

Strategic Acquisition of Innovative Companies Moving Corporations towards Sustainability

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Abstract: Innovation has been powering industrial development for 200 years. Today, in times of social and environmental pressures, it is even more needed to support the transition towards a more sustainable society. Multinational corporations are potential systemic change agents by their global presence and impact magnitude on economics. However, a combination of short-termism and technological inertia rather favours incremental innovation. Meanwhile, some smaller companies have quickly integrated the value of doing ‘better’ rather than doing ‘less bad’, making innovation go hand-in-hand with sustainable development. Therefore, acquisitions represent an opportunity to spread a solution to addressing sustainability challenges faster, but the corporate decision-makers need concise, constructive guidelines for selecting and integrating these external opportunities. This thesis describes how a Framework for Strategic Sustainable Development (FSSD) helps to identify the gaps in the current practices and supports the creation of guidelines for corporations acquiring innovative companies in order to move towards sustainability.

Keywords: Acquisition; Innovation; Sustainable development; Management; Corporate development; Strategy.

Statement of Contribution

Science is an endless ocean and we are thirsty to learn. We are delighted to have been together on this journey. It was full of inspiring learning and new experiences.

This thesis has been a collaboration of three master students from France, Iran and Sweden. Each brought their unique perspectives from various academic and professional backgrounds to enrich this thesis.

We contributed equally to all significant decisions relating to this thesis.

Benoît, with his idealistic, poetic, philosophic and strategist mind, brings strong intellectual properties to the thesis process.

Nafiseh contributed with her scientific background and her economic knowledge to enhance the thesis process.

Katarina, with her solid experience and contacts in finance and management provided most of the interviews for this thesis.

Finally, this thesis has been written with a lot of effort from each group member. The quality of this work would never had been possible without each members contribution.

“If you want to go fast, go alone! If you want to go far, go together!”

Benoît Guyot

Katarina Wikström

Seyedeh Nafiseh
Mousavi Rad

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Executive Summary

Introduction

The industrial world has been shaped by the emergence of powerful multinational corporations (MNCs) aiming to make profit (Friedman 1970). From a market perspective, innovative companies ensure their competitive advantage by being the first to develop the next disruptive innovation, one that “replaces the existing dominant design with exceptional commercial success” (Chandra and Yang 2012, 25). Corporate management is keen on identifying what would be the next disruptive innovation that would make their company create a breach (Knight 2005). However, the competition for innovation is becoming tougher. It is more and more costly and less and less productive to invest in in-house innovation (Chesbrough 2011). This is one of the external pressures on the MNCs, who are part of economic and industrial sub-systems, which are part of society.

The current situation of our society can be illustrated with the metaphor of a funnel in which society, including the MNCs, are moving further into, with new pressures constantly appearing and increasing (depletion of mineral and natural resources, climate change, erosion of soil, rising oceans, industrial disasters, etc.) (Robèrt 2000). MNCs are both subject to these consequences and contributing to them. For example, they are accountable for about 15% of the global greenhouse gas emissions (Carbon Disclosure Project 2007). These impacts are the consequences of the practices of our industrialized societies. Sustainability Principles (SPs) describe four constraints which allow our system, society within the biosphere, to sustain itself overtime. The Sustainability Principles state (Broman et al. 2000; Ny et al. 2006).

In a sustainable society, nature is not subject to conditions that systematically increase...

...concentrations of substances extracted from the Earth's crust;

...concentrations of substances produced by society;

...degradation by physical means;

And in that society...

...people are not subject to conditions that systematically undermine their capacity to meet their needs.

Innovation can be leverage point and goes well with sustainable development. Some companies have integrated the value of ‘doing better’ rather than doing ‘less bad’ quicker than MNCs, representing an opportunity for the latter to combine new capabilities with their great resources. Acquisitions of innovative companies are about enhancing knowledge and values. This would not only guide MNCs towards sustainability, but also leverage the innovation to gain a competitive advantage versus their competitors (Willard 2002; Willard 2005).

However, we identified factors influencing the way corporate executives generally make their decisions. First, most of the corporate decision-makers use historical trends extrapolated as a forecast for predicting the future (Chandra and Yang 2012). This paradox mindset, also described as the ‘innovator’s dilemma’, affects the way organizations successfully tackle opportunities (Chesbrough 2011). It influences how they prioritize, “the options competing for the company’s resources“ (Christensen 2004, 280). Second, most of the corporate decision-makers do not include sustainability in their strategy (Bonn and Fisher 2011). When decisions are not supported by a strategic guideline that is approved by management and spread throughout the whole organization, then investments, such as acquisitions, can be misguided. There is, for example, a risk of being accused of greenwashing when acquisitions of ‘green businesses’, are presented as a sustainability-related action and are not motivated by a solid strategic focus on sustainability goals (Delmas and Cuerel 2011).

An acquisition goes beyond the research of growth and implies various potential synergies such as scientific and competence synergies (Ouziel 2010). Therefore, we would like to improve the likelihood of acquisitions becoming opportunities to create new capabilities and contribute to sustainability. To do this, we will answer our research question: *How can MNCs optimize their acquisition of innovative companies in order to move towards sustainability?* This research focuses on creating a generic methodology for MNCs to optimize their acquisition of innovative companies in order to support society to move towards sustainability.

Methods

In order to answer our research question, three steps have been taken: Sampling, Interviews and Data analysis. The Interactive Model for Research Design (Maxwell 2005) helped us to design appropriate questions for the interviews with corporate representatives who work directly with the

issue of innovation and corporate investment. We performed semi-structured interviews and designed our questions so that we could understand the elements influencing decision-makers.

We used the Generic Five Level Framework (5LF) to provide a basic structure in order to understand the way MNCs were planning towards a desirable outcome, a successful acquisition. We put our key findings in perspective with the Framework for Strategic Sustainable Development (FSSD) (Robèrt et al. 2002), which is a similar five level mental model, specifically designed in order to help organizations achieve their strategic goals combined with backcasting from Sustainability Principles as a main guideline (Robèrt et al. 2002). Our analysis revealed the strategies, actions and tools involved in an acquisition, and we compared them to the FSSD as a ‘golden standard’. This comparison unfolded some differences that we called ‘gaps’.

As a result, we designed Decision-Making Support Questions (DMSQs), which combined key findings related to MNCs’ goals at each level of a Generic Five Level Framework with the component of the relevant level of the FSSD. DMSQs act as a guideline; they support corporate management for enhancing their decision-making in order to optimize the selection of external companies, i.e. moving towards sustainability and support society moving from an unsustainable towards a sustainable society, or ‘bridging the gaps’.

Results

We observed what factors were influencing acquisitions of innovative companies today. Although MNCs are looking to diversify their portfolio, the trends indicate that their core activities were not evolving overtime. For the purpose of developing innovation, MNCs look for innovations that can be beneficial, renew their activities, beyond the limit of their current knowledge. Examples of these ‘external opportunities’ are companies out of the areas of expertise of a MNC that spark the interest of the latter because their knowledge is a potential source of improvement - both a potential source of profit and a provider of new capabilities to ensure the adaptation of the MNC to a change in its environment. We noted the big interests of MNCs in the energy sector for clean technologies, and the general interest for ICT solutions by all the sectors influenced by the ‘eco-efficiency’ factor. Therefore, at this stage, it seems that a good question to ask prior to deciding whether to acquire or not would be: *Will the*

acquisition both support corporations to realize major improvements and address the sustainability challenge?

A large majority of the respondents considered growth, the gain of competence and the diversification of a portfolio as the most important drivers for an acquisition. These criteria influence the way MNCs select target companies, while sustainability was not declared as important. Only a few corporate decision-makers considered that the social and environmental issues would influence their market in 2020. We observed a lack of a clear definition of sustainability that could also be considered as lacking in a long-term vision. Therefore, we suggest to ask a question around the goals of the MNCs, giving a direction for corporate development and combining it with a potential contribution to the socio-ecological sustainability: *Do our corporate goals direct us toward the solutions of social and environmental problems?*

In this context, current decision-making is mainly a validation supported by the due diligence process prior to an acquisition. The latter process is limited to checking several factors of performance. We would therefore recommend an alignment to the above vision: *Will the acquisition both support corporations to reach their objectives and contribute to build a more sustainable society?*

Then, as most of the suggested actions to integrate an acquired company are generic, we would suggest to customize them to each case: *Will the actions and tools implemented align with the objectives of the acquisition, to ensure both integration and cross-pollination?*

Finally, as most of the tools used to validate an acquisition and to follow-up its integration provide quantitative measurements, we suggest the corporate executives to ask the following question: *Will the tools evaluate the compliance of the acquisition objectives as well as develop the personal capacities of the individuals in the organization?*

Discussion

Today, some corporations are on the right track, and awareness of the opportunity to combine technological expertise is rising. We found cross-company collaboration to maximize the diffusion of knowledge and know-how. Acquisitions could be an opportunity for addressing the sustainability challenge when they aim to integrate of more sustainable processes and

products. We therefore emphasize that the decision of an acquisition is the right moment to re-align the corporate strategy towards sustainability. There is a need for developing sustainability-related guidelines to maximize the opportunities of being more sustainable.

Through our interviews, we discovered there was an absence of a clear definition of sustainability and a lack of sustainability-related guidelines and objectives in both MNCs' selection parameters and their long-term vision. Therefore, our thesis claims the advantage of using Strategic Sustainable Development tools, and especially a four-step planning process in the context of acquisition of innovative companies.

We suggest a corporation complement its traditional forecasting, the historical trends extrapolated into the future, with backcasting. A four-step planning process could give a practical way of using the concept of backcasting from compliance with Sustainability Principles combined with the corporate vision of success at the strategic level when acquiring new businesses. Consequently, it can be used as a tool in order to optimize their acquisitions, both the selection and integration of innovative companies, and help MNCs move towards sustainability.

Conclusion

Our thesis builds on the Framework for Strategic Sustainable Development (FSSD), as a formalized way to guide any corporation through its acquisition process. Our research suggests that the current corporate decision-making for acquiring innovative companies could be complemented, and this thesis could be used as a decision-making guideline in a process of acquisition, which will help MNCs in a faster, easier and more effective transition towards sustainability.

Glossary

Acquisition or ‘Takeover’: The acquisition of control of one company by another or occasionally by an individual or group of investors. Takeovers are usually instituted by purchasing shares at a ‘premium’ over existing prices and may be financed in a variety of ways including cash payment and/or with shares of the acquiring company. The terms *mergers*, *acquisitions* and *takeover* are often used interchangeably.

Backcasting: A planning method where planners first build a vision of success in the future, and then ask: “What do we need to do today to reach the vision?”

Cleantech: Technological solutions offering an alternative to polluting technologies and addressing the source of ecological problems versus ‘end-of-pipe’ solutions popularized in the 80’s. Clean technologies emphasize natural approaches such as ‘biomimicry’

Competitive advantage: Special product feature or capabilities allowing a company to gain more customers or greater sales compared with other competitors of the same field or industry.

Core values: In an organization vision, the ‘how’ of the organization; both what it represents today and what its members would like it to represent in the future.

Corporate development: A set of strategic management functions dedicated to meet specific organizational objectives, including product and brand portfolio management, organizational change, organic expansion around the world (i.e. opening up new subsidiaries), and inorganic expansion (i.e. proceeding through mergers and acquisitions).

Dematerialization: Relative reduction in input of a substance to produce the same goods or service.

Eco efficiency: Management philosophy that emphasizes choosing manufacturing and other processes that reduce environmental impact while also leading to financial benefits.

Good governance: The process of decision-making and managing the human resource in order to guarantee the human rights. Good governance

has eight major characteristics: participation, rule of law, transparency, responsiveness, consensus oriented, equity and inclusiveness, effectiveness and efficiency, and accountability.

Greenwashing: The act of misleading consumers regarding the environmental practices of a company, i.e. ‘firm-level greenwashing’, or the environmental benefits of a product or service, i.e. ‘product-level greenwashing’.

Marketing research: The process of identification, collection and analysis of market information in order to help and support management decision-making process for identification and solving the market limitation and opportunities.

Multinational Corporation (MNC): Several companies or other entities established in more than one country, linked to coordinate their operations in various ways. One or more of these entities may be able to exercise a significant influence over the activities of others; their degree of autonomy within the enterprise may vary widely from one multinational enterprise to another.

Open innovation: Program aiming to apply external input in an in-house innovation development process (Chesbrough 2003).

PESTLE Analysis: An analytical tool used for analyzing an organization’s risks and opportunities in Political, Economic, Social, Technical, Legal and Environmental aspects.

Planned obsolescence: Industrial design policy which consists of planning the limitation of a product lifespan.

Public utility: Company contracted by the public authorities to perform a public service or operate public-owned infrastructure. Most common examples are: Electricity, sewage, gas, water, transportation and telecommunication.

Quality Management System (QMS): Set of procedures, processes and guidelines based on the concept of ‘Deming’s wheel’ (Plan, Do, Check, Act) allowing the organizational continuous improvement towards its stated goals.

Renewable energy: Energy production from natural and renewable

resource, such as the sun, water, wind and geothermal heat.

Return on Investment (ROI): The ratio of financial return indicating the difference (loss/profit) over a limited period from an initial investment.

RPV (Resources Process Value) theory: “Organizations successfully tackle opportunities when they have the resources to succeed, when their processes facilitate what needs to get done, and when their values allow them to give adequate priority to that particular opportunity in the face of all other demands that compete for the company’s resources” (Christensen 2004, 280).

Smart metering: A range of metering solutions intended to monitor and record resource consumption such as energy, heat and water.

Stakeholders: The term is used to define organizations, communities or group of interest connected to an organization, which is impacting them or impacted by them.

Substitution: The Principle of Substitution states that polluting materials (e.g. hazardous chemicals) should be systematically substituted by less hazardous alternatives or preferably alternatives for which no hazards can be identified” (Greenpeace 2003, 7).

Sustainable Value: Embedding socio-environmental considerations into a financial analysis and investment decision-making (Sustainable Value 2012).

SWOT Analysis: A management strategic tool used to perform the internal (Strengths, Weaknesses), and external (Opportunities and Threats) diagnosis of an organization to influence its decision-making.

VCE (Value-Chain Evolution) Theory: The action of controlling “any activity or combination of activities within the value chain that drive performance along dimensions that matter most to customers” (Christensen 2004, xix).

Acronyms

5LF	Generic Five-Level Framework
BoP	Base of the Pyramid
BTH	Blekinge Tekniska Högskola
CEO	Chief Executive Officer
CFC	Chlorofluorocarbon
CFO	Chief Financial Officer
CO ₂	Carbon dioxide
FSSD	Framework for Strategic Sustainable Development
GRC	Governance, Risk Management, and Compliance
ICT	Information and Communication Technologies
MNC	Multinational Corporation
PCB	Polychlorinated biphenyls
R&D	Research and Development
ROI	Return on Investment
RPV	Resources Process Value
SP	Sustainability Principle
VCE	Value-Chain Evolution

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1 Introduction

1.1 Multinational Corporations and the Dynamics of Innovation

1.1.1 Innovation is Needed

The industrial world has been shaped by the emergence of powerful multinational corporations (MNCs) aiming to make profit (Friedman 1970). We associate the name Ford, the hundred-year-old corporation, with the man who provided the freedom of personal mobility to the masses, and General Electric with Thomas Edison who invented the light bulb, bringing cities out of the dark. Innovative personnel ensure their corporation's competitive advantage by being the first to develop the solutions addressing the needs of daily life, effectively matching demand and offer.

To remain competitive MNCs consider the forces interacting and affecting their industry. A bird's eye perspective allows scrutinizing the various forces structuring the industry, driving competition and influencing the profitability and the strategic positioning of MNCs. The five forces are: (a) rivalry among existing competitors, (b) threats of new entrants, (c) bargaining power of suppliers, (d) threat of substitute products or services, and (e) bargaining power of buyers (Porter 2008).

The threats of substitute products or services are one of the main undercurrent forces, and MNCs do their utmost to maintain a strategic position and seize opportunities by innovating constantly. For example, at the end of the 1950s, Tetra Pak rolled out a new format of packaging and managed to disrupt the market, i.e. "their new product (including service, process and business model) replaced the existing dominant design with exceptional commercial success" (Chandra and Yang 2012, 25). Top business thinkers from Schumpeter to Christensen have described the phenomenon for decades, making the difference between the *incremental* and *disruptive* innovation clear. Corporate management is keen on identifying what would be the next disrupting innovation that would make their company create a breach (Knight 2005).

Besides the aforementioned disruptive innovation, we can categorize the most frequent type of innovation as 'incremental innovation'. The

technological evolution can be illustrated by the theory of Business Cycles, which explains how a significant innovation is usually followed by smaller innovations of less importance (Schumpeter 1949). An example could be the linear and incremental improvements that increased the efficiency of the internal combustion engine since its development before the beginning of the 19th century (Gruntman 2004).

1.1.2 The Innovation Development Process

Top-down and bottom-up innovations are two different approaches of how MNCs could choose to organize their innovation development process (Deschamps 2008). Top-down is based on the company vision and management strategy and process. Bottom-up is based on the employee ideas being led up through the corporation. Depending on various market forces at a certain time, such as legal aspects, market positioning for competing products, culture or political reasons, a MNC will choose how they will develop an innovation. Other important factors in the innovation process are government incentives, internal drivers and environmental management. As a result the MNCs may choose to develop an innovation in-house, or try to acquire the innovation externally. For example, Tetra Pak chose to totally revamp its innovation process strategy with the top-down approach to refine its new strategy to be the best in the world, despite the large obstacle of not being able to acquire other companies holding technical innovations that they needed. They now acquire patents that have been co-created with suppliers or customers or other external sources (Deschamps 2008).

As shown every year in the Innovation 1000 study of the consulting firm Booz & Company, there is no relationship between investment in R&D and the production of significant innovations (Jaruzelski et al. 2011). It is more and more costly and less and less productive to invest in in-house innovation (Chesbrough 2011). MNCs and banks have strict requirements regarding risks of investing and mainly invest on the trajectory trends (Maine et al. 2009). The traditional innovation ‘pipeline’ seems therefore costly and produces sub-optimized innovation.

1.1.3 Open-Innovation Programs

The development process of an innovation could be illustrated in the form of a ‘pipeline’, a linear process of innovation integrating continuous improvements (Chesbrough 2011). A reason to look for an external

innovation versus developing an in-house solution, is to cut the time to market, high cost and potential productivity decrease of in-house innovation (Chesbrough 2011).

Innovation through external partnership is another method used to integrate external knowledge for a company. A partnership with various manufacturers was the best solution for Electrolux, who co-founded the European Recycling Platform (ERP) with various manufacturers of household appliances. They managed thereby to reach their goal of waste management cost reduction by more than 50% and significantly ease logistics of reusable parts (Lee and Shao 2009). Electrolux has continued to favour collaborations with external partners for twenty years, especially when a special innovative project is to be launched (Smith 2008). Trends in Scandinavian countries show that large innovative firms collaborate with external actors such as clients and suppliers (OECD 2011). Volvo Cars developed competence in internal- and external-partners network management in order to drive product development processes from knowledge to commercialized innovation (Lee and Shao 2009). These trends indicate that large companies need external knowledge and benefits when new capabilities fuel their innovation development process.

1.1.4 Sustainability Challenge and MNCs

Since the age of the industrial revolution, major technological changes have been taking between ten and a hundred years to occur (Utterback 1994; Afuah 2000). However, in some industries, it can only take a few years for innovations to change the competitive landscape. The estimated period of durability as a Fortune 500 corporation is thirty years, only a few of today's biggest corporations are likely to make it to 2050 (Knight 2005). Today, the competition for innovation is becoming tougher. For example one phenomenon is called the *commodity trap* (Chesbrough 2011, 2). The 'commodity trap' is one of the recent external pressures on corporations appearing in today's world and is characterized by: (a) a competitive environment in which engineering knowledge is widely spread, (b) production occurring in low costs countries, and (c) shortening time of replacement of a product by a new and improved one.

MNCs are part of economic and industrial sub-systems, which are part of society. The society interacts with the biosphere, "the place where biological life exists", to form the socio-ecological system. The current situation of our society can be illustrated with a metaphor of a funnel (see

Figure 1.1) in which society, including MNCs, are moving further in the funnel, with new pressures systematically appearing and increasing: political, legal and social constraints are adding to environmental threats (depletion of mineral and natural resources, climate change, erosion of soil, rising oceans, industrial disasters, etc.) (Robèrt 2000). MNCs are both subject to these consequences and contributing to them. MNCs face specific pressures such as economic challenges of increasing their market share and a constant need for innovation to deal with business and socio-environmental challenges. An opposite worldview would consider that socio-ecological problems are not constantly increasing overtime.

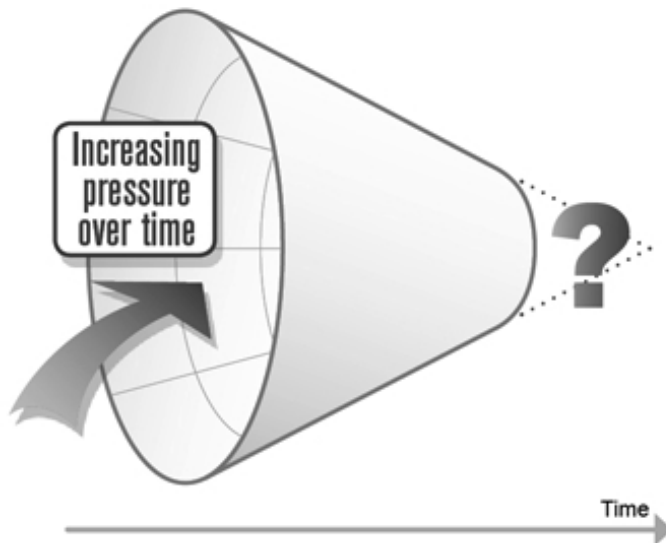


Figure 1.1. The Funnel Metaphor (The Natural Step 2012)

1.1.5 Good Innovation: a Contradiction?

Since the time of Enlightenment, innovation, the introduction of ‘something new’ such as an idea, a method, or a device, has been considered as an improvement. “Post hoc, ergo melius hoc”, which can be translated as “Newer, therefore better” is a common fallacy in Western societies, where people generally mistakenly think that innovation is a source of solution for humanity's problem (Taguieff 2002).

MNCs are part of the ‘production problem’ of society, based on the assumptions of unlimited resources granted to ensure unlimited growth (Schumacher 1973; Stahel 1995; Glachant 2004). As a consequence,

today's industrial flows are linear, from extraction to waste. MNCs are also contributing to the increase in greenhouse gas concentrations. Corporate emissions of greenhouse gases are estimated to represent 15% of the entire global emissions (Carbon Disclosure Project 2007). As stated before in Section 1.1.2, financial constraints also make corporations reluctant to develop or adopt potentially better technologies (Grubb 1997; Nelson and Winter 1982; Dosi et al. 1988). The examples of CFC, asbestos, PCB, biphenyl A and industrial accidents such as Bhopal (Dhara 1995) are examples illustrating the dark side of innovations that should not have been marketed.

1.1.6 Four Conditions to Sustain the System

The last examples illustrate systemic practices of the industrialized society. These practices lead to the impoverishment of the conditions that allow our system, society within the biosphere, to sustain itself. These conditions can be seen as impact categories describing how our societies, including MNCs, damage the biosphere. The Sustainability Principles (SPs), describing the four basic constraints of a sustainable system, are presented as follows (Broman et al. 2000; Ny et al. 2006)

In a sustainable society, nature is not subject to conditions that systematically increase...

- I. ...concentrations of substances extracted from the Earth's crust;*
- II. ...concentrations of substances produced by society;*
- III....degradation by physical means;*

And in that society...

- IV. ...people are not subject to conditions that systematically undermine their capacity to meet their needs.*

As MNCs constantly put more resources into R&D for pushing technological boundaries and scientific knowledge, innovations are patented frenetically (see the trends of patent grants and worldwide publications in technology journal in the Appendix A, Figures 1 and 2). Researchers push the boundaries of knowledge and techniques to new limits. However, the cases mentioned above highlight the need for

responsible decisions¹, for example as seen in bioethics.

Therefore, a MNC can adopt new guidelines based on the above Sustainability Principles. It can make its operations comply with the Principles, if the MNC...

- I. ...eliminates its contribution to systematic increases in concentrations of substances extracted from the Earth's crust;*
- II. ...eliminates its contribution to systematic increases in concentrations of substances produced by society;*
- III. ...eliminates its contribution to systematic physical degradation of nature; and*
- IV. ...eliminates its contribution to the undermining of the people's capacity to meet their own needs worldwide.*

In other words, if the MNC complies with the four Sustainability Principles mentioned above, it will no longer contribute to unsustainability.

1.1.7 The Emergence of Virtuous Businesses

Considering the cases of innovation damaging the biosphere, some MNCs have been improving. As we can observe in Table 1.1 since the 1970s, end-of-the-pipe pollution prevention measures have been implemented to both lower cost and reduce risk of operations (Hart 2011). Then, from the beginning of the 1990s, product stewardship, as a new strategic guideline, was intended to enhance corporate reputation and legitimacy (Hart 1997).

In the meantime, some companies have integrated the value of 'doing better' rather than doing 'less bad' quicker than MNCs, representing an opportunity for the latter to tap into the new flow of start-ups. These companies develop internal capabilities based on clean technologies and involve new tools and concepts such as biomimicry or Cradle-to-Cradle

¹ Further reading suggested: Jonas H. 1979. The Imperative of Responsibility: In Search of an Ethics for the Technological Age. University of Chicago Press. 263 p.

(Hart 2011). This transition and implementation of clean technologies in the companies’ internal processes form a new strategic guideline.

*Table 1.1. Adapted from The Many Faces of
Shareholder Value (Hart 2011)*

	Internal	External
Past / Present	Pollution prevention Cost & Risk Reduction	Product stewardship Reputation & Legitimacy
Future	Clean Technologies Innovation & Repositioning	Global socio-environmental challenges Growth Path & Trajectory

1.2 Acquisitions as an Opportunity to Move towards Sustainability

1.2.1 Socio-Ecological Transition

The path towards a more effective and less damaging development regime requires new solutions. Even if the last examples illustrate the dark side of innovation, innovation can be a leverage point and goes well with sustainable development.

We have a clear view of how innovation, and especially technological innovation is important, by looking at the IPAT formula. IPAT stands for environmental impact (I), population (P), affluence (A) and technology (T) and the formula states that the environmental impact is a combination of the mentioned factors: $I = P \times A \times T$. An observer can notice the more the population grows, increases its ‘affluence’, i.e. its consumption on a daily basis, and lives in a technologically advanced society, the higher the environmental impact is (Commoner 1972; Ehrlich 1971).

If, in that context, the technological progress and innovation can allow an industry to quadruple the resource productivity, corresponding in IPAT

terms to 2A with only 0.5T (Von Weizsäcker et al. 1997), the political and legal support of governments for the transition should be increased to foster innovation (Sachs 2008).

1.2.2 MNCs as Systemic Change Agents

MNCs are also powerful agents who have the resources to diffuse some solutions to several markets quickly. Therefore, we will specifically look into the integration of innovation as part of the acquisition of a company, i.e. a *takeover*. The process of acquisition consists, as seen in Figure 1.2 of identification, evaluation and incorporation of an external component into the process of corporate development (Slowinski 2000, 30).

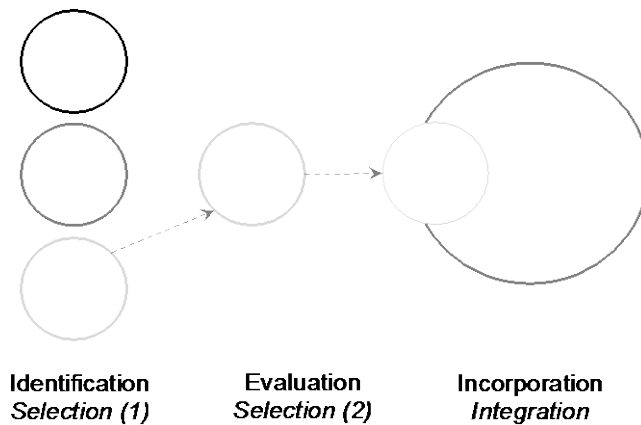


Figure 1.2. Generic Acquisition Process

Corporate management often consider acquisitions an essential part of sustainability initiative integration (Stanislaw 2011). From a business perspective, the typical cases of successful acquisitions are either (a) creating market access for new products, (b) allowing the appropriation of skills or technologies more quickly or at lower cost than they could be built in-house, and (c) driving entrepreneurs and their companies expansion from an early-stage of development (Goedhart et al. 2010). These three cases involve the integration of an external innovation and could support the MNCs in their trajectory towards sustainability.

1.2.3 Corporate Development and External Opportunities

In the cases of successful acquisitions described above, a MNC can expand its knowledge by channelling an innovation throughout the organization. Therefore the merging phase of an acquisition must ensure a harmonious and continuous co-creation and development of both the acquiring and acquired organization by integrating and sharing in an optimal way (Christensen and Raynor 2008).

General Electric's Ecomagination program succeeded to re-position the 120-year old company as the leading provider of clean technologies in less than ten years through investment and acquisitions. It required GE to increase their investments by 350% in six years, from 700 million USD to 1.5 billion USD to buy innovative companies and patents (Hart et al. 2006).

We see acquisitions as an opportunity for MNCs to integrate innovative companies and their new solutions. This could allow the company to both reduce its contribution to the violation of the previously mentioned Sustainability Principles, and to be an opportunity for the development of new markets.

Our aim is to map the opportunities and risks and develop a better strategic approach for a MNC by providing concise and constructive sustainability-informed guidelines. Acquisitions of innovative companies are about enhancing knowledge without missing the opportunity to sustain good ideas. This would not only guide MNCs towards sustainability, but also leverage the innovation to gain a competitive advantage versus their competitors. Some examples of these include (Willard 2002, 21; Willard 2005):

- I. Easier hiring of the best talent
- II. Higher retention of top talent
- III. Increased employee productivity
- IV. Reduced expenses in manufacturing
- V. Reduced expenses at commercial sites
- VI. Increased revenue/market share
- VII. Reduced risk, easier financing

1.3 Innovate Strategically through Acquisitions

Corporate decision-making strategies are not currently influenced by sustainability (Bonn and Fisher 2011). In general, investments, such as acquisitions, can be misguided when decisions are not supported by a strategic guideline. Besides, one specific risk of not embedding sustainability in an organization's strategy is to be accused of *greenwashing*, such as General Electric, which focused its external communication on the Ecomagination program; consisting – among other investments - of the acquisitions of 'green businesses' (Delmas and Cuerel 2011). However, if the strategy embeds sustainability, an organization could transparently opt for producing electricity from a coal-power station, and could later on be rectified with another solution.

1.3.1 'Real options' versus 'Intuition'

Nowadays, most of the corporate decision-makers follow a logical *causality* thinking to determine the innovation needed (Chandra and Yang 2012). They use historical trends extrapolated as a forecast for predicting the future, which is also called 'Real Options' (Amram and Kulatilaka 1999). This paradox mindset, also described as the *innovator's dilemma*, encourages minor incremental innovation less likely to be successful on the market (Chesbrough 2011). On the contrary, following one's passion, as Akio Morita of Sony did in the 1970s, in order to overcome factors likely to keep a MNC in its 'pipeline' (See Section 1.1.3), is called *effectuation* (Chandra and Yang 2012).

1.3.2 Whole System Thinking

An approach used by several global MNCs is to map out potential innovations in a strategic landscape in order to build a game plan for innovations (Anthony et al. 2006, 107). This is to get a clear overview, discover gaps as well as mapping alternatives. When a MNC clearly maps out and illustrates customer needs, corporate production opportunities, new market or product offerings in relation to the competition, it provides a strategic advantage. With mapping, companies can adapt to a constantly changing business environment to be able to keep an eye on innovations and understand how they can contribute to their expansion (Anthony et al. 2006, 107).

1.3.3 Taking a Leap towards New Capabilities

A global survey of more than 200 CFOs suggested that any CFO should ask themselves (Verdantix 2011): “Do our corporate investment strategies and policies take into consideration the shift to a sustainable economy?” The Figure 1.2 below shows other guideline questions framing a strategy.

Table 1.2. Charting the Sustainable Value Portfolio (Hart 2011)

	Internal	External
Past / Present	<p>Pollution prevention</p> <p><i>Where are the most significant waste and emission streams from our current operations?</i></p> <p><i>Can we lower costs and risks by eliminating waste at the source or by using it as useful input?</i></p>	<p>Product stewardship</p> <p><i>What are the implications for product design and development if we assume responsibility for the entire life cycle?</i></p> <p><i>Can we build reputation and legitimacy by engaging a broader range of stakeholders?</i></p>
Future	<p>Clean Technologies</p> <p><i>Is the sustainability of our products limited by our existing competency base?</i></p> <p><i>Is there potential to realize major improvements through new disruptive technology?</i></p>	<p>Social and environmental issues</p> <p><i>Does our corporate vision direct us toward the solutions of social and environmental problems?</i></p> <p><i>Does our strategy focus us on serving the unmet needs of world's population?</i></p>

Asking what synergies justify the acquisition beyond the research of growth ensures that the acquisition rationale is valid. Some examples of the various potential synergies are the scientific, competence, product and market synergies (Ouziel 2010). From a financial perspective, the acquisition, even though it is not supposed to create a new cost-sharing structure, often leads to economies of scale under the name of "financial synergies" (Faber 2011). Pre-identification of synergies in the companies' resources, processes, and values is part of the good practices of due diligence. While performing the selection of a potential target, in any pre-deal phase, it is recommended to ask the question: “Which synergies justify the acquisition beyond the research of growth?” (Ouziel 2010, 13).

Also, not paying enough attention to the process of integration is the largest factor for the acquisition failing (Sadtler 2012). It is the ability of management to manage opportunities and risks for the company (Deschamps 2008). Therefore, being strategic can help the company to overcome the inertia to create new capabilities (Hart 2011). Strategic questions can be: “What superior capabilities do the buyer and target possess? How can the buyer transfer these capabilities to the target? How

can the buyer leverage its capabilities?” (Engert et al. 2010, 50).

1.4 Actions for Integration

The literature suggests that the most common thing is focusing on the integration of the innovation, although the consideration of cultural aspects and values is crucial.

Adapt management practices to the cultural values. Values are especially important because they affect decisions, such as allocation of resources and “the way problems are approached and handled” (Christensen 2004). For example, the high-tech companies are used to innovative management methods (Vester 2002). The purpose, “The opportunity of acquisition”, is to protect and improve the key resources for which the company was bought by, for example, taking into consideration the cultural differences (Hofstede 1982).

Hiring experienced staff. Compared to the huge potential consequences of rashness, the cautious recourse to both internal talent and external expertise is extremely important. For example, hiring external specialized consultants is needed for the due diligence, pre-deal negotiations, and the identification of strengths and weaknesses as well as the harmonization of the processes (Vester 2002).

1.5 Management Decision-Making Tools

Today, understanding one’s environment is decisive in identifying when an innovation has the potential to become successful. Some tools allow the identification of disruptive innovations: Value Chain Evolution theory (VCE), and Resource Process Value (RPV) (Christensen 2004).

Value Chain Evolution theory supports corporate decision-makers to carefully analyze and identify the right companies, strategically positioned in the value chain to increase performance of the final product. The opportunity is therefore to acquire a high market potential innovation. Choosing external innovation could also be a way to avoid what Andersson describes as ‘lock-in mechanisms’; some factors that deter companies to invest in something new, which is not “incremental” (Andersson 2001).

1. Economies of scale: When the fixed cost of a solution is shared among all the users, a rational agent, like a corporation, is less likely

- to choose another solution.
2. Learning by doing/using: The users or actors gain knowledge about a solution and are not keen on changing. This leads to incremental or small improvement on an innovation.
 3. Network effects are several: One could be, for example, the phenomenon of 'lead user' adoption which encourages other users to adopt an innovation.
 4. The geographical clustering of innovation can also be added as one lock-in mechanism (Rieu, 2008).

1.6 Research Question

Our literature review has shown that acquiring an innovative business in order to move MNCs towards sustainability involves economic, social and environmental challenges: (1) evaluating the relevance of an innovation for (a) disrupting the existing market, (b) decreasing the contribution to the violation of the Sustainability Principles (see Section 1.1.4), and (2) ensuring a good post-integration working environment.

This has led us to the following research question: *How can MNCs optimize their acquisition of innovative companies in order to move towards sustainability?*

1.7 Research Scope and Limitations

There are five typical cases of successful acquisition of companies (Goedhart et al. 2010, 2). We will not focus on the cases consisting of improving the performance of the target company that can nonetheless involve the implementation of innovative solutions by the acquiring company for the benefit of the acquired one and the case of removing excess capacity from an industry. We will exclusively investigate the cases that involve the integration of an external innovation such as the (a) creation of market access for products, and (b) integration of skills or technologies more quickly or at lower cost than they could be built in-house, and (c) picking winners early and helping them develop their businesses (See Figure 1.3).

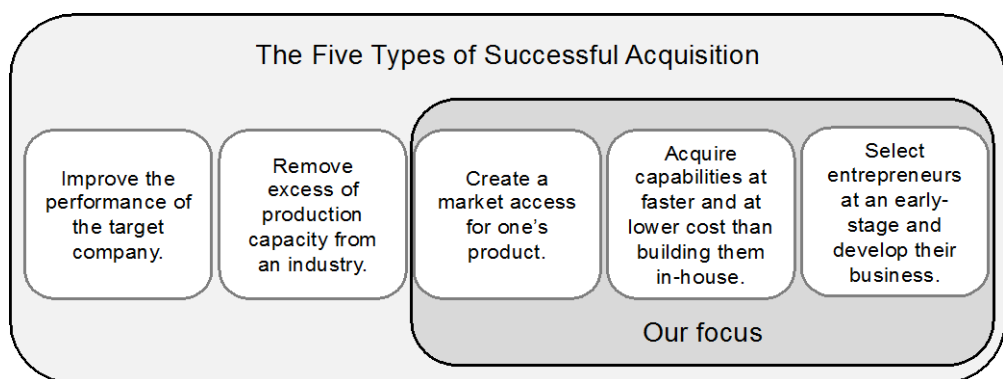


Figure 1.3. The Five Types of Successful Acquisition (Adapted from Goedhart et al. 2010)

2 Methods

In order to answer the research question, the research was divided into three steps: Sampling, Interviews and Data analysis (Figure 2.1).

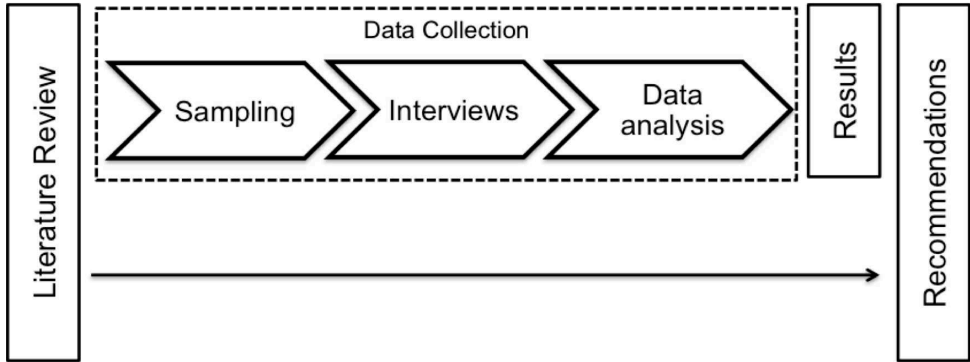


Figure 2.1. Interactive Research Approach

The Interactive Model for Research Design (Maxwell 2005) helped us to design appropriate questions for interviewees. We combined this approach with the use of the Framework for Strategic Sustainable Development (FSSD) (Robèrt et al. 2002). The FSSD provided us with a lens through which scrutinizing our interview results, and perform the data analysis.

2.1 Framework for Strategic Sustainable Development (FSSD)

A Generic Five Level Framework (5LF) is a tool to structure data and information in order to make them suitable for planning in a complex system. When we use the 5LF in a global or organizational scale in order to plan towards sustainability, it is called the Framework for Strategic Sustainable Development (FSSD). The FSSD provides a mental model allowing structuring and understanding of a situation in order to plan towards a specific outcome, which is a sustainable society within the biosphere. The FSSD is applicable in any organization of any scale, in order to achieve its strategic goals combined with backcasting from Sustainability Principles as main guideline (Robèrt et al. 2002). See an elaboration of the two frameworks in Table 2.1.

Table 2.1. Planning in Complex Systems (Waldron et al. 2008, 5)

Name Level	Generic Five Level Framework	Framework for Strategic Sustainable Development
	Generic Planning	Planning for Sustainability
Systems	Any 'system' or set of variables that are relevant to the goal you want to achieve.	Society within the biosphere, including the social and ecological laws/rules/norms which govern this system.
Success	Any goal you want to achieve.	Society within the Biosphere compliant with the conditions for socio-ecological sustainability (i.e. the Four System Conditions).
Strategic	The strategic principles for selecting actions you use to achieve your goal: - Backcasting from success. - Step-by-step while ensuring influx of resources.	Backcasting from success for socio-ecological sustainability and the associated three prioritization questions as a minimum.
Actions	The actions you need to take to achieve your goal.	The actions that help move the global socio-ecological system towards success.
Tools	The tools that support you in achieving your goal.	The tools that support efforts to achieve global sustainability.

2.1.1 Description of the Five Levels of the FSSD

We used the FSSD as an exploratory tool. We could compare our data, information about the current reality framed in a 5LF, to the ideal conditions as presented in the FSSD.

The first level of the FSSD is the Systems level. A good overview of the systems means that we have an understanding, in the context of this thesis, of the MNCs and the role they play in economics, in the societies and within the biosphere. This also informs us of their limitations and opportunities in this context, such as their environmental impact, the

economical conjuncture, the laws to enter a given country's market, or the current technological innovations.

The second level is the Success level. The success, in the context of this study, is the goal a MNC has assigned in the future embedded within the boundaries of the Sustainability Principles. For the long term goal, the FSSD combines the constraint of the elimination of the contribution to the violation of the Sustainability Principles with the specific business or societal goals of the MNC.

The third level is the Strategic level, which assists organizations to set guidelines and represent a method for decision-making to attain their vision. The corporations who would like to be strategic can use backcasting from success, which consists of asking the question: *What do we do today to reach the vision of success?* and prioritizing the actions by asking the following three prioritization questions (Robèrt et al. 2000): Does this action move in right direction with respect to the vision? Does this action provide a flexible platform toward future improvement? Does this action provide sufficient ecological, financial and social return on investment?

The fourth level of the framework is the Actions level. It consists of the actions derived from the strategic level, which are prioritized with the above questions.

The fifth level is the Tools level, which is anything that assists with implementing actions, gaining a better understanding or evaluating progress towards the goal.

2.2 Sampling

As our purpose was to set strategic guidelines for MNCs to optimize their acquisition of companies in a context of sustainable development, we first determined who could potentially contribute to our research. We therefore focused on building relationships with professionals and experts of this field, the corporate decision-makers.

Our first contributors were the corporate representatives who work directly with the issue of innovation and corporate investment: CEOs, CFOs, R&D directors, innovation managers, etc. As corporate executives, they have extensive knowledge of the reasoning of selection and/or acquisition of an external innovation. They have a different perspective on the integration of

an external innovation, through the purchase of patents, the obtaining of licensing rights and/or acquisition of innovative companies.

We prospected among our personal and professional contacts, accessed the staff of the Master in Strategic Leadership towards Sustainability (MSLS) of the Blekinge Tekniska Högskola (BTH) and the alumni network, then we built up from the contacts we previously interacted with. Finally, we created the space for them to share the knowledge and experience.

An additional panel of seven experts brought the extensive knowledge of an average experience of twenty years in multiple MNCs. Their interviews were valuable for us in order to understand the context of acquisition of innovative companies and prepare our questions prior to the interviews with MNC executives.

2.3 Interviews

We elaborated our interview questions in order to maximize our understanding at each level of a 5LF. We performed semi-structured interviews of an average of one hour each. Firstly, we had a free discussion creating the space for the informant to share their views on the topic. Secondly, the interview was conducted with a series of questions for clarification.

Table 2.2. Interview Protocol

1. <i>What is the innovation defining your core activity and when was it implemented? (Systems level)</i>
2. <i>What innovations are relevant for your industry now? (Systems level)</i>
3. <i>Do you think your selection criteria would change in the next 20 years? Please explain why and how. (Systems level)</i>
4. <i>What are the top drivers for your corporation to acquire an innovative company? (Success level)</i>
5. <i>As a corporation do you have a definition and criteria for sustainability? (Success level)</i>
6. <i>Do you have a decision-making process, methodology or tool for selecting an external innovation? Please explain. (Strategic level)</i>
7. <i>What are the processes preparing a good integration? (Actions level)</i>
8. <i>What actions do ensure a good integration? (Actions level)</i>
9. <i>Do you have a feedback process to improve your selection process? Please explain. (Tools level)</i>

2.4 Data Analysis

We obtained our results through the allocation of the answers at the corresponding level of a generic five level framework (Systems, Success, Strategic, Actions, Tools) and a coding process. The FSSD helped us to compare the ideal conditions of planning for Sustainability (see Table 2.1) with the specific conditions in which MNCs develop their practices of acquisition.

2.4.1 Coding

According to the methodological question, *Why do I need to know this?* (Maxwell 2005), we prepared our interview questions in order to inform the corresponding level of a Generic Five Level Framework (See Appendix B, Table 3). It helped us to organize our data efficiently.

Step 1. Structuring our key finding according to each level of a Generic Five-Level Framework (Open coding) (Strauss and Corbin 1998)².

The first phase of coding consisted of highlighting the text of the transcripts to validate the applicability of information at the right level. According to the methodological question, *What do I need to know?* (Maxwell 2005), we ensured that relevant information contained in other parts of the transcripts (e.g. an interviewee speaking about a tool when we expected a description of the system) was moved to the right part accordingly.

Step 2. We categorized each answer, for example, the different types of actions, the different types of tools involved in an acquisition (Axial Coding) (Strauss and Corbin 1998).

A specific coding was defined for each question. We proceeded with an inductive data analysis, which consists of gathering specific data under broader category or concept. For example, for question 2

² Grounded theory is used in qualitative research in order to analyse information (Yancy Martin et al. 1986; Faggiolani 2011). This methodology proceeds from the identification of key-words (open coding) and, then, categorizing these under key-concept in order to find relationship between them (Axial Coding) (Strauss and Corbin 1998).

(*What innovations are relevant for your industry now?*), we obtained various answers, from ‘remote thermo-metering solutions’ to ‘non-intrusive energy metering device’, that we had to find overlapping categories or concepts in order to be able to present comprehensible results; ‘smart metering’ in this example. We could therefore keep the diversity of each answer and summarize it for the reader. See Figure 2.2 below.

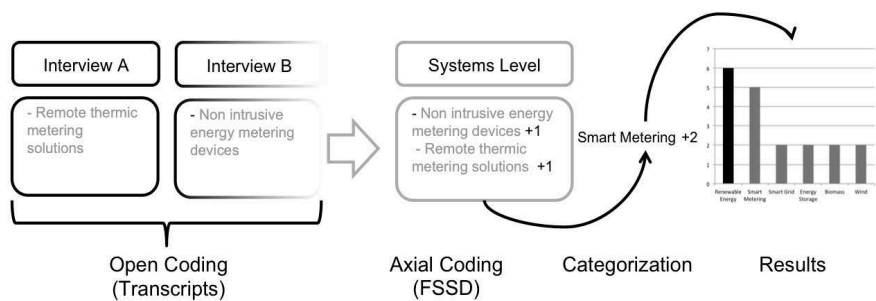


Figure 2.2. Example of Data Categorization

2.4.2 Answer to the Research Question

We analyzed information through the lens of the 5LF. Then, the FSSD helped us to identify the gaps that exist in an organization’s decision-making process for acquiring an innovative business in the context of sustainable development. The gaps consist of the difference between an ideal development planning process towards sustainability and the current reality. This ideal development is supported by the FSSD, defining a ‘Golden Standard’.

Table 2.3. Informing the Level of the FSSD (Waldron et al. 2008, 5)

	Multinational corporations practices (Current reality) - 5 LF	Multinational corporations planning for sustainability (Ideal conditions) - FSSD
Systems level	We incorporated the information communicated about the corporation and its interactions with its environment, including society and the biosphere. <i>E.g.: What innovations are relevant for your industry now?</i>	The MNCs have a clear picture of their systems (MNCs within the global market, within society, within biosphere) and their decision-making process for acquiring innovative businesses are along with all the organizational, social, and ecological laws/rules/norms, which govern the system.
Success level	We investigated the goals and objectives of the MNCs. We wanted to know about both their definition of sustainability and business objectives. <i>E.g.: What are the top drivers for your corporation to acquire an innovative company?</i>	The (i) goals that the MNC has assigned in the future embedded within the boundaries of (ii) the four Sustainability Principles, and a (iii) whole-systems view of global sustainability.
Strategic level	We explored the tactics and criteria helping corporate decision-makers to select the right business to acquire and socio-environmental guidelines. <i>E.g.: Do you have a decision-making process, methodology or tool for selecting an external innovation? Please explain.</i>	Using backcasting from success, which consists of (i) within the boundaries of (ii) and recognizing (iii) (listed above). The three prioritization questions for sustainability and other guidelines to select actions which help achieve organisational or activity-specific goals.
Actions level	We explored what actions could prepare and optimize the integration of an external innovation in order to optimize the acquisition process. <i>E.g.: What actions ensure a good integration?</i>	The actions that help move the MNC towards compliance with success AND global sustainability.

Tools level	<p>We considered the tools used by the corporate decision makers to proceed to an acquisition or to develop their acquisition strategy.</p> <p><i>E.g.: Do you have a feedback process to improve your selection process? Please explain.</i></p>	<p>The tools that help move the MNC towards compliance with stated goals AND global sustainability.</p>
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As our research question aims to suggest answers about ways to optimize the acquisition in order to move towards sustainability, our analysis evaluated the gaps between the current reality, the knowledge and practices of MNCs acquiring innovative businesses, and an ideal strategic planning process towards sustainability. Our results, in answer to our research question, consisted of Decision-Making Support Questions (DMSQ). These DMSQs were intended to evaluate the intention of the MNCs to close this gap, i.e. move towards sustainability when they acquire innovative companies.

These DMSQs had two components. They combined a key finding, which summarized the analysis of the current MNCs' goals at each level of a Generic Five Level Framework, and juxtaposed it with the component of the relevant level of the FSSD. The DMSQs should not exempt the MNCs of keeping their focus on their specific goals, as both the Generic Five Level Framework and the FSSD are supporting the MNCs' path towards the achievement of their objectives. At each level, a DMSQ, acting as a guideline, was designed to support corporate management for optimizing their decision-making in order to fill the gaps, move towards sustainability and support society moving from an unsustainable towards a more sustainable society.

Table 2.4. Example of DMSQ Design

	Multinational corporations practices (Current reality) 5LF (Data collection)	Multinational corporations planning for sustainability (Ideal conditions) FSSD (Ideal scenario)
Systems Level	E.g. “MNCs are becoming more eco-efficient.”	MNCs’ decision-making processes align with ecological laws/ rules/ norms which govern the system.
	<i>“Eco efficiency”</i>	<i>“Address Sustainability Challenge”</i>
Example of DMSQ	Will the acquisition both support MNCs’ goal to be <i>eco-efficient</i> and <i>address sustainability challenge</i> ? ³	

2.5 Validity

For enhancing the validity of our method we used different sources to collect the information (Maxwell 2005, 112). In order to enhance validity of our data, we used literature review and fourteen rich interviews with professionals and experts who were engaged in the decision-making process for acquisition of innovative companies.

According to Maxwell (2005), using the rich data helps to enhance the validity. “Data that are detailed and varied enough that they provide a full and revealing picture of what is going on” (Becker 1970, 51). We chose to research the most representative sample of the corporations in five main sectors: Energy, ICT, Transportation, White goods and Food Sector, as time would allow. Therefore we selected a different range of corporations in different industry sectors, which leads to increased validity of our information.

³ This question is not part of our results and stands as an example. Therefore it must not be considered as a DMSQ.

3 Results

Throughout the research period of four months, we conducted interviews with fourteen representatives of MNCs, in two main sectors; the Energy sector (eight respondents) and Information and Communication Technology, ICT (three respondents). We also integrated other sectors, such as Transportation, Food Packaging and White Goods sectors in order to validate generic corporate practices (one each). See Figure 3.1 for an overview of the fourteen (14) MNCs interviewed per sector, and Appendix B, Table 1 for the complete list of interviewed corporate executives.

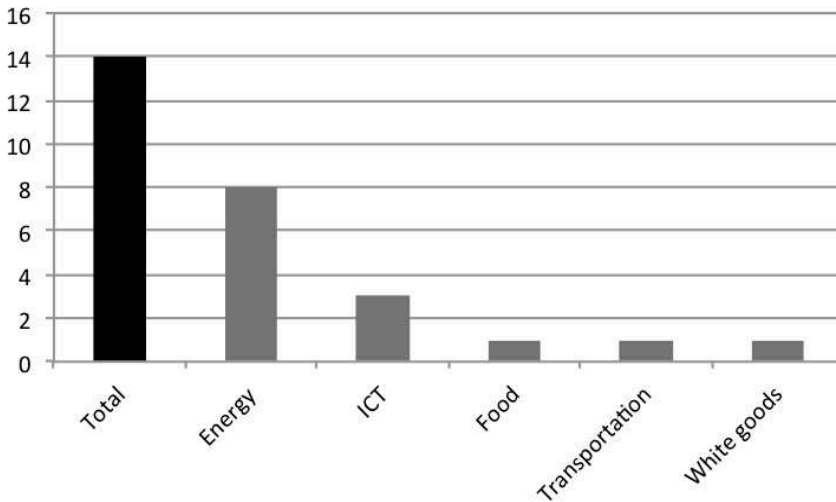


Figure 3.1. Interviews per Industry Sector

We organized our questions so that we could understand the elements influencing corporate decision-makers considering the five levels of the FSSD. Our research objective is to reveal what specifically has worked well in an acquisition. As a result, we suggested additional guiding questions to corporate decision-makers, in order to optimize the selection of external companies.

3.1 Trends in the System

Asking the two next questions, we intended to learn what dynamics were influencing acquisitions of innovative companies at the Systems level. The

questions aimed to evaluate the length of MNCs' respective hegemony in their core business areas and the importance of acquisition of innovative companies for these MNCs within this period of time.

To answer Question 1: *What is the innovation defining your core activity and when was it implemented?* The interviewees had to 'take a look in the rear-view mirror', sometimes dating back the creation of the corporations. Most of the MNCs, seven (7) out of fourteen (14) were created more than fifty years ago.

We received the testimony of other corporate representatives who dated an iteration of their most significant innovation for their business only a few years ago. The field of telecommunication constantly improves too. A collaborator of a global leading telecoms equipment provider put the stress on the apparition of the 3G less than 10 years ago as an example of a recent breakthrough (Maresch 2012).

This information became valuable when we obtained the answers from Question 2: *What innovations are relevant for your industry now?* This question was intended to help us understand to what extent MNCs are bound to their traditional field of expertise in their current research of innovation. This question aims to discover if MNCs innovate within their own field or they rather purchase some 'external opportunities' out of their main areas of expertise.

3.1.1 The Predominant Integration of Cleantech

The importance of integration of external knowledge has been particularly observed in the energy industry. Only one (1) out of eight (8) interviewees of the energy sector did not explicitly mention cleantech innovation as a current need for the corporation.

Six (6) out of eight (8) corporations of the energy sector consider innovations related to renewable energy production as currently needed for the organization. We also observed that five (5) out of eight (8) mentioned smart grid and smart metering technologies as a field of interest for their corporation. See Figure 3.2.

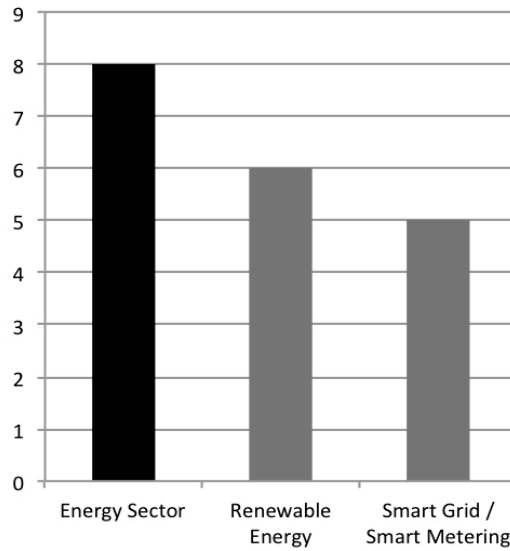


Figure 3.2. Relevancy of Renewable Energy, Smart Grid and Smart Metering for MNCs of the Energy Sector

Of the six (6) companies mentioning the need for innovation for renewable energy production and storage, several technologies were specifically mentioned. Apart from the five-times (5) mentioned energy metering, smart grid, energy storage, biomass and offshore wind energy were all cited twice (2), as illustrated on Figure 3.3. The solar energy production technologies, solar thermal energy and photovoltaic, as well as wave power-generation, hydro-electricity and methanization were also mentioned once (1).

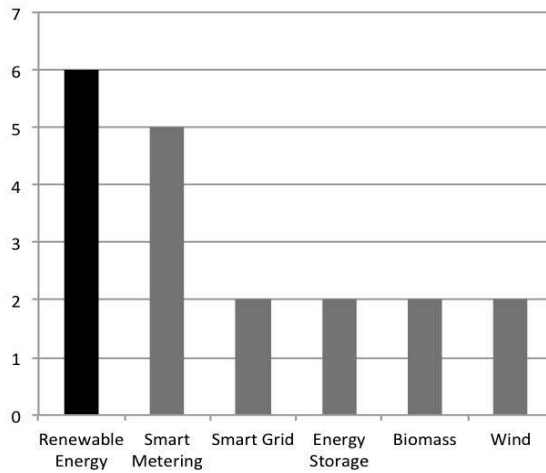


Figure 3.3. Energy Technological Platforms Synonyms of Opportunity

Their answers indicate a trend to shift from traditional ways of producing, storing or distributing electricity to less resource-demanding technologies.

3.1.2 The Integration of ICT Solutions

Although the first sub-section of the results was focusing on the trends in the energy sector, we also got results from other sectors. Out of the nine (9) non-ICT sector corporations interviewed (Energy, 7; Transport, 1; White goods, 1), six (6) mentioned a need of ICT innovations despite a completely different original core activity.

One was even affirming the development of a new competition for smarter energy use involving the use of ICT technologies as a predominant key factor of success in the utilities sector. Two specific cross-sector cases requiring the integration of ICT solutions were mentioned: The developments of new kind of thermostat and remote energy metering solution were evoked in two (2) interviews. We also heard about the introduction of ICT solutions in unexpected sectors such as health and “any other sector requiring advanced computing capabilities” (Eichenlaub 2012) such as energy distribution.

From this we understand that MNCs need external innovation. This seems to be a prerequisite for continuing their existence over time.

3.1.3 Evolution of External Factors Overtime

Question 3: *Do you think your selection criteria would change in the next 20 years? Please explain why and how.* For this question we received eight (8) answers. Three (3) out of the eight (8) corporate professionals interviewed answered this by considering the market evolution as a main factor of change over the next 20 years, for diverse reasons such as customer behaviour or market location (each of the latter examples were cited once). An equal number of professionals think technological evolution will play a disruptive role. Environmental pressures and constraints (one (1) answer) and the impact of organizational change were cited (one (1) answer). They did not mention anything that could relate to the funnel, as described in the Introduction, Section 1.1.4. See Figure 3.4.

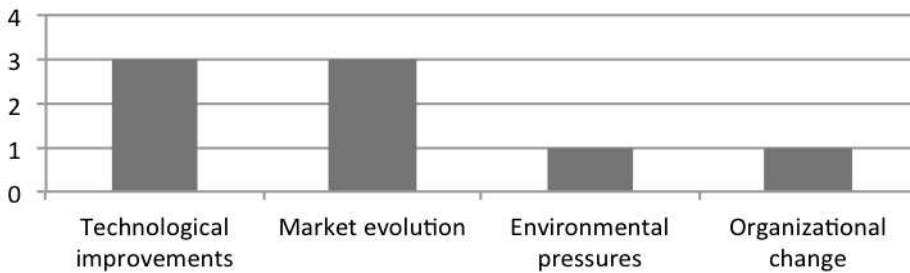


Figure 3.4. The Possible Change for Businesses by 2020

3.1.4 The Benefits of Cross-Pollination

We obtained results unfolding the underlying and long-term forces motivating acquisitions. Some new technological platforms were mentioned. Still related to ICT, the “machine to machine” (Eichenlaub 2012) interactive solutions and “big data analytics solutions” (Eichenlaub 2012) were cited. The need of ‘new materials’ was also evoked. Other than these, ‘social innovation’ and new business model concepts, such as BoP⁴

⁴ The concept of “BoP” or “Base of the Pyramid” categorizes the approximately 4 billion people living with an income of less than 1 500 USD purchasing power parity (Prahalad and Hart 2002). In economics, *purchasing power parity* (PPP) is a condition between countries where an amount of money has the same purchasing power in different countries.

market strategies to expand the customer base, concepts such as ‘peer-2-peer car sharing’ and “non-consumption” (Bryant 2012) new concepts were also mentioned during our interviews.

It is often not explicit yet global challenges seem to be part of MNCs decision-making criteria for their acquisition of innovative companies. The trends nevertheless indicate that their core activities were not fundamentally evolving overtime, although these activities are beneficial and are sometimes totally renewed by innovations. As a key finding, we observed a constant focus on the concept of ‘improvement’, which generally are governed by two driving forces, the adaptation and the appropriation of new capabilities. Therefore, at this stage, it seems that a Decision-Making Support Question (DMSQ) to ask prior deciding to acquire or not would be: *Will the acquisition both support corporations to realize major improvements and address sustainability challenge?*

3.2 The Organization's Goals and Motivations

Question 4: *What are the top drivers for your corporation to acquire an innovative company?* When answering this question, a large majority of the respondents, eleven (11) out of fourteen (14) corporations interviewed considered growth combined with early-profitability, ROI, as the most important drivers for an acquisition.

The second driver evoked by the corporate professionals was the potential for ‘innovation height’, the gain of competence and the significance of the external innovation fuelling the in-house R&D - seven (7) responses. The increase of internal capabilities is therefore part of the vision of success.

As expected from our literature review, the diversification of a portfolio is an important aspect of the decision to start acquiring other companies, seven (7) answers highlighted this point. See Figure 3.5.

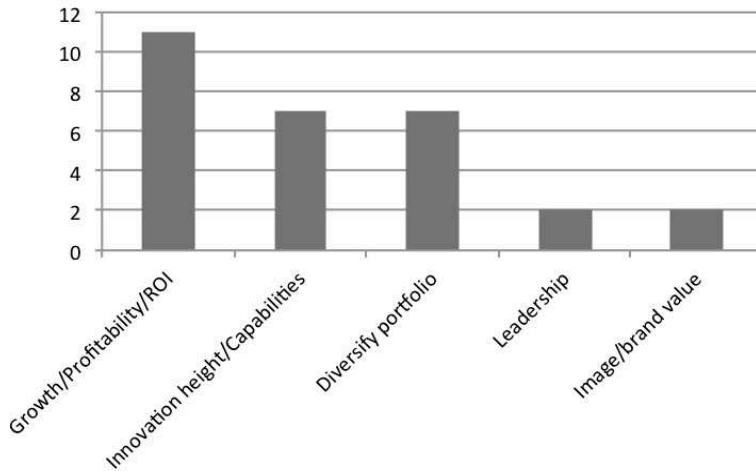


Figure 3.5. Drivers for Acquiring an Innovative Company

The objective of leadership and the increase of brand value have been mentioned twice (2) each. Noticeably, the leadership objective was put forward in a context of portfolio redefinition – gaining market share and becoming a leader in another activity than the original core activity of the company, through mergers and acquisition. Sustainability and risk-related acquisitions were evoked in two (2) answers, as was the opportunity of cutting innovation cost in one (1) answer.

3.2.1 Sustainability: a Relative Concept?

Question 5: *As a corporation do you have a definition or criteria for sustainability?* The first answers of the corporate professionals were about ‘climate change’, as well as the need for decreasing emissions to get closer to carbon neutrality, stated seven (7) times by the fourteen (14) interviewees. We noted two competitors of the energy distribution sector aligning on same higher requirement of 30% decrease of CO₂ emissions by 2030. See Figure 3.6.

* Life-cycle management: *Answers mentioned was ‘waste’ and ‘restoration of mining sites’.*

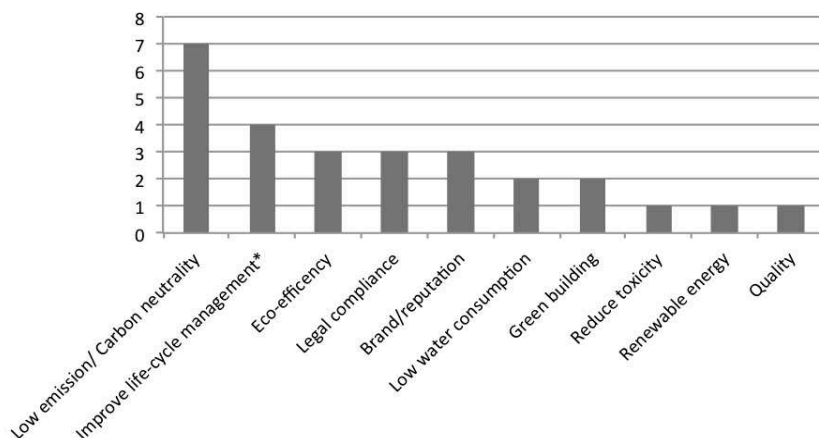


Figure 3.6. Definition and Criteria for Sustainability

Four (4) respondents considered that resource productivity, or resource efficiency, was an important aspect of being ecologically sustainable. It is almost as important, according to our panel, to improve their activities to comply with legislation, stated in three (3) answers, as ensuring a good image, specified in four (4) answers.

The eco-performance of buildings emerged, particularly regarding objectives that aim at decreasing waste of water and energy in buildings, stated in two (2) answers.

The concept of life-cycle management was revealed in two (2) answers, so was the related waste management in one (1) answer and the willingness to decrease the use of toxic compounds in one (1) answer. Finally, the institutional definitions brought forward were the one of the Brundtland Report⁶ in one (1) response.

⁶ “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations 1987).

3.2.2 An Extended Concept of ROI

We observed that the benefits expected from an acquisition were not limited to financial ROI and were including considerations regarding the integration of new capabilities. Therefore, a question to ask prior to acquiring a company could be: *Do our corporate goals direct us toward the solutions of social and environmental problems?* This DMSQ would invite the corporate executives to not only consider the financial benefits and appropriation of new capabilities, but also regard wider opportunities such as the exploration of potential solutions to the sustainability challenge.

3.3 A Bounded Decision-Making Process

3.3.1 Validation Process rather than Selection Process

We inquired whether the corporation had a decision-making process that they could use for selecting their candidates for acquisition. Surprisingly, out of the fourteen (14) corporate executives interviewed, four (4) commented on the intuition involved in the choice of external acquisition opportunities.

The other respondents declared that they used business intelligence, including technological benchmarking (four (4) answers) and marketing research (two (2) answers). It allows the corporate executives to be better informed on what occurs on the market, in some geographical areas (two (2) answers), or where the risk capital is moving (one (2) answer).

3.3.2 Target-Centred Validation

Nevertheless, this unexpected finding does not replace the implementation of an essential and thorough ‘due diligence’ process before any acquisition, as declared during interviews the by ten (10) out of the fourteen (14) corporations when we asked Question 6: *Do you have a decision-making process, methodology or tool for selecting an external innovation? Please explain.*

During this due diligence process, the decision-makers scrutinize several factors of performance. The reader can observe in Figure 3.7 below, that the

marketing (including parameters such as the transfer of the acquired company customers and some geographical and legal considerations), the financial analysis (including the financial value of the acquired company), the technical and technological review components were predominant (cited eight (8), four (4) and three (3) times respectively).

The acceptability of an innovative technology (cited once) or the short time to market of the innovation in general (cited twice (2)) were also mentioned as part of the marketing parameters.

Some comments stressed the need to identify potential synergies. Eventually, one corporate representative admitted refining all the criteria every time (See Appendix C. Figure 1. Acquisition Selection Process). The same person also discussed the importance of involving internal technical expertise, and this point of view was shared by at least two (2) other contributors. The due diligence is said to be more complete compared to what it was in the past. It included, for example, various cultural aspects.

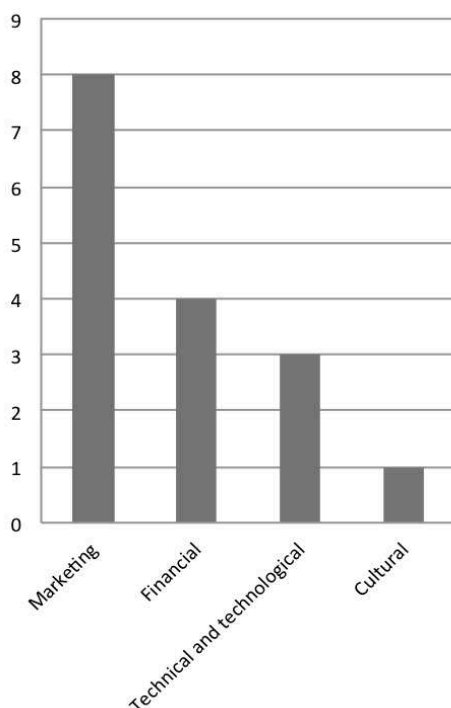


Figure 3.7. Due Diligence Criteria by Relevance

3.3.3 Re-Balancing the Pre-Deal In-Out Analysis

We observed that the respondents were not taking a ‘birds-eye view perspective’ when evaluating the relevance of acquiring a company. Some self-exploration or internal assessment, such as *is our corporation the most suitable partner for this targeted company?* are missing. Our understanding is from our results, that it appears as the acquisition is rather the consequence of an exogenous analysis. It seems that decision-makers are focusing on the targeted company and its environment, rather to also ask themselves: *Will the acquisition both support corporations to reach their objectives and contribute to build a more sustainable society?* This DMSQ, acting as a recommended guideline, invites corporate decision-makers to align the corporate goals with sustainability.

3.4 Integration Process and Actions

The two following questions aimed at determining the actions set prior to and during an acquisition.

3.4.1 The Unilateral Control of the Buyer

Question 7: *What are the processes preparing a good integration?*

A special strategy that was employed by the corporations was to dedicate one special team or department to the merger and acquisition, as suggested by five (5) respondents. They also freely declared having a specific integration process in three (3) answers. See Figure 3.8. Question 8 below describes more detail on the measures taken throughout the latter integration processes.

As we noted from question 6 (Section 3.3.2), the expertise of the acquiring company is involved early in the process. Four (4) respondents declared appealing to the persons in the company with the relevant expertise. Checking the intellectual property protection is also a prerequisite to any acquisition, as mentioned in three (3) answers.

Finally, the presence in board meetings comes naturally at an early-stage,

according to two (2) of the corporate professionals we interviewed.

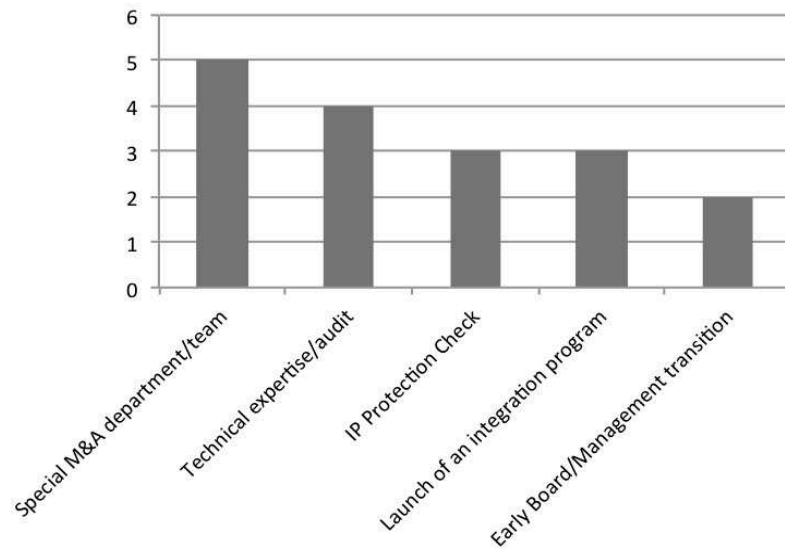


Figure 3.8. Actions before an Acquisition

3.4.2 The Integration as a Curative Process

Question 8: *What actions ensure a good integration?*

Four (4) out of seven (7) corporate representatives describing the actions implemented to ensure good acquisition integration put the stress on cultural aspects. Three (3) of them brought up the importance of the management style adaptation and the need for taking care of, strengthening or improving the acquired company's personnel capabilities.

Two (2) answers mentioned launching common projects as one good measure for committing the newcomers with the acquirer; taking the time for smooth transition was also cited by two (2) respondents.

The harmonization of processes is an important task, according to one (1) interviewee. The recourse to external specialized advisers or consultants is required according to one (1) answer. See Figure 3.9.

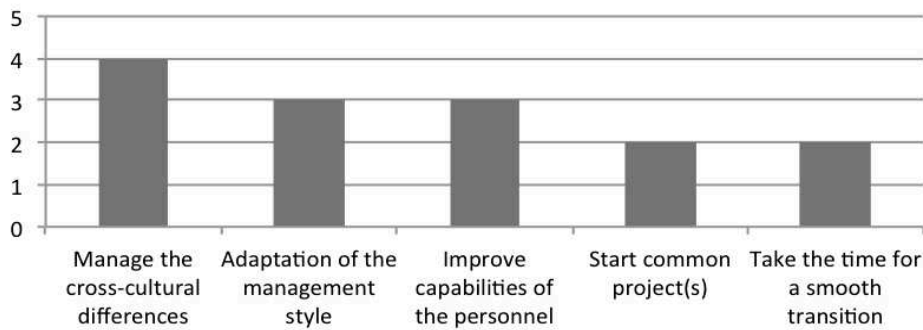


Figure 3.9. Post-Acquisition Integration Actions

3.4.3 Actions to Ensure Cross-Pollination

Although the MNC are willing to collaborate and care exists, we mainly noted the unilateral control of the buyer by the implementation of curative and corrective actions. Therefore, in a context of sustainable development, we would refer to the need for participation in a mutual integration to formulate the DMSQ: *Will the actions align with the objectives of the acquisition, to ensure both integration and cross-pollination?*

3.5 Measuring and Controlling

3.5.1 A Majority of Quantitative Tools

Our goal was to identify if the respondents had tools in place in order to measure their progress or improve their capacity. Almost all our respondents, twelve (12) out of fourteen (14), declared that they had some strategic tools in place when answering the Question 9: *Do you have a feedback process to improve your selection process? Please explain.* Although most of them included financial metrics, only four (4) interviewees specifically mentioned a financial tool. For example, three (3) respondents had a Gate system with specific criteria in place to validate (or dismiss) the continuation of the acquisition project.

Four (4) had a Quality Management System (QMS) as feedback system in place, and two (2) of specified an environmental focus (EMS). Another way for our respondents to assess their current practices is marketing research and Customer Relationship Management (CRM) analysis,

mentioned in four (4) answers. Finally, one (1) specified Six Sigma⁷ and the Governance, Risk Management, and Compliance (GRC)⁸.

3.5.2 Exploring the Qualitative Factors

Most of the tools used to validate an acquisition and to follow-up its integration provide quantitative measurements. Only a few involve qualitative factors or social-related considerations. Some examples of those tools include marketing research tools, such as customer satisfaction surveys. Other aspects that are worth measuring could include the level of motivation, personal development and skill building of employees. As we did not observe the measurement or support of these qualitative factors, we suggest the following DMSQ: *Will the tools evaluate the compliance of the acquisition objectives as well as develop the personal capacities of the individuals in the organization?*

⁷ Six Sigma is a management methodology developed by Motorola, setting high objectives and fine degree of data collection and analysis for the reduction of defects in products and services (Geoff 2001).

⁸ Governance, risk and compliance (GRC) is a set of practices aiming to increase the control on specific corporate management areas such as finance and risk, accountability, stakeholder and regulator relationships and communication.

4 Discussion

In this section we discuss our results, the Decision-Making Support Questions (DMSQ) and the related key findings, considering the methods from which they were obtained. We have outlined our discussion with a critical assessment and recommendations. Our structure is based on the outline suggested by Björn Gustavii in his book on how to write and illustrate a scientific paper (Gustavii 2005).

Even if during our interviews, we only found a minority of respondents expressing that merging with another company was the main solution for integrating an external innovation, we consider corporate acquisition of companies as one of the several different forms of cross-company collaboration. We found cross-company collaboration to be present in several legal forms, such as joint ventures and partnerships, in order to maximize the cross-pollination of knowledge and know-how and to “make it a win-win situation” (Tillberg 2012). As a result, we decided to explore the topic of acquisition as an opportunity. We noted some reasons were to share the harvest or a cost of an innovation, in order to reach the market faster.

4.1 Ill-Equipped Decision-Making on Sustainability

Considering the purpose of our research, which is to scrutinize acquisition strategies and their potential contribution to sustainable development. We have researched if corporate executives were well-equipped to make informed decision. We found out that there was an absence of a clear definition of sustainability and a lack of sustainability-related guidelines and objectives in both their selection parameters and their long-term vision. This aligns with several studies, such as stated in the 2011 Report of the Council on Emerging Technologies of the World Economic Forum - focusing on technological innovation selection, and the 2011 Verdantix 200 - CFOs survey results - focusing on the risks and opportunities related to sustainability in acquisitions.

We found that their definition of sustainability was mainly related to climate issues, such as greenhouse gas emissions. The majority of the

respondents believed the climate threat would change the future of business. We could relate these results to the Systems and Success level of the FSSD. However, we can identify a paradox. Our findings confirm, for example, MNCs to consider sustainability as ‘qualifier’ to accept or not to do business with another company. They even argue in favour of a more stringent regulation, particularly on water and energy use, but they do not embed sustainability in their strategy.

Our views are aligned with a recent article stating that sustainability was the ‘missing ingredient’ in strategy (Bonn and Fisher 2011). We also noted clearly that the sustainability goals arrive much lower in the ranking and are mainly related to image and brand value. We are concerned that corporations miss ‘connecting’ acquisition decision to full sustainability strategy. These are several potential consequences on the future of the corporation. We highlighted, for example, the risk of greenwashing in the Introduction, Section 1.2.

We would therefore illustrate the opportunity for an acquisition to potentially be a moment to re-align the corporate strategy towards sustainability. As we noted a relative lack of a clear definition of sustainability, we thought that the corporate decision-makers would benefit from the boundaries of the four Sustainability Principles (see Section 1.1.2) to ensure that acquisitions can move MNCs towards sustainability. There is a need for developing sustainability-related guidelines to maximize the opportunities for the MNCs.

4.2 DMSQs as a ‘Spiral’ in the Funnel

The funnel metaphor, as presented in Section 1.1.2, is a theoretical representation of the constraints of the sustainability challenge on the society. The compliance of society with the Sustainability Principles would support a transition from an unsustainable to a sustainable society, to eventually allow the resilience of the socio-ecological system, i.e. the ‘opening of the funnel’.

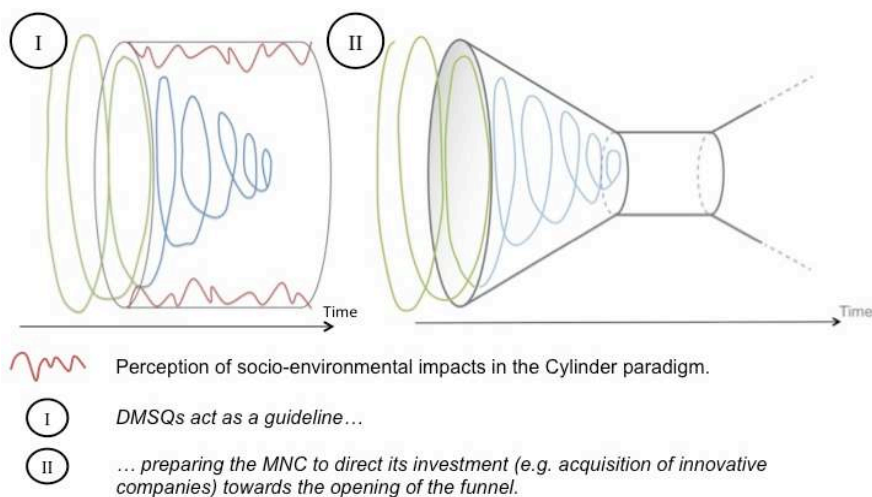
Our intent, mapping the information of our interview in a Generic Five Level Framework and comparing it with the FSSD, was to understand how the practices in the current practices could be complemented or adapted to

fit within this theoretical model.

The DMSQs ask about ‘a story within the story’: The ‘story’ of a MNC within the ‘story’ of the socio-ecological system. We assume that the DMSQs allow to energize a conversation between a sustainability practitioners and corporate decision-makers, or between corporate decision-makers. It might be too abrupt to put in question the current practices or explain straight forward about the ‘great threats’ of the sustainability challenge. We considered that asking questions could soften the dialogue with simplicity.

Why do the DMSQs potentially form a new strategic guideline? The DMSQs can either present a paradox to the respondents, inviting to a change of their practices, or produce an ‘a-ha moment’. An ‘a-ha moment’ defines the surprise of the respondent when they discover something particularly interesting or a valuable insight. In that case, when the respondents have an ‘a-ha moment’ after being asked a DMSQ, they realize that their current practices are not incompatible with sustainability.

On Figure 4.1, we represent the effect of asking the DMSQs as a vortex: The DMSQs were produced applying an ideal model to the current practices. This ideal model is based on a system perspective considering systematically increasing constraints on the socio-ecological system, which is also called the paradigm of the funnel (See Introduction, Section 1.1.4). Rather to make the respondents aware of these constraints upfront, the DMSQs lead them with the opportunity of combining current practices with a positive outcome for the society and the biosphere.



*Figure 4.1. DMSQs' transition role:
From opportunities awareness to paradigm shift*

The DMSQs basically do not change the current worldview of the corporate decision-makers. However, we think that suggesting sustainability proactive measures should level out the unknown walls of the funnel in order to prepare the implementation of a full sustainability strategy towards the 'opening of the funnel'. Therefore, this process intends to lead the corporate decision-makers to make a shift in their practices.

4.3 Recommendations

Today, some corporations are on the right track, and awareness of the opportunity to combine technological expertise is rising. More acquisitions could also be used to cross-pollinate other sectors in order to facilitate development and the diffusion on the market of sustainability-oriented innovative solutions. However, the corporations interviewed in our research do not have a clear picture of their systems; for example, they did not report considering resources as scarce and foresee the limits of the biosphere. Their decision-making process for acquiring innovative businesses could be enhanced by considering the four Sustainability Principles as a boundary. The guidelines and concepts of FSSD would help corporations to have a better understanding and full picture of the corporation as a part of society within biosphere. An affirmative answer to the DMSQs could trigger the

use of full sustainability strategy based on the FSSD guidelines and concepts.

4.2.1 Using the ABCD Planning Process

The ABCD planning process was developed for applying backcasting from principles of success. The principles, as described Section 1.6, are rules of the game, describing the four basic constraints of a sustainable society. We suggest a MNC complement its traditional forecasting, historical trends extrapolated into the future, with backcasting.

Backcasting is a strategic method consisting of asking what an organization should do today to achieve its vision. The backcasting from scenario is a planning method, which consists of building a representation of the future in order to inspire the direction of the steps to be taken (Robinson 1990). An example of backcasting from scenarios is assembling a jigsaw puzzle; you select the pieces in order to arrive at the pictures shown on the box. The Backcasting from principles is based on 'principles of success' allowing the planner to move towards the desired outcome only guided by 'rules of the game'. It favours creativity as it allows to chose what step are relevant to move forward, break free of the trends and avoid the complexity (Dreborg 1996).

With backcasting, an organization can envision a future perspective and overcome the gap between that desired future and the current reality. This helps to plan actions towards success. The benefits of using the ABCD planning process are that organizations, such as MNCs, can engage in a step-by-step way to avoid being part of the problem and taking non-coordinated measure. The ABCD helps to create a shared understanding, and can facilitate brainstorming and participation by various people (if conducted with groups of employees).

As we found only a minority of MNCs consider sustainability, the ABCD planning process could provide a practical way to combine the concept of backcasting from compliance with Sustainability Principles combined with the corporate vision of success when acquiring new businesses. MNCs could utilize this tool to help navigate the risks of not having a complete view on the potential ecological and social impact of an innovation, as well as to ensure the corporate executives take actions and select appropriately the companies to be acquired. Another benefit of the ABCD planning process is that it can help provide an overview of the corporation, clarify

short and long-term goals and aid in the decision-making processes that lead to appropriate allocation of the investment.

4.3.1 The ABCD Planning Process as a Selection Tool

Below is an example of how MNCs could use the ABCD planning process, in order to optimize their selection of potential targets for acquisition as part of an overall strategy to move the MNCs towards sustainability.

The planning session starts with the A-Step, building (a) a common ground and a shared mental model and (b) a vision for the entire MNC.

The B-Step invites the corporation to list their strengths, weaknesses and evaluate in what areas they are violating, and in what areas they are complying with the Sustainability Principles.

In the C-step, considering the future, the corporation brainstorms any and all potential solutions to close the gaps identified in the B-step. It could be, for example, a list of potential target companies for acquisition.

The D-step involves the strategic selection and prioritization of the possible measures produced during the C-Step. This prioritization process uses three questions. (For example, see below) Users of the ABCD planning process are advised to add their own prioritization questions, specific to the issues and context being explored (such as evaluation of potential acquisitions), to these three basic prioritization questions.

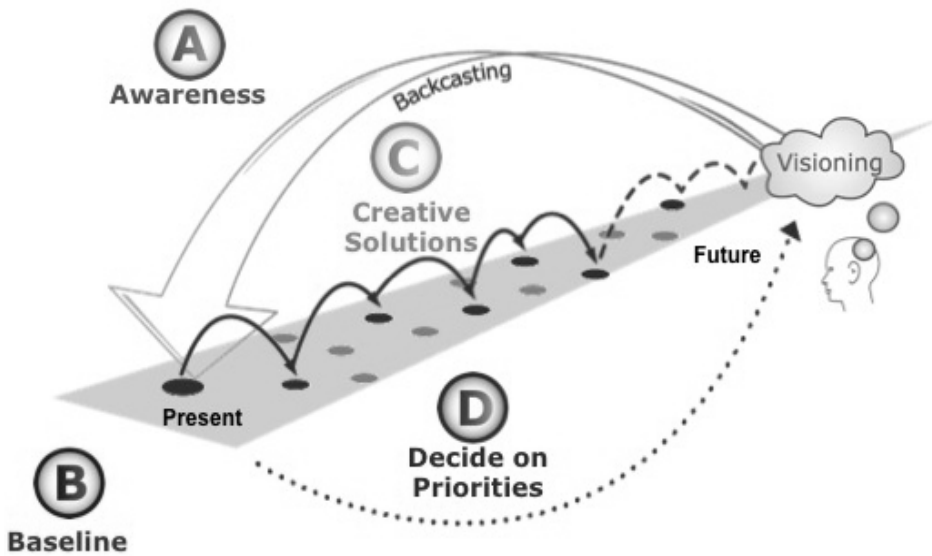


Figure 4.2. ABCD Planning Process (The Natural Step 2012)

Above, Figure 4.2 shows how MNCs corporations could use the ABCD planning process, in order to optimize their selection of innovative companies to acquire with the goal of moving the MNC towards sustainability. It would prioritize from the potential possible acquisitions, as actions, with the following recommended prioritization questions:

Does this action proceed in the right direction with respect to both the Sustainability Principles (as mentioned in section 1.1.6) and the acquiring corporation's objectives? Will this measure bring the MNC closer to sustainability and is our perspective broad enough socially and ecologically to determine this? (adapted from Holmberg and Robèrt 2000)

Does this acquisition provide a 'stepping stone' (flexible platform) for future improvements? Is this measure a platform for the next? (adapted from Holmberg and Robèrt 2000)

Is this action likely to produce a sufficient return on investment to further catalyze the process? Is the measure a low hanging fruit? (adapted from Holmberg and Robèrt 2000)

4.3.2 Key Findings in Relation to the Prioritization Questions

The corporate decision-making criteria, practices and examples were extracted from the interviews as our key findings. We scrutinized them from the perspective of the prioritization questions used in the ABCD.

Right Direction, towards the full compliance with the SPs: As highlighted in the McKinsey & Company Survey called “The business of sustainability,” (2011) the energy sector has the opportunity to increase its shareholder value by diversifying its portfolios. In that context, we observed that the energy sector was looking to acquire ICT companies that had developed ‘smart grid’ innovations, offering the opportunity to measure and adapt the use of energy. Such innovations can lead to dematerialization (Girshick et al. 2002). In this case, the dematerialization reduces the need for energy input (miniaturization) (Holmberg et al. 1999).

Cleantech can be an alternative to polluting techniques, processes and methods. Clean technologies mainly favour substitution; the concept of Substitution states that polluting materials (e.g. hazardous chemicals) “should be systematically substituted by less hazardous alternatives or preferably alternatives for which no hazards can be identified” (Greenpeace 2003, 7). We noted in our results, that renewable energy was represented by several of our respondents as being an opportunity to replace, for example, less eco-efficient means of electricity production for the corporations of the energy sector.

Dematerialization and substitution are part of the current trends towards ‘eco-efficiency’. The focus is ‘resource efficiency’ and financial savings which aim is to decrease contributions to violations of Sustainability Principles 1, 2, and 3.

‘Eco-efficiency’ was mentioned as a success factor and integrated our respondents’ definition of sustainability. See Figure 3.11. For example, dematerialization can decrease the need for mining of scarce material or fossil fuel extraction, while substitution can assist with the phase-out

technologies requiring the input of polluting materials or hazardous substances⁹.

Our results were influenced by the few business sectors represented in the majority of our interviews. As the Energy and ICT corporations we researched sustainability as a field of opportunities. Our results lead to the assumption that the integration of innovation can benefit the environment. This perspective could be contradicted if other research is performed in other industrial sectors.

Flexible Platform, the importance of 'Making the Turn': Some MNCs have the ambition of becoming total game-changers. Electrolux has, for example, the ambition to sell new generations of household-appliances, such as dishwashers washing with CO₂ instead of water (Ekblad 2012). This would be a breakthrough in the current technology. We also found that collaboration on information and communication technologies (ICT) to dominate the latest trends in several markets and different business sectors.

When analyzing our results of question 1 and 2, we could note that the majority of our respondents had been carrying on doing business since the last century. For example;

The director of a world-leading microprocessor manufacturer told us the corporation was created in 1968, a few years before the new kind of integrated circuit was spread (Eichenlaub 2012).

The vice-president of an international nuclear energy provider explained the creation of the corporation with the merger of two specialized firms seven years after the first civil nuclear plant was started, in 1958 (Moussavi 2012).

One of the informants related the case of a today world-renowned company that rolled-out a new kind of food packaging in the early 1950's and remained in a leading position so far (Nilsson 2012).

⁹ We use the *can* instead of *be* in this paragraph, considering the potential “rebound effect” after improving the resource efficiency. Read more about the “rebound effect” in Jevons W.S., 1906, *The Coal Question*, McMillan and Co.

A car construction company, today a multinational organization, was a spin-off of an early-developer of mechanical parts in 1926, corresponding to the beginnings of the industrial car production (Maresch 2012).

We also received the testimony of a representative of an organization built upon the legacy of Thomas Edison who developed lighting (light bulbs) and the first electric power station before 1890 (Enocson 2012).

A utility company started 155 years ago in France as Compagnie Générale des Eaux (Water treatment and water grid), and is today involved in four main activities: Water treatment and water grid, Transportation, Waste management, and Energy (Bertret 2012).

The Figure 4.3 illustrates that these corporations were early-entrants in their respective business sectors. They were able to grow and thrive by developing their core activity in an expanding market. These views on global development mechanisms have been described by economists under the concept of ‘development waves’ (Schumpeter 1949; Kondratieff 1984; Moody and Nogrady 2010) and can result in some dominant positions such as the case of Microsoft for operating systems of personal computers, holding 93,8% of the worldwide market in 2002 (IDC 2003).

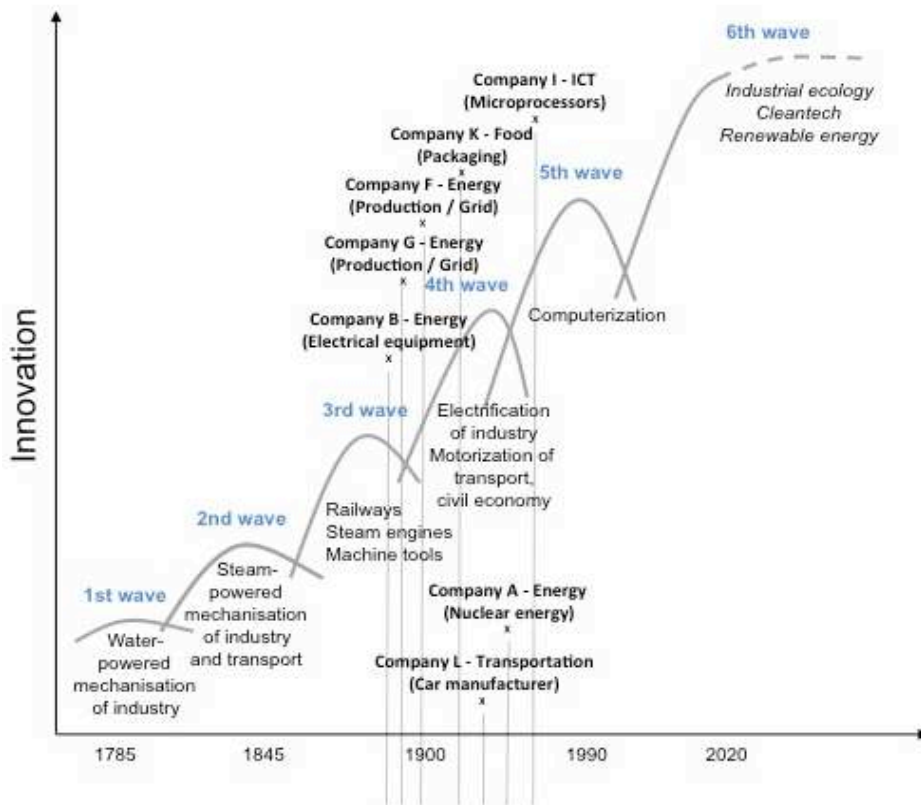


Figure 4.3. MNCs' Creation Dates Combined with 'Condensed summary of the long waves' (Freeman and Louca 2001, 141)

Corporate professionals know they have to adapt to an evolutionary context; while they continue to develop their traditional base, they are exploring new technological platforms. We heard about their diversification of new business opportunities. For example, according to our results, all industry sectors innovations are influenced by the rising concept of 'connectivity'. This consists of building information networks, not only between people, but also between connected devices at home and at work, as well as industrial systems involving people to people, people to machine, and machine to machine interactions. One ITC leader estimated that 50 billion devices would be connected to one another by 2020 (Maresch 2012).

Using the ABCD planning process, corporate decision-makers could explore innovations, such as new technological platforms, and combine them with their core businesses, thereby improving their processes or their products. The decision to integrate the knowledge of ICT companies can be

considered as a stepping-stone towards new forms of business, not just changing a core activity but potentially revolutionizing it.

The use of the ABCD planning process could allow for the choice of options that are currently less sustainable, yet which could work as a stepping stones towards much greater sustainability in the future. Corporate sustainability goals are very complex, as they are often both global and broken down to locally adjusted goals, which sometimes seem to contradict each other. For example, for one energy corporation, the use of renewable energy is standard for its operations in Sweden, whereas in China, it uses coal (Tillberg 2012). The reason behind this difference is the existence of different national, regional or local regulations and customer needs. This illustrates a reality where corporate management has different sustainability agendas according to the location of operation.

In the case of an energy Company operating in Sweden and China, dematerialization is not enough to produce a significant decrease in contributions to violations of the first sustainability principle; substitution would be necessary to phase out the use of coal used for producing electricity, but this would come at a high investment cost. The ABCD planning process is created to avoid the situation of inadvertently creating one new problem while trying to solve another (Holmberg and Robert 2000). Therefore, selecting a ‘low-hanging fruit’ likely to provide short-term return on investment is a sound option to secure a competitive position in the present, while moving towards alignment with the long-term goal.

Return on Investment, a multi-parameter driver in the context of acquisition: Prior to starting our research, we were under the impression that the acquisition process for corporations was a linear and focused solely on Return on Investment (ROI). A focus on financial drivers is confirmed throughout the literature, as without profit, the corporation itself cannot be sustained (Friedman 1970). Our research confirmed that the first selection criteria for success to acquire a corporation are financial ROI, profitability and growth. We found most corporations to have an extensive supply of quantitative tools; used for prioritization or feedback to better enable them to select acquisitions of innovative businesses. Examples of such tools include ones to estimate short-term and long-term benefit “discounted cash-flow models over a 5-year horizon” (Ekblad 2012). Some MNCs use a so-called ‘Gate’ system that sets “pass-level” conditions a potential acquisition must achieve (financial, research, market, etc.) in order to be targeted for

integration. (Moussavi 2012; Maresch 2012; Tillberg 2012).

We also researched if we could unveil a generic selection methodology to target innovations for acquisitions. Our results partially confirmed this assumption, yet gave us a more complete picture of the current reality. For the selection of innovations to target for acquisition, they perform benchmarking, mapping the complete competitive landscape surrounding the target innovation in several ways. For example, they consider:

- the maturity stage of an innovation (Enocson 2012),
- the market and the customer needs (Nilsson 2012),
- the horizontal business area and comparing it, internally, to their in-house technical capabilities (Tillberg 2012) for planning their ‘portfolio diversification’.

In the context of acquisition, interviewees mentioned ‘innovation height’ as the second most important drivers (Skyttvall 2012; Maresch 2012). We discovered that this second main driver consists of the potential significance of an innovation in the future. Acquiring a company that has ‘innovation height’ includes intangible benefit such as ‘capabilities’, ‘knowledge’, that could potentially contribute to achieve a greater ROI, which is the first benefit. The MNCs, in the specific context of acquisition of innovative companies, have also an extended definition of ROI, including the benefit of an external collaboration.

One of the most important success criteria mentioned by three of our expert panel and some of our respondents was creativity, passion and business savvy in combination. One could not exist without the other in order to succeed. Another success criterion is to have a leader or “CEO who want to and is willing to take the risk to make a change in the world, despite if it the change might cannibalize current business and income streams”. “You will make the road as you travel, and new business models will be invented as you go” Two great examples of leaders of our time are Leif Johansson and Håkan Buske” (Larsson 2012).

4.3.3 ABCD as an iterative process: Integrating an Acquired Company

We observed in our results how acquisition integration had changed from the old unsuccessful way to better ensure the collaboration and knowledge sharing with the acquired company (cross-pollination), in order to develop

innovation. Recent literature has shown showed the paramount importance of capabilities enhancement and leverage between the acquired and acquiring companies (Adolph et al. 2012).

We noted the recent progress of acquisitions to become a form of collaborative partnership between the acquired and acquiring companies. Some forms of acquisition allow a ‘delay’ in the integration to happen. In some cases this delay was as long as a few years (Ekblad 2012). We found the reason behind this ‘new collaborative way’ of approaching acquisitions was to minimize the risk of losing the small, innovative, passionate, creative company and its key staff, when merging with a large process-oriented corporation (Ekblad 2012). This had been the unfortunate result when most large corporations acquired small companies in the past (Ekblad 2012).

The ABCD planning process is iterative; it can be applied repeatedly and adapted to every purpose. Our recommendations above focused on the process of selecting potential innovations to target for acquisition. We showed how prioritization questions can aid corporate decision-makers development criteria for this process. We would also invite such decision makers to use the ABCD planning process for integrating the acquired business. This iteration would backcast from a vision of successful integration, whereas the first iteration would backcast from a vision of successful selection of appropriate innovations to target for acquisition.

4.4 Limitations

We were fortunate to obtain two or more interviews from both the Energy and ICT sectors. Our strongest sampling was from the Energy sector, in which corporations acquire innovations with a different focus that is different than the principal industry of the acquiring company. Due to the composition of the sampling, some of our conclusions are limited to the Energy and ICT sectors. Our reading of the literature, suggested that these two sectors are currently known for creating shareholder value from innovation and a redefinition of their business portfolios with a focus on sustainable development (Bonini and Görner 2011). Within the energy sector, minor differences remain, but do not significantly influence our conclusions. For example, one energy company had a different focus on innovation than the others in our sample, as it supplies electricity without producing it. As a result, they would acquire technologies related to energy distribution to customers, for example smart grid or various connection

devices.

Nonetheless, if the nature of the ‘external growth opportunities’ were different with regards to the sectors, the selection process for determining which potential acquisitions to target remained quite generic. This study is therefore useful in order to understand opportunities and threats to be taken into consideration.

We chose an inductive data analysis as a coding method. As a result, we made some assumptions. For example, for question 9 (Section 3.5) (*Do you have a feedback process to improve your selection process?*), such different interview responses as "improving the product" (Ekblad 2012), "quality control" (Bryant 2012), "quality feedback" and "Environmental Management System (EMS)" (Skyttvall 2012), or "Six Sigma" (Enocson 2012) were all coded to the same category (Quality Management System (QMS)). This resulted in our losing some of the quality and richness of the data. However, the advantage of this method was that it enabled us to provide to the reader with basic understanding (in this example) the kind of feedback tools used for improving the selection process. There is some difference indeed between interviews which lasted over two hours versus the shorter interviews of thirty minutes.

4.5 Validity and Confidence in our Results

Overall, we are confident that our knowledge of business and sustainable development has contributed to research that is relevant. Due to the combination of perspectives from organizations of many different industries, we could obtain generic results and thus extrapolate trends from all of them. Our interviews were conducted with fourteen professionals from management level, all knowledgeable of the process of acquisitions. The rigor of our methods and coding has furthered our ability to draw solid conclusions and feel confident. We do recognize the number of interviews is not large, but they do cover, with relative depth, five sectors, allowing us to see defining trends between the sectors, and allowing us to reach our initial research goal.

There may be bias in the data, given that a single researcher set up and conducted and transcribed the majority of the Swedish interviews in Sweden. Due to time constraints, we have not been being able to test and receive feedback about the prioritization questions.

5 Conclusion

Overcoming the sustainability challenge is an enormous, complex challenge. Success will involve each and every one of us collaboratively to make an impact and change. MNCs that include strategic sustainable development decision-making criteria can move wisely towards sustainability. While fully being able to see the opportunities and risks ahead, the MNCs can harvest the benefits and make a better selection of acquisition of innovative businesses to target for acquisition, in alignment with their most desirable future. The faster diffusion of smart and creative solutions faster can both contribute to the MNCs success and support society to become more sustainable. In order to ease the process of integration, we therefore suggest that acquisitions be supported with participatory process to ensure that personnel are invited to be part of designing the integration process.

Our research has revealed the goals pursued by the acquiring MNCs; using the acquisition of innovative companies and successful cross-pollination to enable improvements, adaptation to a changing environment and the appropriation of new capabilities. We have designed guideline questions for MNCs, to help uncover opportunities, risks and evaluate the relevance of combining the corporate goals with sustainability goals for the MNC, and prepare the implementation of a full sustainable development strategy.

Our thesis also recommends the use of the Framework for Strategic Sustainable Development (FSSD), as a formalized way to guide any corporation through its acquisition process. Our research suggests that the current corporate decision-making processes for acquiring innovative businesses could be complemented by use of the FSSD, Further we believe, this thesis could be used as a decision-making guideline in a process of acquisition of innovative businesses, which will help MNCs achieve a faster, easier and more effective transition towards sustainability.

5.1 Further Research

We noticed the growing interest of energy corporations have in innovative technologies related to the ICT field. BTH is a forefront academic and research centre on ICT and computer science. Future research could explore how cross-sector participatory processes associating ICT-knowledgeable students with professionals in a specific sector, e.g. Energy, could lead to

the creation of smart solutions.

In our study we wondered why a corporation would take the risk of not having a complete overview and detailed strategy related to how sustainability will affect the corporation from a risk management perspective, knowing it will affect them. Perhaps this could be answered in future studies.

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Appendices

Appendix A

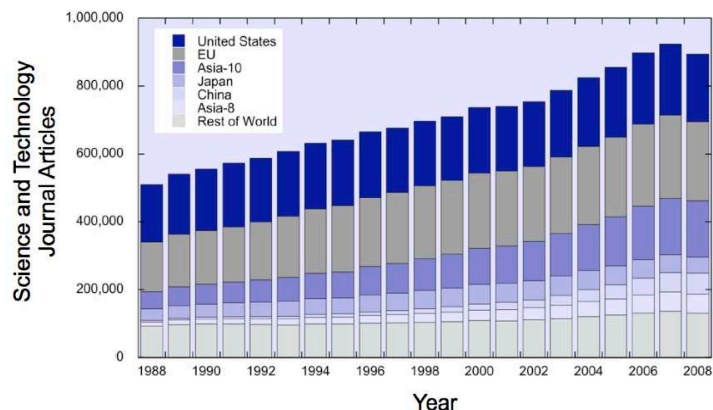


Figure 4: Trends in Worldwide Publication of Science and Technology Journal Articles, 1988-2007
Source: Science and Engineering Indicators 2010, National Science Foundation.
<http://www.nsf.gov/statistics/seind10/start.htm>. Accessed 7/27/10

Appendix A. Figure 1. Trends in worldwide publications in Science and technology journal (Source: World Economic Forum)

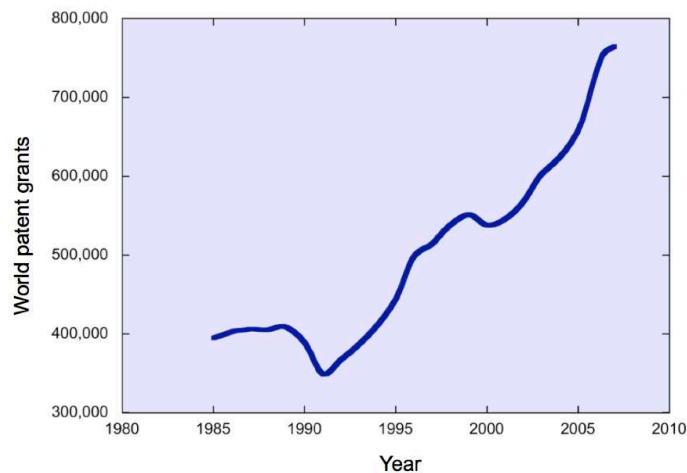


Figure 3: World Patent Grants, 1985- 2007
Source: World Intellectual Property Organization. <http://www.wipo.int/ipstats/en/statistics/patents/>, accessed 7/27/10

Appendix A. Figure 2. World Patent Grants 1985-2007 (Source: World Economic Forum)

Appendix B

Appendix B. Table 1. Interviews

Organization	Countries	Sector	Subsector	Name	Position
ABB	Sweden	Energy	Electrical equipment	Tomas Lagerberg	Research Manager, Automation Technologies
Areva	France	Energy	Nuclear energy	Mehdi Moussavi	VP Partnerships
Dreampark AB - Motorola	USA	ICT	Telecommunication	Per Skyttvall	Former CEO Dreampark AB, acquired by Motorola
E.ON	Germany	Energy	Production / Grid	Göran Tillberg	Research & Development and Environmental Affairs
Electrolux	Sweden	White goods	Household appliances	Mats Ekblad	Director Advanced Development, Global R&D Food Preservation at Electrolux
Ericsson	Sweden	ICT	Telecommunication	Johan Maresch	Innovation strategist and change agent at SilverSpets AB former Business Innovation Director at Ericsson
GDF Suez	France	Energy	Production / Grid	Vincent Bryant	Director
General Electric	USA	Energy	Production / Grid	Hans Enocson	President & CEO Nordic Region and Balticum
Intel	USA	ICT	Microprocessors	Stephen Eichenlaub	Managing Director, Intel Capital at Intel Corporation
SITRA	Finland	Energy	Investor	Jukka Noponen	Energy Programme Director
Tetra Pak	Sweden	Food	Packaging	BG Nilsson	Ret. Director Corporate technology
Vattenfall	Sweden	Energy	Production / Grid	Karl Bergman	Vice President Research & Development Projects
Veolia	France	Energy	Production / Grid	Julia Bertret	Innovation project manager
Volvo	Sweden	Transportation	Car manufacturer	Johan Maresch	Innovation strategist and change agent at SilverSpets AB former Business Innovation Director at Ericsson

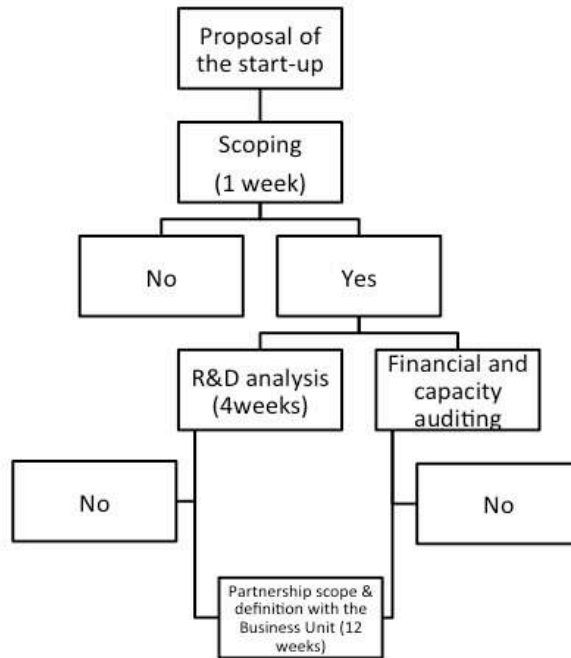
Appendix B. Table 2. Panel of experts

Organization	Countries	Category	Name	Position
Mobile Heights Business Centre	Sweden	Innovative business	Marianne Larsson	Director of Innovation at Teknopol. Director of Mobile Heights Business Centre. Former Business Development Manager at Tetra Pak and Alfa Laval
Stable Table	Sweden	Innovative business	Lena Henningsson	Director and Owner Former Managing Director Tetra Pak Ireland
Telecom City	Sweden	Innovative business	Michael Soderlund	
Verteego	France	Innovative business	Jeremy Fain	CEO
Svenskt Näringsliv	Sweden	Business expert	Lars G. Johansson	Executive Vice President Former Senior Vice President Electrolux
The Royal Swedish Academy of Engineering Sciences	Sweden	Experts, Innovation	Johan Carlstedt, Jan Westerberg	Project Manager & Communication

Appendix B. Table 3. Interview Protocol

Questions	5-LF Level	Why do I need to know this? (i.e. How can the answer to the interview question help us get the information relevant for MNCs' optimization of acquisition of innovative companies?)
What is the innovation defining your core activity and when was it implemented?	System	To evaluate the porosity of MNCs' 'innovation development pipeline': Has this MNC based its development on a fundamentally traditional industry? Or has the MNC combined its original expertise with new capabilities to evolve?
What innovations are relevant for your industry now?	System	To evaluate if some business sectors currently need cross-pollination from other field of expertise.
Do you think your selection criteria would change in the next 20 years? Please explain why and how.	System	To evaluate if the MNCs currently anticipate long-term changes.
What are the top drivers for your corporation to acquire an innovative company?	Success	To find some MNCs' success criteria to potentially add to an optimized decision-making tools. Is there any overlap with sustainability, with the 4SPs? Do they think strategic, i.e backcasting from success?
As a corporation do you have a definition and criteria for sustainability?	Success	To explore MNCs' current sustainability-related criteria for decision-making and their definitions of sustainability in general: What do they know and what do they think about Sustainability? How does that affect their decision-making?
Do you have a decision-making process, methodology or tool for selecting an external innovation? Please explain.	Strategic	To check whether MNCs currently use methodologies or tools in order to increase the success rate of acquisitions.
What are the processes preparing a good integration?	Actions	To explore upstream business practices for preparing the integration of acquired companies.
What actions ensure a good integration?	Actions	To explore business practices for integration of acquired companies: Potential actions that the corporation considers as good for post-acquisition integration.
Do you have a feedback process to improve your selection process? Please explain.	Tools	To identify relevant criteria to measure the performance and improve the integration of an acquired company.

Appendix C



Appendix C. Figure 1. Acquisition selection process (Bertret 2012).