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ADOPTION OF OPEN INNOVATION STRATEGY

THE ELECTROLUX CASE

Master Thesis by

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ABSTRACT

Open Innovation strategy has come as a new way of doing innovation that has allowed the companies to rely not just into their internal research and development assets but also, they can exploit opportunities from outside and bring them inside the firm. Therefore, challenging the not invented here syndrome and making the boundaries of the company permeable where ideas might come in and out of the company as needed.

Electrolux, a global leader in home appliances and appliances for professional use, has implemented the Open Innovation model successfully since six years. The study shows in detail how Electrolux implemented its Open Innovation Strategy through establishment of an independent business unit acting as interface between an external world of innovators and the internal stakeholders within Electrolux, with the further task of establishing a culture supporting the adoption of Open Innovation. In further the paper explains more about the implementation of an open innovation strategy, in particular about the specific themes like service design tools used, TRM (Technology Roadmapping), The Broker system or Network Management and Innovation Management. The study concludes by showing how the open innovation supported the industrial operations with the different use cases of Electrolux.

TABLE OF CONTENTS

CHAPTER 1	INTRODUCTION	6
CHAPTER 2	LITERATURE REVIEW	8
2.1	Closed Innovation: Xerox Parc Case	8
	a) Problems with the old Paradigm – Root Causes	8
	b) Erosion Factor 1: The increasing availability and mobility of skilled workers	10
	c) Erosion Factor 2: The Venture Capital Market	10
	d) Erosion Factor 3: External options for ideas sitting on the shelf	11
	e) Erosion Factor 4: The Increasing capability	11
2.2	Open Innovation Paradigm	12
2.3	Open Innovation Funnel	13
2.4	Three Core Processes in Open Innovation	14
	a) Outbound Open Innovation	14
	b) Inbound Open Innovation	14
	c) The Coupled Process	14
2.5	Open Innovation Networks – Network Intermediaries	15
2.6	Electrolux Global Company	16
	a) Generalities	16
	b) Corporate Strategy	16
2.7	Strategy Overview	17
	a) Profitable Growth	18
	b) Experience Based Innovation	18
	c) Operational Excellence	18
	d) Talent & Teamship	19
2.8	Innovation	19
2.9	Brand	20
2.10	Transformation Initiatives	21
2.11	Electrolux Open Innovation	22
	a) Objective of the Open Innovation Strategy	23
	b) Roles and Responsibilities of the OI Team	24
CHAPTER 3	ELECTROLUX INNOVATION HUB	25
3.1	iHub Strategic Pillars	25
3.1.1	Open Innovation	25
3.1.2	Technology Liaisons	25
3.1.3	Innovation Academy	26
3.1.4	Technology Garage	26
CHAPTER 4	ELECTROLUX OPEN INNOVATION MANAGEMENT – EMPIRICAL EFFORT	27
4.1	Open Innovation Strategy 2.0	27
4.2	SWOT Analysis	27
4.3	The Three Pillars Strategy	28
4.3.1	Challenges	28
4.3.1.1	Challenges Ideas	33
4.3.1.2	Challenges – PACS, ENABLERS	33

4.3.1.3	Challenges Process – HOW	34
	a) Focus	34
	b) Launch	35
	c) Scout	35
	d) Screen	36
	e) OIB – OIB Check	36
	f) Bridge	37
	g) Challenges – BAU	37
4.3.2	Network	38
4.3.2.1	Interfaces	39
4.3.2.2	Platforms	40
4.3.2.3	Network Process	41
4.3.2.4	Network Process – HOW	43
	a) Brokers : Focus	44
	b) Brokers : Launch	44
	c) Brokers : Scout	44
	d) Brokers : Screen	45
	e) Brokers : OIB	45
	f) Brokers Activation – Signed Agreement	45
	g) Brokers Activation – Informal Agreement	46
4.3.2.5	Broker Management	47
	a) Broker Rating	47
	b) Selection	47
	c) Maintenance of Formal and Informal Agreement	48
	d) Rating Process	48
	e) Results	49
4.3.3	Mindset	51
4.3.3.1	Mindset Objectives	51
4.3.3.2	Mindset Typologies	52
4.3.3.3	Mindset Process	52
4.3.4	TRM – Technology Roadmapping	52
4.3.4.1	TRM definition and implementation : Project Goals	54
4.3.4.2	GRP (Gaps Recovery Planning) definition and implementation: Project Goals	55
4.3.4.3	TRM & GRP in Open Innovation	56
CHAPTER 5	OPEN INNOVATION – ELUXHUB PROJECT	58
5.1	Unveiling the Gaps	58
5.2	Defining the Strategy : Service Design As Main Driver	59
5.2.1	Service Design for EluxHub Project	60
5.2.2	Service Design Inside an Organization	61
5.3	Eluxhub Service design Process	62
5.3.1	Discover – Explore Phase (Electrolux Eluxhub Case)	64
5.3.1.1	Stakeholders Maps	65
5.3.2	Define	67
5.3.2.1	Challenge Process : SWOT Analysis	67
5.3.3	Deliver & Develop	70

5.3.3.1	Eluxhub – Accelerators	70
5.3.3.2	Eluxhub Awakening	72
5.3.3.3	Eluxhub Awakening – Storyboard	75
CHAPTER 6	ELECTROLUX GLOBAL INDUSTRIAL OPERATIONS (GIO) & USECASES	81
6.1	GIO	81
6.2	Key role of open innovation in GIO	82
6.3	The Challenges process of open innovation in GIO (Focus, Launch, Scouting, Screening & Open innovation Board)	83
6.4	GIO Use cases	83
CHAPTER 7	CONCLUSION	88
	REFERENCES	89

CHAPTER 1 – INTRODUCTION

The Open Innovation strategy is a new paradigm that has revolutionize the way the innovation is done in the companies, the traditional way happened inside the four walls of the company, the research and development were done inside and all the products and services that the company would launch were a result of the job done by the scientist inside it. In this sense, the R&D was the major asset of the companies in order to achieve successful products, that is why, there was heavy investment into their internal departments as in this way the company would guarantee that they will be the leaders of their particular industry, this is known as the Closed Innovation Paradigm, unfortunately, even if this was true for certain period of time, industry conditions changed, one of the main breaking points was that the knowledge stopped being concentrated inside the companies labs, as Universities started to grow, its research did so as well, new technologies started to arise from garage inventors, and even other smaller players started to have breakthroughs, this fact and others are going to be shown during the literature review as companies such as XEROX faced this problem, causing them to lose the opportunity to be the leaders of their industries and even being the pioneers of new ones.

Due to this fact, Open innovation arose as a new way of doing innovation, by taking into consideration all the new industry and ecosystems conditions instead of ignoring them as in the previous paradigm. Open Innovation finished with the believe that the innovation needs to happen always inside the companies' lab, instead innovation might come from outside of the company, and the firms are the ones that have to be aware of these potential opportunities in order to absorb them as fast as possible in order to embed them into their particular technology road maps. Likewise, innovation could happen from inside of the company, but on contrast to the traditional paradigm, the company does not need to wait until everything is ready in order to take advantage of any technology, they might also put those ideas outside of the company where they can grow and become successful products for the customers. To sum up briefly, the boundary between the company and its environment become permeable, where ideas can flow inside or outside of the firm.

Electrolux decided to explore this new paradigm seven years ago, when they created what it was considered at the time a start up inside the company, the main objective was to start building the Open Innovation framework inside Electrolux, Former Innovation hub Director Lucia Chierchia has been since then the coordinator, leader and main driver of the OI team. After this time, the OI has come from being a "start-up" inside the company, to be embedded inside the organization, more exactly under the GTC (Global Technology Center) that works shoulder to shoulder with the R&D of the company and that every day is receiving requests from brokers and innovators with new potential opportunities to be explored by Electrolux. A clear strategy was built around this concept that defined three main pillars for its daily processes: Challenges, Brokers and Mindset. The first one is related to how the company processes all the ideas when launching a "call for idea" event which is led by the brokers, about the latter, they are the ones that connect Electrolux with the potential innovators with technologies for Electrolux. The last pillar "Mindset", has to do with change management as Open Innovation is a new paradigm, there is a learning process that needs to be

implemented inside the company in order to have its employees fully aware about how they can harness the Open Innovation team, for their particular activities.

This thesis has come to realize as part of an internship developed during six months in the year 2017/2018, as members of the Open Innovation team, we got an opportunity to be exposed to all the different areas inside the OI team, exploring really close how the process of OI works in Electrolux, especially our focus was on the TRM and Industrial operations which are two different areas in OI. TRM is a strategic plan, output of the technology roadmapping process, which outlines activities to identify, develop and implement specific technologies to achieve company business goals. It is translated into a map, aiming to both summarize and display the application and the evolution of different technologies over time, providing a shared view of the future landscape available to decision makers. Whereas Industrial Operations focus on the scouting of new business opportunities based on the specific and strategic needs for the Global Electrolux network, which will be further explained in the literature review.

The thesis is divided in five main parts with the use cases, starting with a literature review about the open innovation framework and an introduction about Electrolux, then about the four main pillars in the Electrolux Innovation Hub and Open Innovation process inside the company is going to be explained as well. Finally, the TRM & GRP process of how it works and about the part of how Open Innovation team plays a part in the Global Industrial Operations. At the end, conclusions and final comments will be made based on the obtained results and the internship experience.

CHAPTER 2 – LITERATURE REVIEW

In order to start with the explanation of what Open Innovation is, the first part of this chapter will focus on examining the previous paradigm called closed innovation, by illustrating the case of Xerox Corporation and how their strong focus this particular mindset (close innovation) led them to fall from their dominant position

2.1 CLOSED INNOVATION: XEROX PARC CASE

Xerox is recognized as one of the most successful companies around the world during the 20th century (top Fortune 500 companies), it is well known by its copier business and by its large history in innovation, which back in the time came from Xerox Palo Alto Research Center (PARC), which main focus was to innovate in the computer industry.

During the year 1970 Xerox was in the top of its business by being the dominant player of the office copier market, they were growing fast and generating a lot of profit, in this sense the Chief Executive Peter McColough realized that in order to keep going as one of the top companies in the world, there would be a need to make big investments in research and development to maintain this dominant position, his vision was to make Xerox not just a leading office copier company but to make it the leading office equipment supplier of information intensive products, in order to do so Peter decided to start with the creation of PARC. This research center became a huge success as from it came the graphic interface of the computer, the very first personal computer, the mouse was introduced, the Ethernet protocol among other invention were created here. (Chesbrough, 2003).

So, if the research centre was so successful, why Xerox failed in order to be the leader in the computer industry? A lot has been said around this but according to Chesbrough it is important to take into account that thanks to innovations that came from PARC is that the computer industry was able to become what it is today, in this sense the author suggested some root causes to consider that are going to be analysed in the coming paragraphs.

a) Problems with the Old Paradigm – Root Causes

When reviewing all the innovations and projects that came from PARC, the problem came from the way Xerox was managing its innovation process with the so called Closed Innovation Paradigm, in few words Xerox was focusing on making all the breakthroughs, the development, distribution, finance of all the products by themselves inside the company as it is shown in the Figure 1. Unfortunately most of these innovations could only realize in different conditions with the so called Open Innovation way, in this sense most of the researchers from PARC left the center and it was like this that the ideas were able to grow, in general the companies created from these innovations pursued a different approach were they decided to commercialize their technologies to other companies, like the word processor (word early version) called Bravo to Microsoft, in this sense these innovations formed start-ups (spin offs) with researches from PARC as entrepreneurs that looked for financial resources from venture capitalist, some examples of these companies are: Adobe and 3Com (Chesbrough, 2003)

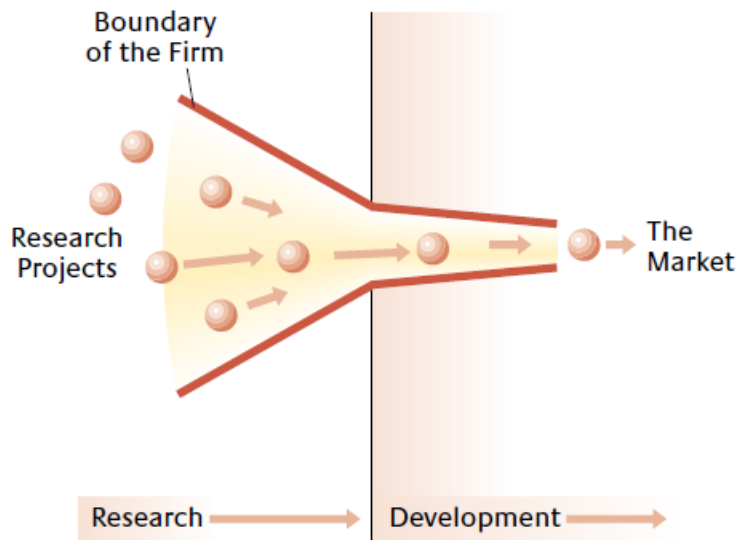


Figure 1. Closed innovation - source: Henry Chesbrough (2003), The Era of Open Innovation, Mit Sloan Management Review

Many of these start-ups with the time became a huge success like the case of Adobe, it left PARC in 1983 in order to commercialize a page description language that was their first product (PostScript). This technology allowed printer to use digital fonts to reproduce a broad variety of characters generated from a PC, many of the technologies that were able to successfully realize and sustain, helped to development of the personal computer era, as well as the computer networking and communications, as it is shown in the figure 2, some of these technologies gained a significant market value after leaving Xerox. In addition, during the year 2001 the sum of all the spin offs market value overcome the one from Xerox by doubling its market valuation. Even though these technologies were so successful, it was difficult to see real value for XEROX back in the day when they were developed inside PARC, but once they got out of the company the technologies were able to transform and develop further, they even created new architectures for the communication and personal computing industries which are business that are not necessarily connected to Xerox copiers and printers. To sum up briefly although Xerox was able to generate new technologies, its innovation process was not the most suitable for dealing with the market uncertainty generated by the creation of new products coming from these technologies. (Chesbrough, 2003)

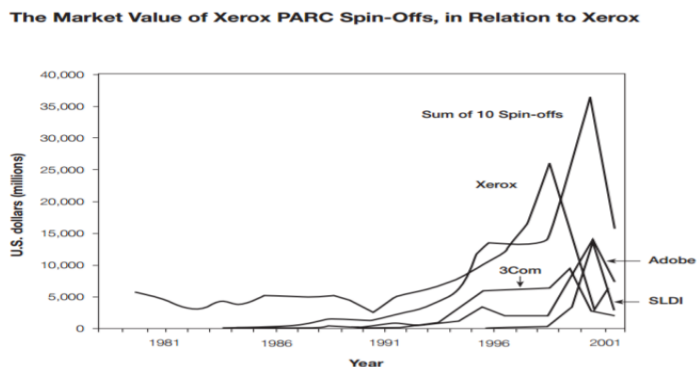


Figure 2 - the market value of Xerox's PARC spin off in relation to Xerox - Source: Henry Chesbrough (2003), Open Innovation

According to Chesbrough whenever a company discovers a new technology three guidelines must be taken into account: First of all, look for different possibilities in order to get feedback on the product as soon as it possible at the lowest price. Second, search for market tests in order to assess the potential of the market and finally be flexible and versatile with the established plan, sometimes it is needed to go out form the planned path and be reactive to the new information that might come. To sum up, when commercializing a new idea, market and technical uncertainty needs to be resolved in order to do so it is suggestable to make and initial product in order to know what customers might like or dislike about it, and adapt all the process of the idea creation along with feedback received (Like Software development) and then try to use the technology in more than one market and with different approaches so the full or hidden potential of it could be unveiled. (Chesbrough, 2003).

Unfortunately, Xerox was not able to fully understand this at the moment as they were following a close innovation approach, where the ideas are just able to follow one established path in order to be realized, however this paradigm has been eroding and according to Chesbrough, there are in particular four main factor that are going to be discussed as follows.

b) Erosion factor 1: The increasing availability and mobility of skilled workers

There has been an increase in the availability and mobility of skilled workers, in first instance, due to the high supply of skilled graduated people, on the other hand well trained workers started to go from company to company, this allow to spread more the knowledge among different player of the industries, for example, the mobility of disk-drive engineers caused IBM’s leadership to erode over time. An engineer named Al Shugart left IBM to go to Memorex, where he helped Memorex improve its hard-disk drives that plugged into IBM mainframe computers. Then he left Memorex to start a company called Shugart Associates, pursuing a new kind of hard-disk drive, the 8-inch disk drive, intended for minicomputers and workstations. Eventually, when he fell out with the financial backers of, he left to start another new company, called Seagate (well-known data Storage Company). (Chesbrough, 2003)

c) Erosion factor 2: The Venture Capital Market

There has been a huge change in terms of VC capital invested, as it shown in the figure 3, during the year 1980 around \$700 million were invested, in contrast during the year 2000 \$80 billion were used. (Chesbrough, 2003)

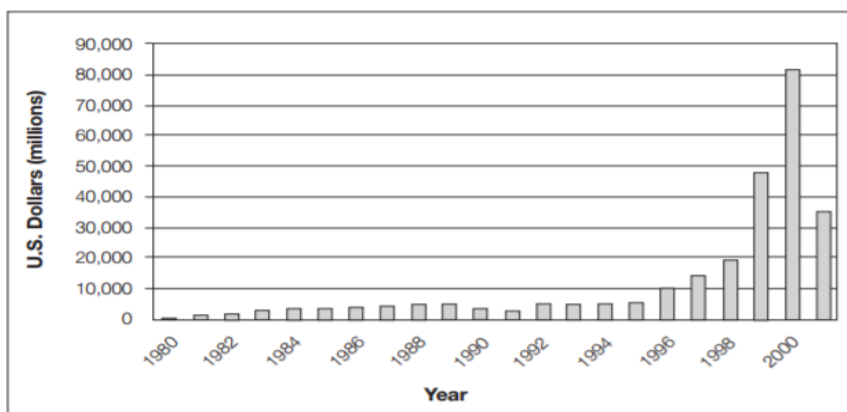


Figure 3 - The growth of VC market until 2000 Source: Paul Gompers and Josh Lerner, The money of invention (Boston: Harvard Business School Press, 2001), 72-73; and Venture Economics for 2001, http://www.ventureeconomics.com/vee/news_ve/2002VEpress/VEpress02_04_02.htm

This large and growing pool of VC created real hazards for the companies that made investments to internal R&D. The knowledge that they created inside their research and development was at risk, due to the fact that, employees from their R&D labs were attracted by new start-up firms with outstanding compensations, in the sense that even though large firm were able to offer top class research equipment and intellectual environment, they were not able to match the stock option given by the start-ups. (Chesbrough, 2003)

d) Erosion Factor 3: External Options For Ideas Sitting On The Shelf

Due to the existing tension between the research and development departments many ideas started to be stored inside the company’s portfolio, this factor combined with the previous ones, as depicted in the figure 4, a new path was created, so instead of waiting in queue in order to be developed the technologies can go outside of the company by their own and make use of external resources (VCs) and explore potential new markets. (Chesbrough, 2003)

The Outside Option for Ideas on the Shelf

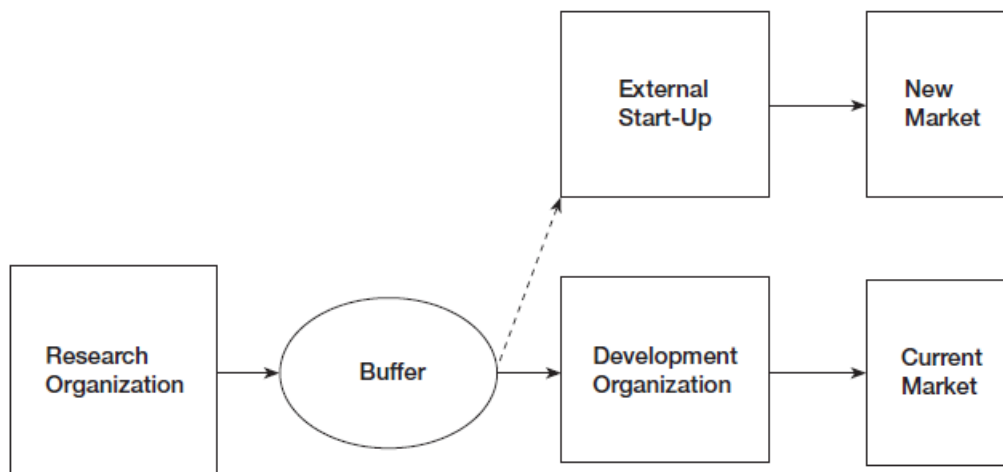


Figure 4 – Outside option for ideas on the shelf - Source: Henry Chesbrough (2003), Open Innovation

e) Erosion Factor 4: The Increasing Capability of External Suppliers

The external suppliers are nowadays more capable as there is an expansion in the universities, the research done there, the availability of skilful workers and the VCs, the external supply has increased. The presence of capable external suppliers could be considered as a beneficial and problematic situation for large companies with extensive internal R&D investments. On the one hand, it supports the R&D done inside the company will have the needed support in order to be realized successfully but on the other hand, these external suppliers are available to all people, which places pressure on companies that have built up a portfolio of R&D projects, as easily the external suppliers are able to develop the technologies.

To sum up briefly, these erosion factors have loosened the linkage between R&D in the Closed Innovation paradigm. Ideas can no longer be inventoried on the shelf, because they will leak out to the broader environment over time. A company that fails to utilize its technology may later see variants of those ideas exploited by other firms. More subtly, these erosion factors have rearranged the landscape of knowledge. The distribution of knowledge has shifted away from the tall towers of central R&D facilities, toward variegated pools of knowledge distributed across the landscape. Companies can find vital knowledge in customers, suppliers, universities, national labs, consortia, consultants, and even start-up firms.

2.2 THE OPEN INNOVATION PARADIGM

Open Innovation means that valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well. This approach places external ideas and external paths to market on the same level of importance as that reserved for internal ideas and

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

paths to market during the Closed Innovation era. (Chesbrough, 2003). In the following chart, the main differences between the two approaches are explained.

The main differences between the Open Innovation paradigm and the Closed Innovation is summarized in [Figure 5](#).

Figure 5. Contrasting principles of closed innovation and open innovation - Source: Henry Chesbrough (2003), The Era of Open Innovation, Mit Sloan Management Review

With the open innovation approach, companies normally commercialize external as well as internal technologies/products/services by using in house and outside resources to do so. In addition, firms

are able to put in the market internal ideas through channels that are currently outside of their current business scope (generating value), some of these channels are start-ups or licensing agreements. In addition, ideas could come from outside of the company's labs and be brought inside for its commercialization. The following figure depicts the Open Innovation process as it has been just explained.

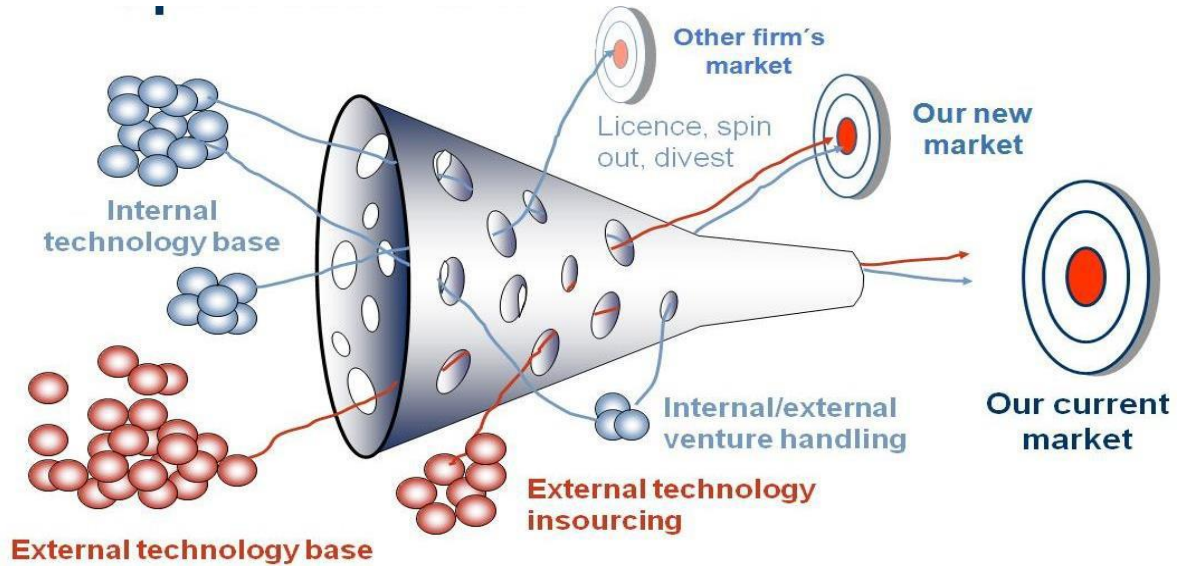


Figure 6 – Open Innovation Diagram (Chesbrough, 2008)

To sum up briefly, the existing boundary between the company and its environment is permeable so it allows innovation to cross inside/out of the firm; the ideas will find a pathway either outside of the company or inside the company. According to Chesbrough and Appleyard Open innovation should integrate an Open Strategy, which is a different approach to the traditional one, normally, a company will try to gain a competitive advantage against its competitors by building a strong position of core assets with high barrier entries and focus on their own internal development, instead an Open strategy embraces the potential opportunities that could bring the direct interaction with innovators from outside of the company to build value for the company.

2.3 OPEN INNOVATION FUNNEL

According to Chesbrough, the innovation process is represented as a funnel (just like the open innovation one), but in this case, the whole process is divided in three main steps: Research, Development and commercialization, as depicted in the following image.

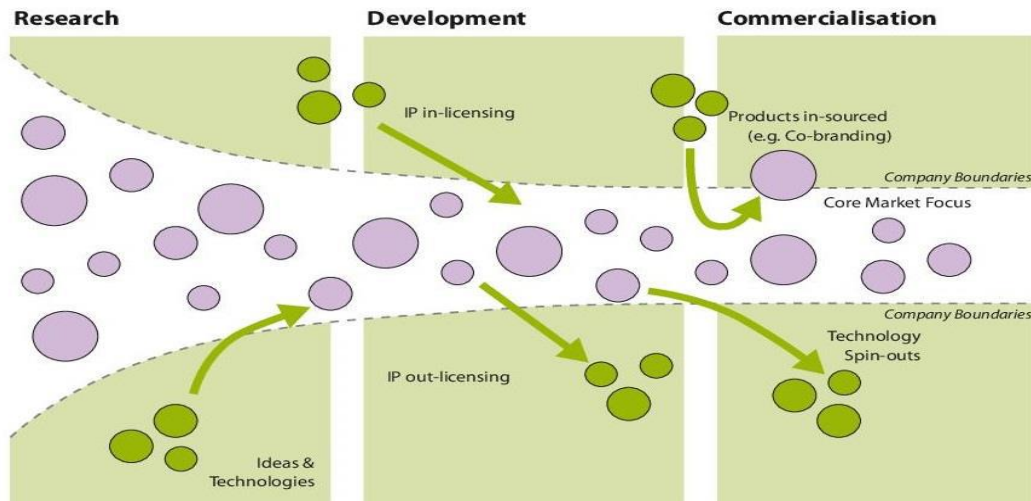


Figure 7- Innovation Funnel (Chesbrough, 2009)

The **internal ideas** are represented by the **purple circles** that flow from the research stage and if after an approval, they might continue till the commercialization step, instead, the **green circles** represent those ideas that are following an inside-out or outside-in pathway, they might come at any stage of the process, they might be business ideas or technologies, IP license agreements (in-out), spin outs among others. As it is mentioned in the previous section, the established boundary between the company and its environment should be permeable in order to facilitate the flow of the ideas. (Chesbrough, 2003)

In this sense, the traditional paradigm in which companies used to manage their R&D is mostly over in most of the industries. (Chesbrough, 2003). Even though R&D is still a key important part of the company, with the new paradigm its previous role logic changed, according to Chesbrough companies need to re structure themselves in order to harness the new existing knowledge landscape instead of just relying on their internal research roadmaps. In the case when the companies have technologies on the shelf, they should not wait until their own business make use of them like in the Xerox case; this tech could become a source of a revenue opportunity with the Open Innovation paradigm. On the other hand, in the case when the companies wait until the internal technologies arrive, under the new paradigm this situation must not happen, instead the firms need to access to whatever they need as soon as they can either from their own R&D or from external one. (Chesbrough, 2003)

2.4 THREE CORE PROCESSES IN OPEN INNOVATION

Open Innovation could be describes in three ways, depending on the flow of

- a) **Outbound Open Innovation** It is about taking the Company's technologies/business ideas, which are not exploited internally. According to Lichtenhaler, the technological innovation level and the transaction rate of the technologies in the markets have a positive impact

into the companies implementing this type of innovation. On the other hand, a high level of patent protection does not have a positive impact on the firm.

- b) **Inbound Open Innovation** The main goal in this case is to bring inside new business ideas/technologies/knowledge from outside to the company. In this case, the companies are constantly scouting and screening new ideas outside of their trusted network not necessarily depending on the in-house R&D capabilities for gathering new technology. In order to be able to bring those ideas from outside, the companies need to develop a key competence called “absorptive capacity”, usually they will need help in order to create this particular competence and at this point a new actor arises, the so called “intermediaries” who will help the company to develop the absorptive capacity, this will be further discussed during the next section. (Building absorptive capacity to organize inbound open innovation in traditional industries by Spithoven, Clarysse and Knockaert, 2010).
- c) **The Coupled Process** According to Gassman and Enkel, this is a hybrid model that comes from the combination of the previous ones (inbound and outbound flow of ideas from the company). In this process, there is a key aspect to develop by the firms and it is about the creation of partnerships with complementary allies (other firms) in order to be able to develop and commercialize the potential ideas into the market with the combination of internal and external resources that is represented on the lowest level on the following figure.

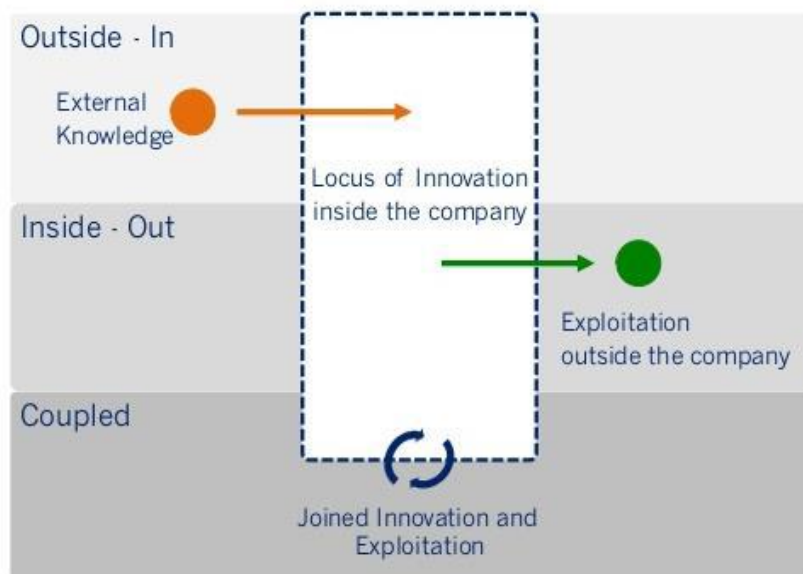


Figure 8 – De-coupling the locus of Innovation Process (Gassmann and Enkel, 2004)

2.5 OPEN INNOVATION NETWORKS

With the new paradigm of Open Innovation, new roles have been created in order to foster it to its maximum. The opportunities that this process brings to the companies, is mentioned in the previous section, one of these roles are the so-called intermediaries whose main goal is to serve as a facilitator in order to create connections between the companies and the innovators outside of it. During this

section, all the characteristics and definitions in regards to the intermediaries is explained in detail, as well as, other key elements that compose the networks.

a) *Network Intermediaries*

According to the literature there are different definitions for intermediaries, some of them are as follows:

“Intermediaries can be considered as institutions, that provide methods, tools, and services to foster and enhance knowledge transfer, and so strengthening the innovation process” (Baltes and Gard, 2010)

“They cover the role of agents enhancing the connectivity within and among innovation networks” (Stewart and Hyysalo, 2008).

“Intermediary network is defined as a formal or informal collection of people or companies that facilitates a productive working relationship between two previously unconnected parties, usually on a one-time basis.” (Billington and Davidson, 2013).

This particular definition takes into account three main characteristics of the intermediaries:

- An intermediary is a “bridge” between two parties that did not have any previous relationship.
- The connection between the two parties aims to the creation of a relationship, in which the Company is expecting to find potential new ideas/technologies that might add value to the firm’s operations.
- The relationship with the intermediary is on demand basis so there is no full time partnership, once the bridge between the source of innovation and the Company is formed the intermediary plays a secondary role as there is no further expected actions from it. In general, this depends on the type of services and capabilities that the intermediary has.

2.6 ELECTROLUX A GLOBAL COMPANY

a) *Generalities*

Electrolux is a global leader in household appliances and appliances for professional use. We offer thoughtfully designed, innovative and sustainable solution, under esteemed brands including Electrolux, AEG, Zanussi and Frigidaire.

Electrolux is one of the world’s largest appliances company, with 2016 products sold of approximate 60 Million annually and \$122 Billion Sek in sales. Electrolux vision is to be the best appliance company in the world, as measured by our customers, employees, shareholders and planet. Currently, 56,000 employees who work vigorously satisfying customers in 150 countries around the world support Electrolux.

b) *Corporate Strategy*

Electrolux’s strategy is to achieve the group’s purpose - Shape living for the better - and drive profitable growth, Electrolux uses a business model that focuses on creating Best-in-class Consumer

Experiences. A strong foundation of Operational Excellence and Talent & Teamship, as well as three important transformational drivers support this.

For developing this strategy, Electrolux is organized into six business areas. There are four major appliances sectors covering North America, Latin America, Europe/Middle East/Africa and Asia Pacific and two global business areas, Small Appliances and Professional Products.

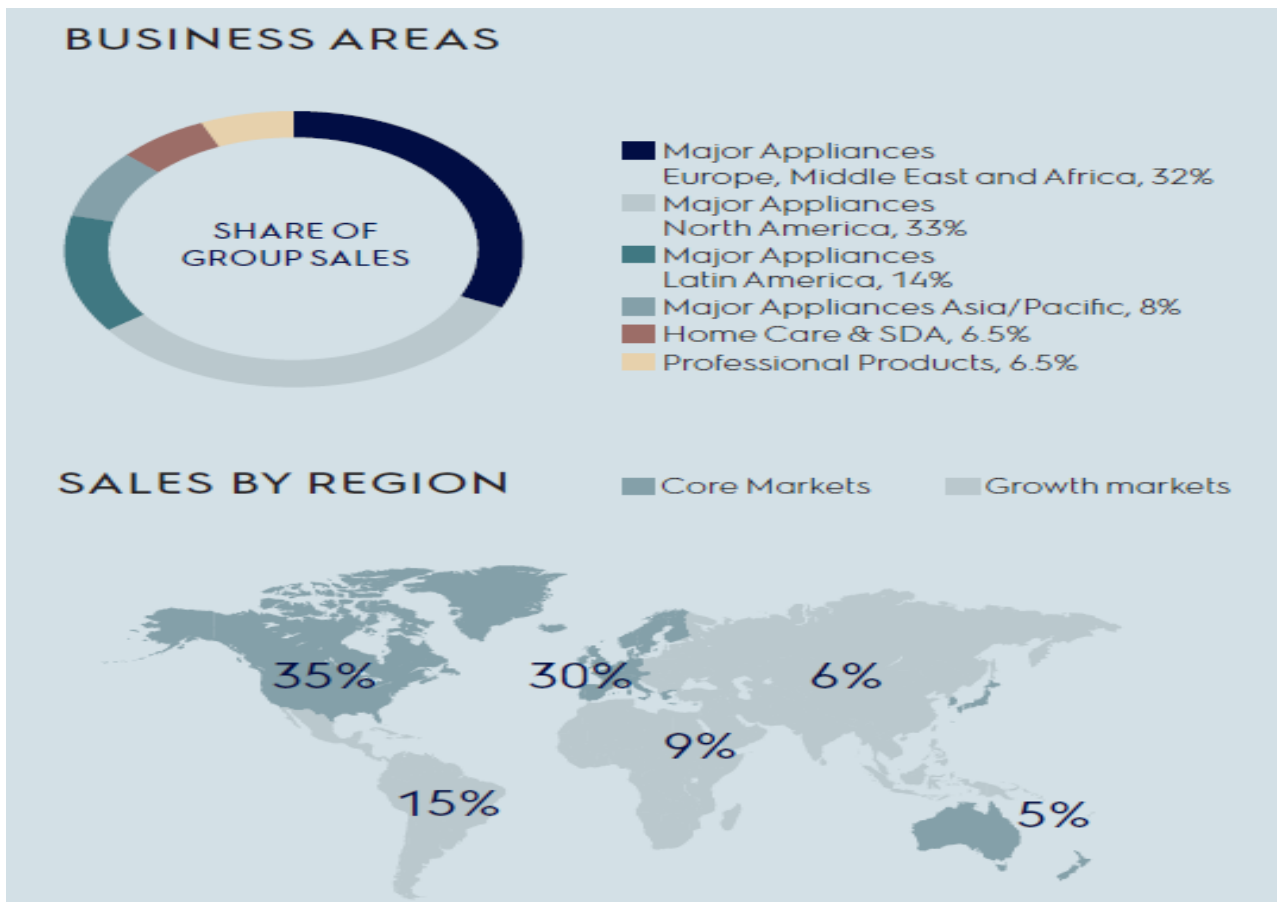


Figure 9 – Corporate strategy

2.7 STRATEGIC OVERVIEW

Electrolux strategy is to drive profitable growth by creating best- in-class consumer experiences. To create best-in-class consumer experiences means focusing innovations on what consumers can achieve through the Group’s products and solutions. Work aims to strengthen the overall experience of the Electrolux offering — before, during and after the purchase of the product. Based on sustainable profitability and efficient capital utilization, Electrolux strives to grow profitably by reaching more consumers around the world with solutions that improve their daily lives and experiences. (Electrolux, 2017)



Figure 10 – Strategy

The Electrolux strategy is based on four pillars:

- Profitable Growth
- Experience-based innovation
- Operational Excellence
- Talent and Teamship

a) Profitable Growth

To achieve profitable growth, Electrolux uses a business model that focuses on creating best-in-class consumer experiences.

- Best-in-class consumer experiences The Electrolux business model focuses on creating best-in-class consumer experiences. Work in the Group targets three crucial areas: relevant experience-based innovation, optimization of the product portfolio and quality. At the same time, a number of transformation drivers are crucial to achieve these goals. Possibly the most significant of these is the digital transformation, with great potential to both enable best-in-class consumer experiences and drive results through operational excellence. In addition to this, continuous improvements are implemented to increase the effectiveness of Electrolux operations and processes. These efforts are carried out in a sustainable way, an area that is becoming more and more important for the Group to retain its competitive advantage in the market.

b) Experience Based Innovation

Focus is to invest in innovations that are most relevant for creating the best consumer experience to make great tasting food, the best care for clothes and to increase well-being in the home. A key factor is the transfer of expertise from the Group's professional business operations to consumer products. Over a number of years, the Group has progressively increased investment in R&D. Targeted growth and optimization of the product portfolio to the most profitable product categories and products with distinct consumer benefits will strengthen the presence of Electrolux in the product categories and channels where the Group is most competitive. Efforts to provide consumers with the best possible owner experience are central to the process. Quality is a prerequisite for best-in-class consumer experience and long-term consumer brand loyalty. The Group has long-term goals to continue to enhance quality.

c) Operational Excellence

Electrolux focuses on operational excellence in all parts of the value chain. Efforts to optimize operations focus on modularization, automation and re-engineering investments in existing plants to ensure a competitive cost structure and best prerequisites for further growth. The foundation for this is a stable and focused organization that strives to minimize complexity and make work practices simpler to deliver products and services of superior quality and high delivery reliability. Electrolux is committed to sustainable growth and efficient use of resources comprises a key

component of this. Through the Green Spirit programme, targets are set to continuously reduce the use of resources.

d) **Talent & Teamship**

Electrolux seeks to attract and develop excellent talents with diverse backgrounds. Teamship is the Electrolux way of working to build a high performing and learning multicultural global organization. Talent Electrolux aims to drive a culture enabling the right behaviors for a high performing and learning organization.

Talent - To achieve the purpose and the business goals, the Group searches for and develops talents within four core competences:

- Energy focuses on drive and ability to deliver results.
- Openness focuses on needs and opportunities of the customers and on collaborating with others.
- Agility focuses on the ability to adapt to a constantly changing reality.
- Growth focuses on curiosity, ability to learn and develop.

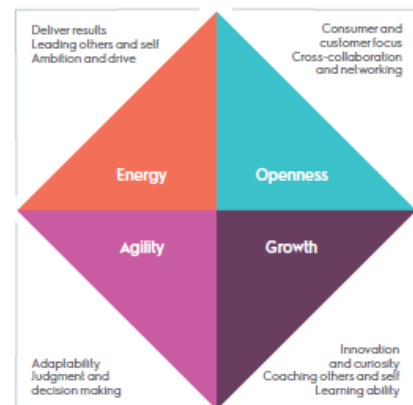


Figure 11 – Talent

Electrolux places substantial focus on talent management to attract, recruit, develop, and retain excellent talents with diverse backgrounds. The four core competences are included in the performance management process, as well as in the recruitment process, to identify and assess the behaviors needed for the position. With clear targets and coaching on performance, together with development plans, employees are encouraged to contribute to the Group’s success, and their own personal development. In 2017, the digitalization of all talent related processes continued through the TalentONE. TalentONE is an online cloud solution that will provide leaders with a simpler, more effective way of driving performance and developing employees.

Teamship – It is the Electrolux way of working. It’s about setting aligned goals that allow clear choices and continuous improvement. It’s about knowing how to collaborate. It’s about transparency and a learning organization. Finally, it is about engagement and passion about Best in-class consumer experiences. During 2017, interactive Teamship workshops were arranged for new employees.

2.8 INNOVATION

The Electrolux Group’s efforts in innovation have a distinct focus on the consumer’s experience. The aim is to create best-in-class experience for consumers.

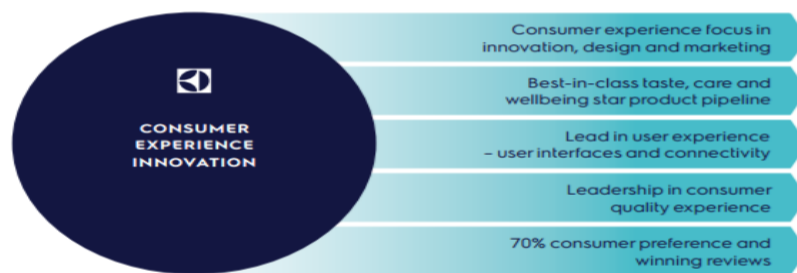


Figure 12 – Consumer experience

All product development at Electrolux aims to give consumers the best possible experience and results when using Electrolux products. A key factor is the transfer of knowhow from the Group’s professional business operations to consumer products. Over a number of years, the Group has progressively increased investment in R&D.

Electrolux gains knowledge of consumer behavior by performing an extensive number of interviews and home visits to obtain information on the use of various household appliances and the needs that exist. In order for a new product to be launched, at least 70% of the consumers in a test group must have expressed a preference for the product over similar alternatives in the market.

Key Areas of innovation to strengthen the Brand

All product development at Electrolux aims to give consumers the best possible experience and results when using Electrolux products. Product development focuses on three main areas to offer Best-in-class consumer experiences: great tasting food, care for clothes and healthy wellbeing in the home.

- **Taste** Electrolux products help consumers to achieve a culinary experience, and cook healthy and nutritious food for family and friends. Some examples include the Electrolux CombiSteam Pro Smart ovens including CookView camera and the My Electrolux App, as well as the Anova Precision Cooker, an innovative connected device for sous vide cooking that enables restaurant-quality results in the home. A continuous dialog with professional chefs and the development of new solutions for restaurants and hotels across the globe provides valuable insight that is conveyed to other parts of the Group. (ElectroluxGroup, 2017)
- **Care** Electrolux helps consumers to take care of their clothes so they feel new for longer. A common problem is avoiding using the washing machine or tumble dryer for certain garments. Electrolux has, however, solutions to make it possible to use its products without having to worry about the outcome. In 2017, the AEG connected washing machines and dryers received top marks from several magazines and consumer organizations around Europe. In the textiles area, the Group also benefits from the experience of professional users when new products are being developed for consumers, such as dryers with heat-pump technology. (ElectroluxGroup, 2017)
- **Wellbeing** Consumers also want to create a clean and healthy indoor environment free from dust, allergens and pollution. Electrolux has solutions for this, including vacuum cleaners, air-conditioning devices and water cleaners. One example of innovative solutions in this area

is the Frigidaire Cool Connect in North America, the Group’s first connected air conditioner. (ElectroluxGroup, 2017)

2.9 BRAND

Electrolux is our flagship brand for kitchen and cleaning appliances for both consumers and professional users. Since 1919, innovative solutions from Electrolux have made life easier and more enjoyable for hundreds of millions of people all over the world.

Electrolux has many strong brands in its portfolio. Its focus is to continue to build Electrolux, its biggest and most important brand, known and trusted by both consumers and professional users around the world. Electrolux also has a range of other strong brands for consumers and the professional market as well as offering brand-licensing opportunities.

Every brand in Electrolux represents a promise to its market: “buy me and you will get this experience.” Strong brands are trusted brands; they have built a reputation with customers over time by living up to their promises of quality, innovation and leadership.

Electrolux also has a range of other strong brands for both consumers and the professional market. Some of these brands have an international reputation, such as AEG and Frigidaire. Others are local brands that are mainly known by consumers in a particular country, or professional brands known by users in a special field, such as Molteni for professional chefs.



Figure 13 – Brands (ElectroluxGroup 2017)

2.10 TRANSFORMATIVE INITIATIVES

The increasing pace of change in the global market for household appliances stems from a number of trends such as increased consumer power, digitalization, sustainability, consolidation and a growing middle class. These changes are placing demands on investments and economies of scale, but also open up major opportunities.

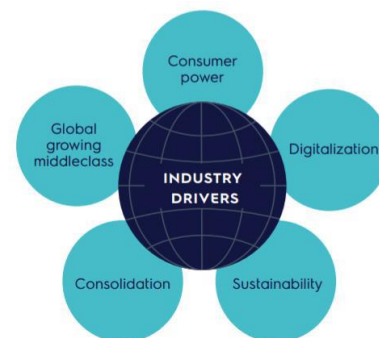


Figure 14 – Drivers (ElectroluxGroup, 2017)

a) *Digitalization*

The digital transformation is changing consumer behavior, the industry and the world at an accelerating pace. This offers substantial opportunities for streamlining operations and continuous interaction with consumers. The digital transformation affects all areas of Electrolux operations and includes several measures and projects in five core areas: connected appliances, productivity, supply chain, modularization/manufacturing and consumers' experience of purchasing and using products.

b) *Consumer power is growing*

Consumer power is growing as increasingly well-informed customers easily can access information about prices, offers and product characteristics. This means that Electrolux, as well as other brands, need to offer transparent information about how the products and offers are differentiated to meet customer needs. Continuous improvements mean delivering higher customer value at a lower price. Electrolux works continuously to improve cost structures, and develops methods, processes, skills and the company culture to achieve this.

c) *Sustainability*

Sustainability leadership is crucial to realizing the Electrolux strategy. The objective is to continuously improve at meeting people's needs and enhancing their daily lives in a sustainable way. The Group's sustainability priorities target nine main areas that combined contribute to: Better solutions, Better operations and Better society.

d) *Global Middle Class is Expanding*

A global middle class is expanding because of strong economic growth in emerging economies. This trend has been visible for many years and will continue.

e) *Consolidation in the Sector*

Consolidation in the sector is largely, driven by the above trends as they result in challenges that require major investments and economies of scale. Manufacturers and retailers of household appliances are becoming fewer, larger and more international.

2.11 ELECTROLUX OPEN INNOVATION

Open innovation is a new way of doing business through the synergy among people working in different ecosystems, it is important to take into consideration that not all innovation takes place inside a company. It is very likely that great ideas are also found outside the organization. Under this principle, the Open innovation team was created in 2011 as an internal start-up in Electrolux; it was embedded under the GTC department (Global technology center) that reports directly to the COO of the company. Lucia Chierchia has acted as coordinator of the Open Innovation team since then, by developing a strategy to capture new potential businesses (ideas) and new types of alliances with external innovators.

During the internship at Electrolux, there was the opportunity to be involved in different activities and processes carried out by the Open Innovation team that allowed all the team members to know intimately all the different processes related to the Open Innovation Strategy 1.0. The different components that composed the OI strategy are covered in this chapter.

a) *Objective of the Open Innovation Strategy*

The main objective of the Open Innovation team is to move beyond the trusted network, reaching innovators in non-conventional ecosystems, such innovators could be Universities, start-ups, venture capitals and even garage inventors, these so-called “Open Network” has allowed Electrolux to find new innovative ideas that could be represented by different types of technologies, products, processes.

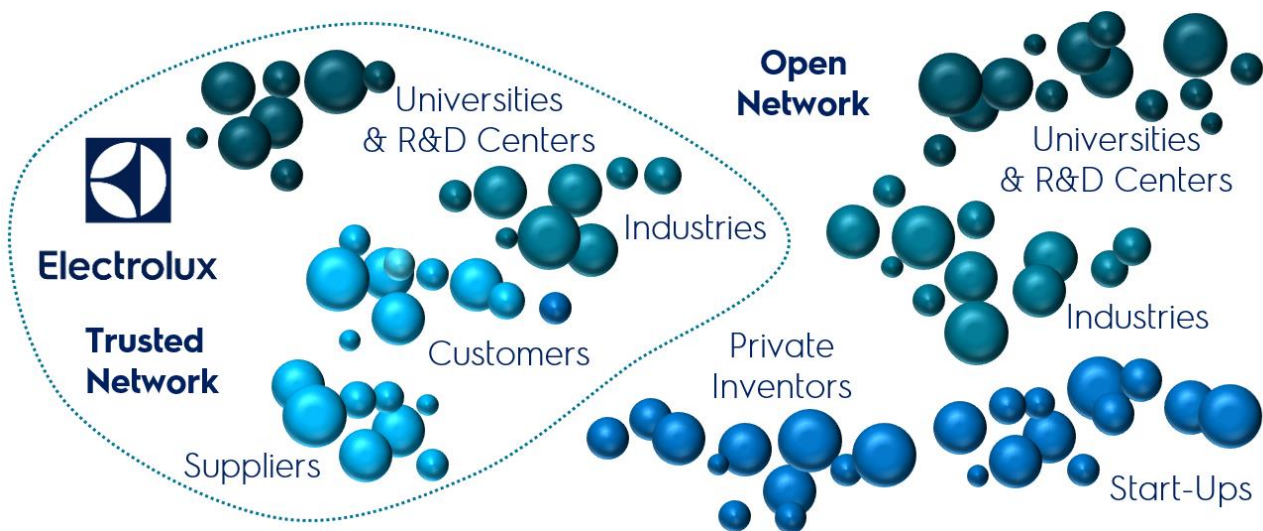


Figure 15 – Open Innovation Electrolux



Figure 16 – Areas Open Innovation Electrolux

b) The Roles and Responsibilities of the Open Innovation Team

The role of the open innovation team is to function as a bridge between external networks of innovators and Electrolux. It is important to take into consideration that All people, functions, all departments, all sectors, all levels have a role in OI processes.

“Some people asked us if we really wanted to work with a crazy crowd of inventors, even without public patents. I said ‘yes’, and we started to collect a huge number of ideas – good ideas – solutions able to create new value for our consumers.”

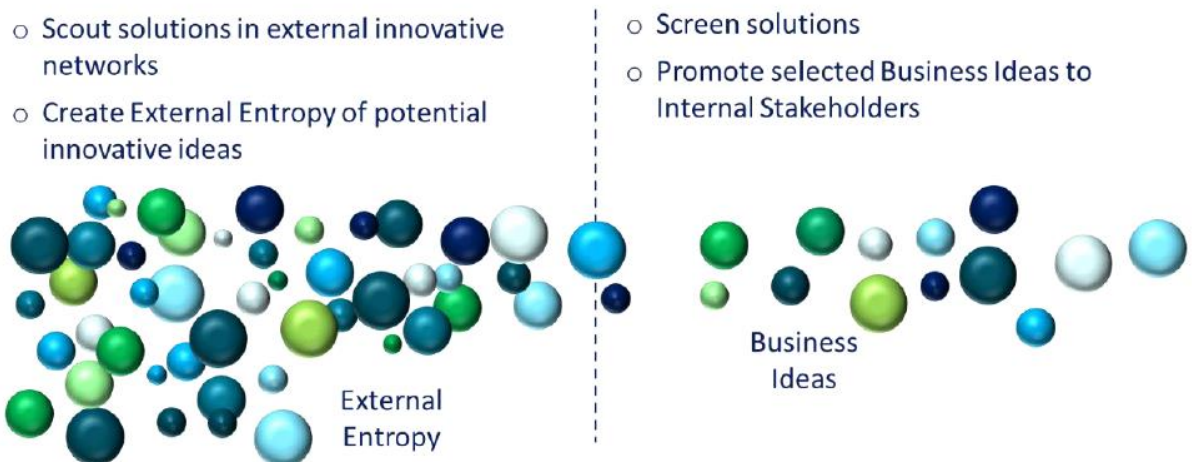


Figure 17 – Open Innovation Roles Electrolux

CHAPTER 3 – ELECTROLUX INNOVATION HUB

3.1 iHub STRATEGIC PILLARS – SCOPE

- Forecast future directions based on technology and business trends
- Inspire and enable transformational business opportunities
- Identify and promote external innovative solutions from diversified ecosystems
- Activate collaborations & public granted projects with selected players
- Deliver technology assessment of new advanced solutions
- Execute gaps recovery plan for all company stakeholders, to build a unique & integrated technology roadmap
- Attract new generation of talents through calibrated partnerships

3.1.1 Open Innovation:



Build a BRIDGE to reach external innovative non-conventional ecosystems, from startups to consolidated industries, to identify innovative solutions and support execution of company gaps recovery plan.

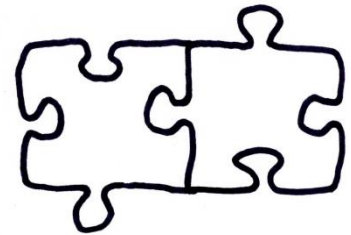
a) Three Elements and their objectives:

- Brokers' Network: Build a global and diversified OI network through a balanced brokerage portfolio
- Ideas challenges: Capture innovative ideas in terms of technology solutions, business solutions and alliances opportunities.
- People's Mindset : Embed OI model in all company functions, allowing every employee to deploy OI activities autonomously.

Note : Detailed explanation about the three pillars will be elaborated in the next chapter.

3.1.2 Technology Liaisons:

Build and coordinate PUBLIC GRANTED PROJECTS and COLLABORATIONS with universities, enterprises and institutions, enhancing access to competences, technologies and resources for company projects execution.



a) Four Elements and Their Objectives:

- Academy Collaborations: Define and implement a common framework to build, manage and access to academic network, in terms of communities, methodologies and process and governance, providing a key contribution to gaps recovery plan.
- Enterprises Collaborations: Identify and activate opportunities of partnerships with companies in different sectors, enhancing technology transfer paths and new business models experimentation
- Institutions Collaborations: Develop a selected pool of institutions to activate specific services and alliances and support of company innovation execution.
- Public Granted Projects: Identify and join selected government initiatives and other financial instruments to fund research and innovation programs, facilitating access to external resources and structuring collaborative projects to deliver company strategic areas.

3.1.2 Innovation Academy:



Build and coordinate a project-based PROGRAM for university students to develop, experiment and deploy competences, technologies and models, supporting deliverables of a selected projects portfolio.

a) Three elements and Their Objectives:

- PhD Academy: Build and coordinate a doctorate program focused on selected research topics, to build unique competences and develop advanced technologies, offering a special growth path in technology development and management.
- Research Academy: Build and coordinate a research internship program for postgraduates, focused on selected research topics, to develop advanced technologies and innovation models, offering a special introduction path in technology development and management.
- Master Academy: Build and coordinate an internship program for undergraduates and postgraduates, to support deployment of innovation models, offering a special educational path about innovation management.

3.1.2 Technology Garage:

Drive and deliver ASSESSMENT and DEMONSTRATORS of new solutions, derived from emerging technologies from different fields or from non-conventional applications of known architectures.



a) *Two Elements and Their Objectives:*

- Technology Assessment: Study and evaluate new technical solutions under a global and x-functional perspective and a future-oriented vision, applying an interdisciplinary approach and identifying short- and long-term opportunities.
- Technology Demonstrators: Develop the proper architectures to apply specific technical solutions into strategic applications, to deliver a robust proof of concept in terms of technical feasibility and consumer benefits.

CHAPTER 4 – OPEN INNOVATION MANAGEMENT

4.1 Open Innovation Strategy 2.0:

Until recently several little improvements were realized to the Open Innovation strategy, after five years the strategy has been depurated by the concept learning by doing, even though this has been a successful approach since the strategy has growth and nowadays, Electrolux Open Innovation area is well recognized around the world, there was the need to sit down and take a look to all the elements and tools that at this moment are the core of what Open Innovation is and how it works in order to try to identify all those areas that are working properly, maybe complement them but above all, harness this opportunity in order to find all those processes that need improvement and that for sure will help to build the core competences for a successful open innovation strategy.

In order to do so, a series of workshop sessions were organized with all the team members (China and Italy), where the strategy started to be revised through the use of different managerial and design tools, during this process each of the pillars was revised by all the team members, in particular, I was in charge of the network one, but for the explanation a brief overview of each of the pillar is going to be done, with a special emphasis on the improvements done to the Network pillar.

In order to define the strategy during the following sections, each of the pillars is going to be analyzed through a set of tools that will allow to identify those areas of improvement during the process carried out by the team.

4.2 SWOT Analysis:

The first step that was taken in order to start building the Open Innovation Strategy 2.0 was the definition

<ul style="list-style-type: none"> o OI processes and tools allow to manage a high number of ideas o iHub platform is a good tool to manage ideas workflow o In FOCUS step, Focus Areas are well described, including priorities o In SCREEN step, access to SMEs network is easy and quick o Alignment across company functions is enhanced by OI o “low-cost” challenges open new ways to experimentation o This is the era of the startups; technological advances are happening fast and all over the world. 	<ul style="list-style-type: none"> o Many ideas are rejected after different re-loops o Lack of idea data, no standard format, no direct data exchange with broker cause re-loops of activities and manual activities. o The process of transforming ideas into projects is not formally defined; it is not BAU o No complete awareness of OI Driving Map o Lack of tools to select the proper brokers for challenges.
<p style="text-align: right;">To capitalize S To exploit O</p> <ul style="list-style-type: none"> o Make other departments drive ideas scouting by themselves o Increase awareness of OI Electrolux strategy (results and processes) for stakeholders, brokers and innovators. o Open iHub to brokers / innovators o Launch Co-challenges (together with other companies) o Create Open Innovation web page o Define new challenge typologies (f.i. hybrid message) o Experiment new alliance models (corporate venture, etc.) o Launch specific challenges with customers o Deploy internal OI 	<p style="text-align: right;">W To eliminate T To avoid</p> <ul style="list-style-type: none"> o Out-of-scope ideas (solicited/unsolicited) number is high o Lack of ideas in specific areas o Solutions from other industries require complex tech transfer o Some alliances require a complex collaboration process o IP mgnt process is not 100% embedded in OI team and not 100% understood by other functions o Spill overs of Elux confidential information through brokers o Challenge request vs OI capabilities

Figure 18 – SWOT Analysis - Open Innovation Electrolux

4.3 The Three Pillars Strategy

OI model is deployed through “learn by doing” approach: a clear target to achieve combined with flexibility to calibrate direction during the journey.

As it was explained before the main role of the OI team is to identify new business opportunities outside the company along the overall value chain of the company and promote those inside the company, in order to do so, Electrolux Open Innovation team has developed a strategy during its five years of existence where they have identified three core components that allow to specify all the different processes held inside the team in order to comply with its function as bridge between external network of innovators and company stakeholders. These components are depicted in the following picture.



Figure 19 – Pillars Open Innovation

As specified above the strategy is composed by three main elements: Network, Challenges and Mindset:

- o **Mindset**, it is the behaviour that defines the “change management” process inside the organization in order to boost all the different processes of the Open Innovation paradigm.
- o **Challenges**, these are the so called “call for ideas” that are created in order to reach innovators with potential solutions useful for Electrolux
- o **Network**, it is composed by the portfolio of the so-called brokers “intermediaries”, through them and the definition of new alliances, it is possible to reach new potential innovators.

4.3.1 Challenges:

The first pillar that is going to be discussed is called Challenges, in order to understand it, it is of key importance to rise the following questions in order to define properly how Electrolux interacts with the external network: Once the OI team has identified a potential network of innovators, how to reach this innovator?, how to call for ideas from this potential network?.

In order to answer these questions, the team defined what to expect from the innovators, so the definition of the first type of challenge comes, it is called **Targeted challenge**, this means that the company defines a specific internal request (internal could be a request for a technology in advanced therefore, the call for idea based on this specific working around this.

Targeted Challenges. Request of solutions to a specific need identified by the company.

need coming from an clients), for example, there particular type of materials or user interfaces, (targeted challenge) is made topic, the innovators will be



Figure 20 – Targeted Challenges Open Innovation

On the other hand, there is the **inspired challenge**, in this type of call for idea, the team would share the Electrolux strategic areas (inspired areas), which are defined yearly and can be share easily with the potential innovators, in this sense the team is trying to inspire them in order to find new solutions and even new business models. The main goal behind this business decision is to reach those technologies already available in the inventor’s pocket.

Inspired Challenges. Message of openness to listen to proposals aligned to company strategic areas.



Figure 21 – Inspired Challenges Open Innovation

The outcome from the challenges, especially in the case of the inspired ones is heterogeneous, including the following:

- New technological elements, that could be used for improving the existing products
- New type technologies using known or disruptive technologies
- New design concepts for the Electrolux products
- New products that could be included or embedded into the existing Electrolux portfolio
- New potential partners for developing new types of alliances and collaborations
- New types of doing business
- New manufacturing processes that could be implemented into the production plans

The implementation of inspired and targeted challenges shows how Electrolux Open Innovation team is able to assess innovative solutions for its current and potential customers at 360°. This open approach is one of the core differentiators in the OI strategy, this has empowered the team in order to test a wide variety of methodologies and tools in order to interact with the innovators. In fact, Electrolux has successfully launched a great number of challenges with great success, for example the herb garden introduced during Milan Eurocucina:



Figure 22 – Herb Garden Open Innovation

This high-tech herb garden appliance was created to be incorporated or installed like an under counter refrigerator and comes with humidity controls and bulbs that emit artificial sunlight.

4.3.1.1 Challenges Process:

There is a well established methodology in order to launch a challenge, the following picture shows the five steps that are covered during this process.

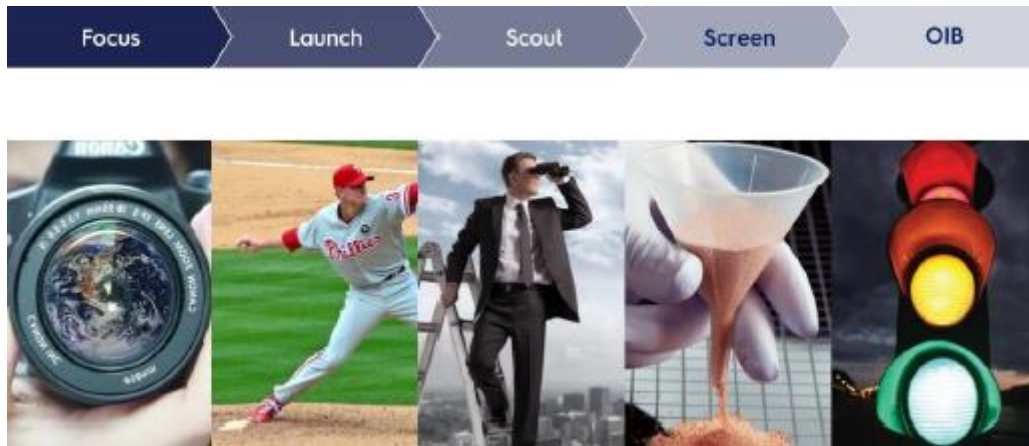


Figure 23 – Challenges Process Open Innovation Electrolux

During the first step “Focus”, the main idea is to define properly what are going to be the requirements and expectations of the OI Team from the challenge, in this step, the challenge definition is set along with the specific client (one of the lines of R&D), a formal documentation is done with all the needed details in order to be shared with the specific broker and therefore the potential innovators (in the following section about network, this process is going to be explained in further detail), this process is the one that is followed when launching a targeted challenge, in the case of the inspired challenge, the process is similar, but the specifications are normally not that technical as in the targeted case, normally Electrolux defines some focus areas per year, and the ideas for the inspired challenges are related to these areas that are shared with the brokers and their network of innovators.

Once the definition of all the requirements for the challenge have been set, it is possible to carry on with the next step called “Launch”, during this stage, the particular challenge could be delivered to the broker in order to be conveyed to their network of innovators, normally the duration of the challenge is set during the creation of the collaboration contract with the broker which is defined totally and includes all the requirements definition along with the terms and conditions of the alliance between the broker and Electrolux.

The next step is called “scout” during this specific period the challenge is officially running and all the ideas from the innovators are gathered through the broker via their platform or their specific service portfolio. Depending on the type of the agreement the brokers will look and explore further in their network of innovators in order to satisfy as much as possible the requirements set by the challenge. Once the challenge running period is finished the broker will gather all the potential solutions coming from the innovators and they are presented to the Open Innovation Team in a form of a report, depending on the type of broker, they will can present a list of ideas or a list of innovators (startups) that can work around the specific challenge. Once the Open Innovation team receives all the ideas, the “screening phase” begins, during this time each of the ideas collected is assessed by the team members, looking for the best ones that comply with the specific requirements and needs, during this phase and the next one the so called “decision triangle” is used,

which basically are all the decision makers when screening and filtering the ideas, the outcome of this phase are the selected ideas, which are presented in a form of a one page to the Open Innovation Board.

Finally the Open Innovation Board is held in order to make the final decision about the selected ideas, this board is composed by the heads of R&D of the specific business unit for each of the geographical areas around the world, during this meeting the OI team would introduce all the ideas to them along with all the specifications, after the meeting is held the OIB will provide the go/nogo decision.

As it was mentioned before there are some key components inside this pillar to take into consideration in order to understand how the challenges are carried out, they are compiled inside the so called challenge triangle, each of the elements encompass the main actors and their role during each of the challenge's steps.



Figure 24 – Challenges Triangle Open Innovation Electrolux

Let us start with the “OI Team” element, their main role is to scout and screen potential ideas that might be of interest for Electrolux, depending on the type of challenge (inspired or targeted), these ideas might have different type of technology readiness, for instance, in the case of the targeted challenge, the ideas must have a high level of TRL, on the other hand in the case of inspired challenges the ideas might be an inspirational concept or insights about the future in the appliance industry.

In regards to the element called “Decision Makers”, it is the so called Open Innovation Board or steering committee, who is composed by the Open Innovation team and the R&D heads of each of the business areas of Electrolux. During this meeting the “one pages” of each of the scouted technologies is introduced to them and the decision of accepting or rejecting the idea is taken, in some cases if further development of the information is needed the decision is postpone for the next meeting, this can be re-looped until it is necessary.

The last item called SMEs, who are internal or external experts who help the Open Innovation team in order to scout and screen the ideas, in this sense, depending on the type of broker, they themselves are the ones who are experts in certain topics, so they have the capabilities to act as consultants as well when doing the screening of the ideas. For example Desall is an open innovation and crowdsourcing platform that, through design contests, connects companies and private clients

with a worldwide community of creative talents, in this case, they are experts in design challenges topics, so they are able to act as external experts on this type of topics. Moreover, suppliers also sometimes act as experts whenever a new technology needs to be tested in order to be embedded into the existing Electrolux products, anyway in cases when there is a high technical orientation in the solutions, there is a strong concentration of the experts, inside the company due to NDA reasons.



Figure 25 – Desall Challenge, Open Innovation Electrolux

4.3.1.2 Challenges Ideas:

As it was discussed in the previous section, during the challenge process, the expected outcome is a set of ideas that are going to be evaluated during the **OIB** step (go/no go decision), for instance in the previous example of desall challenge, the expected outcome are ideas related to the specific challenge, depending on the OI client requirements the ideas could be categorized in three ways: PACS, Enablers and Synergies, in the following section of this chapter the definition of each of these type of ideas is going to be given.



Figure 23 – Challenges Ideas Type

- **PACS** - PACS consist on those technologies/business ideas that will become in final products/services for the consumers, an example could be the precision cooker called Anova (which Electrolux recently acquired), The Anova Precision Cooker is a device that brings sous vide to the customer's home, so they can enjoy a cooking technique made famous by professional chefs for its incredible results, it Heats and circulates water in the pot, evenly cooking food to a precise temperature to guarantee perfect results every time. Cook everything from meats, fish and vegetables to soups, and desserts. When this idea was scouted it was classified as PACS, since it was a final product with its own technology applied to the sous-vide cooking technique.



Figure 24 – Anova Sous Vide Cooker, Open Innovation Electrolux

- **ENABLER** - The case of the enablers is different from the PACS, as in this case it is not about a final product, but it is a technology that will be part of a final products, in this sense, it could be considered as a component of a whole system, for instance, given the specification of the challenge, the OI team could be scouting for a special sensor that would allow them to measure different kind of information inside an oven, in this case the technology is not the final product itself, but it is part of it.
- **SYNERGY** - In this type of idea is when the innovator will offer external assets that Electrolux lacks in order to develop a product, in this case there would be a partnership in order to successfully launch the final product to the customers.

4.3.1.2 Challenges Process – HOW

As it was explained during the previous chapter, the challenge process for the open innovation concept inside Electrolux is held in 5 steps:



During the workshop, after building and discussing the SWOT matrix, it was decided by all the team that the challenge process needed improvements, first of all, the already established steps needed to be further defined in order to set properly the scope and deliverables of each of them as sometimes many of the ideas are kept in a loop until they are mostly rejected (high time expenditure), so the team is able to follow up the timeline of the challenge in an easier and efficient way, in addition in many cases there was a problem with the idea information, as there is no standard format for presenting them, this was causing that many of the ideas coming from the brokers after the challenge were missing information, therefore, causing re loops and high manual labor in order to complete the missing information, second of all, the challenge process was having serious problems in transforming those ideas that were screened and selected and transform them into projects, as this process was not formally defined, each of the ideas would usually follow different ways to develop, in brief in order to standardize it, there was a need of defining a BAU for

this part of the process. Finally, another pitfall detected through the SWOT was that the current tools used by the OI team were not enough to cover the new challenge process definition, so within the workshop the team worked in the design and creation of new tools that would allow to complement the existing ones and extend beyond the current use of them. The new process was defined as follows.

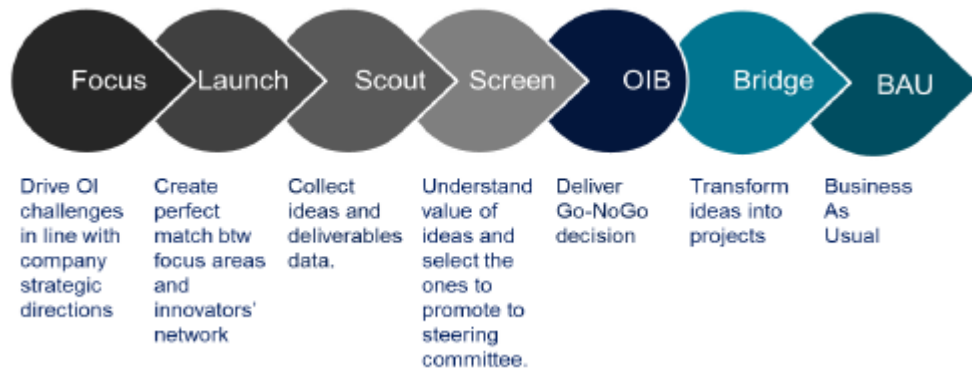


Figure 25 – Challenges Process Steps - Open Innovation Electrolux

a) FOCUS

The first step was kept as before under the name of focus, but a more detailed definition was elaborated by the team during the workshop. In the following paragraphs the description of each of the steps is going to be explained through 4 main items: Why (to understand the main objective of the step), what (different actions and expected outputs), who (the main actors involved in the particular step) and How (define the methodology and tools to be used):

- WHY – Objective:

- o The main goal of this step is to drive OI challenges in line with company strategic directions.

- WHAT – Actions & Outputs: The idea is align with all the company stakeholders and define the following two main items:

- o Ideas Requests for targeted challenges
- o Focus Areas for inspired challenges

- WHO – Actors. The main actors are: **OI Team** and **company stakeholders**

- HOW – Methodology.
 - o Align about strategic directions, problems to solve & gaps to fill
 - o Discuss opportunities from business & technical perspectives
 - o Define priorities vs internal & external resources

b) LAUNCH

The second step was kept as well but the team decided to add more details to this stage of the challenge process.

- WHY – Objective.

- o The main goal is to create a perfect match between focus areas and the brokers innovators' network.

- **WHAT – Actions & Outputs.**
 - o Define the expected external networks and identify the proper brokers
 - o Launch challenge following the appropriate business model
- **WHO – Actors.** The main actors involved are **OI Team** and **OI Brokers.**
- **HOW – Methodology.**
 - o Analyze OI Brokers' portfolio with reference to required deliverables
 - o Finalize brokerage model (when required)
 - o Define working model for scout and screen steps

c) SCOUT

Once the second step has been completed and all the deliverables have been successfully done, the scout step can start, by following the same structure of the previous steps, this step is defined as follows:

- **WHY – Objective.**
 - o The main goal in this stage is to collect ideas and deliverables data.
- **WHAT – Actions & Outputs.**
 - o Identify ideas and their value proposition.
 - o Cluster Ideas (PACS, enable, synergy).
 - o Collect Data to describe ideas deliverables.
- **WHO – Actors.** The main actors are OI Team and OI Brokers.
- **HOW – Methodology.**
 - o Use of brokers services according to brokerage model
 - o Follow deliverables

d) SCREEN

Once all the ideas scouting has been successfully done, the challenges process carries on to the screening phase of all those ideas that have been gathered in the previous step:

- **WHY – Objective.**
 - o Understand value of ideas with reference to deliverables and select the ones to promote to steering committee.
- **WHAT – Actions and Outputs.**
 - o Analyse ideas through deliverables, leveraging competences of SMEs.
 - o Prepare one-page and project-brief to support steering committee to deliver decision
- **WHO – Actors.** The main actors are: OI Team, Innovators, OI Brokers and SMEs
- **HOW – Methodology.**

- o Onion Approach
- o Innovation Language
- o NDA Guideline

e) OIB – OIB CHECK

Once the potential ideas have been selected by the OI Team, it is possible to introduce them during the Open Innovation Board where it is decided whether Electrolux sees any potential opportunities with each of the introduced ideas.

- WHY – Objective. The main goal is to deliver the Go-NoGo decision, facilitating interaction and aligning internal and external expectations
- WHAT – Actions & Outputs.
 - o Present the idea one-page or project-brief to the Open Innovation Board
 - o Identify open points to support decision process
 - o Define actions plan to complete deliverables and support idea transfer into project.
- WHO – Actors. OI Team, Steering Committee and SMEs.
- HOW – Methodology.
 - o Introduce each of the ideas in a 5 minutes' pitch each and end with Q&A session and gather action items accordingly.

As it is possible that the ideas coming from this step are put in check status because there is a need for further information or some deliverables need further clarification by the innovators, the OIB step requires a loop process where the ideas that are checked are able to complete the whole required information so the decision committee is able to decide whether it is accepted or not. This process is defined as follows:

OIB CHECK

- WHY – Objective.
 - o Finalize uncomplete deliverables to support Go-NoGo decision @OIB-Reloop.
- WHAT – Actions & Outputs.
 - o Identify critical elements in terms of technology, business, and alliance
 - o Complete deliverables description, at deeper level for the identified critical areas (tech specs, IP, business model)
 - o Check with other departments - not involved in OIB - who can drive the new business area and involve them in the next OIB
- WHO – Actors. The main actors are: OI Team, stakeholders, Innovators, supporting functions (Purchasing, IP & legal)
- HOW – Methodology.
 - o Use OIC to prioritize and crosscheck value

- o Identify the «real check» vs «Feak check»

f) BRIDGE

- WHY – Objective. Facilitate or Drive initiation of project after green light (idea in “passed” status), executing OI deliverables defined with project leader
- WHAT – Actions & Outputs.
 - o FACILITATE INITIATION: support preparation of some deliverables for project initiation; communication with internal and external parties, support formal and informal negotiation
 - o DRIVE INITIATION: OI assigned on behalf of driving function to execute tasks to complete CP deliverables for project initiation (OI + Driving function), including analysis of working model across parties
- WHO – Actors. OI Team, project Team, Innovators, supporting functions (Purchasing, IP & legal)
- HOW – Methodology.
 - o F2F meeting btw parties (external & internal)

g) Challenges – BAU

- WHY – Objective. Support project Team or drive CP tasks to deliver specific/additional Innovation Activation tasks involving external innovator
- WHAT – Actions & Outputs.
 - o AD HOC TEAM: support actions like IP licencing contract preparation, innovator TRM sharing, benchmark with other external innovators proposals, additional scouting (OI deliverables
 - o CORE TEAM: (if OI formally assigned) Execute CP deliverables assigned to OI by project leader
- WHO – Actors. OI Team, Project Team, Innovators, supporting functions (Purchasing, IP & legal)
- HOW – Methodology.
 - o Follow-ups with project leader on project status
 - o Follow-ups with external innovator on project status

4.3.2 NETWORK

The second pillar that is going to be explained is the so called “Network” one, this element of the strategy is composed by three main actors: Electrolux, brokers and innovators as depicted in the following figure:

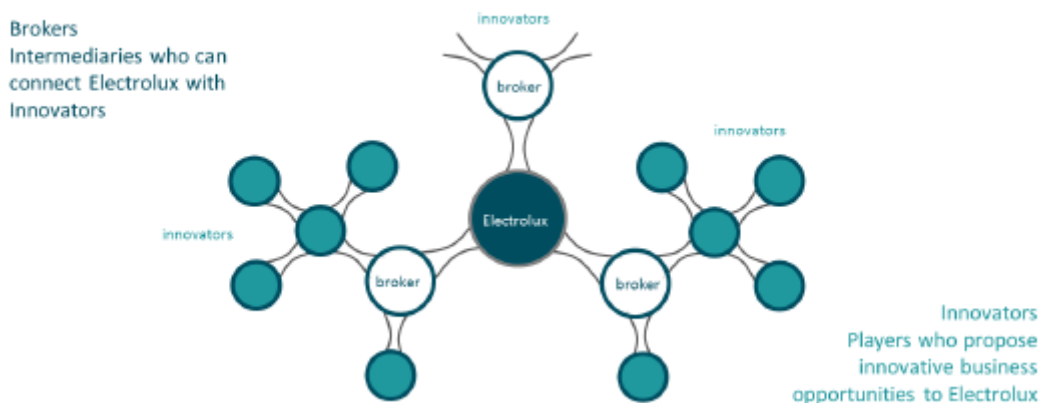


Figure 26 – Network Brokers, Open Innovation Electrolux

The interplay of these three actors are what form the core of the network pillar, in first instance through the relation between Electrolux open innovation area and brokers, the idea is to be able to reach those hidden innovators that are part of the network of each of the brokers inside the Electrolux portfolio, as it was mentioned in the previous section this process in order to reach the innovators with potential solutions is done through the definition of challenges.



Figure 26 – Network Triangle - Brokers, Open Innovation Electrolux

One of the key activities of the open innovation area is to manage the interplay among the internal OI network that is composed by all the Electrolux employees that interact through all the business units, also the external trusted network, which are those players that have already worked with Electrolux and a close relationship for potential collaborations has been built, finally the external OI network, which are all the external players that are unknown for Electrolux, so, this particular area is one of the main focus of the OI team as this “ecosystem”, represents all the potential brokers and innovators that might have interesting ideas and technologies for Electrolux, here the scouting and screening part plays a key role in order to identify all the key players in order to be included into the Open innovation portfolio.

Finally, during the process of looking for potential collaborators to reach innovators with potential solutions, Electrolux Open Innovation team has identified two main types of brokers

(intermediaries) that cover all the spectrum of services and network of innovators. The first one that is going to be explained are the brokers categorized as **“Interfaces”**

4.3.2.1 INTERFACES

The interfaces are considered the **non-traditional** brokers, this categorization has several implications, the first one is that the specific broker is considered an interface if among their specific business offering/purpose, being an intermediary for Open Innovation is not their core business, instead, this activity might result as a secondary one that comes, since, because of their main business, they are constantly working with innovators and the network they have built could be used by Electrolux, second of all, a broker is an interface, also because generally in order to find potential innovator the Open Innovation team has to do the scouting process by themselves and sometimes the broker is not even aware that the OI team is doing so, in this sense, the last consideration to take into account is that, in some cases there is no need for a formal agreement in order to scout for potential innovators.

Interfaces. Simple links to non-traditional innovative networks, without any OI services.



Figure 27 – Network Interfaces - Brokers, Open Innovation Electrolux

In addition, with an interface it is possible to launch both inspired and targeted challenges, depending on the business needs the OI team will decide whether an interface’s network has a valuable and potential innovator which can satisfy the given need. The following broker is a great example in order to understand further the interface concept

TECH BERLIN

- Berlin, Germany
- Government
- 1 – 10 Employees
- Startups, Investors

Broker Name : Tech Berlin
www.techberlin.com

Status: ACTIVE FOR OI TEAM SCOUTING

Owner: Manuel

Broker Description

- The platform www.techberlin.com is Berlin's new (digital) central point of contact for all information about Berlin's ever-growing tech and start-up scene. Following the example of digital.nrw, young businesses and developers as well as venture capitalists or simply those interested in technology can now also learn and exchange information via the Berlin platform. News, information on public offerings for entrepreneurs, event tips, job openings, offices, workplaces, as well as tips for starting a business can all be found here.

Challenge Service

- Multiple request

Challenge Name:

- Type:
- Scope:
- Launch Date:
- Cost:
- Agreement Type:
- Duration:
- Visibility:
- Communication spot:

Figure 28 – Tech Berlin - Brokers, Open Innovation Electrolux

In this case Tech Berlin is a startup community that shares news, events and resources. In this particular case through this kind of broker the OI team is able to scout for potential events where there might be startups with technologies that are interesting for Electrolux, in the same way, it is possible that prominent startups might get reviews in this place, therefore the OI team is able to scout for potential ideas that might be used in Electrolux

4.3.2.2 PLATFORMS

The so-called platforms are systems/business specifically designed to support the launch of Open Innovation challenges and within their core services they offer a wide variety of open innovation services.

Platforms. Systems specifically designed to support the launch of OI challenges and offer OI services.



Figure 29 – Platforms - Brokers, Open Innovation Electrolux

Platforms themselves are differentiated by the type of services, challenges, network and costs they offer. As it was specified in the challenges section, normally when launching this process, the open innovation team has to select among all the brokers (in this particular case platforms), the one that complies with all the requisites in order to fulfil the challenge requests, in that sense the OI team supports themselves on previous launched challenges with them (if applies), otherwise the portfolio of previous challenges play a key role in order to decide whether a broker fits or not for the specific challenge, in order to explain further in detail the platform concept, the following example is provided:



Figure 30 – Pioneers - Brokers, Open Innovation Electrolux

Finally, It is important to consider that it is possible to launch both targeted and inspired challenges. As it is likely that within the network of innovators, they might have potential technologies that might fit into inspired challenges, as well as, innovators with a high degree of technical knowledge in order to solve a targeted challenge

4.3.2.3 NETWORK PROCESS



Just as in the challenges process the network process is composed by 5 steps (Focus, launch, scout, screen and OIB), the logic behind each of the steps is the same as well, for instance, in the first step **Focus**, the OI team is going to check the existing brokers portfolio and determine which kind of brokers (DNA) and services are needed for covering some detected gaps in the ihub database, the DNA concept is going to be explored in the next section. In the second step **Launch**, the OI team will select the potential brokers matching the current needs in order to organize an **introcalls**, this tool is key during the scouting and screening phase, anyway the expected output is to have a clear list of candidates. During the scouting step the OI team will try to contact the potential brokers and gather some initial documentation from the broker in order to be able to start with the screening part, the main task during this phase is to try to understand which kind of services the broker offer, the network of innovators they manage, among others, the OI team calls this information **“Brokers deliverables”**:



Figure 31 – Deliverables - Brokers, Open Innovation Electrolux

During the scouting and screening phase with the documentation and the introcall organized with the broker, the main goal is to understand the information from the deliverables, first of all it is important to know which kind of broker is, depending on the **ecosystem** they work on they could

classified as: Industrial, academic, accelerator, start-up, investor, media, OI partners etc. Another key fact is to understand which **kind of challenges** they run, either targeted or inspired (both of them) and how they launch the challenges, then another characteristic to understand is which type of **services** they offer: speed dates, pitches, scouting, workshops, databases among others. The value is represented by the variety of services offered:

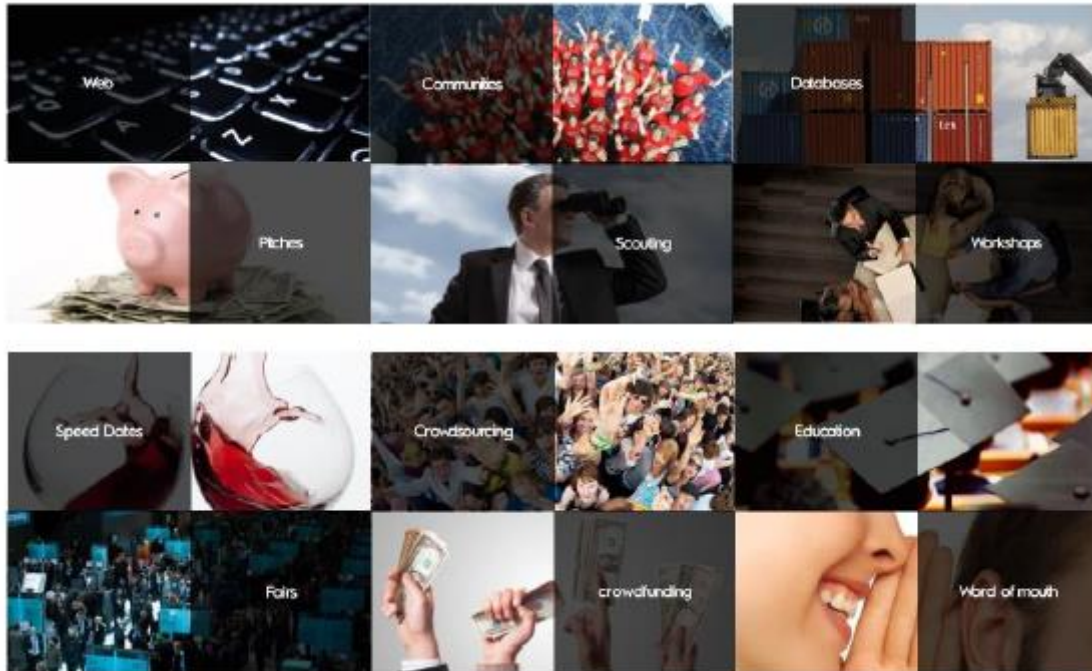


Figure 32 – Brokers Services, Open Innovation Electrolux

Finally, another important information to gather is the business model, so how much they charge, in general the companies work with two types of business models: flat fee or success fee:

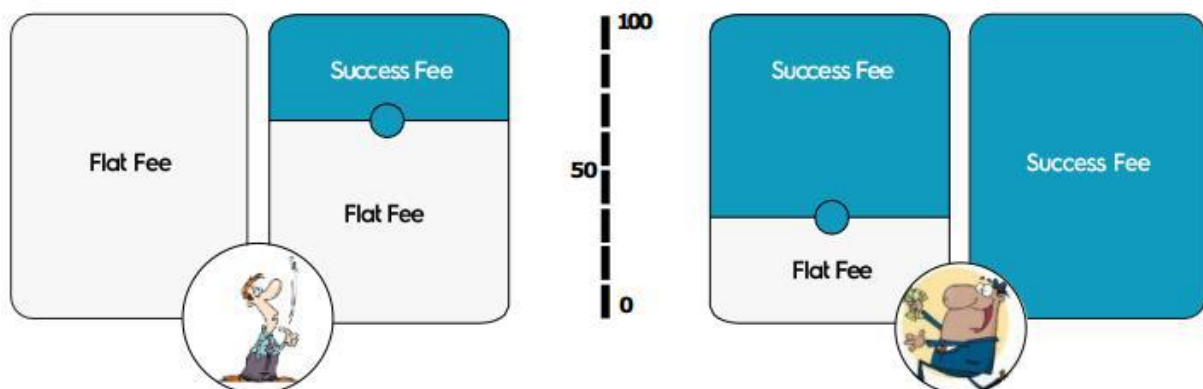


Figure 33 – Business Model - Brokers, Open Innovation Electrolux

In the first case (Left part of the figure), the **flat fee** means that the broker charges a fixed rate for its services, regardless of the outcome delivered to the OI team, normally this fee is payed yearly or per challenge, a formal contract needs to be signed from both sides in order to define properly all

the challenge details, anyway there are different variations of this type of fee, but it depends on the broker, but in general there are two cases: the first one is a full flat fee type, this means that the partnership will cost a pre-established price and no additional charges will be made, all of this is specified in the contract. The second case is a combination of flat fee with a success fee, in this type of agreement, there is a price to pay upfront for the broker's services, but one part of the agreement/services is going to be charged in success fee base. This takes us to the second type of fee called **"success fee"**, this kind of agreement means that the payment will be done just if there are positive results from the challenge, so potential ideas were gathered by the OI team, most of the times, this payment is done via rewards to the winners and a fixed fee to the broker for its services.

Normally after completing all the information in regard to the brokers offering the scouting and screening phase is done, but before starting the next step the **Open Innovation Board**, the team will complete a broker's profile with all the information in order to be introduced during this meeting, an example of this profile is as follows:

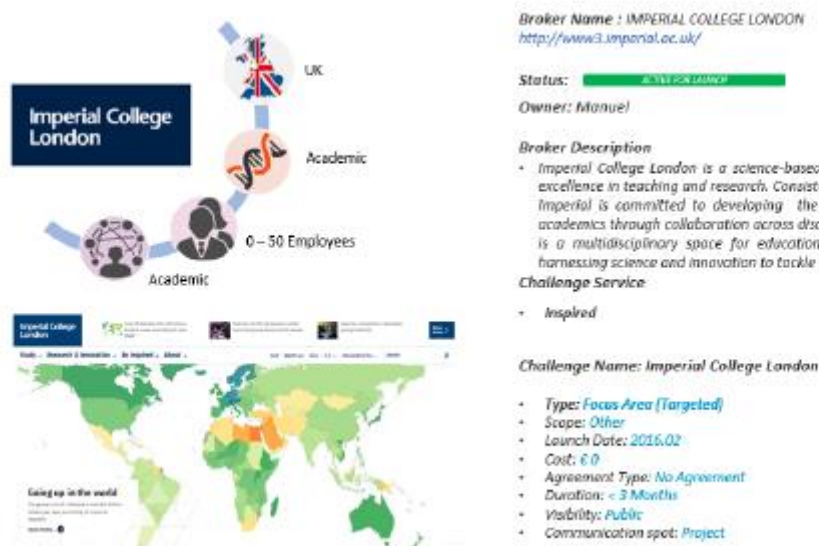


Figure 34 – Imperial College London - Brokers, Open Innovation Electrolux

In this particular example the broker is called **"Imperial College London"**, as it can be seen all the broker details are organized in this page, it is possible to find the DNA, the geographical scope, a description, the business model and type of challenges among other details, in this specific example, Electrolux has launched a challenge with them with a success fee type of payment.

During the **OIB** this profile will be introduced to the whole team to give the go/no go decision, in some of the cases further re loops are required in order to understand the real value that the broker will give to Electrolux. In the case that the broker is selected, it will be included into the Electrolux portfolio.

4.3.2.4 NETWORK PROCESS – HOW

During the Open Innovation workshop, there was the opportunity to work as well on the Network pillar, as during the internship I personally led the management of all the brokers inside the team, the development of the activities related to the improvement of the Network process was mainly driven by the OI coordinator and me. The network pillar is composed by the following steps:

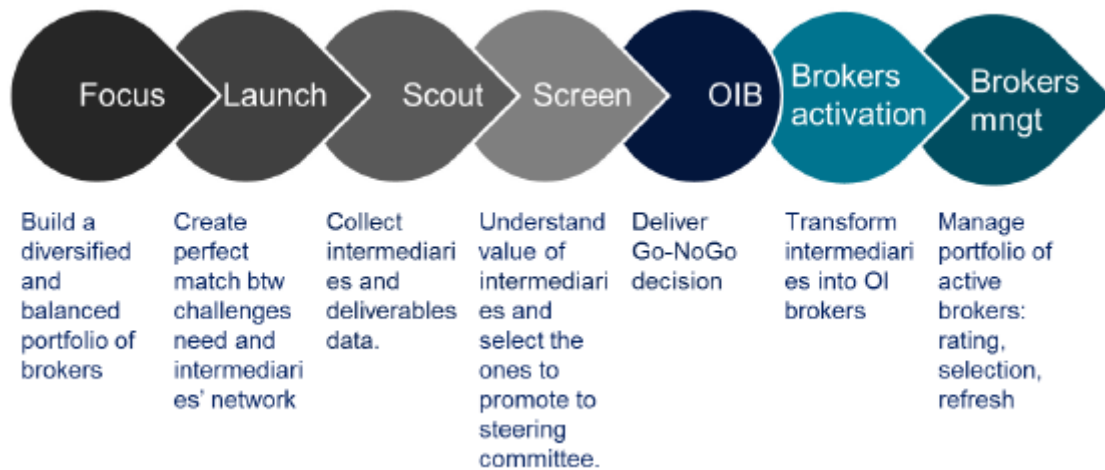


Figure 35 – Brokers process steps, Open Innovation Electrolux

a) BROKERS – FOCUS

WHY – Objective. Build a diversified and balanced portfolio of brokers.

WHAT – Actions & Outputs. Align with OI head and define short/long term priorities in terms of

- o DNAs
- o Geographical areas
- o Services
- o Brokerage model

WHO – Actors. OI Team.

HOW – Methodology.

- o Gaps and opportunities analysis of existing brokers portfolio
- o Capabilities analysis vs challenges requests

b) BROKERS – LAUNCH

WHY – Objective. Create perfect match btw challenges and intermediaries' network

WHAT – Actions & Outputs.

- o Define the expected brokers networks and identify the proper research activity plan
- o Run research activities in line with OI brokerage model path

WHO – Actors. OI Team.

HOW – Methodology.

- o Identify role models in OI brokers portfolio as reference cases
- o Identify gaps/opportunities in terms of services and geographical area

c) BROKERS – SCOUT

WHY – Objective. Collect intermediaries and deliverables data.

WHAT – Actions & Outputs.

- o Identify intermediaries and their value proposition
- o Cluster intermediaries by DNA

- o Collect Data to describe intermediaries deliverables

WHO – Actors. OI Team, OI Ambassadors.

HOW – Methodology.

- o Verify potential brokers in OI iHub in silence/buzz/bank status with reference to defined needs
- o Search new players with similar services/models in new geographical areas

d) BROKERS – SCREEN

WHY – Objective. Understand value of intermediaries with reference to deliverables and select the ones to promote to steering committee.

WHAT – Actions & Outputs.

- o Analyze intermediaries through deliverables.
- o Prepare one-page & alliance-brief to support steering committee to deliver decision

WHO – Actors. OI Team, OI Ambassadors

HOW – Methodology.

- o Brokerage intro guideline
- o Brokerage remuneration model guideline

e) BROKERS – OIB

WHY – Objective. Deliver Go-NoGo decision, facilitating interaction and aligning internal and external expectations

WHAT – Actions & Outputs.

- o Present one-page or alliance-brief @OIB
- o Identify open points to support decision process
- o Define actions plan to complete deliverables & support broker activation
- o Finalize official FB

WHO – Actors. OI Team.

HOW – Methodology.

- o 10 min pitch per broker
- o Q&A following deliverables

f) BROKERS ACTIVATION – SIGNED AGREEMENT

WHY – Objective. After the go decision by the OI team, the broker collaboration alliance has to be defined accordingly

WHAT – Actions & Outputs.

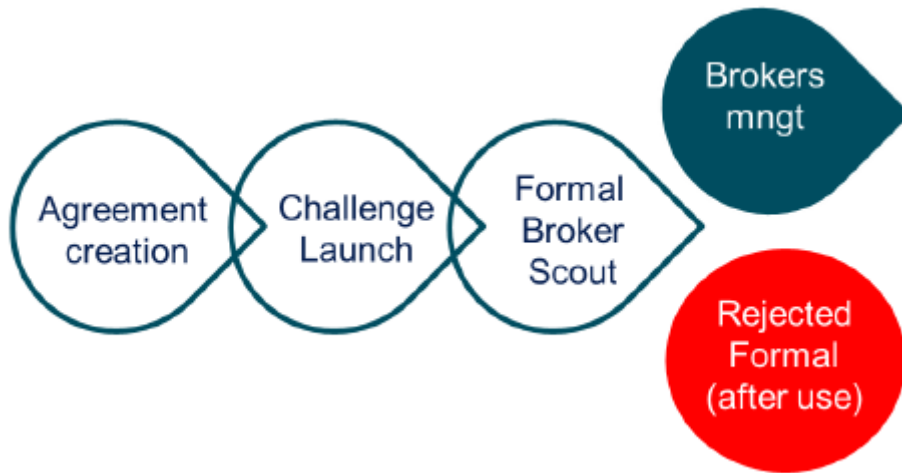
- o Define which type of collaboration needs to be
- o Identify step to follow broker activation
- o Finalize official FB

WHO – Actors. OI Team.

HOW – Methodology.

- o 10 min pitch per broker

- o Q&A following deliverables



g) BROKERS ACTIVATION – INFORMAL AGREEMENT

WHY – Objective. Keep up to date the brokers information and statuses on iHub

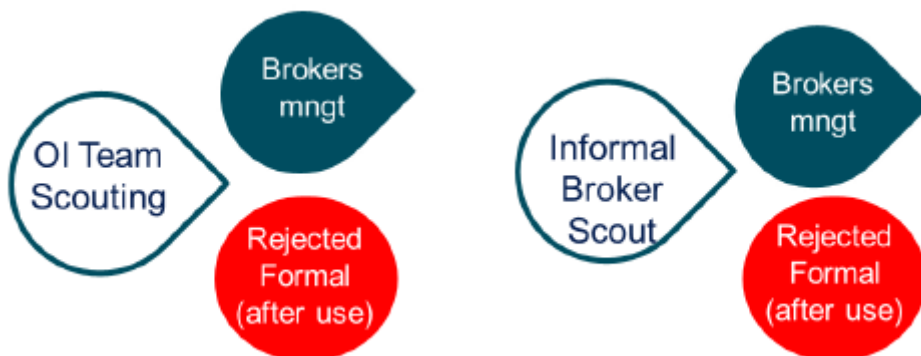
WHAT – Actions & Outputs.

- o Verify brokers profile
- o Check for potential areas of collaboration
- o Update the status in ihub
- o Brokers database updated with the proper feedback given the case

WHO – Actors. OI Team, Broker.

HOW – Methodology.

- o Yearly base, an assessment of the brokers in OI Team Scout and Informal Broker status needs to be done.
- o Verify brokers collaboration during the year.
- o Update the status to rejected to those brokers which no collaboration has been done
- o Keep the brokers and provide with feedback in the cases when needed.



4.3.2.4 BROKER MANAGEMENT

a) BROKER RATING :

Rating drivers

- Geographical expansion (1-5)
- Number of employees
- Area of expertise of network
- Able for targeted challenges?
- Able for inspirational challenges?
- Cost
- Agreement type: Flat, Success, Flat + Success
- Services:
- Quality of Platform (1-5)

Rating elements

- Competences
- Network
- Services
- Cost
- Strategic fit

Rating reports

- Rating systems by challenges
- Rating systems per category (interface/platform) & per DNA

b) BROKER SELECTION

WHY – Objective. Keep up to date the brokers information and status on iHub

WHAT – Actions & Outputs.

- Verify brokers rating assessment after challenges.
- Check for potential areas of collaboration
- Update the status in ihub
- Brokers database updated with the proper feedback given the case.

WHO – Actors. OI Team, Broker.

HOW – Methodology.

- An assessment of the brokers which have been collaborating in formal scouting needs to be done.
- KPIs of the challenges need to be checked in order to update the status accordingly
- Update the status to rejected after use to those brokers which don't comply with the OI team standards and update the others to Formal Broker Scout

c) BROKER MAINTENANCE – FORMAL AGREEMENT

WHY – Objective. Keep up to date brokers status on iHub.

WHAT – Actions & Outputs.

- Verify brokers rating assessment after challenges.
- Check for potential areas of collaboration
- Update the status in ihub
- Brokers database updated with the proper feedback given the case.

WHO – Actors. OI Team, Broker.

HOW – Methodology.

- An assessment of the brokers which have been collaborating in formal scouting needs to be done.
- Update the status to rejected after use to those brokers which don't comply with the OI team standards and update the others to Formal Broker Scout

d) BROKER MAINTENANCE – INFORMAL AGREEMENT

WHY – Objective. Keep up to date brokers status on iHub.

WHAT – Actions & Outputs.

- Verify brokers profile
- Check for potential areas of collaboration
- Update the status in ihub
- Brokers database updated with the proper feedback given the case

WHO – Actors. OI Team, Broker.

HOW – Methodology.

- Yearly base, an assessment of the brokers in OI Team Scout and Informal Broker status needs to be done.
- Verify brokers collaboration during the year.
- Update status to rejected to those brokers which no collaboration has been done
- Keep the brokers and provide with feedback in the cases when needed (Brokers award).

e) RATING PROCESS

In order to do the assessment of all the records that needed to be updated, a rating process was designed, the main goal was to try to identify those brokers which could offer a great value to Electrolux Open Innovation team, as well as those players that don't align properly to the OI needs. Therefore, a list of rating elements was devised, so each of them could provide a grade to the broker to rate it accordingly, the following were the drivers that were taken into account:

- Portfolio (Network)
- Available technologies/start-ups
- Reputation
- Search Engine
- Competences & Strategic fit
- Geographical Coverage
- Database (portfolio) update cycle

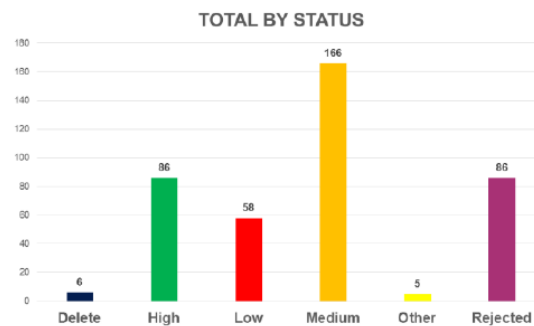
Once each broker was analysed through the drivers, a final decision was made in terms of which qualification it should have. In consequence, four main categories were created.



f) RESULTS

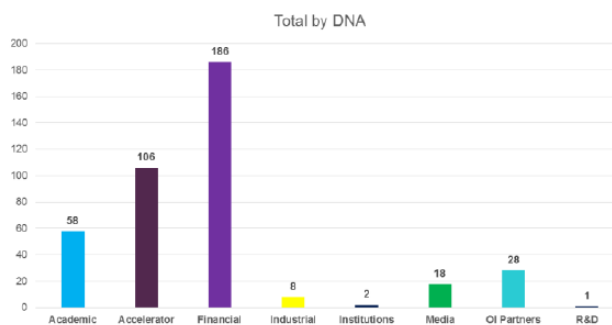
- BY RATING STATUS - According to the rating assessment created the results were that around 90 brokers were rejected, at the same time, all the others were located in the high, medium and low slot, in the recommendations section, the process that need to be followed in order to perform the proper maintenance to these brokers in the ihub database is going to be explained in further detail.

STATUS	TOTAL
Delete	6
High	86
Low	58
Medium	166
Other	5
Rejected	86
Grand Total	407

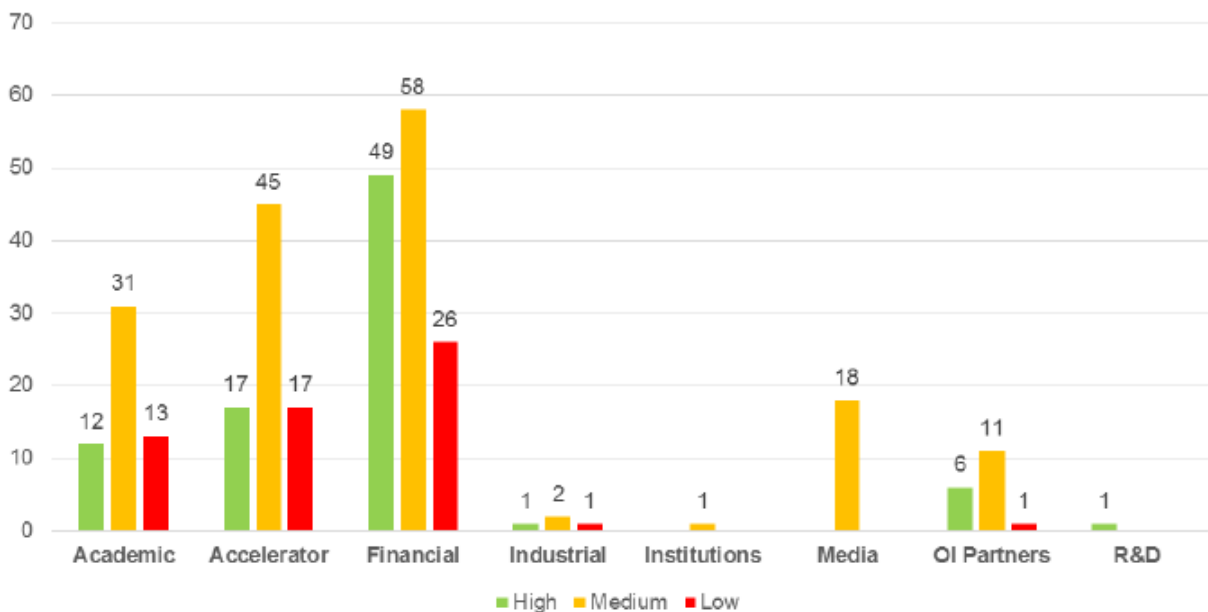


- BY DNA - In order to identify which are the main type of brokers that can be found on this status a filter was applied in order to know which the main groups are so the Open Innovation team is able to put effort in those types of brokers where a wider offer is needed.

DNA	TOTAL
Academic	58
Accelerator	106
Financial	186
Industrial	8
Institutions	2
Media	18
OI Partners	28
R&D	1
Grand Total	407

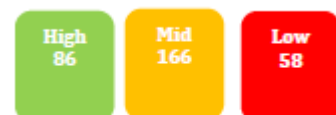


DNA type	High	Medium	Low
Academic	12	31	13
Accelerator	17	45	17
Financial	49	58	26
Industrial	1	2	1
Institutions		1	
Media		18	
OI Partners	6	11	1
R&D	1		
	86	166	58



In order to do a proper assessment of new and existing brokers for this particular status (Open Innovation Scouting), the following fields for the so-called rating driver elements should be added on Ihub in order to be added and filtered better by the Open Innovation Team:

- Portfolio (Network)
- Available technologies/start-ups
- Reputation
- Search Engine
- Competences & Strategic fit
- Geographical Coverage



- Database (portfolio) update cycle

Another consideration to be taken into account is that these fields would have a value between 1 and 5 and that once they are filled up, the system will automatically give a **Weighted average**, that is going to characterize each of the brokers into one of the rating status (High, Medium, Low), in cases where the broker leader sees that a broker that is in the low status, he can determine whether is viable to keep it or just reject it right away in order to avoid a re-loop. In addition, once the assessment is done, it is good to take into account that in order to review the brokers and check whether they have potential new technologies, according to each ranking they should be re checked and re-categorized (if needed) as follows:

- HIGH: Quarterly done
- MEDIUM: Twice per Year
- LOW: Once per year

4.3.3 MINDSET

“The mission of the mindset pillar is to embed the Open Innovation model in all company functions, allowing every employee to deploy OI activities autonomously”

Finally, the last pillar of the Open innovation strategy is the Mindset that is related to change management, as Open Innovation strategy is a new paradigm for an organization like Electrolux, a mindset change is needed in order to achieve a proper implementation of the Open innovation approach inside Electrolux. This new mindset will facilitate the synergy and collaboration across people, inside and outside of the company, the ultimate target is to boost the potential collaboration of internal and external networks when working on the inbound and outbound open innovation ideas flow.

4.3.3.1 MINDSET OBJECTIVES

The main objective of this pillar is to achieve all the best conditions where the different business units are aware of the open innovation approach and are open to use it in order to accomplish each of their specific requests. There are three main barriers that the OI team is trying to overcome through this pillar:

- IP paradigm
- Fear of diversity
- And, the not invented here syndrome

The first one, **IP paradigm**, is based on the premise that in order to have a successful company a large patent portfolio is a must. For instance, in the Xerox case the company itself never benefited from all the inventions that were held inside PARC (Chesbrough, 2003), so having a large number of patents is not a guarantee of a successful company.

The second one is the **Fear of diversity**, it means that Electrolux might find a reluctance in order to use open innovation due to the fact that they might need to interact with actors with high differences with the company, in terms of, industry, business focus, size etc.

The last one is called **not invented here**, it refers to the fact that corporations culture tends to avoid using/buying already existing research or knowledge because of its **external nature**. With the open innovation paradigm, this syndrome is solved by embedding and boosting the open-minded behavior inside the company.

4.3.3.2 MINDSET TYPOLOGIES

It can be considered that there are two main kind of typologies for the mindset pillar:

- **Inside.** Set of initiatives to deploy OI strategy in the company, spreading knowledge of the model and creating OI expertise beyond OI Team.
- **Outside.** Set of initiatives to support external players (suppliers, customers, other industries...) to discover OI model and deploy in their contest.

4.3.3.3 MINDSET PROCESS

The mindset process is composed by four main steps, in which the OI team intends to solve those problems that arise when implementing the Open innovation strategy, the process is designed to understand the fact that there is a learning process in which the employees need to slowly come to learn about OI approach, the ultimate goal is to empower them in order to use OI as one of the tools for research and developing of new ideas inside the Company. The process is described as follows:

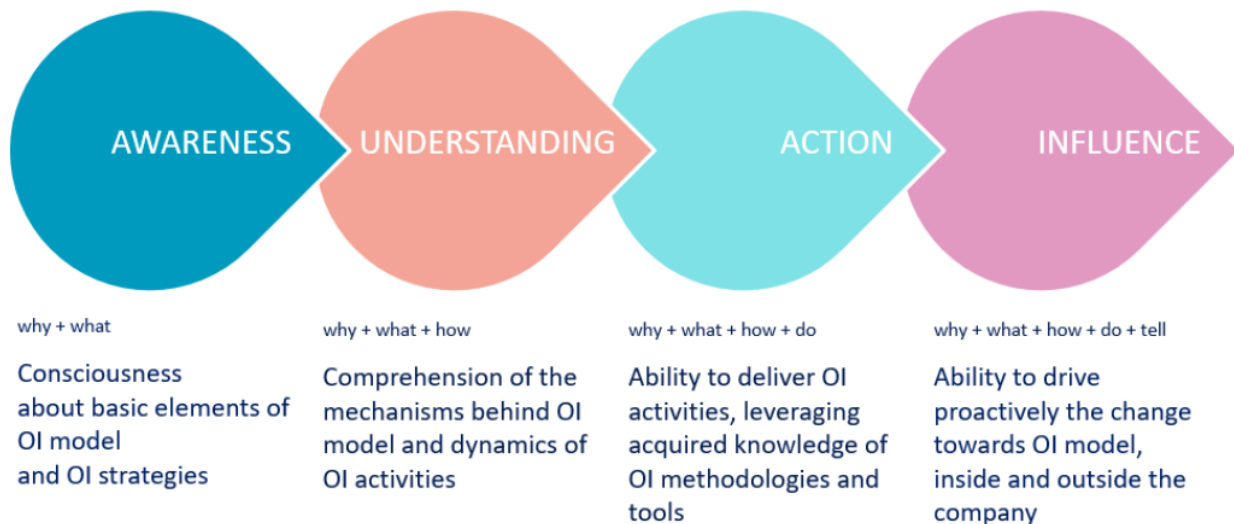


Figure 36 – Mindset Process, Open Innovation Electrolux

4.3.4 TRM – TECHNOLOGY ROADMAPPING

TRM as a “a time-based chart, comprising a number of layers that typically include both commercial and technological perspectives”, depicting a set of structured relationships between markets, products and technologies over time.

At the same time, a definition of the Technology Roadmapping process was retrieved from the scientific literature, based on the work by Simonse, Buijs and Hultink (2013).

According to these authors, who carried out a qualitative analysis on a sample of 12 different companies, Technology Roadmapping is a process aiming at providing an organized view of interlinked elements (namely technologies, products and markets) over a certain time horizon, facilitating a shared view of future plans on innovation and creating mutual understanding.

Once the meaning of TRM and Technology Roadmapping was clarified, efforts were deployed to understand the main purposes and benefits of such a methodology.

Identification of the various benefits resulting from the correct implementation of the TRM methodology within a company, and the selection of the major benefits for Electrolux.

The company’s decision to carry out such a methodology within GC&T (Global connectivity & Technology) stems from the fact that this group has a great cross-business relevance, assessing technological opportunities that can later be implemented in different product lines and can be valuable for more than one generation of a product.

Therefore, responsibility was assigned to the GC&T managers for the review of their roadmapping approach, dealing with a small number of key areas (namely ‘Big Bets’). The most desired benefit is to reach a close cooperation between R&D and GC&T, leading to mutual support especially in the Advanced Development process, as stated in chapter one.

After successfully accomplishing the first two goals described above, the third goal of this thesis was the definition and the development of an agreed TRM process and of a shared structure of the TRM tool, starting from GC&T. After that, the implementation of such elements within GC&T was carried out.

In order to define, develop, and implement the TRM methodology within Electrolux GC&T, an expert- based approach was followed, according to the definition provided by Kostoff and Schaller (2001).

These two authors identify two different methods, namely the expert-based approach and the computer-based approach. In the former, a team of experts from different teams/functions are gathered to discuss the TRM methodology, whereas in the latter, databases that store information about scientific disciplines, products and so forth are utilized.

Moreover, according to Garcia and Bray (1997), an expert-based approach requires not only an appropriate set of knowledge (both of consumer’s needs and technologies, as well as of the TRM process and tool) but, also, “*interpersonal and group process skills*”. While the definition, the development and the communication of the TRM process and tool were completed within the internship project, the implementation was only possible with regards to the interaction between GC&T and R&D Food Preservation.

The TRM is charted using computer-based tools as PowerPoint and Visio. These tools are easy to use and allow free-wording. Each technology cluster represents a different TRM and all the TRMs concerning a specific technology group are collected in a deck of slides.

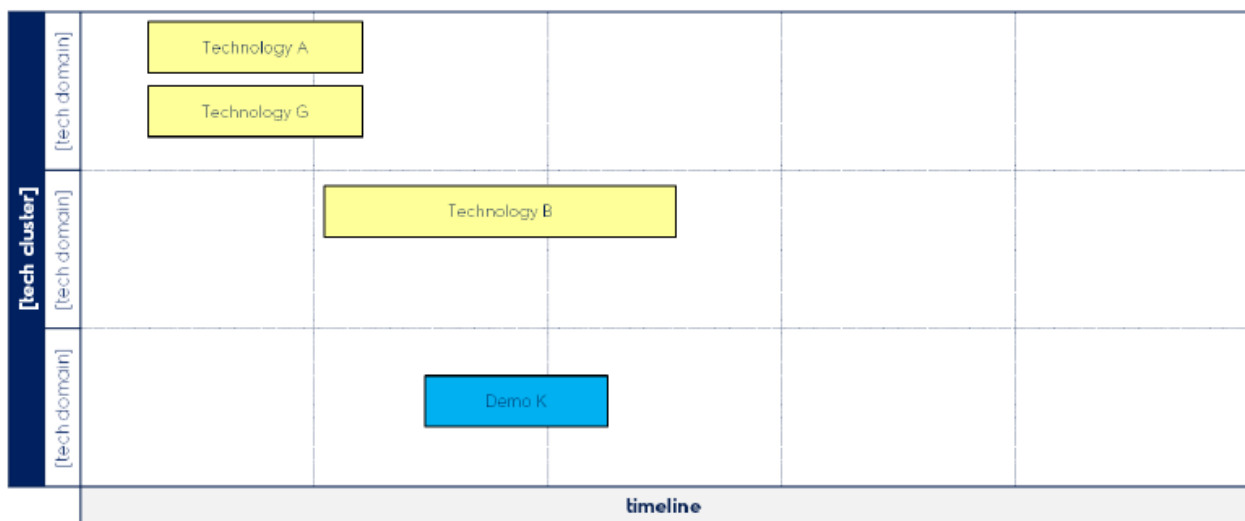


Figure 37 – Theory – based TRM within GC&T, Electrolux

According to the classification provided by Phaal, Farrukh and Probert (2004a), this TRM can be described as a single-layer TRM with a planning purpose. It displays the different technologies owned by a certain technology group over time (usually, five years), dividing them according to the cluster and the domains they belong to. This because, as stated by the same Phaal, Farrukh and Probert (2004b), the TRM architecture should resemble the structure of the organization that is building it, facilitating the collection of existing information, especially in this preliminary phase. Moreover, a color code was introduced in order to differentiate the technologies from the demonstrators, that can be now preliminarily described as the application of a specific technical solutions in order to deliver a robust proof of concept in terms of technical feasibility and consumer benefits. Although we are far away from a product, said demonstrator might represent, under a large number of assumptions, a preliminary commercial perspective implanted into our TRM.

The second version of the TRM tool, namely the TRM skeleton, was created, finally achieving a fusion between the commercial and technological aspects within the same tool, even if each TRM skeleton will concern only a specific Big Bet.

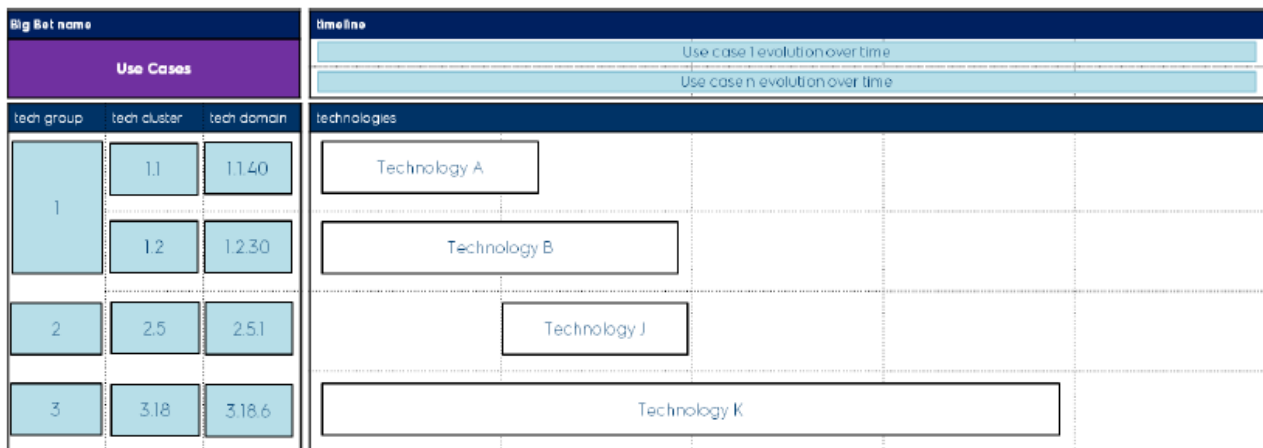


Figure 38 – TRM skeleton

Specifically, the Technology Roadmapping process and its outcome (i.e. TRM) must provide an organized view of interlinked elements (namely technologies and use cases within our TRM skeleton) over a certain time horizon, facilitating a shared view and creating mutual understanding between R&D and GC&T. This, in order to reach a close cooperation leading to mutual support, especially in the Advanced Development process.

Therefore, after having carried out the roadmapping process within GC&T, and having achieved a preliminary TRM skeleton, this tool must be completed with the insertion of the R&D groups, their technologies and their point of view, concerning each of the Big Bets involved.

4.3.4.1 TRM & GRP – TECHNOLOGY ROADMAPPING & GAPS RECOVERY PLANNING

Despite the importance of the innovation process and the vast organization underlying it, the different teams that are dealing with technology development activities in GC&T put a very limited effort in aligning their respective strategic plans. The communication of the future strategies of said teams is very limited and often entrusted to personal interaction between managers. Moreover, a specific tool that describes and communicates strategic plans concerning technology has not yet been identified clearly.

Instead, there are different tools used by different functions, and, even within the same function, different approaches coexist. Therefore, it can happen that this alignment issue leads to an overlap of activities and, consequently, to a waste of resources.

In this respect, the Technology Road Map approach immediately attracted a growing attention within Electrolux Group due to its large diffusion within companies, entire industries and even governments (Bray and Garcia, 1997; Kostoff and Schaller, 2001; Phaal and Muller, 2008).

Technology Road Map (TRM) is deemed to be one of the most powerful tools available to support technology management and planning, enabling activities concerning technology innovation to be systematically carried out and shared explicitly within the organization.

Moreover, with regards to technologies, this approach supports the identification of gaps between the current situation and the desirable scenario the company wants to achieve in order to understand in advance which technologies will be needed and when.

Below, an overview table summarizing the goals described above is provided.



Figure 39 – TRM Project Goals overview table

4.3.4.2 GAPS RECOVERY PLAN DEFINITION AND IMPLEMENTATION: PROJECT GOALS

Once the TRM methodology was correctly implemented within a company, a set of markets, products and technologies was defined, together with the relationship between these three elements, over time.

In the context of an R&D organization or a research center on advanced technologies, as Electrolux GC&T, it might be of great significance to move beyond the TRM analysis. More specifically, it could be very important to make a step forward with the support of other valuable tools useful to provide an overall characterization of the technologies identified by the TRM methodology and depicted by the TRM tool.

This overall characterization will lead to the occurrence of at least two benefits:

1. Obtain a clear view of the scenario concerning a specific technological area, achieved through an evaluation of the competitors' performance, or through the assessment of relevant threats and trends;

2. Reach a better understanding of the existing gaps between the current status of these technologies and the desirable one, comprehending whether the company has the necessary elements in order to reach this desirable status. These elements might not only involve capital or manpower to acquire a new technology or to develop a technology in-house, but they could also include, for example, the knowledge required to exploit or understand a concerned technology.

The development and the implementation of a set of tools capable of providing an efficient overall description of the technologies identified by the TRM. On the other hand, the creation and the implementation of a tool, referred to as the Gaps Recovery Plan, able to highlight the gaps that arise between the current situation and the desired one, defining an action plan to bridge these gaps and, if possible, indicating the individual in charge of the activity concerned.

In order to summarize the goals described in this section, here below an overview table is reported.



Figure 40 – GRP project goals overview table

4.3.4.3 TRM & GRP IN OPEN INNOVATION (ACTIONS)

The Electrolux Open Innovation team, its model and its strategy, drives the ideas management process in order to capture external solutions that meet company innovation needs.

Focusing on the process that will enable Electrolux Open Innovation to carry out the activities necessary in order to recover the gaps, on the one hand, a single GRP provides an outline of the activities identified by technology experts, activities which are as detailed as the ‘limited’ tool allows them to be. On the other hand, these activities will have to be performed by an Open Innovation team member, who is in need of further information in order to be able to move forward.

A compromise between the dual approaches could be reached by adding a few crucial details to the output provided by the GRP without reaching the complexity of what we can call a project specification document, also making an explicit reference to the deadline by which the results of such activities are to be delivered. The tool which allows the addition of the details discussed above is illustrated in the table depicted in Fig. below.

The left side of the structure, marked with a dark color, indicates the GRP drivers. The right side, contrastively marked with a lighter color, gives room to the addition of the discussed details. Moreover, the table illustrates that, in order to recover a single gap, Open Innovation can carry out more than one activity, either contemporary or subsequently.

GAP deliverables		GAP	OPEN INNOVATION	
			what	when

Figure 41 – Generic Open Innovation deliverables

In order to comprehend how to use this tool properly, one needs to wonder how to add detail to the information provided by the GRP, without reaching the complexity of a project specification. The answer to this question differs from one gap to another, since the level of detail that one could reach strongly depends on:

- The knowledge achieved on that specific gap. For example, if a scouting action is identified to recover a gap, it is probable that we are still in the preliminary phase. This implies that not many details could possibly be added, unless a specific technical solution has already been identified. Moreover, only the provider of said solution is of concern to the scouting action.
- The scheduled deadline by which the gap is to be recovered. For example, if the activity is scheduled in say 5 years' time, absence of detailed information is very likely.

Finally, once all the activities are detailed according to each technology, a collection of all the Open Innovation deliverables included in a single project is provided to the Open Innovation team member in charge.

Furthermore, in order to provide a clear overview of the activities that will have to be carried out within the projects where Open innovation is involved, a booklet on deliverables that arise from all the different projects is created.

In conclusion, a satisfactory outcome was achieved, dividing the technologies needed to reach Electrolux's strategic objectives into eight different groups:

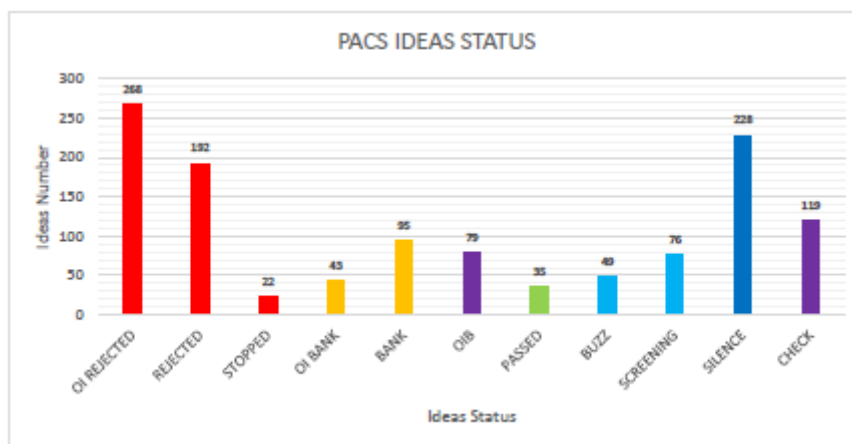
1. GC&T Advanced Technologies (AT)
2. GC&T Robotics & Artificial Intelligence (Robotics&AI)
3. GC&T Electronics
4. GC&T Connectivity
5. R&D Food Preparation
6. R&D Food Preservation
7. R&D Dish Care
8. R&D Fabric Care

The first four groups are owned by GC&T, whereas the last four belong to the R&D, and each group owns a variable number of technology clusters and domains.

CHAPTER 5 - OPEN INNOVATION – ELUXHUB PROJECT

5.1 UNVEILING THE GAPS

In order to detect the potential existing problems and gaps for the open innovation process inside Electrolux, the first step taken was to extract from the ihub database the information related to the ideas managed by the team and their different current status. The actions taken during this analysis was to extract the ideas for PACS and enablers that represent the whole pool of ideas managed by the OI team, once the information was extracted it was possible to analyse it through pivot tables and the following chart was created in order to show the different status and the amount of ideas in each of them:

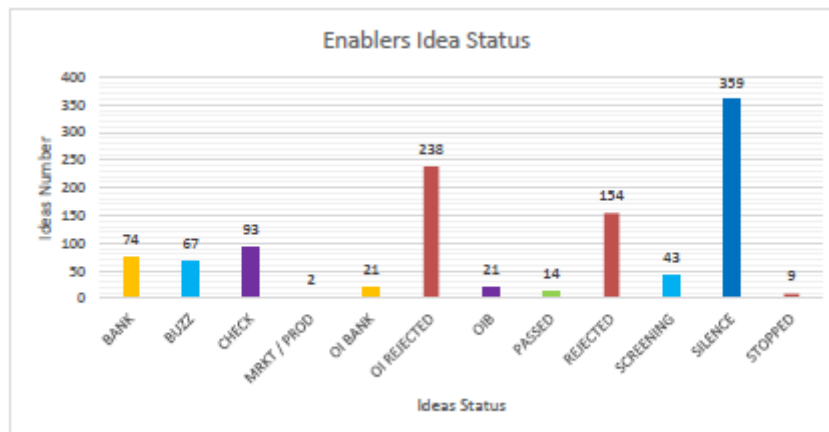


As it can be seen the first three columns represent the ideas in the statuses: OI Rejected, Rejected, and Stopped, these ideas are all of those that have gone through the Open Innovation process and have been rejected either by the Open Innovation team or by the OIB, the following columns (OI bank & Bank) are those ideas that have been put inside the Electrolux portfolio by the OI team and the OIB respectively, these ideas are considered to be interesting but due to different business reasons, no further development is done and they are kept in the “pocket” in order to get back to them whenever there is an opportunity to exploit them. The following column named OIB is for those ideas that are currently being introduced to the Open Innovation Board in the different geographical locations. The green column (checked) represents those ideas that have been introduced to the OIB and have passed this filter, so there are potential opportunities with these kind of ideas. For the following columns (Buzz, Screening, and silence) are those ideas that are currently being analysed by the OI team in order to assess their potential for Electrolux.

From this data, it is possible to extract that from a total of 1206 ideas just 35 have been given the “passed” status after going through the whole Open Innovation process that represents the 2.9% of the total of ideas in all the different statuses, in this sense, in addition there is a large amount of ideas being analysed by the team and put in standby, around 485 ideas are under this circumstance, this includes: bank, OI bank, Silence and Check, it represents around 40% of all the ideas. Finally, around 482 ideas have been rejected (first three columns), which correspond to around 40% of the total of ideas inside the OI portfolio. Out of this analysis it is possible to arrive to the following conclusions:

- There is a high number of ideas rejected (40% of the ideas) during the screening and scouting phase on top of those that are introduced to the OIB, this means that the screening and scouting process is not being robust enough in order to depurate better the ideas that are being gathered and screened by the OI team and introduced to the OIB.
- 40% of the ideas that are analysed are in put in stand by statuses, this has a big impact in the work done by the OI team as most of the time this is leading to re loops in the decision making as well as, a time waste since whenever the team comes back to the idea, the momentum gained during the first analysis is lost and additional effort is needed in order to catch up and update properly the current status of the previously scouted idea.
- Even though the Open Innovation team has inside their portfolio outstanding ideas that have been accepted by the OIB (passed status), they are not coming to realize because of different business reasons (lack of the manufacturing resources, not available human capital, risky investment, ROI cycle is too long), in this sense for Electrolux this is setting a big barrier in order to fully exploit the ideas that have been already selected. (Zero ideas have been put into the market)

In addition, an analysis for the enablers ideas was extracted as well, the following chart shows the main findings from this database:



Some conclusions that can be drawn are as follows:

- Just 2 ideas have come to market production status, in this particular case these ideas are not being used for final products for the customers.
- Still a great amount of ideas are being rejected during both phases (OI rejected and OIB Rejected).
- About 49% of the ideas are in standby status, where there would be a high chance of decision reloop.

5.2 DEFINING THE STRATEGY: SERVICE DESIGN AS MAIN DRIVER

Once these gaps were detected, it was decided to further develop the eluxhub project with the ultimate objective of cover them, in addition to try to exploit potential hidden opportunities during the formulation of this new Open Innovation Strategy. So, to carry on as part of this thesis study, the following step was to define a way to establish which were the main stakeholders involved,

identify their pains and goals, and based on this being able to bring up a strategy, in order to do so, **service design** was proposed as possible solution in order to formulate the strategy for the eluxhub project. In the following sections, the reasons of why service design could be key in order to generate, not just a successful strategy, because you can put the best of the processes in place but if you do not integrate this to the people, the results might not come as expected, but rather to identify as well, all the resources needed from the organization and how they need to interact with the strategy in order to successfully achieve the desired results.

5.2.1 SERVICE DESIGN FOR ELUXHUB PROJECT

The subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience (Buchanan 1992: 16)

To introduce why the service design approach is going to be used for developing the Eluxhub project, in first instance, some concepts in regards to this specific topic are going to be defined and then each of the most valuable tools from service design will be defined along with the complete framework of how they will be integrated to the development of the Eluxhub project.

Service design is considered a brand-new discipline, that emerged as a key contribution of a group of design thinkers (Morello 1991, Hollins and Hollins 1991, Manzini 1993 and Pacenti 1998), they started to see that the role of design was changing, during that time the dominant practices and culture of design was still strongly focused on the physical and tangible outcome of the design processes. Nowadays the industries have evolved to the so called “service economy” there was a big grow in the service development sector (Meroni & Sangiorgi, 2011).

In regard to the definition of design, as Richard Buchanan stated in his paper for the conference “Researching design, designing research”, if we ask different people what service design is, they all would come with different answers, which is a strength as those fields that already have a settled definition are “lethargic”, “dying” or dead fields. In this sense service design has all the potential to be.

According to Stickdorn, service design has five main principles to follow:

- User centred
- Co – creative
- Sequencing
- Evidencing
- Holistic

Before explore further about service design, it is also important to define which is the current **role of design inside Electrolux**. As it was mentioned in the first section, the open innovation team is part of the R&D department inside Electrolux, as part of this department, there was the chance to work closely to the design and engineering team during the internship, in this sense, I got the chance to really grasp how the design team work.

In terms of design, Electrolux works with the classic view of it, where it is used for doing incremental improvements to the existing product portfolio, this is due mainly to business reasons related to the existing products manufacturing platforms on the other hand design focuses mainly on the product’s outlook, as many products that are launched have strong technical improvement but as a differentiation factor design is used in order to make them more appealing to the customers.

In addition, nowadays Electrolux has two main challenges (Call for idea) competitions, that are managed by themselves, the first one is called Electrolux Ideas Lab, each year this particular competition is launched in order to gather the best ideas coming from people outside of the company, for instance the last year’s topic was “How can we **inspire** people around the world to

enjoy tastier, healthier and more **sustainable home cooking** in the future?”, in this sense, design is used in order to generate concepts of potential ideas coming from outside of the company, the winner from last year’s competition was **WatchYourself** – a wrist-worn gadget that scans food straight off the supermarket shelf and projects recipes into the palm of your hand, an innovation to simplify shopping and promote healthier eating. Another example of one of the finalist was a 3D printer for making and cooking vegan food that appears like meat products.



Figure 41 – Ideas External Challenge, Open Innovation Electrolux

The second one, is about an internal challenge held yearly based, where ideas are collected internally from Electrolux’s employees, last year the topic was the same as the challenge for the Electrolux Ideas Lab, the best ideas are rewarded, but again, as in the previous case, mostly talking the ideas are concepts of possible products that Electrolux might create in the long run

To sum up briefly design has these main roles inside Electrolux: Idea generation (product’s concepts), product design outlook and product incremental improvements so design is strongly related to product design.

5.2.2 SERVICE DESIGN INSIDE AN ORGANIZATION

“Service design is considered as an interdisciplinary approach that connects a set of different tools from different fields”

As it was mentioned during the introduction of this chapter, although it is important to put in place a properly established process, it is of key relevance as well to create the needed change inside the organization in order to support the introduction of the new process

In this last point it is important to underline that this is one of the key problems inside Electrolux as there is still some reluctance to embrace the Open Innovation tasks approach and integrate it to the daily use is a big barrier the team is facing, even though the mindset pillar is trying to deal with this, it is still not enough, even when Open Innovation is trying to introduce new approaches to be embedded into the organization, according to Van Aken, he describes a design approach to organizational development that aligns human and business values, he makes special emphasis on first instance on designing the minimum specifications for the process that are done by the designers or the change drivers in charge, but at the same time taking into consideration what he calls “second re design” that is made by the direct stakeholders that interact with the service providing process and allows them to customize the process that is being implemented. As stated by the Service design and change of systems paper Van Aken makes strong emphasis that for effective change to happen, it is essential to treat the first design as the means rather than the end, and to focus on creating the conditions and learning that enables the second redesign to occur. In addition Junginger and Sangiorgi (2009) in their paper for human-centered service design and organizational change encourage designers, they suggest that the designers should move from playing the role of ‘directors’ in the process, to playing the role of ‘enablers’, ‘facilitators’ and

'connectors' in a participatory design process that iteratively 'builds capacities from within the organization, as it is shown in the following graph:

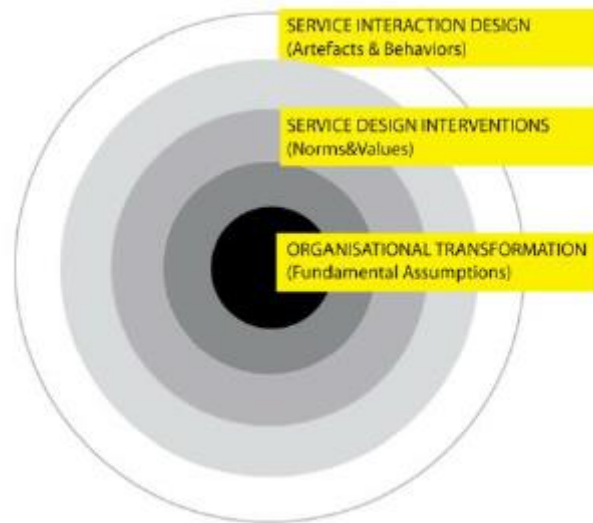


Figure 42 – Service design inside the Organization (Meroni & Sangiorgi, 2011)

5.3 ELUXHUB SERVICE DESIGN PROCESS

Given the already explored reasons in order to use service design for the Eluxhub project, the next step is to define the needed framework in order to develop the service design process for Eluxhub, although the workshops that are being held quarterly are a powerful tool for building the OI strategy among other team elements, in order to have a more structured way that involves not just the creation, this process might become a BAU process that might be used by the Open Innovation team to develop future projects

The process of service design can be described in four iterative stages: **exploration**, **creation**, **reflection**, and **implementation**. (Stickdorn & Schneider, 2012). In the following section, each of these steps is going to be described. But firstly it is important to take into consideration that service design is an iterative process that according to Stickdorn, it is like when you are trying to design a car, it is a process where, everything starts with a market research where the company assess whether the potential new car has customer willing to buy it and then the designers would start working on the 3D designs, then trying to adjust the design to all the technical features and the integration with other important part of the car, from this process a prototype might come, but it is certain that it will be improved until the car design achieves that point where the company decided to roll out the design into a massive production, just like this process, the service design on is itself a iterative process where many time you have to go back in order to arrange something and then you have to recheck whether the new change adjust properly to the whole process. In this sense, it is possible to picture a structured iterative approach for the service design

This four step approach can be considered as basic one, as you are able to find inside the literature other models with more steps (up to seven or more) but basically they share the same core mindset, in addition there are some considerations that might be taken into account, during the design process there is a leap process between the design of one component and how this affects the whole process, it is necessary to check for instance in the case of a touchpoint, how some actions taken in this single step might affect the whole customer journey which is the major process at the end. (Stickdorn & Schneider, 2012).

The British design council developed back in 2007 the so called double diamond diagram, which was an in-house research done by this institute, where they came with a simple graphical way for describing the design process, they divide the process in 4 simple steps: Discover, Define, Develop and Deliver, as it is depicted in the following picture. (Council, 2007).



Figure 43 – Double Diamond, Service Design (council, 2007)

The whole process starts with the first step called **Discover** (first diamond’s quarter) or exploration, everything starts with an initial idea or inspiration, the main objective of this phase is to be a “divergent thought”, where designers and team members have a wide and open position in order to explore a broader range of ideas. Basically, during this stage the company identifies a problem (problem definition) and places a hypothesis based on market analysis data, trends among other information sources and then this problem/user need or opportunity is addressed and channelled into design-led product or for the purposes of our study a service development process. (Council, 2007). The four main sources of inspiration are: market and user research, managing available information and design research groups, the particular tools in order to do so are going to be described during the service design case developed for Electrolux Open Innovation.

The second step is called **Define** (second diamond’s quarter) or creation, this stage acts as a filter where all the findings gathered from the previous stage are selected and discarded, the main ideas is to define them properly as problems, and finally the group of designers are able to pitch and prototype solutions for those problems. The key activities to be developed during this stage are: project development and management and project sign off. (Council, 2007).

The third step is called **Develop** (third diamond’s quarter) or reflection, during this stage the idea is to develop, implement and if necessary refine the service process concepts that have being built during the last two stages, some of the key activities during this step are: multidisciplinary working, visual management, development methods and testing. At the end of this stage, the design process will take the design team to a point where the product/service is ready to delivery and put in production or implementation in the case of the service. (Council, 2007). One of the things to take into account is that for the purpose of our study, we are developing a service in which is needed to use distinctive methods from those used in product design prototyping, as one of the challenges to tackle is the intangibility of the service, in this sense is of key importance to prototype service concepts in reality or in circumstances really close to it. The tools in order to achieve a proper development of the service are going to be explored during the process design section.

The final step named **Deliver** (final double diamond’s quarter) or implementation, this stage is where the resulting service is finalized and then launched within the company, the main activities carried out during this stage are: final testing, approval and launch, and target, evaluation and feedback loops. (Council, 2007)

In order to complete our study, the design process principles and steps mentioned in the previous sections are going to be followed with the main objective of designing a service for one specific problem that was detected while developing the internship in Electrolux Open Innovation team, which is going to be explored during the Discover stage of the service design process, during this phase the idea is to identify properly the problem and its scope then continue with the other 3 steps specified by Stickdorn and the British design council, during the define phase, tools are going to be used in order to further filter the findings from the first step. Once the first part of the diamonds is completed, the Electrolux case is going to be defined for the second part of the double diamond which includes two phases, more specifically the develop and deliver ones, in order to do so, for these two final steps, the methodology for prototyping and implementing the service design introduced by Stickdorn and defined in the previous section is going to be followed, including as well, tools that will allow to properly identify each of the elements that will allow to achieve the successful delivery of the service design for the Electrolux Open Innovation Team. The following section the study is going to start with the problem definition based on internal data gathered from the database that the Open Innovation team uses for storing all those ideas that have been scouted, screened, and analysed during the last 5 years, since the introduction of the Open Innovation area in Electrolux.

5.3.1 DISCOVER – EXPLORE PHASE (ELECTROLUX ELUXHUB CASE)

The main goal is to develop new insights on the new service that is going to be designed, in this sense, based on the data that was extracted from the ihub database and that was introduced at the beginning

- **Decrease the number of ideas** that are **being held up inside the Electrolux Open Innovation portfolio** after they have completed the whole assessment process pipeline.
- Reduce the reloops in the decision making due to **ineffective and inefficient communication** between Electrolux Open Innovation, IO client, the brokers and its innovators.
- **Reduce** the amount of **NO GO ideas** during the OIB.
- Make **OI clients active actors** during the process, also improving/influencing their **OI awareness and mindset**. (*Currently they are passive actors*)
- **Boost** the current network **process analysis** (focus, launch, scout, screen...) through the exploration of **new collaborations**.
- Create a process/workflow that integrates all the needed resources (human and physical) in order to **empower** the selected ideas to **successfully realize**.

In order to have a better understanding of the whole situation and find potential solutions for these detected gaps, the specific **Open Innovation process** that is directly linked to the ideas screening and scouting is the one related to the **challenges**, as it was explained during the second chapter, the outcome of this process are the ideas that are coming from the potential innovators, the process's steps are as follows:



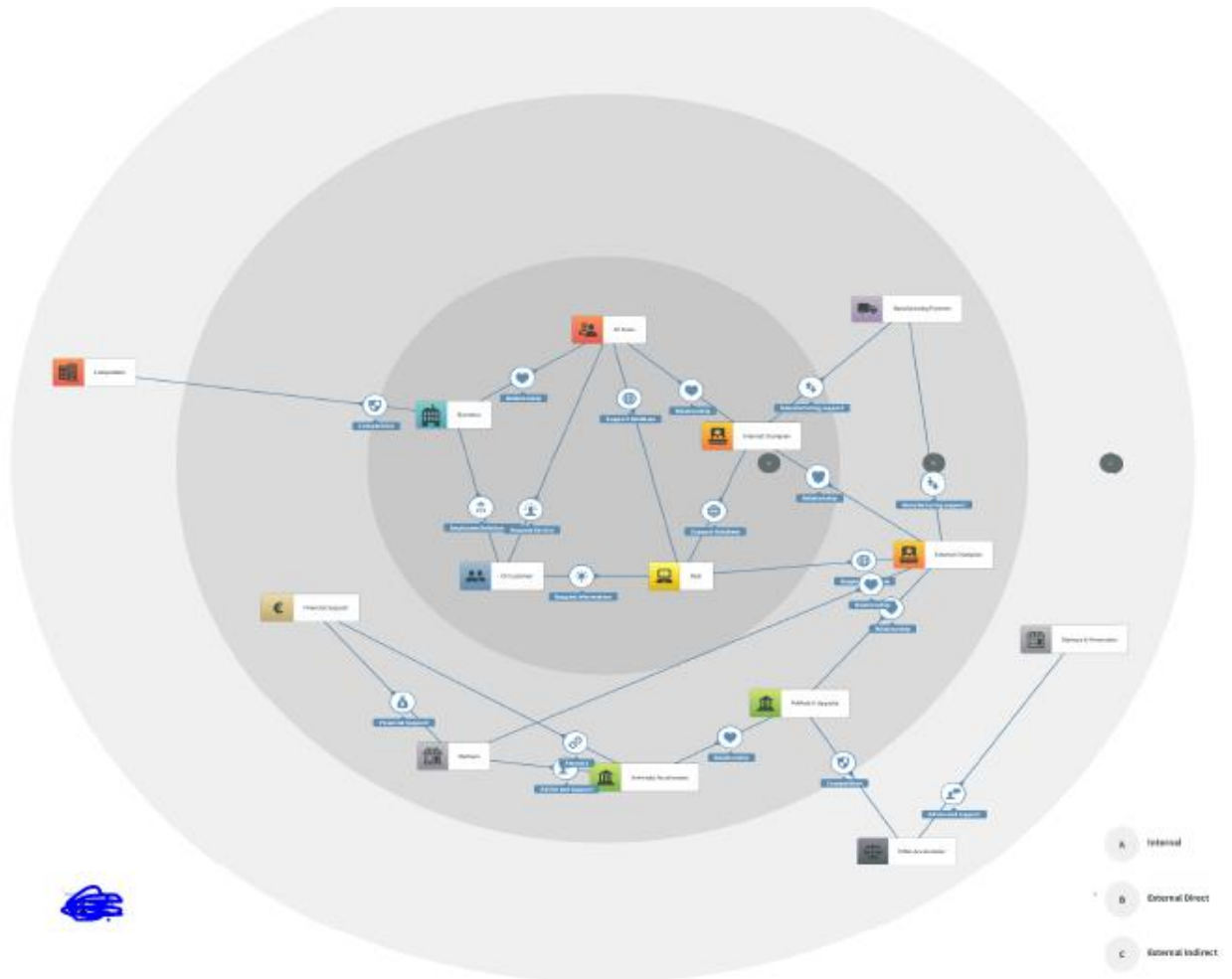
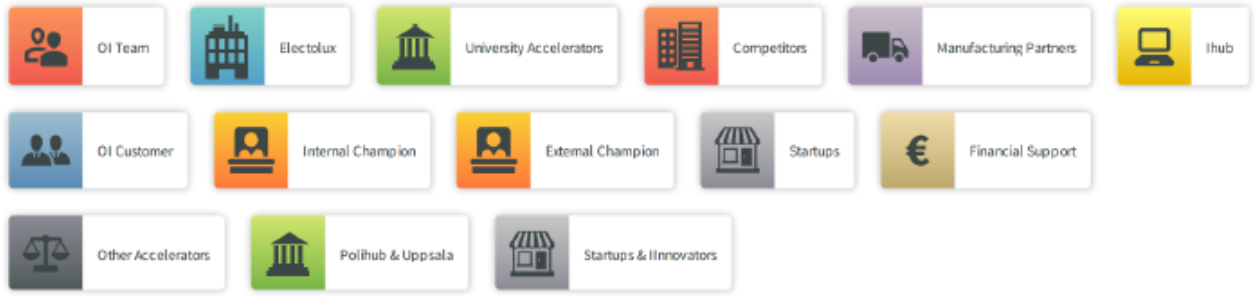
Figure 44 – Open Innovation Process

The above figure describes the Challenges process as it is structured now inside the Open Innovation team, and shows all the steps that are required in order to complete a challenge, the process consists of six main steps (Focus, Launch, Scout, Screen, OIB and Bridge), in order to explore further the process the first analysis to be done is to understand who are the main actors of this process and how are the relationships between them (information flow, expectations), one service design tool to carry out this analysis is the stakeholder map, that is going to be further explored during the next section.

5.3.1.1 STAKEHOLDERS MAPS

Among the tools that are going to be used in order to start with the explore phase of the service design, we are going to start with the *stakeholder's map* which is a visual representation of all the different groups involved in the service, this kind of tool will allow to depict and analyse which are the actors involved in the service and the interaction they have during it. In addition, by doing so, it will be possible to visualize all the complex situations that surround a service as, it will be possible to see that each of the actors influence on how successful a service is designed.

In that sense, the first step in order to create this map is to create a list of all the stakeholders along with the interest and motivations of each of them, once this is completed, the way the different actors interact among them needs to be identified, the idea behind this is that it will be possible to easily and graphically explain who are the stakeholders and how they interact. Once the map is completed, the goal is to be able to identify the potential opportunities in order to create a proper service process for the *eluxhub* project in Electrolux. The following actors were detected, some of them will be introduced later in the design process:



5.3.2 DEFINE

During the second phase of the service design process called “**define**”, the ideation tool is going to be used, this kind of technique is the one that service designers normally use in order to make the most out of brainstorming sessions, during this ideation period is possible to use tools such as SWOT matrix, the six thinking hats to the mind mapping as well (Stickdorn & Schneider, 2012). The idea behind these sessions is to stimulate all the participants to participate in the discussion for the idea generation and generate momentum or reflection during the group sessions. (Stickdorn & Schneider, 2012) In this sense, Electrolux Open Innovation team is a perfect match for doing so, during the workshops done for the generation of the strategy 2.0, among these ideation techniques the one chosen by the team was the SWOT analysis, since it would allow them to identify all the different characteristics of the current strategy and build this matrix with the team will be a good exercise for building the strategy 2.0.

5.3.2.1 CHALLENGE PROCESS : SWOT Analysis

According to the classic definition of the SWOT, it is a business analysis tool that allow organizations to assess their products/ services, internal process among others in order to create the proper strategy giving the analysis. (R.D. Irwin, 1969). The whole process requires identifying strengths and weaknesses of the organization, this part of the matrix represents the internal analysis, in addition, the opportunities and threats are also identified which represent the external analysis of the company. This process is explained in the following chart.

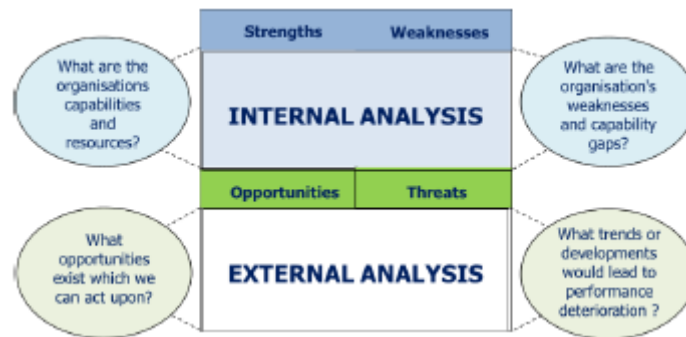


Figure 45 – SWOT Analysis

Once the SWOT is completed, this matrix and the analysis that is compiling will help to decide which strategies need to be formulated to comply with the specific set of goals and objectives formulated for the Open Innovation strategy. (Newton and Newton 6,7,8,9,16,19,20,29)
The SWOT matrix is going to analyse the Challenge process and its steps (Explore phase) generated after the process of the ideation, in this particular case for the Eluxhub project is as follows:



Figure 45 – SWOT Analysis, Eluxhub

Some of the main findings were that, for instance, Electrolux counts with some key strengths, such as a wide portfolio of ideas, there is also a well defined process and tools that support the whole process of each of the OI pillars, in addition, there are defined focus areas for Open Innovation to follow, in terms of what kind of technologies Electrolux is looking to explore in order to expand their business, finally Electrolux and the open innovation team counts with a great technical capabilities which is a core asset in order to exploit further all the potential opportunities that might arise from the Open Innovation scouting process.

Following with the weaknesses, some of the main items detected were that there is a lack of two main things: disruptive technologies and ad hoc resources and prototyping, in general Electrolux counts with a great number of scouted ideas but even though some of them have a great potential, they lack of real disruptiveness in the industry, along with this problem, all the ideas that are included into the portfolio and introduced to the internal R&D, due to business reasons they can not be realized as there are limitations in terms of prototyping and testing of the new idea, as there is a high cost associated towards the creation of a brand new factory from scratch or new assembly lines for a product with a great uncertainty associated, which lead us to the other weaknesses as there is a problem of OEM suppliers and partners for the pilot production, as Electrolux might take a high risk by creating all the manufacturing premises from scratch.

In regards to the opportunities, the main findings from the workshop were related to the possibility to speed up the process of technology concepts and prototyping as well as the market and customer test of them, since Open Innovation is opening its doors in order to accept potential technologies from hidden innovators, there is a big chance that it will increase the possibility of exploring new business and technologies before anyone else in the industry, in addition, there is the opportunity to create new partnerships in order to mitigate that associated risk that was detected in the weakness, this includes partners for manufacturing part as well, as the OI team could explore the access to non traditional industrial assets.

Finally, the identified threats were, in first instance, about the possibility of missing business opportunities because of slow speed to market and business restrictions when selecting a potential technology, as other player might develop it before Electrolux does. This problem brings to main consequences: delay in the projects and re-loop on the decisions. In second instance there is another problem with the market experimentation as the potential innovation might lack of the necessary customer and market validation/test before trying to introduce it to the general public, due to this fact there is another big threat for Electrolux and is the reputation, as it might give a bad image the fact of not doing innovations at all or even putting into the market poor products.

These previous conclusions were identified after crossing all the elements gathered in the SWOT analysis and the gaps that were identified at the beginning of this chapter, once this process was done, as it was explained in one of the sections above the idea behind this analysis (SWOT) is to establish the game rules in order to identify which are the strategies to follow in order to achieve the already defined objectives properly, the following figure summarizes the strategies and their definition:

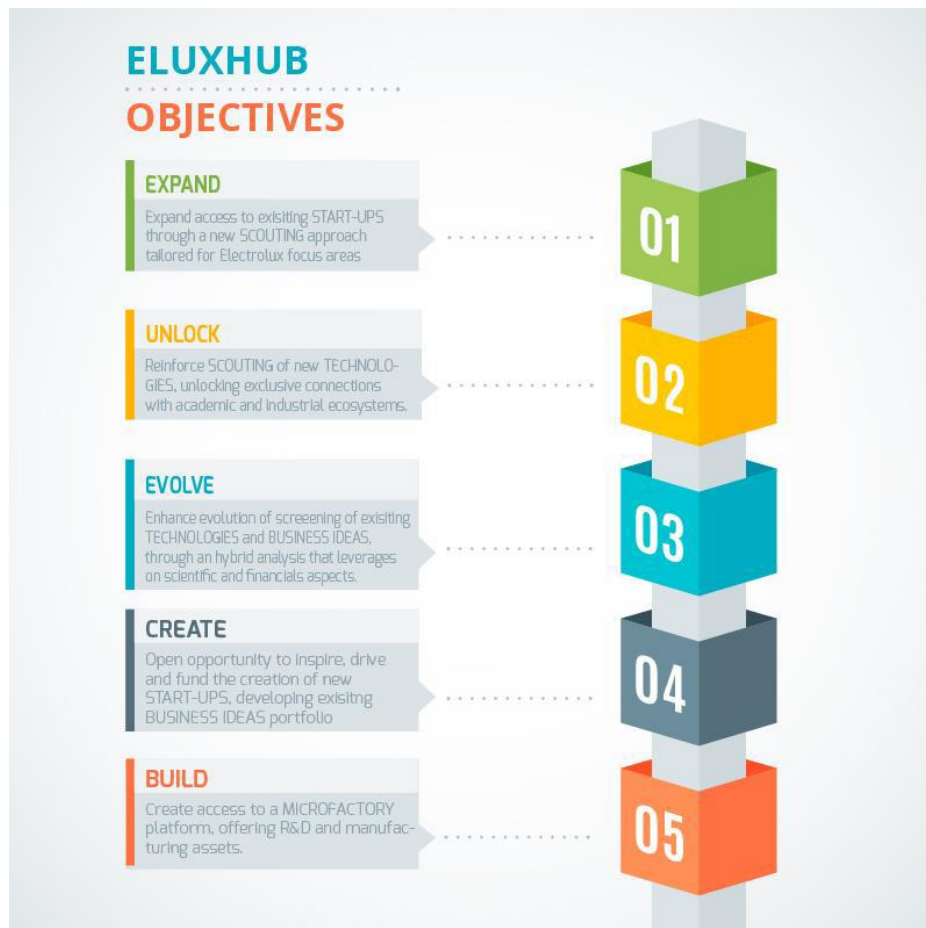


Figure 45 – Eluxhub Objectives

The above five strategies were generated after doing a cross between the SWOT analysis and the detected gaps introduced at the beginning of the chapters. One of the main points that was taken into consideration (as it was mentioned before), was the fact that currently the Open Innovation team is doing a great job at the beginning of the scouting and screening process (OI processes and tools), but the main issue that was found from the weaknesses is that the so called metabolic rate of innovation described by Chesbrough is not happening, at the beginning of the innovation funnel the things are working but the at the end, when the new technology is supposed to get out from the company into the customer, that part is not yet happening, so in that sense and for the reasons explained at the beginning of the chapter (ihub data analysis), it was decided to create the project called eluxhub. In the next sections, each of the above-mentioned strategies is going to be explained in detail, by following the service design double diamond framework, the next stages to cover are the deliver and develop ones.

5.3.3 DELIVER & DEVELOP

5.3.3.1 ELUXHUB ACCELERATORS

The next step was to select which were the incubators to be selected in order to be included into the potential collaboration framework for the eluxhub project, the following main considerations were taken into account:

- Geographical coverage
- Alignment of the technical capabilities between the incubators and Electrolux
- Network of innovators (quality and reputation)
- Reputation of the Incubators
- Successful innovation cases
- Physical assets
- Ecosystem partners

In the first case the geographical coverage was a key feature to take into consideration, as a Swedish company Electrolux R&D as well as main factories are located in Europe, in fact the European area is the one that leads all the decision making in terms of the firm's technology roadmap, so It will make sense to try to engage in a collaboration framework with incubators that are in the same geographical area, obviously, there are excellent incubators outside this area but in terms of business mobility, technological transference and access to resources, is imperative to have European incubators as allies for this project.

The reputation of the incubators was included as a decision maker in order to scout and screen them, nowadays there is a well-known ranking that is provided by the UBI Global, that is Swedish-based research and advisory firm, they have a partnership with incubators and accelerators which produces the data to drive international business incubation related insights and networks, one of their main goals is to identify and give recognition to the best incubators & accelerators in the world, the analysis is done with the participation of more than 600 incubators in over 70 countries, that enables them to help business incubators & accelerators become more efficient and competitive through a comprehensive global benchmark. (UbiGlobal, 2016)

Another key characteristic that was analysed was the technical alignment between the incubator and the particular technological competences of Electrolux, in that sense, even though there might be some excellent incubators according to the previous filters but if their main area of interest in terms of the industry they work with, is for example the Health one, this particular area is not aligned with Electrolux, so in order to filter them accordingly, it was taken into consideration as well the University that is behind them, as this will give a great understanding of their capabilities and the potential academic and industrial network. One of the selected incubators was the POLIHUB associated to Politecnico di Milano whose profile is as follows:

Startups portfolio & ideas screening process

- o 50 incubated startups
- o 20 Incubated Entrepreneurial Projects in 2015
- o 1200 ideas evaluated in 2015
- o 400 cumulative startup employees
- o 83% startups are still operating
- o 12 ml€ Cumulative Startup Turnover
- o 7 ml€ Cumulative Startup Investments
- o 5 acquisitions

Incubated startups

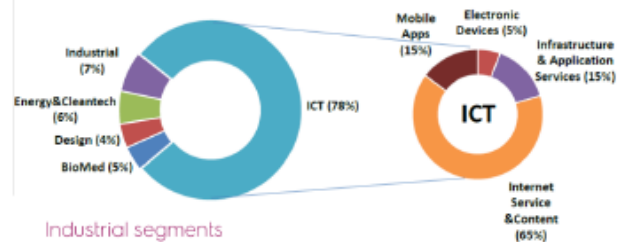
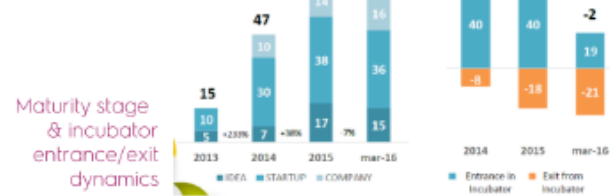


Figure 46 – Polihub Profile

In the above figure it can be seen the generalities in terms of numbers in regards to the ideas and start-ups that they are working on. In second instance in term of the resources and network of allies that they have, the following information was scouted:

Access to

- o **academic resources:**
 - o Politecnico di Milano, Politecnico di Torino, «MIP» Business School, «PoliDesign» Consortium, «CEFRIEL» R&D center
 - o MIT (Harvard, Stanford, US), University of Cambridge (UK), Ecole Polytechnique (Paris, FR), Fraunhofer Gesellschaft (DE), Max Planck Gesellschaft (DE)
- o **industrial players:** Novartis, Everis, Microsoft, Qualcomm, Terna, Vodafone, Pirelli, Siemens, Eni, Enel, IBM, Microsoft, Finmeccanica, Epson, Danieli & C, Officine Meccaniche
- o **financial players:** CARIPLO foundation, Intesa SanPaolo, Deutsche Bank, Unicredit, BNP Paribas, UBI Banca
- o **micro-factory resources:**
 - o Mechanical Department @Politecnico di Milano (CNC machine & CAM, haptics & virtual prototyping, micro manufacturing, mechatronics & smart structures, etc.)
 - o Precision Mechanics SMEs networks

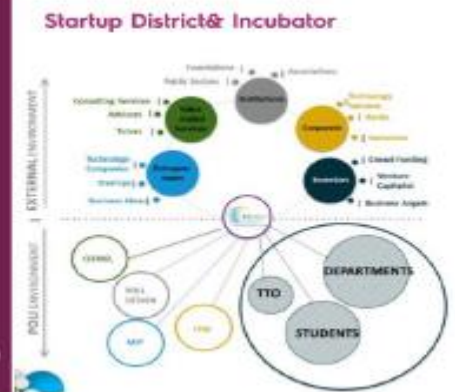


Figure 47 – Polihub Profile

In terms of the ranking, geographical coverage, reputation, technical capabilities, resources and assets, the following information was gathered:

Collaboration spaces

- o 4,000 m2 incubator spaces
- o Proximity to university & R&D centers and industrial areas
- o Proximity to the 3 airports of Milan, 10min away from High-Speed Trains to main EU capitals



Ranking



- Incubator:**
- #2 University Incubator in Europe
 - #5 University Incubator in the World



- University:**
- World #187, Europe #83
 - Art&Design: #10 World, #3 Europe
 - Engineering & Technology: #24 World, #6 Europe

Figure 48 – Polihub Profile

By building these visual profiles it was possible to understand better what were the assets and resources of the scouted incubators and what could be expected from each of them in order to build the collaboration framework and successfully launch the eluxhub project. The same structure was followed for the other scouted incubators. The next step after selecting the incubators was, given the variety of assets and opportunities that each of the incubators could offer to Electrolux, how to exploit them in the best way possible for the specific goals and needs of the Eluxhub project, in that sense a collaboration framework was needed, that will provide the foundations in order to build the partnership between Electrolux, the incubators and its network of innovators. The following were the basic proposed rules for the assets, business model and structure.

ASSETS:	BUSINESS MODEL:	STRUCTURE
<ul style="list-style-type: none"> o Startups portfolio & ideas screening process o Tutorship/mentorship/advisory board o Access to <ul style="list-style-type: none"> o academic resources: competences, technologies, labs o industrial players, for new potential alliances o financial players, for common project fundings o micro-factory resources: scale-up-ready prototyping, pilot manufacturing o Collaboration spaces o Ranking 	<ul style="list-style-type: none"> o Yearly Fee to access to a selected pool of services & resources o Ad hoc Fee for funding new projects that leverage the distinctive capabilities of accelerator and its network o Flexible funding model of startups: equity participation, project funding, supply agreement, IP licensing... 	<ul style="list-style-type: none"> o Pre-defined focus areas o Pre-defined active services o 1 resource focused on Elux activities (%FTE tuned on demand) o Pre-defined KPIs per services and projects o Periodical follow-ups on running projects and new opportunities

Figure 49 – Collaboration Basics - Eluxhub

5.3.3.2 ELUXHUB VISUAL AWAKENING

The OI team main goal is to unveil hidden opportunities on their existing Open Innovation process by leveraging on its own assets and in external ones as well (Eluxhub project). This situation resembles to the **blue/red ocean strategy** situation, currently the OI team is generating ideas and strategies that are inside a red ocean. But in order to exploit fully the improvement opportunity an alternative approach could be explored, in this case some tools from the blue ocean one could be imbedded into the Open Innovation strategy generation process in particular for the Eluxhub project.

The main advantage with the blue ocean approach is that, it will produce strategies that will unlock and boost the creativity of the people working for the company as it has a strong focus on the big picture of the firm’s situation. (W. Chan Kim, 2005). As it is shown in the next figure this process has four major four steps in each of them there is a lot of visual stimulation that will foster the strategy innovation process.

Four Steps of Visualizing Strategy

The four steps that pushes a company's strategy canvas to blue oceans



Figure 50 – Blue Ocean

The strong visual focus that the Blue ocean strategy employs could be exploit through service design tools, as most of them have a strong visual communication, so the OI team could use them in order to define better the Eluxhub project, but it will not limit just to this discussion, but it will be useful for future ones, when the OI team needs to define new innovative strategies to be included into their processes, expecting every time to engage better each of the team member and stakeholders and obtaining successful results that will be reflected in innovative and creative projects. In this sense one tool that has been already explored during the previous section was the **stakeholders map**, in which all the actors of the challenge process and in specific for the Eluxhub project are visualized in a map that allows to see them in a graphical way, divided by internal and external from the company, including their connections, and in specific the different flows among them. In order to carry on with the visual awakening of the Eluxhub project, so far, the analysis that has been done integrates three main elements: the six-step challenge process, its identified gaps and the strategies generated from the SWOT analysis, this is summarize in the following figure:



Figure 51 – Visual Awakening: Process and Gaps

The six challenge steps are represented by each of the circles in the figure, for each of them the linked gaps were listed and organized in order to understand in which step of the process the specific problem is arising. This is providing a clear panorama of the process and its identified problems, that will allow the team to have a visual way for representing the process as proposed by the blue ocean strategy and in future, allow the OI team to make improvements and to have an easy way to list the potential problems that might be detected for any of the strategies.

Once this figure was completed, the visual awakening approach allowed to detect that there were common problems in some of the steps and potential ways to solve these identified issues were proposes, in particular the one that could potentially not just boost the challenge process but also unveil potential new ways of exploring innovative solutions with Open Innovation, was the possibility to collaborate with incubators, more in specific the university ones, the advantages with this type of brokers will be explained during the incubators section:

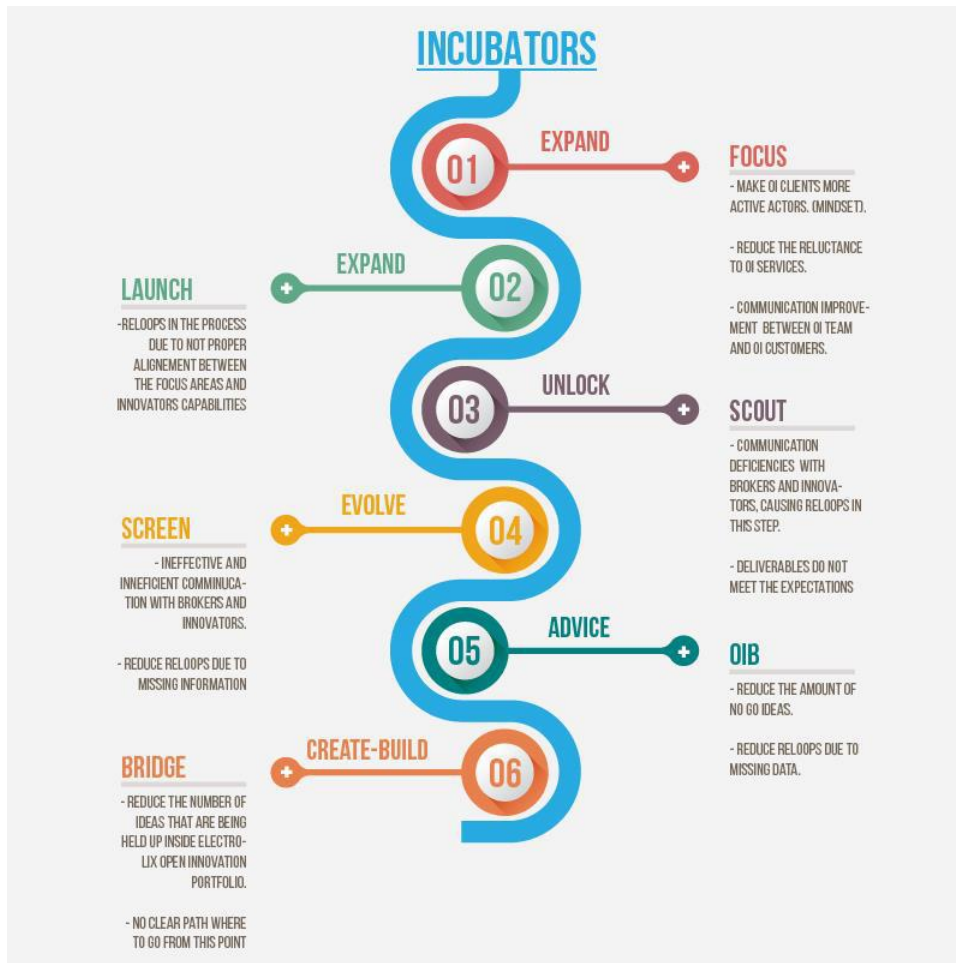


Figure 51 – Visual Awakening Process, Gaps and Incubators

5.3.3 ELUXHUB AWAKENING – STORYBOARD

- EVOLVE

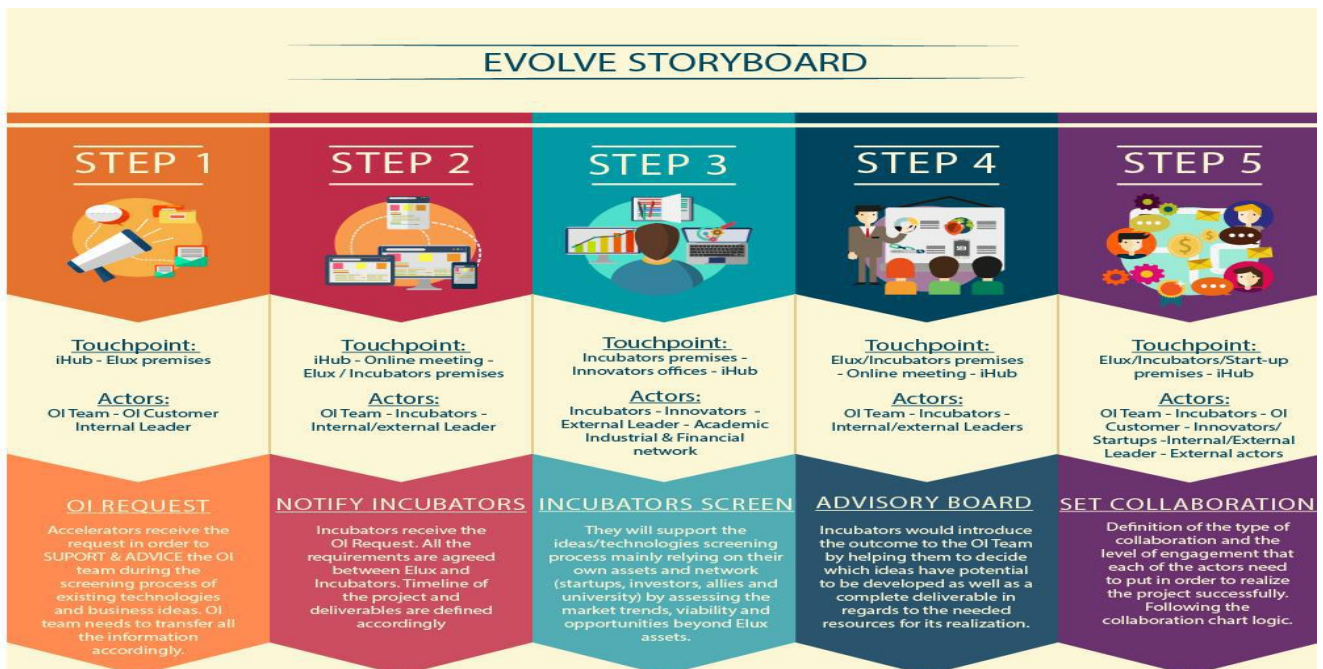


Figure 52 – EVOLVE Storeboard, Eluxhub

o What: Currently the scouting and screening process of all the ideas/technologies is a well-defined process but somehow there are areas of improvement where it could be possible to explore an approach more techno-business oriented, rather than just one of the two as it is currently done, it is also important to take into consideration that nowadays the analysis is done by taking into account just Electrolux assets, in this sense, it is important to change this mindset as with Eluxhub it will be possible to exploit external assets, in brief these are the three main considerations to develop further for this strategy:

- Techno-business analysis
- Business potential vs market trends
- Alliance viability beyond Electrolux assets

o Who: it is also important to consider who is going to help Electrolux to realize this particular objective, since Eluxhub is looking for examine the ideas with a wider vision and take into consideration possible external players for the development of the new technologies, the following were the main actors that were identified:

- Other industries
- Investors (financial resources)
- University tech experts

o How: So, how to reach the what and the who, after doing this analysis was determined that the best way to reach the objective was through the use incubators as they are in direct contact with the external assets that Electrolux is willing to explore along with the technical expertise in order to examine the technologies and the market opportunities associated to each of them, the latter, as they are constantly exploring new start-ups with new technologies, they are more knowledgeable about the current market trends.

- Incubator as facilitator

- CREATE

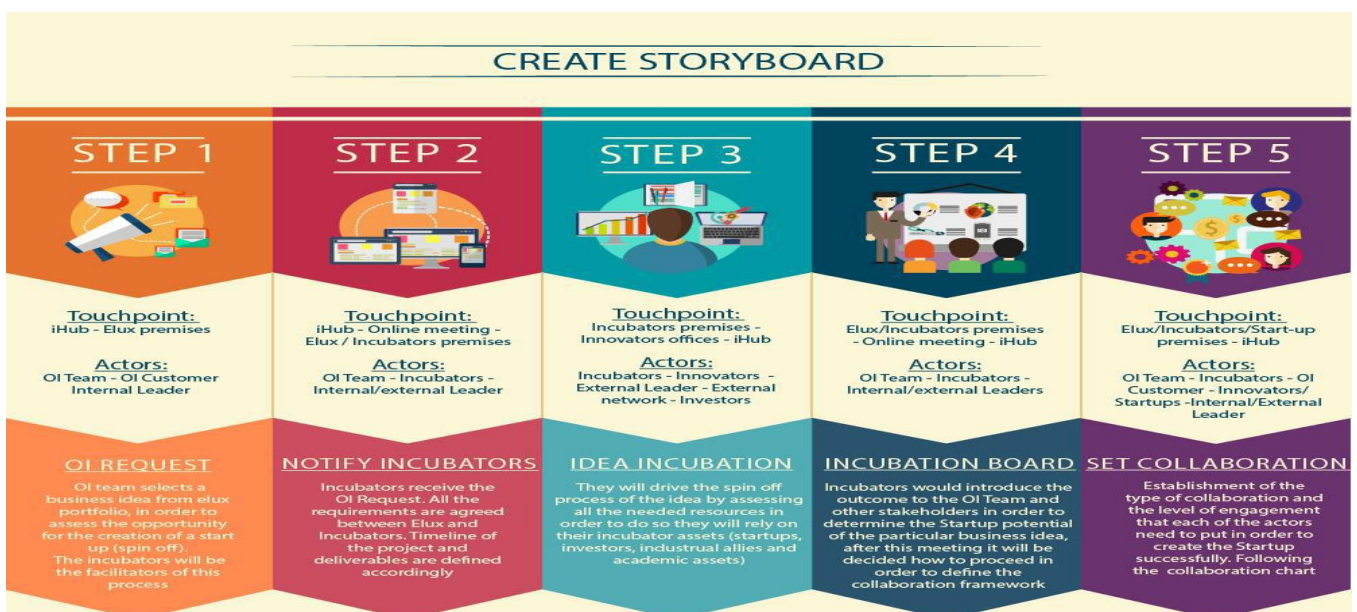


Figure 53 – CREATE Storeboard, Eluxhub

By following the same structure as before, let us explore the what, who and how of the create strategy.

- o **What:** In addition to the new ideas that the Open Innovation team is constantly assessing there are also the existing ideas that have already been filtered by the team and accepted by the R&D heads in order to be included as a technology to be used or implemented by Electrolux. In that sense, inside the Electrolux ideas portfolio (passed status), it is possible to find potential disruptive technologies and business ideas that Electrolux has not been able to exploit due to business restrictions, so in order to call off this factor, the Eluxhub project is willing to develop these ideas outside of Electrolux, by giving them the necessary tools in order to come to realize successfully without the influence of the internal factors already mentioned before.

- o Complementary asset for Electrolux ideas portfolio.

- o **Who:** The players that could help by providing the complementary assets to Electrolux ideas portfolio are listed as follows:

- Other industries

- Investors

- **Start-ups / Incubator:** They are the main driver of the Eluxhub project, as they will act as the main leaders when exploring the potential of each of the ideas/technologies provided by Electrolux Open Innovation.

- o **How:** As it was mentioned before the main driver of this endeavour will be the incubators, through them Electrolux will be capable of covering up the missing part of the ideas (complementary assets).

- o Incubator as facilitator

- o Flexible collaboration agreement with start-ups

- UNLOCK

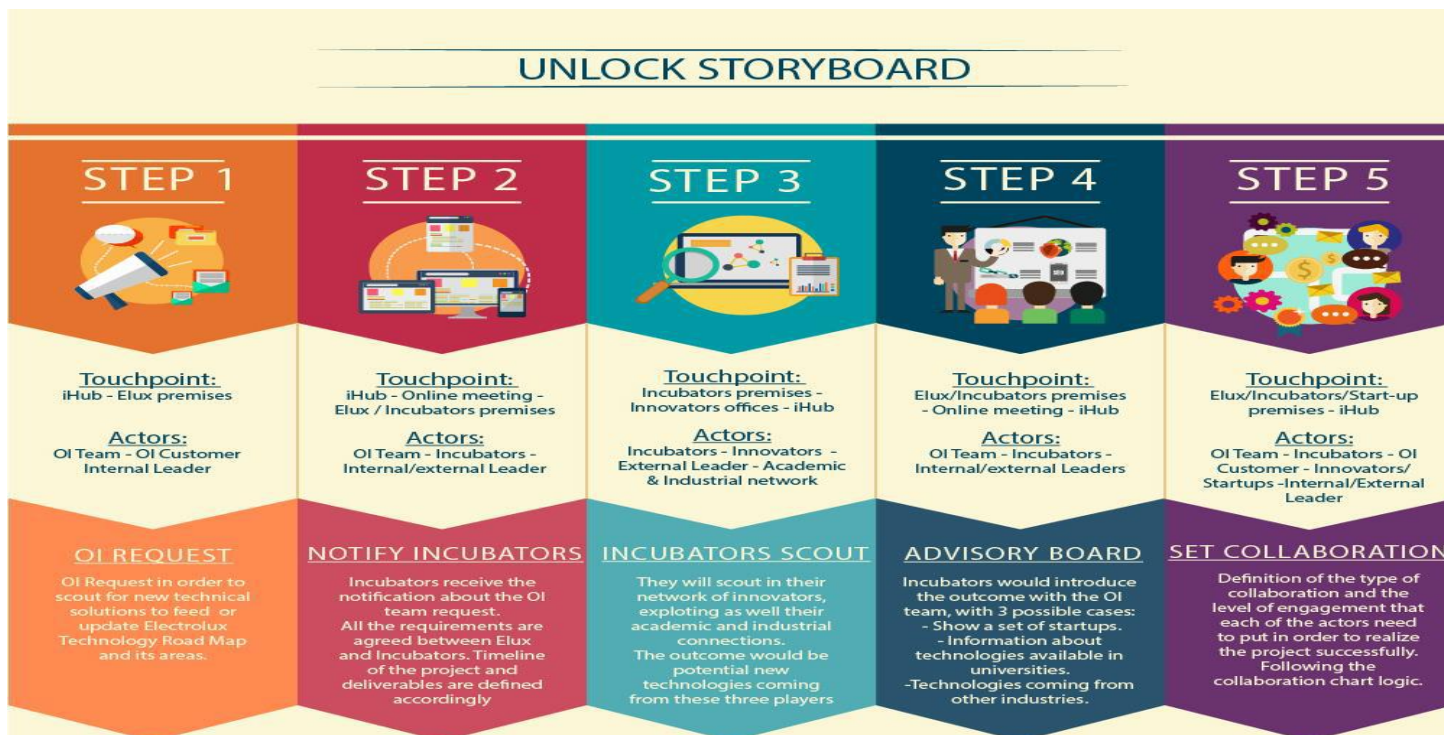


Figure 54 – UNLOCK Storeboard, Eluxhub

o **What:** In this case the OI team and other involved stakeholders will try to engage in a collaboration framework that allows them to scout for new trends in the market that might affect how a particular technology cluster might develop in the future, in this sense, the main goal of this strategy is to be able to have in the radar the most prominent technologies that will feed and complement Electrolux TRM.

o **Who:** The players that could help by providing the needed resources in order to work in the TRM areas are listed as follows:

- o Other industries
- o University departments
- o Start-ups

o **How:** The incubators will act as a empowered broker that will not only allow Electrolux to reach new potential innovators, but they will act as a focused trained scouter that will keep up to date the OI team with the latest technologies that will at the end help in order to keep up to date Electrolux TRM areas so they can have a leader potential in the market given the circumstances of a potential breakthrough in any of the focus areas or even in a new one.

- EXPAND

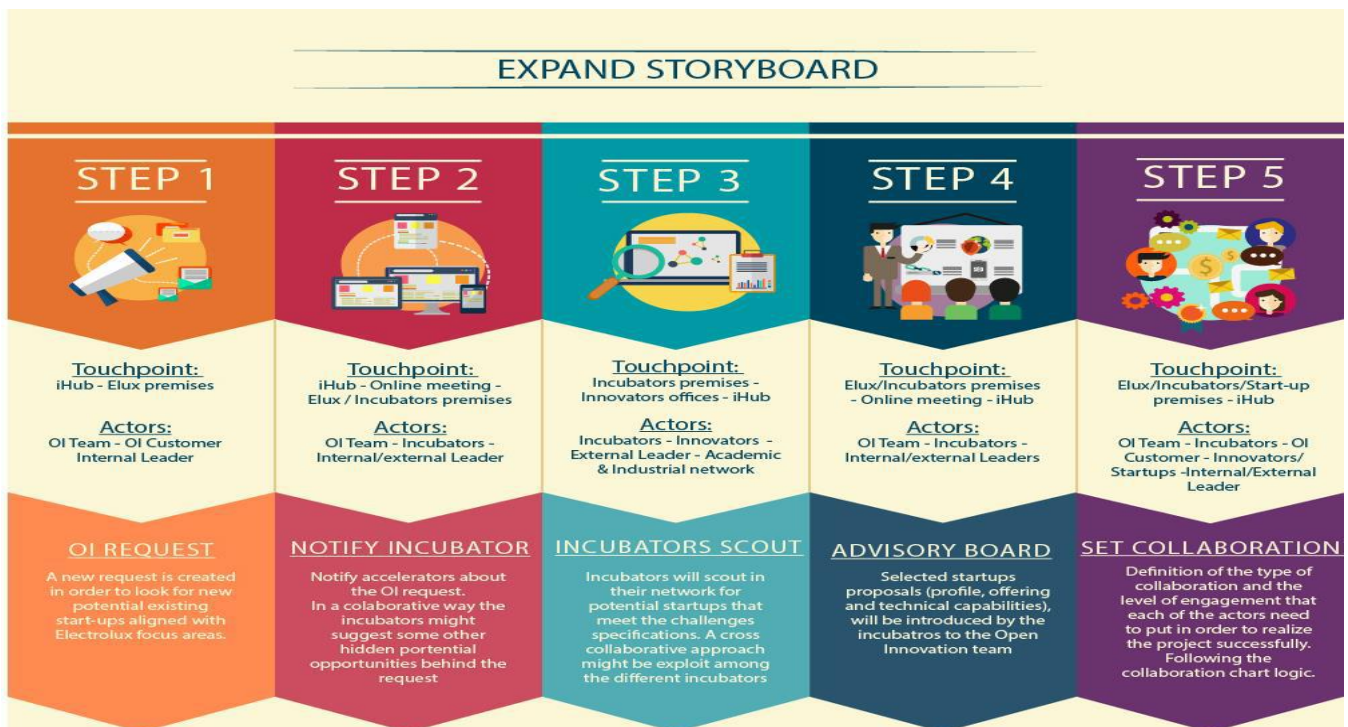


Figure 55 – EXPAND Storeboard, Eluxhub

o **What:** One of the key issues that the OI team is facing today is the fact that they are having to many reloops in the decision making, due to different factors, but one of the main reasons is due to the quality of communication among OI Team, broker and innovators, this has cause that the

outcome from some challenges is not the expected one and Electrolux is not giving green light to most of the ideas that are going through the Open Innovation process.

- New business solutions for Elux business portfolio
- New inputs for Elux business portfolio, beyond today business model

o Who: The main actors during the expand storyboard are the ones that will help Electrolux in order to tackle that problem in regards to the reloop in decision making when selecting ideas, the OI team will have to work closely to them:

- Other industries
- University spin-off
- Start-ups

o How: Just like in the previous case the main goal is to empower the incubators in order to be able to find new business solutions that will be included into the challenges workflow and at the end the might be included inside Electrolux portfolio for future development. In this sense, Electrolux will be able to exploit fully all the incubators network (start-ups, financial allies, university TTO and other partners) in order to have new top class potential technologies from these innovators.

- Incubator as trained and focused intermediary
 - BUILD

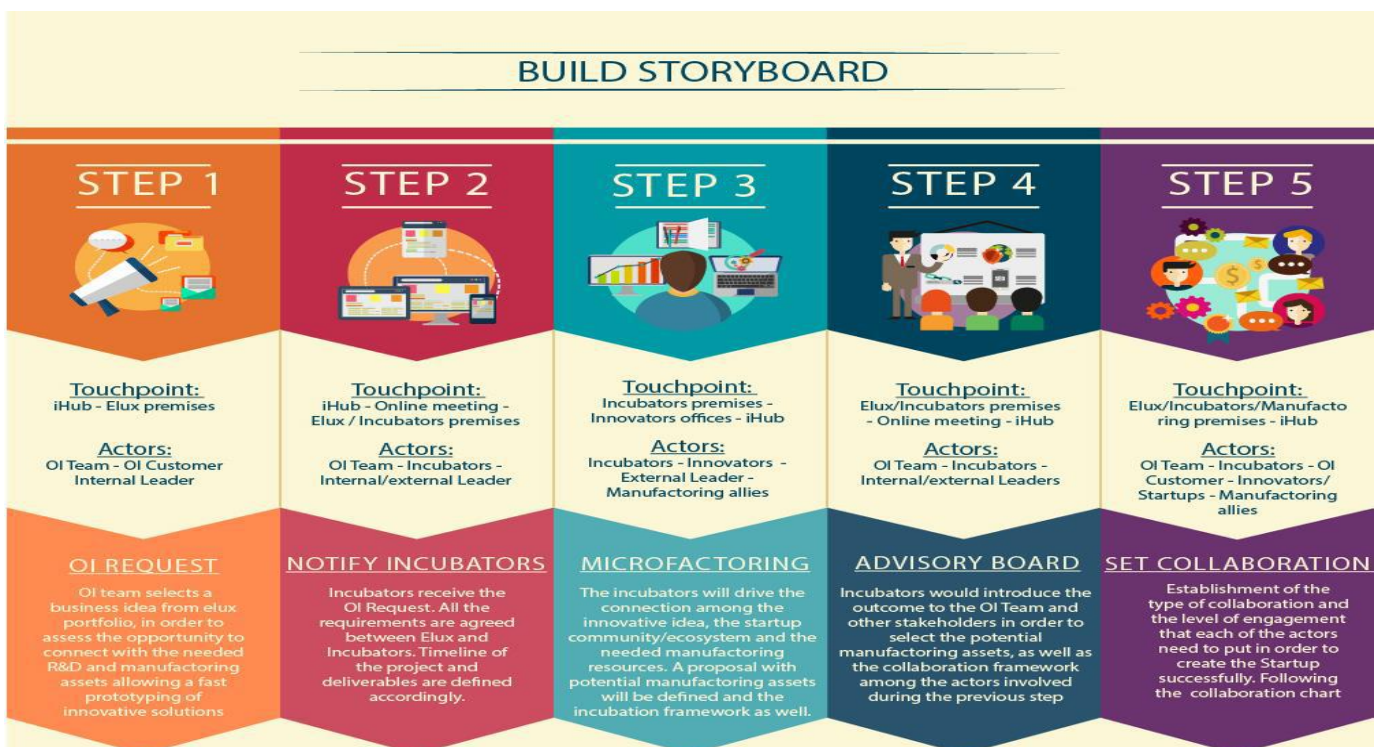


Figure 56 – BUILD Storeboard, Eluxhub

What: With this storyboard, the OI team will be working on solving the problem of increasing the metabolic rate of the innovations and complementing the second part of the type of open innovation (outbound flow), as currently Elux portfolio of ideas has a good number of already

selected ones, along with inhouse technologies that are just there “sitting” in order to get the necessary resources to successfully realise, in this sense through the collaboration with incubators and their network, Electrolux will be able to complete those micro factoring resources that are the ones that in most of the cases are holding up the development of the ideas. The following are the main components of this stage.

- o Fast prototyping of innovative solutions
- o Small series for market tests

Who: The main actors are as follows:

- o Incubators network
- o Small maker companies
- o Makers communities
- o Tech shops

How: As it was mentioned during the collaboration model, different cases will arise and one of the key facts to take into consideration is that it will need to be flexible for the incubators and ecosystems, that’s why it was decided to pursue the Eluxhub project as, it has generated the foundations in order to define the partnership among OI team, the incubators and its resources, in addition to the already defined cases of collaboration, for the particular case of the micro factoring resources, the following were the main scenarios that were defined when having this type of projects.

Scenarios	(+)	(-)
Acquisition of small maker (startup growth stage or small enterprise)	Control, speed, cost, multiple pilots	Investment, no asset flexibility, limited interaction with other industries
Collaboration agreement with makers community	Asset flexibility & evolution, access to wide network, no investment, access to consumers, interaction with other industries, access also to ideas	Cost, limited n° pilots, project constraints, speed
Co-funding of tech shop	Asset flexibility & evolution, access to wide network, cost, interaction with other industries, spinoff opportunity	Investment

Figure 57 – Microfactoring Scenarios, Eluxhub

CHAPTER 6 – GIO (Global Industrial Operations) & USECASES

6.1 GIO (Global Industrial Operations):

Global industrial operation (GIO) is a fundamental division which permanently is willing to implement innovation looking for increase efficiency, reduce waste of resources, and make better and faster the production process, Implementing Industry 4.0, following the vision and the global goals of the group. Global manufacturing is now under the control of the GIO, some of the core functions including the Electrolux Manufacturing System (EMS), safety, Energy, Supply chain, Quality inspection and finally digital industrial operations, the area that will be analyzed in deep on this work. The industrial environment is changing constantly and rapidly, and the current evolution of technologies driven by digital are disrupting many businesses and their operation, Electrolux is looking for be in the forefront of this change, and be the first mover to warranty quality, service, and cost. To achieve results, Global Industrial Operations (GIO) has identified three main areas for digitalization while using the MES as its foundation.

I. Connecting Wearable technologies for safety of workers

The wearables for worker, monitors the working conditions and individual health to ensure workplace safety. Employers can choose a set of applications that are mandatory for workers to wear that actively monitor health and safety factors, Improper body movements. In some cases, these applications are a modern, cost-effective approach to comply with government mandated requirements for workplace health and safety. Workers can also choose applications that help them monitor their own health and well-being independently.

II. Connecting manufacturing to the product lifecycle

This means visualizing of all the production life cycle phases before the physical production of the product, which means the complete creation of a 3D model to reduce and eliminate potential problem that can emerge from design or the manufacturing process as there are some constraints behind that are needed to be in consideration, moreover the involved of the assembly lines interfaces. This will help the company to better find an optimal design of the assembly lines based on the product requirements in a fast and cost-efficient way.

III. Connecting business partners (customers/suppliers/factories)

The idea is to create a digital environment where all the stakeholders involved along the value chain meaning suppliers, customers and intermediaries and the factories itself, are connected to ensure a coordinated and integrated plan looking for an automatic supply and answer in a fast and effective way the requirements of the demand.

IV. Connecting planning to execution

The main objective is to create a flexible digital environment where the management within all the factories are monitoring in real time, meaning the integration of diverse process starting from the bottom in the production planning passing through the assembly line scheduling and the management of materials flows, delivery and stock. Technology play a fundamental role to enable the interconnectivity of the information coming from the different process and the worker thanks

to the help of the use of tablets and smartphones, and thus factories will become more flexible and easily adaptable to face the changes of workflow.

Complementing the three main areas of GIO Digitalization strategy, there are 8 interconnected digital activities that will help GIO achieve its digital targets and are the starting point for Open innovation to define the focus areas towards industry4.0:

1. Wearables	5. Recruitment Technologies
2. Cobots	6. Skill Matrix/ People Experience
3. HVAC Efficiency	7. Predictive Maintenance
4. 100% Quality Control	8. Inbound and Internal Logistic

Global Industrial Operations Digital Activities

Through all the eight areas, automation became one of the fundamentals areas for Electrolux to increase productivity, quality and efficiency, and not necessarily mean the replacement of the workers, automation is willing to improves workflows and process.

6.2 Key role of Open innovation in GIO:

Since beginning of the creation of Open innovation the cooperation between OI and GIO started, OI conceived as partner to make the bridge between Technologies, suppliers, innovators, and startups, and the firm. Following the same approach in product lines in sense of process to deploy innovative ideas but instead products, this time on the floor shop of the factories. Along this cooperation, many success project were developed thanks to the OI active participation, as an example of it was the project related to the problem known as “Fish scaling” problem which consist in the defect on the surface of the enamel, referring to the hard-lustrous finish traditionally used to surface many products on the market from bathtubs and washing machines to pots and pans is used today in heat critical applications such as the inside of ovens and the surfaces of hobs. The process remained the same for more than 100 years of industrial enameling and has never been 100 per cent reliable. Aware of this problem and understanding the value of find a solution that is transformed in significantly cost reduction in the testing phase, the OI Team have been searched for potential partners inside variety of networks, scouting and analyzing variety of networks and found the right one in a business incubator in Pisa, Italy. The collaboration resulted in the implementation of a Helios II Machine, helping Electrolux to identify fish Scaling by measuring the level of hydrogen absorbed by the metal plate, the test now only takes half hour in comparison to the two days of previous technics, meaning stopped of the production for almost half day.

6.3 Transformation of Innovative ideas into real Projects:

we already discussed in the network process itself the 5 steps of how we find the ideas and present it in to the Open Innovation board. Based on the input or internal request from the different sectors from Electrolux group, we must find the innovative ideas and should discuss with the Pre- Open innovation Board (Pre-OIB) before screening it to the OIB

Role of Pre-OIB?

1. They are also internal stakeholders who has direct contact with the sector members of GIO, so if there is a change of request or change of focus area, sector will let the Pre-OIB to know, then Pre-OIB will inform to OIB.
2. They will take the decision of OI team’s idea before the screening it to OIB
3. They will continuously monitor the OI team activities, reference person for the selected idea from OIB and innovators (Startups, Universities, Private inventors.,)

Projects before and after implementation

The Projects accepted by the OIB will be assigned with a reference person whose work is aligned or has knowledge about it. Then OI team will help them in finding the contact of the innovator of that project and will continuously monitor the progress of the project and must update it in the further OIB meetings. Once the project is completed in the Industrial factory, OI team must get the feedback report from the reference person.

Example,

Product name	Provider company	Pilot Location	Project Category (to be defined)	Reference Person	People Involved	Cost of the pilot/prototype	How long did the Pilot ran? (weeks)	Short Description & objective of the pilot	Key Activities Performed	What was the output	Did you follow a methodology or procedure during the pilot
Chairless Chair Noonee			Manufacturing	Manuel Silva							
ProGlove	ProGlove	Forli	Manufacturing	Samuele Ghetti							
		Porcia		Emanuele Quarin							
Augury	Augury	Anderson	Predictive Maintenance	Gordon Smith							
Teeprack	Teeprack	Sieweitz	Sensing								
TruckMeUp	DL3	Porcia	Logistics	Cristina Baccichetto							

Feedback form created by OI team to the reference person

6.4 GIO Use Cases:

With the objective of evaluate some specific phases of the OI innovation process towards Global industrial operation, was selected a specific focus area Safety Wearables, where safety of workers can yield significant business benefits, improving productivity can also dramatically improve a company’s bottom line. When it comes to digital, the potential business impacts are well understood, with variety of innovative wearable solution in the market, Electrolux look ahead to be leader in implementation of new safety wearables for workers in the shop floor of the plants. The involvement of a practical case not just help to discovery hidden gaps in the innovation process but

also to understand the coherence between the steps, actors and external partners, definition of the project objectives and possible scenario to test the solution, finally understanding the potentialities of the industry 4.0 solutions in the manufacturing process.

Solution

Passing through all the phases of the funnel of innovation the idea selected to run a pilot test was Prognostics solution, an automated report for industrial assets. The three solutions focused on safety wearables which is presented in Open Innovation board will be discussed in detail below

1. Innovator solution: Laevo

Laevo

one page

INNOVATOR: Laevo
Broker: OI Internal Network

ENABLER DESCRIPTION
The Laevo is a wearable chest and back support that adapts to every posture. Everywhere you go, you can lean against the chest pad. Laevo transfers force from the rest to the thighs. Due to the leverage the force on your chest is 10 times less than what your spine and back muscles have to endure. Costs around 1700€.

FUNCTIONAL OPPORTUNITY

Technical Benefits:

- Reduce up to 50% of back load
- No batteries
- Ability to bend, squat, stoop, crawl, stand, sit

USP: The newest version of the Laevo increases the interchangeability of the Laevo by multiple users

APPLICATION OPPORTUNITY

Market Opp: New to Electrolux

Strategic Fit: Wearables

ALLIANCE VIABILITY

Partner Objectives:

Supply agreement
 IP licensing/acquisition

R&D Collaboration
 Brand

Capabilities:

	Innovator	Elux
Proto	<input checked="" type="checkbox"/>	<input type="checkbox"/>
R&D	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Manufacturing	<input checked="" type="checkbox"/>	<input type="checkbox"/>

IP Model:

No IP
 Patent pending

Patented (Nr. ...)

Alliance Model:

R&D Collaboration
 OEM/ODM supply
 Brand licensing

IP licensing/acquisition
 Component supply

Technology Readiness Level (TRL):

Basic Tech. Research
 Tech. Development
 System

Research to prove feasibility
 Tech. Demonstration
 System Operations

Electrolux Open Innovation

Country: Netherlands

Description: The Laevo is a wearable chest and back support that adapts to every posture. Everywhere you go, you can lean against the chest pad. The Laevo transfers force from the rest to the thighs. Due to the leverage the force on your chest is 10 times less than what your spine and back muscles must endure. Every time you experience pressure, your back is saved.

Functional Opportunity (Technical Benefits):

- Reduce up to 50 % of back load
- Ability to bend, squat, stoop, crawl, stand, sit.
- No batteries

Unique Selling Proposition (USP): The newest version of the Laevo increases the interchangeability of the Laevo by multiple users

Testing Scenario: The testing is done in One of the big production plant (Solaro). The definition of the location was based taking in consideration the proximity to the suppliers of the solution. The test was conducted with few workers in Logistics area and we got the positive response, but only drawback is the cost which is expensive if we buy plenty of devices. Since we got a good feedback we distributed it to other factories for different opinions.

Motivation: The main motivation of Electrolux is to focus on the workers safety and their wellbeing, which in turn increases the productivity and decrease the 50 percent work load of each worker.



Laevo offer description



24

2. Innovator solution: V22 Ergo skeleton



V22 Ergoskeleton one page

INNOVATOR: StrongArm Technologies
Broker: Media

ENABLER DESCRIPTION

The V22 Ergoskeleton is a workplace safety vest which keeps the position of the human body as to always stay within a safe body posture while lifting or moving heavy objects. The V22 applies pressure to remind the user both during improper lifts and over rotation. Operators are automatically reminded to follow the NIOSH and OSHA lifting guidelines in every lift to promote pivoting, knee bending and better body mechanics every day for safer more energetic and more productive work.

FUNCTIONAL OPPORTUNITY

- o Very light and comfortable to wear for long durations
- o Provides a sensation of transfer the load from the upper body and enforce proper lifting techniques
- o Completely passive device, no motors or sensors
- o 994.80 euros (Inc VAT)



APPLICATION OPPORTUNITY

Strategic Fit:

Market Opp:

ALLIANCE VIABILITY

- Partner Objectives:
- Supply agreement
 - IP licensing/acquisition
 - R&D Collaboration
 - Brand

Capabilities:

	Innovator	Elux
Proto	<input checked="" type="checkbox"/>	<input type="checkbox"/>
R&D	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Manufacturing	<input checked="" type="checkbox"/>	<input type="checkbox"/>

IP Model:

- No IP
- Patent pending
- Patented (Nr. ...)

Alliance Model:

- R&D Collaboration
- IP licensing/acquisition
- OEM/ODM supply
- Component supply
- Brand licensing

Technology Readiness Level (TRL):

- Basic Tech. Research
- Tech. Development
- System
- Research to prove feasibility
- Tech. Demonstration
- System Operations

Country: US

Description: The V22 Ergo skeleton is a workplace safety vest which keeps the position of the human body as to always stay within a safe body posture while lifting or moving heavy objects. The V22 applies pressure to remind the user both during improper lifts and over rotation. Operators are automatically reminded to follow the NIOSH and OSHA lifting guidelines in every lift to promote pivoting, knee bending and better body mechanics every day for safer more energetic and more productive work.

Functional Opportunity (Technical Benefits):

- Reduce arm fatigue
- Transfer the load from upper body to the legs
- Reduce common lumbar compression back injuries

Testing Scenario: The testing is done again in Solaro production plant. The definition of the location was based taking in consideration since we had the main home appliances that are manufactured in Italy, that’s why we have considered one of the Italian production plant (Solaro). The test was conducted with few workers in Logistics area and got the mixed response, some are feeling its quite tight and couldn’t resist the device compresses the body much and few are giving positive response of the device. Once the test is done, we transferred to the Electrolux innovation factory to further collaborate with the strongarm technologies company to work on new technologies should be developed in the existing model, which provided ease to the workers to use the device.

Motivation: The main motivation of Electrolux is to focus on the workers safety, which decreases the maximum work load and give an attention for the worker not to give a bad posture while carrying the item in the logistics area.

V22 Ergoskeleton offer description

THE V22 PASSIVE EXOSKELETON IS DESIGNED TO HELP

- ✓ Reduce arm fatigue
- ✓ Transfer the load from the upper body to the legs
- ✓ Reduce common lumbar compression back injuries
- ✓ Enforce proper lifting techniques

Diagram of proper lifting posture with ErgoSkeleton™

Diagram of improper lifting posture without ErgoSkeleton™

HAND EFFECTOR

HAND CLUTCH

HEIGHT ADJUSTMENT

← Load Shifting

14

CHAPTER 7 – CONCLUSIONS

The purpose of the thesis was to analyse the Open Innovation strategy through service design tools in specific for the Eluxhub project in order to generate a framework of the OI team in Electrolux. Even though there was an initial analysis of the problem based on numbers, the main driver for designing the Eluxhub strategy process, were the visual tools implemented during the thesis as they allowed to portrait the process as it is working and from there build the potential solutions, this approach was the one suggested by Junginger & Sangiorgi, as the improvements are based on an appreciative inquiry, this has a positive impact as it will diminish the reluctance of the team to change the status quo in the OI Strategy overall.

Another positive aspect of using service design and the visual discovery was that it was easier to understand and identify the gaps through TRM & GRP toolkit, becoming a powerful tool in order to create successful strategies, just like in the blue ocean strategy, the visual awakening boosts the creativity of the team in order to propose really innovative solutions.

The communication among the different parties is definitely better when using graphical resources rather than when using plain text versions of the same information, in this sense, through service design and its tools, the Open Innovation Team could improve and avoid waste of resources due to missing pieces of information

Finally as one of the core values of Electrolux states “Passion for innovation”, the Open innovation area is a clear example of this value, and the fact that the team is willing to receive new proposals from other disciplines (like service design) is a clear statement of the high commitment, they have in order to develop innovation in all the areas throughout the whole company, like in this case with the development of the business strategies such as the alliance between Electrolux and the incubators.

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