

# Open Innovation Strategies: A Case Study of Ericsson

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## Abstract

Open innovation is an approach to innovation that has steadily started to gain ground during the last few years, as a practice that can help companies to remain innovative.

This practice allows ideas to move freely inside out and outside in of a company. This means that a company can use external ideas to enhance its internal R&D and it can also utilize internal ideas in new innovative ways. As a result developing costs are reduced, products reach the market faster and new perspectives for future growth are created.

This thesis studies Ericsson and how that company uses open innovation, what processes it implements and what are the motives behind its open innovation moves. By studying a company that utilizes open innovation for many years now and is considered a pioneer in this field we can gain valuable insight on this fascinating phenomenon.



## **Acknowledgements**

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# 1. Introduction

## 1.1 Background

Open innovation is used to describe the new emerging model of innovation where companies understand that good ideas do not come only from inside of their own organization and that not all the valuable ideas that come from inside their own walls can enter the market successfully through their own business model (Chesbrough and Crowther, 2006).

Open innovation is becoming increasingly popular both in practice and in theory and the main reasons are the shorter cycles in innovation, the escalating costs in the industrial R&D as well as the shortage of resources. This attraction to open innovation has started when firms realized that they needed new ways in order to bring their own ideas as well as ideas from other firms to the market and that the place where knowledge is created is not necessarily the place where innovation is going to happen. By adopting this approach to innovation the boundaries have transformed from a solid wall to a semi-permeable membrane where innovations can move freely from the internal innovation process and the external environment (Gassmann and Enkel, 2004).

Today there are companies that can be located throughout the spectrum of innovation according to how openly they operate, from totally closed (nuclear reactor industry) to totally open (movie industry) and in a transition phase (Chesbrough, 2003b).

Regardless of the recently increased popularity of open innovation and the effort to document some practices that help organizations to adopt these open concepts, there is no clear recipe on how companies should use open innovation. Each company is using a unique way to innovate, which is directly linked with its history, its culture and the industry in which it operates.

Ericsson is no exception. It is possibly the world's largest maker of mobile telecommunications equipment and it is a user of open innovation for many years now, but in the recent past they have decided to give even more emphasis to this approach to innovation.

Throughout its history Ericsson has displayed great skill and adaptiveness to change. The Stockholm, Sweden-based company was founded in 1876 as a telegraph repair shop but following the advancements in technology it shifted into telephone exchanges and then in mobile telecom. Innovation is in the nature of Ericsson and it can display a rich history of successes like the introduction of the world's first fully automatic telephone system in 1956 or the early hands-free speakerphone in the 1960s as well as the invention of the Bluetooth technology in 1994. (intelfreepress.com, 2012)

Loyal to its ability to adapt with the times, Ericsson has recognized the need to change its innovation model in order to take advantage of the globalized economy and the possibilities for growth that open innovation has to offer. The innovation model of Ericsson puts weight on collaborations that can lead to more effective solutions, taking into account the increasing influence that customers have in the development of new technologies.

In the first part of this paper the background is introduced, then the research objective and question and the scope of the study. The second part analyses the methodology used for conducting this study. The third part describes the conceptual framework of this study, which consists of an analysis of the closed and the open paradigm of innovation, the different innovation processes, an outline of the advantages and disadvantages of open innovation and a description of open business models. The fourth part analyses the case study of Ericsson and how this company utilizes open innovation strategies. The fifth part contains the discussion on the research question followed by the conclusions. The last part describes the limitations and possible future research subjects.

## **1.2 Research objectives and question**

Even though open innovation is steadily gaining ground and it is considered as a very effective option for companies that want to remain innovative and keep their growth rate stable, while spending less money in R&D, there are significant differences on how each company perceives open innovation and how it implements such an approach to its business model.

It is very interesting to study what open innovation strategies each company promotes, what motives are behind them, how those strategies are chosen and what effect they have on the business model of the company. By looking at each company's open innovation strategies separately we can draw very useful conclusions on what determines a successful open innovation strategy in order to create general guidelines for other firms that want to adopt a more open approach to their innovation processes with a minimum amount of risk. In addition the study of these strategies can help us grasp the philosophy behind the operations and the corporate culture of each firm, which determine them to a great extent.

This study focuses on Ericsson and the research question is:

How did Ericsson open its innovation processes and what specific open innovation strategies does Ericsson currently use?

To answer this question it is important to look at the motives that influenced Ericsson to open up their innovation procedures, what were the challenges of such moves, the characteristics of the telecommunications industry in which Ericsson operates, what open innovation moves managers had to make and what changes took place in Ericsson's business model.

## **1.3 Scope**

The scope of this study is to examine the challenges that companies face in order to adapt to open innovation strategies and the benefits that these strategies can offer. Specifically this study outlines the outbound, inbound and coupled open innovation methods that Ericsson uses and the necessary changes that had to be done in its business model in order for these methods to be successful.

## **2. Methodology**

The research methodology followed in this thesis project is the qualitative methodology. This type approaches research subjects, in the environment in which they take place, with an interpretive, naturalistic point of view and it puts emphasis on the quality of the processes that are being studied (Gephart, 2004).

With the qualitative methodology researchers get the tools they need in order to study complicated phenomena within their contexts. This requires the use of a variety of data from different sources, ensuring that each issue is explored through many lenses, which reveal different views of the phenomenon (Baxter and Jack, 2008). Open innovation is a complex phenomenon and with a qualitative research within the context of a company, like Ericsson, that has been actively pursuing the transition from a closed to an open innovation model during the last few years, a clearer picture is drawn.

This study uses the case study approach which is considered when: (a) the study focuses on answering “how” and “why” questions; (b) the behavior of the involved parties in the study can not be manipulated; (c) contextual conditions are covered which are relevant to the phenomenon which is under study; (d) there are no clear boundaries between the phenomenon and the context (Baxter and Jack, 2008).

Another factor that determines the type of research needed for a thesis is the research question. The research questions include a substance and a form. The substance is mainly what the study is about and the form is what determines the strategy of the research. When the phenomena of the study are beyond the control of the researcher, an experimental method is not sufficient and a case study method is considered as the most appropriate method to analyze those phenomena. Each case study has specific features, they can be particularistic, descriptive, heuristic, and inductive. In a case study the focus should be on one phenomenon and the research of that phenomenon should result in its rich, detailed description. As a result case studies increase the reader’s knowledge, on the phenomenon that is described in the study, heuristically by presenting this phenomena in a new way. Therefore the readers of case studies either confirm the facts that they are already aware of or they expand their experience. Case studies aim to introduce readers to the discovery of new findings and to deepen their understanding of a specific phenomenon. A case study can provide descriptions of phenomena, test theories, generate new theories or combine some of the above (Svensson, 2010).

It is apparent that in order to answer the research question of this thesis a qualitative case study method is the correct approach. Open innovation phenomena in firms are beyond the control of the researcher and a heuristic description is the most befitting option. The focus on the case study of Ericsson can offer valuable insights on how a corporation of that magnitude has adopted its innovation processes in today’s unique conditions. Thus it will increase the knowledge of the reader on innovation strategies and on the implementation of open innovation theory in practice.

The primary data of this thesis include an interview of a senior manager at Ericsson who is involved in the innovation strategies of the company. He will remain an anonymous even though this will affect the reliability of the findings of this thesis.

### **3. Conceptual Framework**

The common comprehension about innovation was that it is generated by closed internal procedures within a company and that technology is its main moving power. Innovation was considered to be a job for engineers.

All these notions seem to be a thing of the past.

Innovation is now considered as the commercialization of an invention. It is not limited only to products but it spreads into businesses, processes as well as business models (Chesbrough, 2008).

Chesbrough (2006) introduced a new concept in innovation, open innovation and gave the following definition: “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively”.

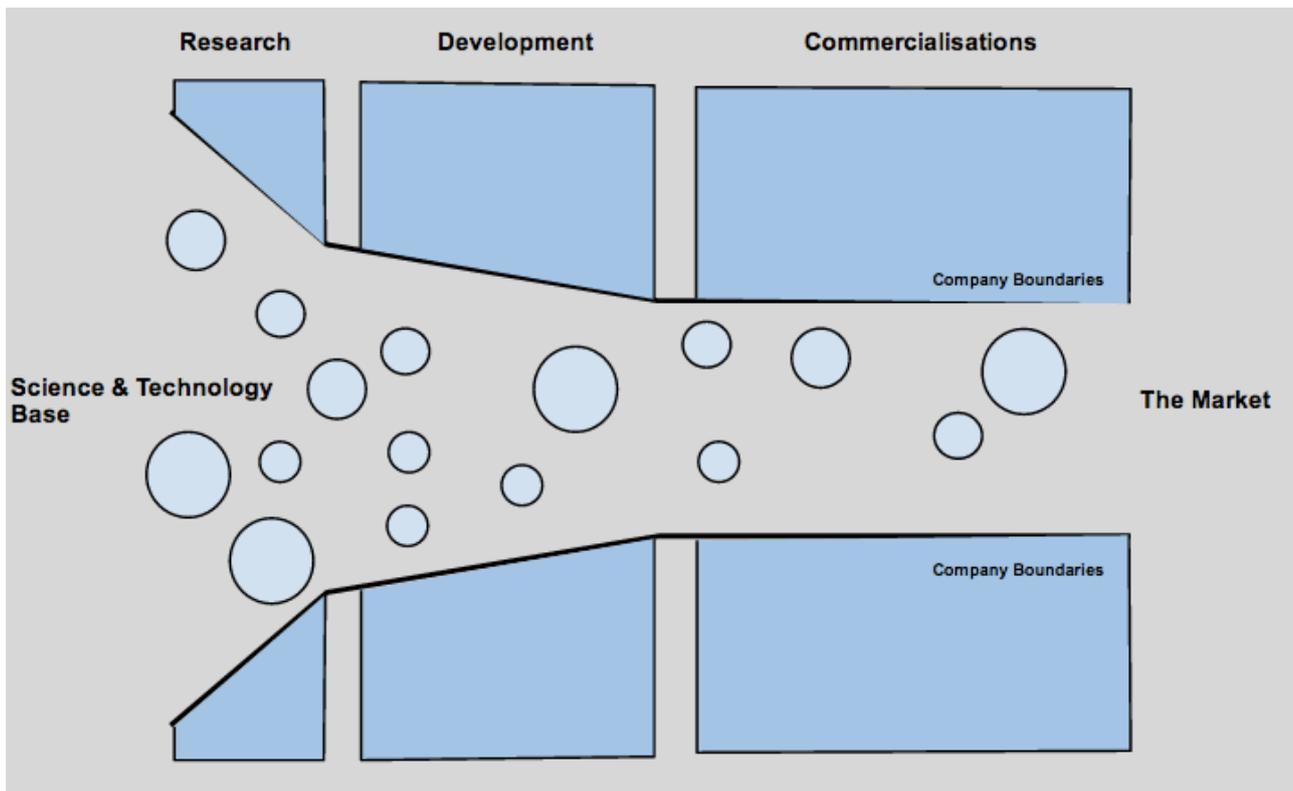
Even though Chesbrough is considered to be the father of open innovation there have been some researches before him who talk about similar concepts. One of them, Robert C. Allen (1983) talks about the collective invention where firms within an industry exchange new techniques and designs of plants free of charge. Allen describes the case of the iron and steel industry in the 19th century. When a firm constructed a new plant with a design that lowered the costs, it made that design available to other firms. This was a way to counter the low invention rate that this industry had to face.

Wesley M. Cohen and Daniel A. Levinthal (1990) are two researchers who laid the groundwork for open innovation with their research on the absorptive capacity, which is one of the key elements in open innovation. Cohen and Levinthal characterize innovation capacity as critical for the innovative capabilities of a firm because it describes the ability of a firm to recognize the value of new, external information and apply it for a commercial use. They argue that the development of the innovative capacity of a firm depends on its history and its goals that and that the lack of investment in this ability will cause serious problems in the future growth of the company. The absorptive capacity plays a crucial role in the innovative activities of a company, which include the basic research, the adoption and the diffusion of innovations. The absorptive capacity also affects the decisions that a firm makes in order to participate in R&D cooperations.

Admitting that innovations can come from outside of the closed borders of a company is a basic condition for open innovation and Eric Von Hippel (1988) is one of the first researchers who traced the sources of innovation. The common knowledge until then was that innovations come from the companies that develop and commercialize products and that perception has sapped to a great extent firm’s management of innovation and government innovation policies, but Von Hippel claims that product manufacturers are not always responsible for product innovations and that the sources of innovation can vary greatly. There are fields where product users develop most of the innovations and there are also cases where suppliers are the innovators.

### 3.1 Innovation: The Old Paradigm

Until recently innovation was considered to be an internal process for each company. Companies utilized their own research and resources in order to innovate, building a protective barrier around their intellectual property with patents and trade secrets (Chesbrough, 2007b). It was a common perception that in order for a company to be successful in innovation it should have total control on its research and development and to conduct them internally (Chesbrough, 2003a).



Picture 1- Closed Innovation paradigm (Chesbrough, 2003a)

As the above drawing illustrates, in the closed paradigm, innovation works as a closed funnel system, where science and technology interact with a large number of research subjects that a company pursues. These ideas are filtered and reduced into fewer projects that a company develops and after the development phase, new products and services are created, which are then introduced to the market, contributing to the growth of the firm (Chesbrough, 2012).

This model is characterized as “closed” because there is only one way for projects to enter the innovation system of a company (science and technology base) and only one way to exit (entering the market). This model has been quite efficient with countless success stories throughout the course of history (Chesbrough, 2012).

Companies invested heavily in research and development departments in order to remain innovative and to continue to grow but a number of factors have caused a shift in this model (Chesbrough, 2006). During the last two decades the world of business has changed and it has driven companies to pursue new strategies in order to remain innovative.

The Globalization of the economy with high mobility and fewer entry barriers, the technology



### 3.3 Open VS Closed Innovation

Closed Innovation	Open Innovation
The smart people in our fieldwork for us.	<b>Not all the smart people work for us. We need to work with smart people inside and outside our company.</b>
To profit from R&D, we must discover, develop and ship it ourselves	<b>External R&amp;D can create significant value; internal R&amp;D is needed to claim some portion of that value.</b>
If we discover it ourselves, we will get it to market first.	<b>We don't have to originate the research in order to profit from it.</b>
If we are the first to commercialize an innovation, we will win.	<b>Building a better business model is better than getting to market first.</b>
If we create the most and best ideas in the industry, we will win	<b>If we make the best use of internal and external ideas, we will win.</b>
We should control our intellectual property (IP) so that our competitors don't profit from our ideas	<b>We should profit from others' use of our IP, and we should buy others' IP whenever it advances our own business model.</b>

Table 1 – Principles of Open vs. Closed Innovation (Chesbrough, 2003a)

Shifting from a closed innovation model to a more open one is a big change that requires substantial changes in the organization of a company. The table above presents the basic contrasting principles of open and closed innovation.

### 3.4 Open Innovation Processes

There are three core processes in open innovation.

**Outside – in:** It is the most common process in open innovation and it helps a company to improve its knowledge base by taking in knowledge from its surroundings (suppliers, clients etc). This process helps companies to take in external stimuli and utilize them in order to improve their innovative capabilities (Enkel et al, 2009). Inbound open innovation can offer a competitive advantage and suggests that companies should not rely only on their own research and development department (Chesbrough, 2012).

The table below displays the characteristics of outside-in open innovation and the characteristics of the companies that use this process.

Characteristics	Outside-in process
<ul style="list-style-type: none"> <li>- low tech industry for similar technology acquisition</li> <li>- act as knowledge brokers and/or knowledge creators</li> <li>- highly modular products</li> <li>- high knowledge intensity</li> </ul>	<ul style="list-style-type: none"> <li>- Earlier supplier integration</li> <li>- Customer co-development</li> <li>- External knowledge sourcing and integration</li> <li>- In-licensing and buying patents</li> </ul>

Table 2: Characteristics and company examples of the outside-in process (Gassmann and Enkel, 2004)

**Inside – out:** In outbound open innovation companies let knowledge and ideas flow outside of their walls in order to be used by others. During this process a company takes ideas, which are not

necessarily compatible to its own business model and tries to find ways to introduce them to the market. This is done by either selling intellectual property or by transferring technology to other firms (Enkel et al, 2009). Projects can also find their way to the market by outlicensing or by creating spin off companies as well as through a company’s own sales and marketing channels (Chesbrough, 2012).

The table below displays the characteristics of Inside-out open innovation and the characteristics of the companies that use this process.

Characteristics	Inside-out process
<ul style="list-style-type: none"> <li>- (basic) research-driven company</li> <li>- Objectives like decreasing the fixed costs of R&amp;D, branding, setting standards via spillovers</li> </ul>	<ul style="list-style-type: none"> <li>- Bringing ideas to market</li> <li>- Out-licensing and/or selling IP</li> <li>- Multiplying technology through different applications</li> </ul>

**Table 3: Characteristics and company examples of the inside-out Process (Gassmann and Enkel, 2004)**

Coupled process: This process refers to alliances, cooperations and joint ventures between companies. These companies co-create innovative products or services, in this process the sharing of knowledge is crucial for the success of their efforts (Enkel et al, 2009).

The table below displays the characteristics of coupled open innovation and the characteristics of the companies that use this process.

Characteristics	Coupled process
<ul style="list-style-type: none"> <li>- standard setting (pre dominant design)</li> <li>- increasing returns (mobile industry through multiplying technology)</li> <li>- alliance with complementary partners</li> <li>- complementary products with critical interfaces</li> <li>- relational view of the firm</li> </ul>	<ul style="list-style-type: none"> <li>- combining outside-in and inside-out processes</li> <li>- integrating external knowledge and competencies and externalizing own knowledge</li> </ul>

**Table 3: Characteristics and company examples of the coupled process (Gassmann and Enkel, 2004)**

The ways that inbound and outbound open innovation is applied in practice can be categorized according to whether a company is using these two processes for making profit or not. Table 4 is illustrating these inbound and outbound open innovation processes. When firms use open innovation in order to gain profit the exchange of knowledge is in a form of a transaction, which aims to exploit innovation. In inbound open innovation firms license or buy novel knowledge from outside of the company, this knowledge is usually IP or it is related with the use of clearly defined IP. In outbound open innovation firms sell or license out their own IP. In these transactions IP plays a very important role by providing certainty and clarity (Lee et al, 2010).

	Inbound	Outbound
For Profit Transaction / Exploitation	Acquire / Buy /Contract In/ License In	Sell / License Out / Contract Out
For Profit Co-Creation / Access	Cross License & Barter, Pool	
Not for Profit Co-creation / Exploration	Take (formal & informal) / "Open Source"/ Crowd Sourcing/ User Sourcing	Disclose (formal & informal) / Contribute & Publish / User Participating Kit /

**Table 4 - Modalities of Open Innovation (Lee et al, 2010)**

When profit is not the motivation for using open innovation, in inbound cases companies use knowledge, which is disclosed or published and they participate in “open source” communities and in open innovation platforms where innovation tasks and assignments are faced (i.e “crowd sourcing”). Firms also use the knowledge from users on their products. In outbound open innovation firms disclose their knowledge and the tasks that they concern them in order to innovate. Firms try to contribute back to the communities where they took the knowledge from and they provide kits that uses use in order to participate to the innovation processes. This type of open innovation is done with either identifiable actors like groups of community members, with specified groups like platform users, with unidentifiable contributors like forum communities or with the public. These innovation processes are unregulated, firms use mandatory IP law and there are rules in order to participate (terms of use). There are cases where a hybrid open innovation model is adopted between commercial and non commercial exploitation. There is a co-creation of the standards and there are networks where there is limited access to knowledge and IP is pooled or cross-licensed (Lee et al, 2010).

### 3.5 Advantages, Challenges and Boundary Conditions of Open Innovation

#### 3.5.1 Advantages

The main reason why companies adopt open innovation strategies is that open innovation helps them generate more revenue, achieve growth and create new innovative products (Chesbrough and Crowther, 2006).

Adopting an open approach to innovation can be extremely beneficial for companies that choose to go towards that direction. One advantage that open innovation offers is that it treats spillovers from the internal R&D not as a cost but as an opportunity to achieve growth by expanding its business model or by spinning off a technology outside of the firm, with a totally new business model. In addition open innovation approaches IP in a different way and instead of using it as a way to protect the company it uses it to generate additional revenue by selling it or licensing it. (Chesbrough and Crowther, 2006)

Other advantages of open innovation include the reduction of the time and the cost for the development of a new product or service, the shared risk of the projects, the reduction of time to market, the easier access to knowledge and resources that are needed for a new innovation, the concentration of core competencies, branding, the utilization of internal creativity and the

realization of learning effects (see e.g. Gassmann and Enkel, 2004; Chesbrough, 2006; Keupp and Gassmann, 2009;).

### **3.5.2 Challenges**

Chesbrough (2006) claims that the successful adoption of open innovation strategies means that companies have to face some very important challenges. One of the most important is the “Not Invented Here” syndrome, when companies resist to knowledge that was not developed within their own borders. It is faced by realizing that to achieve sustainable growth, internal efforts are not enough and that external technologies can help to create value. A second adoption challenge is to remain committed to open innovation long enough in order to see the benefits and it is confronted with constant managerial support and funding of open innovation initiatives.

Another challenge is the protection of IP. Being open contains the risk of being exploited by others which makes it difficult to seize the benefits of your innovations. (Dahlander and Gann, 2010). Companies also have to face some risks and they have to overcome barriers so these strategies can be successful. The most common risks are the loss of knowledge, high coordination costs, loss of control and high complexity. The internal barriers are the difficulty in finding the right partner, the imbalance between open innovation and their daily business along with insufficient time and financial resources that can be allocated to the open innovation activities (Enkel et al., 2009).

West and Gallagher (2006) identify three fundamental challenges for firms in applying the concept of open innovation:

- Discovering creative ways to exploit internal innovation

Companies need to find ways to maximize the performance of their internal R&D. Firms that achieve that can create innovations that can be commercialized internally, develop absorptive capacity, create innovations that can be externally commercialized, create IP that can generate revenue through spillovers or sale of related goods and products.

- Incorporate external innovations into internal development

Firms need to be able to identify external innovations and use their absorptive capacity in order to incorporate them into their strategy successfully and to create products that fit in with the firm’s needs.

- Motivate outsiders to supply a continuous stream of external innovations

In open innovation the constant flow of external innovations is necessary. Organizations that provide these innovations have to feel that their efforts are not exploited so they can continue their innovative activities. Firms need to provide individual innovators and innovative firms with incentives.

### **3.5.3 Boundary Conditions**

Chesbrough (2012) suggests that no one can guarantee that open innovation is the right choice for all the companies. There are some conditions that need to be satisfied so that open innovation can

contribute to the growth of a company. One condition is the mobility of the workforce. This condition is necessary in outbound open innovation when a new venture is created outside of a company's walls and knowledge needs to be transferred outside too, this is done by relocating the right people for some extended period of time.

Another condition is the presence of internal R&D. Using open innovation does not mean that the internal R&D should be diminished. Open innovation helps companies to improve their absorptive capacity so they can transfer external ideas internally and put them in good use. For innovation to work properly people inside of a company and people outside of a company cooperate in harmony, the presence of people who work in the boundaries of companies and who can to combine different sources of knowledge is very beneficial.

The last condition is the presence of basic IP rules. These rules are needed when capital investments are made to support an innovation project. IP protection ensures that investors will get something in return for their capital (Chesbrough, 2012).

### **3.6 Open Business Models**

A business model performs two important functions: It creates value and it helps to capture a portion of that value. An open business model enables organizations to be more affective in both of these functions. (Chesbrough, 2007a). Consequently business models are very important in the innovation process. With an adaptive business model companies can capture more value from their innovations by commercializing ideas that do not fit with their current business model (Chesbrough, 2012).

Organizations have a tendency to pursue ideas that fit with their current assets, resources, market position and with ideas that were successful for them in the past. Recognizing the value in concepts that are unfamiliar to them has always been difficult but open innovation can help ideas that do not fit with a company find a place where they can produce value (Chesbrough, 2007a).

There are two trends in the world market today that motivate companies into choosing an open business model: the rising cost of technology development and the shortening life cycles of new products. These two trends make investments in innovation difficult to justify but an open innovation model can help by providing external R&D resources, which means that less money and time is needed in order to innovate (Chesbrough, 2007a).

Saving time and money is not the only benefit of such a business model. Open business models give the opportunity to firms to generate revenue from markets that are not directly linked with them. By using means like licensing fees, joint ventures and spinoff, companies create more overall revenue from the innovation. As a result innovation becomes economically attractive (Chesbrough, 2007a).

To be able to gain the benefits mentioned above companies need to develop the ability to experiment with their business models and explore new possibilities. That means finding ways to face the limitations that companies have when it comes to their reputation in the market, their relationship with their distribution channels or with their manufacturing strategies. Spinning off companies and investing in startups are some of the ways that companies can achieve that (Chesbrough, 2007a).

## 4. Case study - Ericsson

This chapter describes how Ericsson applies open innovation and it demonstrated how a company opens up its innovation processes especially when it operates in a fast paced field, like Ericsson, which can offer a lot of opportunities but it is also extremely competitive.

The focus is on the open innovation strategies that Ericsson employs, what led Ericsson to adopt these strategies and how they affected the operation of the company.

### 4.1 Ericsson in Numbers

Ericsson is a Stockholm based global company with 135 years of history and it now operated in 180 countries. The table below displays facts about Ericsson's that justify the claim that Ericsson is the leading provider of telecom equipment and services in the world.

<b>Employees</b>	110,255 (December 31, 2012)
<b>R&amp;D Centers</b>	17
<b>R&amp;D Employees</b>	22 000 (March 2012)
<b>Net Sales</b>	SEK 227.8 billion (2012)
<b>Operating Income</b>	SEK 14.5 billion (2012)
<b>Investment in R&amp;D</b>	15% of the Net Sales
<b>Granted Patents</b>	27.000
<b>Number of Subscribers to Ericsson systems</b>	2 billion
<b>Volume of Mobile traffic</b>	40%

Table 5-Facts about Ericsson (Lorenzo, 2012) & ([ericsson.com](http://ericsson.com), Facts & Figures)

### 4.2 Ericsson's Business Model

Understanding the business model of a company and grasping the ways that it uses in order to capture value is crucial in order to gain an insight on how a company can open up its innovation processes.

Two main elements of a business model are the value propositions and the customer segments. The value propositions are the value that a company delivers to its customers, the products or services that it offers to them and the customer segments are the ones that receive the value that a company offers, mainly its customers (Osterwalder and Pigneur, 2010).

The table below illustrates these two important elements in the business model of Ericsson. The value that Ericsson offers has a very wide range. Everything begins with the intellectual property of Ericsson, this can be used to create technology which is then turned into products. The products are turned into solutions and the solutions can become full managed services. This value that Ericsson offers satisfies the needs of a variety of customers and in a variety of ways, from a complete solution for their business to a patent that can be used by them (SINFO do IST, 2012).

Value Propositions	Customer Segments
Intellectual Property (Ericsson Patent Portfolio)	<ul style="list-style-type: none"> <li>• Mobile Handset Manufacturers</li> <li>• Computer Industry</li> <li>• Consumer Electronics</li> </ul>
↓	
Technology (ST-Ericsson Platforms)	
Technology (Ericsson Technology)	Developers and Content Providers
↓	<ul style="list-style-type: none"> <li>• Telecom Operators</li> <li>• Service Provides</li> <li>• Utilities</li> <li>• Governments</li> </ul>
Products (Ericsson's Portfolio)	
↓	
Solutions (Ericsson System Integration and Consulting)	
↓	
Managed Services (Ericsson Managed Services)	

Table 6-How Ericsson Delivers Value (Lorenzo, 2012)

### 4.3 Open Innovation at Ericsson

Even though there is a hype around open innovation during the recent years, this practice is not something new for Ericsson which is a company that is practicing open innovation for many years now. As a senior manager at Ericsson, who will remain anonymous, describes: *“Ericsson is one of the companies leading and pioneering open innovation strategies. The change in the business world has not affected Ericsson which has been in open innovation for the last 20 years, of course there have been different ways in how we use it but it is not really a new trend, we continue to do things the way we are doing them.”*

### 4.3.1 Inside-Out Process

In 1994 Ericsson created the Bluetooth technology which is a short-range radio communication link and it is adopted by more than 1600 companies (Ericsson Review 4, 1999). For the case of Bluetooth the interviewee from Ericsson said that: *“Ericsson had the biggest share of the property technology and we decided to license it totally for free, because we thought that it was what we should do, so it could take off and be used widely.”*

Licensing-out is an important part of the inside-out open innovation processes and Ericsson had to go through a change in order to take full advantage of its IPR. *“Some 15 years ago, in the net balance of licensing, we were actually in warranties to other companies instead of getting revenues for royalties to our IPR but now that has totally changed. Now we are somewhere around 1 billion dollar mark of net income from licensing our IPR and we are paying very little to some agreements.”*

*The senior manager from Ericsson mentions that: “we and our competitors a number of years ago (NOKIA, Nortel etc) decided to create a scheme for licensing technology to other companies. If mobile handsets are available then there is a need for more network deployments and then there are more subscribers and then there are more revenues for our customers and for us, so it is a type of virtuous cycle.”* This type of mentality helps the ecosystem of Ericsson to grow. *“The other alternative would have been to say: ok we are manufacturing equipment for the networks and we are manufacturing devices, then only 10% of the number of today’s handsets would have been out there and with 10% the market would not be the same”*

For inside-out innovation process to work a company must have a practice in order to take the IP that does not fit its business model to the marketplace. This is understood in Ericsson: *“First of all we are not acting on that opportunistically. An example that has to do with that is the WIFI technology, that Ericsson is actually a pioneer, from the standards point of view and companies like Toshiba and Lenovo pay a fee for using Ericsson’s licenses to WIFI technologies for each laptop and PC they are delivering. This is an example of something that when it was created it was not in our product development interest but it was something that we thought we could contribute in and now we are getting the revenue flow of licensing.”*

In firms that innovate like Ericsson patents are a very important tool. Especially in open innovation when a company licenses out IP to other companies. Generally Ericsson does not evaluate, when developing a new technology, if a patent could be granted and if they can get money from that instead as the interviewee from Ericsson claims: *“we have over 90 licensing agreements with other companies, we license a whole portfolio of IPR that they need to build a solution based on 3GPP.”*

A very important way of using inside-out open innovation is the creation of spin-out companies. Ericsson creates spin-out companies from innovations that are of high risk but also have high potential. This is done by experimenting with various business models which may end up competing with each other and that is why an extrovert approach is needed in order to deal with such uncertainties. There are projects in Ericsson that are dealt with this way, securing independence to the research team as well as sufficient funding. Projects are treated as start-ups and internal sponsors play the role of internal venture capital, if expectations are met, which are usually very high, funding is continued (Lorenzo, 2008).

### 4.3.2 Outside-In Process

The outside-in open innovation process is also a very important part of the innovation strategy of Ericsson. One of the ways that Ericsson brings knowledge and technology from outside of the company in is by acquisitions. There are two reasons why Ericsson goes through with an acquisition: *“The first one is that we want to advance our current portfolio and we have a technology gap”*, the senior manager of Ericsson mentions the acquisition of a small company, of only 14 people who were working on a technology which filled a gap. *“we acknowledged the gap and we went to an acquisition of the company with just one customer so in that case it was an early acquisition of a start up and it was technology driven.”*

The second reason for an acquisition is: *“to have access to a wider market because the acquired company has a better position in that market. That is the case of a late acquisitions and it has a higher price.”* Ericsson acquires companies that can fill the gaps that it has in either technology or market footprint. The interviewee says that: *“There are other companies who acquire external firms to colonize new markets but it is not the case of our company. In general we acquire in order to consolidate our current business model.”*

The open approach of acquiring companies in different stages of maturity has helped Ericsson significantly: *“Starting a long cycle of research would not be good for anyone because acquiring a company that has invested four years in developing a technology is four years that you are saving and if it is in the right moment it can be at a good price.”*

As the senior manager mentions there are some challenges in this process: *“I think that what can be a problem is the “invented here” syndrome, that you have a bias towards internal thinking instead of buying what others have done, but I think that once that process is launched, for instance an acquisition process, all the forces are put in the integration of that company to our firm.”*

### 4.3.3 Combining Outside-in and Inside-Out Processes (Ericsson Labs)

Indicative of the importance of open innovation for Ericsson are the various tools that it develops in order to promote this open approach. Such a tool is Ericsson Labs.

Ericsson Labs is a website where Ericsson displays their latest research in the field of Internet and Communication Technologies (ICT), opening up the findings of their R&D department and making them accessible to everyone. Through this initiative Ericsson reveals concepts that have already been proven in practice but it also reveals ideas that are in an early stage of development. ([ericsson.com](http://ericsson.com), Ericsson Labs)

The users of Ericsson Labs can find prototypes and running code on several research areas. In addition Ericsson provides software and tools that these users can try out. The outside-in part of Ericsson Labs is letting the public to temper with its IP. Ericsson receives valuable feedback that can improve their innovations or it may lead to new concepts. This initiative is Ericsson’s way of admitting that their R&D department is not flawless and that there are people outside of the company that can contribute to their ideas. The inside-out purpose of Ericsson Labs is to allow its users to access the intellectual property of Ericsson so they can develop their own ideas and if these

ideas lead to a commercially viable option Ericsson can close deals with them generating revenue for the company that otherwise would not be possible to generate (SINFO do IST, 2012).

The senior manager's comment on Ericsson labs was that: *"it is officially confirmed as a good strategy not only for us but for the way that the Apps ecosystem is built, where plenty of people who have the possibility and are able to do a number of things that they could not do otherwise."*

Ericsson's role is to be a hub like Google, apple and Samsung are doing for the mobile apps, *"we are using that approach in slightly different way to make sure that people could try out their ideas based on the most recent technology that we were creating in our research labs. Then we can have an early indication on how people can use that technology. This cooperation can lead to further agreements for partnering or for other types of cooperation. Of course it is not something very big thing just another tool for engaging early with people who use your technology."*

#### 4.3.4 Coupled Process

Ericsson is taking part in many standardization initiatives in the telecom industry. Cooperating in order to innovate is not something new for this company. One of these cooperations is the 3GPP ecosystem. In 1998 more than 300 companies, even though they competed in the market, decided to cooperate in order to create the standards for new generation telecommunication networks. This is a very characteristic case of a coupled process of open innovation. Through that cooperation, standards like the EDGE, HSDPA and LTE were introduced in the market and they have become the dominant standards in this industry, creating significant growth opportunities for the future that will benefit all the participant companies. The main reason why this specific cooperation is a success is the clearly defined IPR policy. This means that the firms that participate in the 3GPP ecosystem know beforehand the percentage of the revenue that they will receive when a new innovation is introduced to the market (SINFO do IST, 2012).

As the interviewee comments: *"the competing companies are agreeing on the terms, which are challenges and how by cooperating we can find a common solution and that is the basis for creating the technology that we need on serious of standards for online communications from 2G to 4G, this is basically how the industry works."*

This way of working has helped new handset manufacturers to enter the market easier: *"mobile handset manufacturers were able to create a portfolio of solutions without having to invest in research for a long time. 3GPP creates a set of rules for making it clear how you can start developing and commercializing technology based on the technology that others have created previously."*

Another way that Ericsson utilizes open innovation is Business Labs. With this tools Ericsson works with customers and business partners in order to find new ways in order to create sustainable businesses. Business labs is a platform that offers support to customers from several sectors in order to explore, test and bring to the market sustainable solutions ([ericsson.com](http://ericsson.com), Business Labs).

The interviewee points out that with business labs: *"we try to influence our current customers with new things that will challenge our and their business model"*

Business labs is not only indicative of the spirit of cooperation that Ericsson cultivates between their own company and parties outside of it but it is also an indication of the cooperation that its



promoted between the different subsidiaries of Ericsson. There are several Business Labs that operate throughout the globe. Some of the locations are Sweden, Russia, China, USA, India, Germany and Spain ([ericsson.com](http://ericsson.com), Business Labs). The internal cooperation is *“something fundamental, we have transparency and the means to communicate across the company on the new things happening. It is a challenge to have a network of over nine business labs who are trying to do things and share as much as they can among them.”*

In 2011, Ericsson worked with customers all over the world, helping them gain access, plan, develop and manage innovation in their business, which relate to sustainable cities and machine-to-machine communication. Ericsson engaged with leaders in the telecom industry in Asia, Europe, North and South America, South America as well as Australia and Africa ([ericsson.com](http://ericsson.com), Business Labs).

In the coupled process where companies form alliances and cooperate in order to innovate there is a very important limiting factor. As the senior manager of Ericsson says *“The limiting factor is one of the two ends, we might be very open and the customer might be very closed or it could be the other way around. Maybe we are not as open to some customers who want to be more open. We have to find the right chemistry, it is like talking the same language and you need that. Some partners are very different, the definition of open varies a lot from one company to another.”*

All the involved parties contribute in R&D with concepts and technologies. The existence of mutual nondisclosure agreements is necessary for the protection of such a cooperation. By opening up the research of Ericsson, joint innovation projects are created and technologies are tested in new business contexts. All the organizations involved have rights over the results of the R&D and by exposing their research and getting feedback they can adjust their internal innovation accordingly. Even though some of the ideas become joint patents and some are patented separately the inclusion principles are the ones that motivate for expanding the collaboration. In the projects that were Ericsson jointly participated with others it is observed that the implementation and the adaptation of innovations was done faster as well as the time that is required for an innovation to reach the market was significantly reduced (Lorenzo, 2008).

#### 4.4 Ericsson's R&D

Adopting open innovation, as part of the innovation strategy of a firm is not enough, firms have to continue investing in their own R&D. Ericsson is faithful to that principle by recognizing the importance of starting open innovation internally: *“Open innovation should start inside your company, otherwise you could be acquiring knowledge or technology or companies from the outside but not use them internally, so it has to start internally and I think that business labs is that type of example”*.

Companies should not consider openness as a way to save money from their investment in R&D because that may lead to an insufficient absorptive capacity. Investment in R&D and open innovation go side by side and according to Kasim Alfalahi Ericsson spent nearly \$5 billion in 2012. With this investment Ericsson wants to remain the leader in wireless communications and their vision is to reach 50 billion connected devices by 2020 (Bounds, 2012).

As the interviewee confirms the importance of internal R&D: *“Ericsson is keeping an investment of 15% of net sales in R&D. We can confirm that even if we do a lot of open innovation processes,*



*outbound and inbound, we are heavily investing in R&D but we are changing the understanding of what R&D is as well, in the same process.”*

When we examine large corporations like Ericsson we can observe that regardless of their size they have developed some core competencies over the years that play a crucial role in the way that they operate, in their product development and in their corporate strategy. It is not always easy to focus on these core abilities. In the mobile ecosystem which consists of operators, vendors, and mobile handset manufacturers Ericsson decided according to the interviewee to: *“focus on one of the parts, the network equipment but give access to others to create the other end, the terminals because then we can do what we are good at. I am convinced it was a good decision, not only for our company but the industry as well.”*

#### **4.5 The Telecommunications Industry**

When choosing an approach to innovation a lot depend on the environment in which a company operates and the ecosystem that it is part of. Every industry has its unique characteristics and unlike some industries where companies want to maintain a monopoly, in the case of Ericsson and the telecommunications industry: *“ We need a number of companies competing and creating the best technology they can and letting users and operators decide what they want to buy.”*

The application of open innovation is not always without problems. There as circumstances when this approach is second guessed. That mainly happens when the industry in which the company that uses open innovation operates, is going through a rough period.

In 2000 open innovation went through a crisis in Ericsson when: *“the internet bubble and the 3G bubble was there, it was three to four tough years where this was put at a test because when the market is contracting you can have the tendency to take monopolistic approach and I think that we were wise enough not to try that.”*

## **5. Discussion**

Chesbrough (2012) defines open innovation as an open funnel where projects can enter and exit the innovation process of a company at various points and in different ways, companies that use open innovation treat this wide range of ideas differently in order to gain the maximum benefit. By observing the way that Ericsson applies open innovation we can see that it has the form of an open funnel as Chesbrough (2012) describes it.

Ericsson is using all three types of open innovation processes in its innovation strategy as well as combinations of these three types and it moves within the frame that Enkel et al. (2009) Chesbrough (2012) and others have defined.

### **Inside-Out**

As Enkel et al. (2009) mention, outbound open innovation allows knowledge to flow outside of a company to be used by others. The case of the Bluetooth technology is a very characteristic example of how Ericsson has utilized inside-out open innovation, not only for its own benefit, but for the good of the whole industry, by releasing a key enabling technology like Bluetooth. Ericsson opened up that technology to the world for free, which eventually resulted in making that technology dominant.

When a company has such a long tradition in innovation, like Ericsson, its patent portfolio is strong and it has IP that could be utilized by many other companies. Outlicensing as Chesbrough (2012) mentions is one of the options that open innovation gives to companies to take advantage of their IP and gain significant revenues. As we can see in the empirical part Ericsson out licenses IP that is not directly useful to them and it acquires noteworthy income.

### **Outside-In**

According to Enkel et al.(2009) inbound open innovation can improve the knowledge base of a company by importing IP from outside of the company. In Ericsson this is done mainly with acquisitions. These acquisitions has the role of bringing technology that can fill Ericsson's gaps in R&D and they can also help Ericsson to improve its place in the market.

### **Coupled**

The coupled process of open innovation, where according to Enkel et al.(2009) companies cooperate to co-create innovative products or services, is a process that is very common in the industry that Ericsson operates. It is in the telecommunications industry nature to be open. Companies are willing to share their IP with their competitors and common standards are formed that apply to all the companies in that industry. The 3GPP platform is such a successful effort.

We can see that in order to combine internal and external ideas Ericsson is using platforms like Ericsson Labs, Ericsson Business Labs etc which lead to an appropriate business model in order to capture the value of innovations like Chesbrough (2012) describes. These platforms indicate that Ericsson has adopted the philosophy that not all people work for them and that they need to work with smart people from inside and outside our company (Chesbrough, 2003a).

## **Business model**

By taking a look at the business model of Ericsson we can see that it facilitates open innovation because it is structured in a way that, as Chesbrough (2007a) describes, it can both create and capture value. By having a flexible business model Ericsson can capture value in different ways and from markets that are not within their immediate scope. We can see for example that Ericsson can use its IP for either creating a technology, which can then be sold to the market or by licensing out IP to others. This way Ericsson gains more revenue, which makes this open business model, economically attractive as Chesbrough (2007a) points out.

Although when we look at the theory (Lee et al, 2010) we can see that open innovation is not always used in order or to gain profit. This depends on the motives of the company. Ericsson is a firm that is using online platforms where users can temper with its IP. Ericsson does not have an immediate economical benefit but it can explore how its technology can be used. The Bluetooth case is another example where Ericsson used outbound open innovation without intending to gain money, but this move helped the telecommunications industry to grow and so did Ericsson.

## **Challenges**

According to West and Gallagher (2006) there are challenges that companies have to face when they apply open innovation to their innovation strategies and a key factor for facing these challenges is the development of an absorptive capacity. This quality helps companies to incorporate external knowledge to their own R&D. Without the presence of an advanced adsorptive capacity within a company, the stimuli that flood inside are not used to the fullest, depriving that company from opportunities to produce innovative products and services. Developing an absorptive capacity is very important for Ericsson. As we can see in the case study, Ericsson invests a significant percentage of its net sales in R&D so they can continue to be innovative.

As Chesbrough (2006) claims there are two other challenges that the practitioners of open innovation have to face: the “Not Invented Here” syndrome, when companies are reluctant to use knowledge that was not developed by them and the challenge of remaining open long enough, so the benefits of open innovation are revealed. Ericsson has been in open innovation long enough in order to be able to see clearly the advantages of such a practice, it has continued to grow and the use of open innovation has been economically beneficial. The “Not Invented Here” challenge is considered a problem in Ericsson but with the full commitment of the company, when knowledge comes in from outside (acquisitions) there is an intensive effort to integrate the external IP to the internal.

## 6. Conclusion

Ericsson has been actively involved in open innovation for many years now. It is not a company that hesitates to open up its IP to others, even for free (Bluetooth) and to absorb IP from outside of the company when it is beneficial for the corporate strategy of the company.

Answering the research question of this thesis: *“How did Ericsson open its innovation processes and what specific open innovation strategies does Ericsson currently use?”* we can see that Ericsson has opened up its innovation strategies by utilizing all three of the open innovation processes. Ericsson is using the inside-out process by licensing-out IP and by creating spin-off companies. The outside-in process is mainly put into practice with acquisitions of companies that fill technological gaps or that can offer a better position in the market and the coupled process is expressed by strategic cooperations and alliances with companies which help to create the standards on which the telecommunications industry operates today.

It is exactly the nature of the industry in which Ericsson operates that has favored the extensive use of open innovation practices. The fast pace of the telecommunications industry, the importance of being constantly innovative in order to continue to grow and the dynamics of the market, has made the companies that operate in that industry to realize that open innovation can be beneficial for everyone.

Unfortunately using an open innovation approach should not be considered as a panacea for the companies that want to remain innovative. There are still a lot of issues that should be addressed in order to have a smooth operation of such a model. By observing the case of Ericsson we can see that in order to implement an open approach the entire organization must be willing to discard the “not invented here” attitude and in order to cooperate with other companies a common definition of open innovation is needed because each company has a different perception on how open is open innovation.

In addition using open innovation does not necessarily mean that companies can reduce the money that they invest in their own R&D. Investing in a company’s R&D results into developing an absorptive capacity, which is a competence that is necessary to absorb knowledge from the outside, enabling that company to create more innovative products and services.

## **7. Limitations and Future Research**

This thesis has only scraped the surface of the open innovation strategies that Ericsson uses. The size of this study is insufficient in order to analyze such a complex phenomenon in a multinational company of the magnitude of Ericsson.

A study of a larger scale that may include some other companies that are using open innovation practices, successfully or unsuccessfully could provide a more accurate understanding of open innovation and it could also provide some specific guidelines for companies that want to engage in such a practice.

Another limitation of this study is the absence of figures that would indicate the cost of implementing open innovation in Ericsson. This can be a subject for a future research in order to understand how much a company should invest in open innovation and what should that company expect from that investment. This can also lead to a benchmark between investing in open innovation and investing in R&D.

Moreover, this thesis mainly emphasizes on the positive side of open innovation. A more thorough investigation on the negative effects of open innovation could be a very interesting research subject.

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