between various related concepts.

The thesis is based on a solid structure made of a wide range of scientific articles written by well acknowledged scholars, like James F. Moore, Marco lansiti, Henry W. Chesbrough, Carl Shapiro and Hal L. Varian, and practical examples offered by the experience of one of the most successful companies that use a connected community strategy, ARM Corp. Employing case study research methods, the thesis is build on the structure **What? - Why?-How?**. Quite surprisingly, most essay's research questions, like:

- What is an open business ecosystem?
- What are the reasons for a company to choose it as a strategic approach?
- What benefits it might bring to a business entity?
- What kind of challenges can be meet when applying it?

get answers in the second section, that examines a wide range of theories about connected community strategy. The third part, case study, plays the role of confirming the existing theories about the subject, and giving insights about best practices and strategy building, with a focus on creating and maintaining relationships and business network management.

Form second part of the thesis, theory, the reader have the chance to learn about concept's origins, get a detailed definition of the notion and understand the context in which the strategy

should be employed. Valuable insights about *How to create a network of partners*, including stages, roles, health assessment, value creation is also offered in this section. Although more details about *How to manage business partnerships* are offered in the next section, this part also cover some existing theories about ecosystem management.

As previously said, the case study section of the essay, is mostly concerned with offering the answer to the remaining research question:

- How the strategy is applied in real business situations?

Based on a wide range of sources, like company's portals and wikis, newspapers articles and presentations retrieved from Internet, firm's annual reports, together with helpful information provided by ARM key persons, this chapter provide insights about real-life practices in building and managing a wide network of partners. It follows previous section's structure, complementing the theories with practical examples extracted from company's procedures. Over the length of this section, the reader have the opportunity to learn about the specific conditions that determined ARM's management to adopt an open business ecosystem strategy, and about company's business and revenue model. The largest part of the chapter is dedicated to an analysis about How ARM manages its network of partners, in which its main strategic directions are investigated, together with issues like company' organization and its culture. As every firm is different, several specific features of ARM's connected community of partners are offered.

In author's opinion, this section is especially interesting because it offers valuable lessons about strategy building in general. By studying ARM's practices, someone can learn a lot about following a coherent strategic approach while being continuously aware about own industry developments.

Conclusions

By combining theoretical knowledge with practical examples from IT industry, the present essay manages to offer proper answers to initial research questions. Feedback from peer reviewers shows that the text explain in an easy to understand way a concept that at first glance seems complex and difficult, contributing to an increase in the general level of knowledge about the subject, with potential of becoming a starting point lecture for the ones interested to learn about it. The thesis demonstrates also that a connected community strategy

is not a mere theoretical construct, showing how it is employed in real business situations and explaining its benefits.

Discussions

As previously said, a strategy based on networking and collaboration is not "one-solution-fits - all" in business management, but it does have the potential to offer answers to many difficulties met by firms in our days. Its basic principles might provide solutions to the ever increasing complexity of modern world, because it promotes collaboration, flexibility and sharing of opportunities and risks. It provides an alternative to the "classic" way of doing business and should be taken into consideration even when a firm position is analyzed, because, even without being aware of, it might operate in an ecosystem. Consequently awareness about ecosystem operating principles would help the modern manager to properly evaluate its firm strategic position. Before adopting any strategy a company should do a deep analysis of its offering and the market in which operates, then decide what option is the best for it. As Sir Robin Saxby, the former ARM chairman said, "community creation... is not for everyone". It requires long-term planning and continuous effort, but, for ARM it had been the only solution.

Future developments

The beauty of thesis subject resides in the fact that, the process of studying and understanding it continuously presented challenges and offered countless paths and subjects for development. Therefore, only the limitation in time and essay's length made the thesis to cover only one case study company. A very interesting approach would be to study ecosystem strategy from a "failed" company perspective, since fiasco might teach valuable lessons. Another development might be to study the local clusters of business and make an "ecosystem" assessment. Overall, the whole section about "related terms" might provide future subjects for study: their likeness and complementarities with the ecosystem strategy. Therefore, the student considers the present work only the beginning of a learning path.

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