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**SCHOOL OF BUSINESS, ECONOMICS AND LAW**

## **Growing Ideas with Radical Innovation Potential**

Kamran Taherian

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Master of Science in Innovation and Industrial Management

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Supervisor: Rick Middel

## Growing Ideas with Radical Innovation Potential

By Kamran Taherian

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© Kamran Taherian

School of Business, Economics and Law, University of Gothenburg, Vasagatan 1, P.O. Box 600, SE 405 30 Göteborg Sweden

And

Volvo Technology

Götaverksgatan 10, SE – 405 03 Göteborg - Sweden

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Contact: [jonas.thorngren@volvo.com](mailto:jonas.thorngren@volvo.com)

## **Abstract:**

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Generating ideas with radical or incremental innovation potential can be considered as the tip of an iceberg. The tough part is supporting, refining and advancing ideas toward innovation. One major barrier which prevents ideas from turning into radical innovations could be the lack of proper selection criteria or settings. Another barrier is considered to be that different types of ideas are treated with the same implementation process. In order to contribute to the understanding of the implementation phase of the radical innovation process in academia and large firms, this research was carried out at Volvo Technology, a Business Unit considered as an Innovation Catalyst within the Volvo Group. The purpose of this thesis was to explore how large established firms (multiple case studies) define, evaluate and implement ideas with the potential to be radical innovation. The final contribution of this thesis was to assist Volvo Technology in identifying and choosing a safe landing ground for survival of ideas generated from Innovation Jams with radical innovation potential within the Volvo Group structure.

**Keywords:** Radical innovation, Selection, Implementation

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***Kamran Taherian,  
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This paper represents the master thesis of the program in Innovation and Industrial Management in School of Business, Economics and Law of Gothenburg University. It was carried out at Volvo Technology, a business unit within Volvo Group that operates as an innovation company, partly as a research institute with limited customer base (appendix 1).

## 1. Introduction

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CEOs and business leaders around the world are concerned about their business when they see their products and services are becoming commoditized (Business week, 2006). Also, facing slow growth and global competition has urged CEOs to consider new sources of competitive advantage for their corporate success (Sawhney et al., 2006). One key element of competitive advantage earlier stated by Porter (1990) could be innovation. Innovation usually has different types and implication to different organizations, and one definition of it could be “successful commercial exploitation of new ideas” (Dodgson et al., 2008). Furthermore, O’Connor et al., (2008) extensive research in large firms showed that innovation is more like a journey rather than a single event and the more experience companies gain, the faster the journey become. So is the case for Volvo Technology (sometimes referred to as VTEC) trip toward developing radical innovation.

### 1.1 Background

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Innovation can take place at an individual level (improvement), at functional level (process improvement), at company level like an entire value chain (radical product / service innovation and new business models), and at industry level (technology breakthroughs) (Edquist, 1997). Industry life cycles usually start with radical innovation then follows a learning curve. Following a radical innovation, companies start to improve their innovation performance (incremental innovation) then, they compete on market segments after that, supply chain, marketing, design would play role and finally competition enters the complementary stage. Meanwhile, there is always a possibility for technology shift (Davila et al., 2006).

In today’s environment of rapid changes, firms cannot rely on incremental innovations (step by step improvement) alone. Because incremental innovations can only enable large companies to remain competitive in short run, but radical innovations can change the game and lead to long-term growth (Leifer et al., 2001). It has also been claimed that radical innovation is critical to the long-term survival of many firms because they provide the foundation for future generations of products or services (McDermott and O’Connor, 2002).

On the other hand some companies are experiencing deteriorating growth rates and face situation like “squeezed most of the juice out of lemon” then the reality is that incrementalism is not going to solve any problem (Skarzynski and Gibson, 2008). Radical innovations not only have an impact on firms, they also affect society and customers, since they are the engines of economic growth and sources of better products (Chandy and Tellis, 2000). Thus, to sustain a long-term competitiveness, firms need to generate radical innovations; otherwise decline is inevitable (Hamel, 2002). In general, radical innovation adopted in the academic literature and management practice to identify projects

whose objectives are to create new lines of business for companies (O'Connor and McDermott, 2004).

However, it is rare to find large established firms to create radical innovations, whereas most recent radical innovations seem to originate from small start-ups (Markids and Geroski, 2005). Researchers have devolved into the underlying reasons of why large firms are less successful than small firms. Lack of an innovation strategy, lack of distinction between invention and innovation, inappropriate expectations for radical innovation, inappropriate process, risk barrier, lack of value chain capability, out-of-the-box thinking and lack of breakthrough ideas are all listed as challenges of large established firm to develop radical innovations (Assink, 2006 and O' Connor et al., 2008).

In order to tackle one of the stated challenges in large firms "lack of ideas", Volvo Technology as an innovation catalyst in Volvo Group has developed an event called Innovation Jam (originates from IBM). The purpose of the event is to involve employees around the world in an idea generating and sharing event, to gain most out of diversity and cross-functional collaboration among employees while **generating new ideas** with the potential to be incremental or radical to Volvo. The main issue lying here is how one can define and distinguish between incremental and radical type of ideas generated during an Innovation Jam. Because differentiating radical and incremental type of innovations projects by applying right metrics is crucial in any kind of innovation process (Bessant and Tidd, 2009 and Christensen et al., 2008).

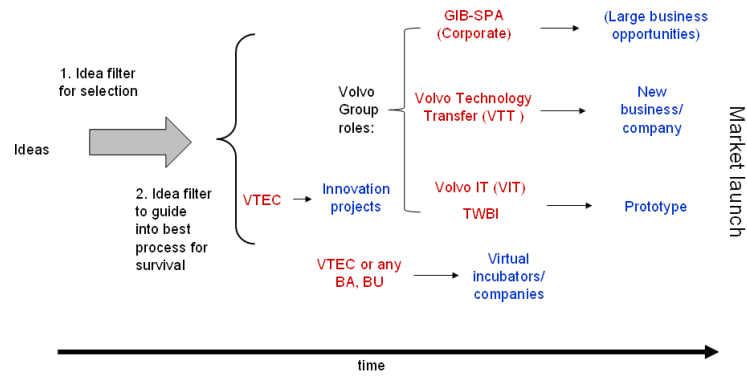
Further, as Edward Bevan the vice president for innovation in IBM (founder of Innovation Jam) said "Idea generation is in some ways the easy part – and darling star child-of innovation, whereas implementation, refining and building support for those ideas is really the tough part", and further noted "the online portion of the Jam is rather the large tip of an iceberg" (Bjelland and Wood, 2008). To build support and advance the ideas, companies depending on their own organizational structure might have different landing ground for an idea to be further developed.

For instance, picture 1 displays a snapshot of some possible landing ground for an idea within Volvo Group. As one can see, different business areas (like Volvo Trucks) or units (like Volvo 3P) can become the owner of ideas. One option would be delivering an idea to Volvo Technology Transfer (Corporate Venture organization within Volvo Group); or asking Volvo IT to develop a prototype for some IT related concept. Moreover, there are some corporate resource functions such as GIB-SPA<sup>1</sup> to take care of big opportunities within soft product, or GIB-T for technological opportunities. Finally, VTEC can invest in an idea through innovation projects, or later through virtual incubators.

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<sup>1</sup> Volvo Group Issue Boards (GIB) is established with the purpose of driving synergies and accelerates the pace of change within the Volvo Group. A Group Issue Board is chaired by members of the Group Executive Committee (GEC) who determine the membership of the GIB from the different BA/Bus (Volvo Group). GIB- SPA: Soft Products and Aftermarket.





**Picture1:** (Possible path for the Implementation of ideas within Volvo Group)

Therefore, for Volvo Technology and the team running the Innovation Jams, it is first crucial to know how to identify and select the ideas with radical innovation potential from the incremental ones. Secondly, it is highly important **where** potential radical ideas can **land** in Volvo Group structure to be further developed. Such understanding can be supported by studying two main issues of selection and implementation of radical innovation within large firms that has already been discussed in literatures as the challenges for the survival of radical innovation projects in large firms.

## 1.2 Purpose

Ultimately, the purpose of this study is to create an understanding of how ideas with radical innovation potentials can grow in a large firm. To do so, the paper first is going to explore how ideas can be identified and selected as radical innovation potentials. After that, in order to give a good picture of possible methods to implement ideas with radical innovation potential within a firm, different corporate entrepreneurship settings and processes will be explained. Further, they will be supported by snapshots taken from other large firms as multiple case studies in the empirical chapter.

### 1.2.1 Research Question:

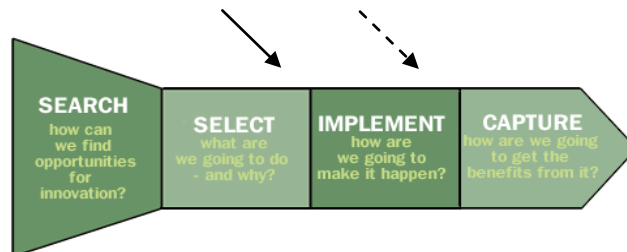
To achieve the purpose of this thesis the following research questions need to be answered.

- ***What would be an appropriate process for Volvo Technology to grow ideas with radical innovation potential generated from Innovation Jams?***
  - How can the ideas with radical innovation potentials be selected?
  - How can the ideas with radical innovation potentials be implemented?

### 1.3 Delimitations:

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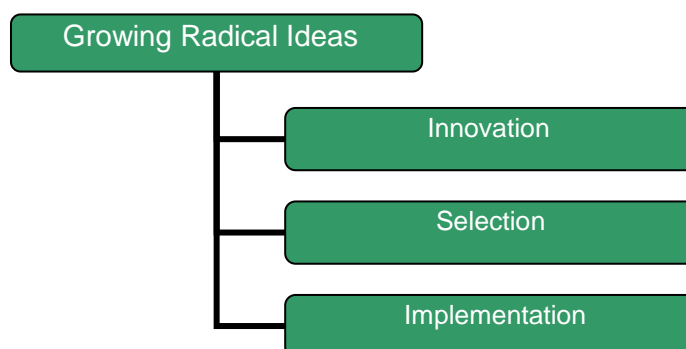
Innovation has been considered as a process (Picture 2) among companies starts with identifying opportunities by searching for ideas, selecting the right ones, implementing and finally capturing value from them in the market (Bessant and Tidd, 2009).



**Picture 2:** Innovation Process (Bessant and Tidd, 2009)

Since Volvo Technology already has the Innovation Jam in place as one method for capturing new ideas, searching methods for opportunities within an innovation process is out of this paper scope. Another aspect not addressed in the paper is the methods for capturing benefit or commercializing innovation in the market. In contrast, this research is mainly limited to selection (main emphasis) and implementation tools, so as to assist Volvo Technology as an innovation catalyst within Volvo group in making a proper decision for selecting the right path for ideas. Finally, it is important to note that this paper is trying to have a process focus and tries to exclude strategies discussion of radical innovation out of its scope.

In conclusion, the paper will have three main findings as Innovation, Selection and Implementation (picture 3) and hopes to end with an understating of how ideas with radical innovation potentials can be identified and implemented within a large firm.



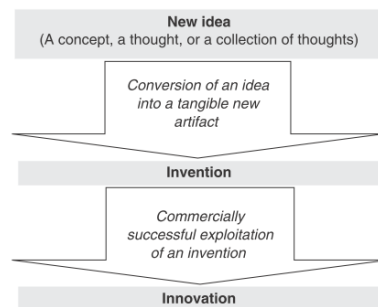
**Picture 3:** Main Findings Structure

## 2 . Theoretical Framework:

*The purpose of this chapter is to outline the theoretical framework for the present paper. This chapter has been divided into three main sections as Innovation, Selection of Radical Innovation project and finally Implementation.*

### 2.1 Innovation:

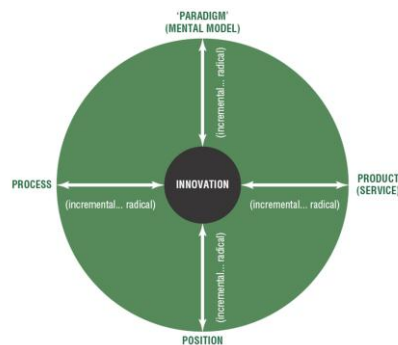
One of the problems of managing innovation is, understanding what we mean by ideas, invention and innovation. Therefore, it is essential to define the concepts “idea,” “invention” and “innovation.” For example Product Innovation starts with new ideas that could be a concept, a thought or a collection of thoughts and an idea becomes an invention when it is converted into a tangible artifact (Trott, 2002) (see Picture 4). As long as customers regard the idea as new, it is an innovative idea, even though it may not be “objectively” new. So, as Rogers (1983) and Robertson (1971) noted, the key issue in determining the novelty of an idea is customer perception.



**Picture 4:** Product Innovation (Trott, 2002)

Innovation can have more aspect than product for instance; Bessant and Tidd (2009) considered four dimensions toward the change that innovation entails and called it four Ps of innovation (Picture 5):

1. **Product innovation:** changes in product and service offerings
2. **Process innovation:** changes in the delivery of product and services
3. **Position innovation:** changes in the context of product and services offerings
4. **Paradigm innovation:** changes in the business model of an organization.



**Picture 5:** 4 Ps of Innovation (Bessant and Tidd, 2009)

As picture 5 shows, a firm can deal with four change dimensions that understanding each can assist them in identifying what type of idea has been generated. Secondly, for each dimension there is a radical and incremental change domain (arrows) (Examples in Table1).

<b>Innovation</b>	<i>Incremental</i>	<i>Radical</i>
Product	Windows XP, Vista, 7	TOYOTA Pirus, LED TV
Process	Fixed line telephone services	Skype, eBay shopping
Position	Low Cost airlines Ryan air	Tata Nano: bottom of Pyramids
Paradigm	IBM service shift	Rolls-Royce power by hour shift

**Table 1:** 4Ps Examples (Bessant and Tidd, 2009)

Therefore, 4P of innovation can create a good picture of type of ideas are generated in a firm.<sup>2</sup> However, to provide a landing ground to a stage where ideas can stand up for themselves, companies should treat incremental and radical ideas differently (Bessant et al., 2009). Thus, understanding if an idea entails radical change is highly important for a firm.

### 2.1.1 Radical Innovation:

Skarzynski and Gibson (2008) stated an idea is radical if it passes one of the following questions:

1. Does it have power to dramatically reset customer expectations and behaviors?
2. Does it have the power to change the basis for competitive advantage?
3. Does it have the power to change industry economics?

And Leifer et al. (2000) and O'Connor and McDermott (2004) define a project as radical innovation when it entails one of the below points:

- 30- 50 % significance in cost reduction
- 5 – 10 % improvement in features
- New to the world or market performance features

Moreover, radical innovations may disrupt the position of established firms (disruptive) and create opportunities for new firms to enter the market and overtake incumbents (Christensen, 1997). But it is good to note that only 6 to 10 % of all innovation projects could be disruptive (Ettlie, 1999). Finally, the research of O' Connor et al., (2008) identified different terms large firms apply for an innovation project, depending on the uncertainty level of an idea (Picture 6).

<sup>2</sup> There are more dimensions to consider for innovation that for the sake of simplicity are just provided in Appendix 2.

Innovation Categories			
<i>Degree of Uncertainty and Ambiguity</i>			
	<i>Relatively Low</i>	<i>Moderate</i>	<i>High</i>
Company 1	Horizon 1	Horizon 2	Horizon 3
Company 2	Making the most of what we have	Getting new business	Breaking new ground
Company 3	Incremental	Platform	Breakthrough
Company 4	Today	Tomorrow	Beyond
Company 5	Incremental	Major Improvements	Step-outs
Company 6	Incremental	Substantial	Transformational
Company 7	Business unit projects	CEO projects	Advanced technology programs
Company 8	Incremental	Longer term	"We don't have a clue"
Company 9	Aligned	White space projects	Gray space (multialigned)

**Picture 6:** Innovation categories (O' Connor et al., 2008)

However, as already mentioned radical, breakthrough, discontinuous, step out, horizon 3, gamechanging innovation are all labels adopted in the academic literature and management practice to identify projects whose objectives are to create new lines of business for companies (O'Connor and McDermott ,2004) and so is the case for Volvo Group.

## 2.2 Selection of radical innovation projects:

One of the most crucial tasks in innovation process is selecting the right ideas with potential to be radical innovation to a firm, since firms resources are limited to bet on all ideas (Bessant and Tidd, 2009). Hence, the following chapter is going to address the theories like uncertainties, selection tools and metrics that can assist firm in deciding over the right ideas with the potential to be radical.

### 2.2.1 Uncertainties:

In developing radical innovation, firms deal with unknown – unknowns (Dodgson et al., 2008). To make unknown, known Davila et al., (2006) mentioned, companies can perform ignorance management- meaning that firms should understand the uncertainties that an idea entail. Therefore, asking relevant questions could help firms in finding what they don't know and assist them in realizing different kind of uncertainties they are facing with radical innovation projects. For instance, Skarzynski and Gibson (2008) proposed some questions to ask in judging over ideas with high novelties:

#### Size:

- How radical is the ideas?
- How big or important could it be?
- What kind of impact it could have on the customers, on the competition, on the whole industry?
- How big is the potential market?
- Would customers actually want it?
- How much would they care about it?

## Feasibility

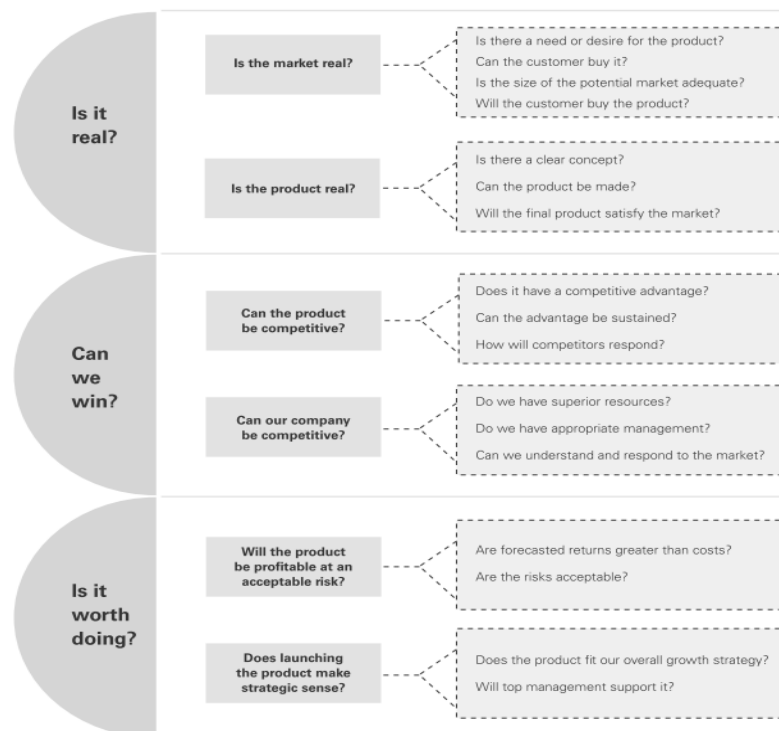
- How feasible is this?
- How mature is the technology?
- Do we have the resources, the competencies, the capabilities to make this happen, or can we get them somewhere else- that is, through partnership?
- Do we have the distribution channels to bring this to the market?

## Profitability:

- Can we actually make it profitable?
- What sort of revenue might these ideas generate?
- What are the costs involved?
- What sort of margin can we put on this?

## **Real-Win-Worth Screen(R-W-W):**

Additionally, The Real, Win and Worth Matrix (R-W-W) (Picture 7) could be used against innovation concepts not as an algorithm for go/no-go decisions. Whereas it can be employed at multiple stages to expose faulty assumptions, gaps in knowledge and potential sources of risk, and to ensure what possible improvement needs to be explored. R- W-W screen is divided into six questions that saying no to any of them may jeopardize the success of the single project (Day, 2007).



**Picture 7:** R-W-W Screen (Day, 2007)

### **Business Model:**

Another perspective that can be considered in order to see what type of uncertainties one is facing with an idea could be a business model. Because when an idea is developed it should be wrapped with a business model for capturing value. Therefore, identifying the unknown elements of a business model can assist an idea generator or a firm to see in which areas they need to seek for more information.

- What: What problem an idea is going to solve?
- Why: Why a firm should resolve this problem? (Resources, assets, capabilities?)
- Who: Who is the customer?
- Where: Where the product or service is going to be offered?
- What price: What would be the cost structure?
- How: How are we going to do it? (Key resources, activities, customer relationship...)  
(Coles & Mitchell, 2004 and Osterwalder and Pigneur, 2010)

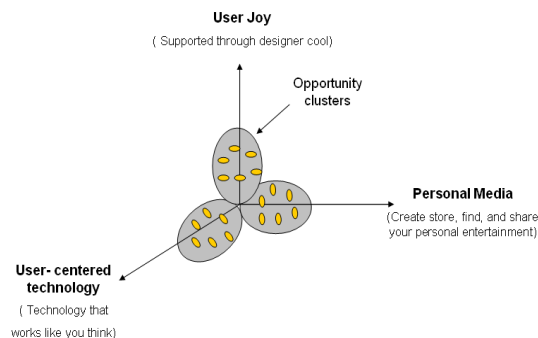
Applying the above question, R-W-W matrix and business model perspective might illustrate some uncertainties that an idea entail. However, finding an answer to the above questions is not an easy task and it requires some tools to assist firm further. Therefore, in the next section, tools that can help firm make some unknowns – known are going to be addressed.

### **2.2.2 Selection tools:**

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#### ***Innovation Architecture:***

In case of selecting radical innovation projects, firms normally employ subjective or heuristic methods which are mainly based on the innovation strategy of a company to evaluate the ideas (Davila et al., 2006). Defining an innovation architecture which normally consists of 3 or 4 vectors that display the direction to transform a firm existing business model or reinventing the rules of its industry can assist companies in choosing the right ideas, like Apple co. in picture 8 (Skarzynski and Gibson, 2008). Therefore making innovation architecture not only can help firm choose the ideas in line with their mission, but also can help to group relevant ideas according to their innovation architecture. In general, innovation architecture can direct the innovation effort of large firms toward certain platforms.



**Picture 8:** Apple Co. Innovation Architecture (Skarzynski and Gibson, 2008)

### Scenarios:

One interesting tool that may help companies in identifying their vectors in their innovation architecture could be developing scenarios.

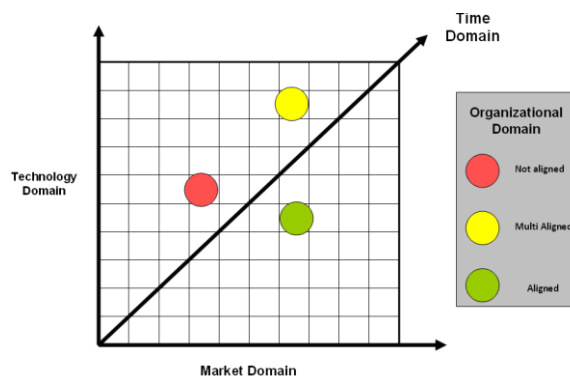
Scenarios are alternative plausible futures that have inputs from quantitative and qualitative assessments such as societal, technological, economic, environmental, legal and political drivers. Scenario building, using metaphors, storytelling and vision building in a cross sectional fashions are used by companies like Shell (GameChanger), BMW, Nokia and Whirlpool in order to create a sense of unease – a burning platform from which the new directions forward can be developed (Bessant and Tidd, 2009). Besides, scenario-based approach is an effective way of creating and exploring futures to help firms manage their ignorance (Stamm and Bessant, 2006) and it could be a useful tool for testing assumptions with high uncertainty (Strauss and Radnor ,2004). Scenarios not only assist firm in deciding over the vectors of their innovation architecture, but also can foster a shared understanding among employees or executives by envisaging a future exercise (Garvin and Levesque, 2006).

### Portfolio Management:

Another important tool that O'Connor et al., (2008) research about breakthrough innovation identified is portfolio management. Such can be beneficial for the firms to map the novelty level of ideas.

Portfolio management is normally considered as an important tool in creating a picture of different types of projects a firm is dealing with. Cooper (2001) identified the following problems when there is a lack of portfolio management in innovation projects: *No limit to projects taken, reluctance to kill- off projects, lack of strategic focus on project mix, weak selection criteria, and weak decision criteria.* Thus, balancing a research portfolio is one of the important tools that can be considered for managing technological innovation (Dodgson et al, 2008). Such could also be relevant when a company is dealing with different type of ideas in an Innovation Jam.

For instance, O'Connor et al., (2008) considered **Market**, **Technological**, **Organizational Fit** (fit current BU, fit with multiple BUs or not aligned with any BUs) and **Time** as major domain for a portfolio of radical innovation projects (Picture 9).

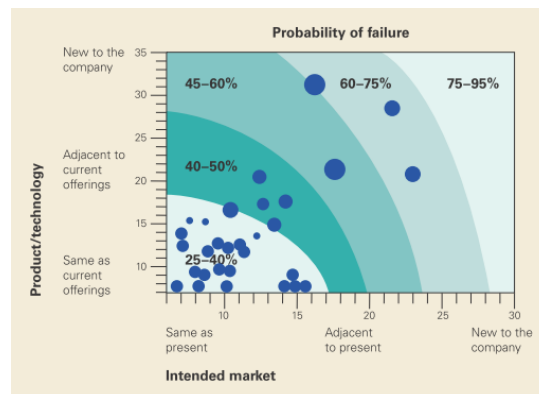


Picture 9: Portfolio Management derived from (O' Connor et al., 2008)



### ***Risk Matrix:***

Day (2007) research over innovation projects identified the Risk Matrix that display the risk level of innovation projects in a company. As picture 10 displays, X axis is dealing with market and Y with technology novelty. Also, the size of each dot shows the expected revenue of a single project. Finally the layers with percentages are displaying the potential failure percentage of a project. Further, Day (2007) developed a questionnaire (Appendix 3) in order to identify where a single project stands on a Risk Matrix.



**Picture 10:** Risk Matrix (Day, 2007)

The outcome of portfolio management and Risk Matrix might show the level of the uncertainty or novelty of an idea on technological, market and revenue potential. But it is highly important to see in which stage of an innovation process firms can answer those questions (Appendix 3). Last, based on the outcome of a portfolio, a firm might use different terms for specific ideas as explained in chapter one (innovation) (Picture 6).

In general, the Risk Matrix is very similar to the portfolio explained in picture 9. However, there is an option to consider the organizational fit by the color of the bubbles in the Risk Matrix and add a time dimension to it. As a result, one can arrive to a portfolio that has five dimensions of Technological, Market, Revenue Potential, Organizational Fit and Time.

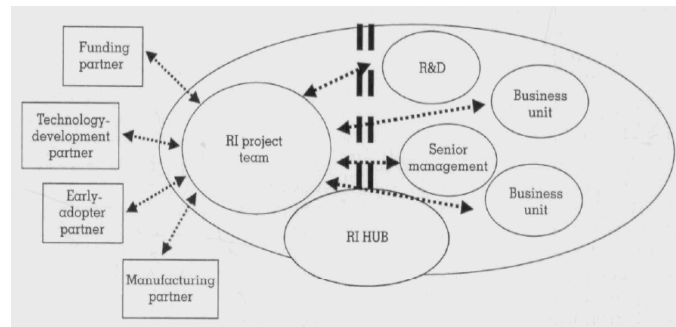
### ***Selection practices:***

Finally, Bessant et al., (2010) has identified some selection practices among large firms. First the application of alternative decision making pathways such as the internal idea market- where ideas can be traded through virtual stock market and open evaluation platforms. Then, they identified the principle of "crowd sourcing" made by an aggregation of employee's opinion with different backgrounds for the selection of ideas in firms. Last "Dragon's Den" approach by inviting the senior managers or external entrepreneurs and potential investors to evaluate the concepts generated in a firm.

Another interesting area that firms can consider in evaluating the ideas is applying the role of hubs explained by Leifer et al., (2001), such is also in line with crowd sourcing and Dragon's den approach already explained.

### 2.2.3 Innovation Hub:

As explained already applying a subjective judgment for selecting high novelty ideas is very common within firms. To do so, Leifer et al., (2001) identified the “*innovation hub*” to serve as a repository for cumulative learning. The hub sits at the interface between the radical-innovation project team and key internal and external stakeholders (Picture 11). A hub establishes radical-innovation project-management systems, refines them through cumulative experience, and then helps teams implement those (Leifer et al., 2001).



**Picture 11:** Innovation Hub (Leifer et al., 2001)

#### ***Multi Criteria Assessment (MCA):***

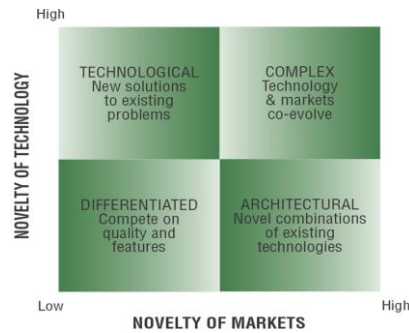
Moreover, Dodgson et al., (2008) mentioned that managers in radical innovation projects deal with unknown unknowns and they need to have the ability to adapt, change and learn in these projects. One cross functional technique that can be used for making unknowns, known is MCA that is used in early stages of innovation process for evaluating research programs. The MCA usually has a facilitator who does not play in defining the criteria, weightings or voting on particular options. She or he mainly encourages brainstorming and presenting the results (more info in Appendix 4).

#### ***Delphi:***

Delphi is a qualitative approach based on eliciting, coordinating and synthesizing expert opinions and can be used when there is a great deal of uncertainty for long term horizons. The choice of experts, area and level of their expertise, and structuring the questions are very important. Some involve suppliers, dealers, customers, consultant and academia. Also, experts in non-technological fields are involved to make sure trends in social, environmental fields are not overlooked (Bessant et al., 2009 and Dodgson et al., 2008).

#### ***Steering an Innovation Hub:***

Deciding who to invite in a hub by applying MCA and Delphi in order to receive his/her opinion over an idea is very critical for firms. Bessant et al., (2009) has developed a matrix of two-by two with technological maturity on one side and market maturity on the other (Picture 12) which is in line with the Risk Matrix already explained in the portfolio management approach.



**Picture 12:** Technology versus Market Matrix (Bessant et al., 2009)

They explained that in the architectural part, as one can see technologies are old but market is new, and innovation is made based on the close collaboration with potential lead users. Not only is lead users opinion important in developing radical innovation since they are almost 7 years ahead of the market (Von Hippel, 1986), but lead users are also early adopters and have an important role in shaping the adoption of the complex products (Bessant et al., 2009).

In the technological part, market is matured but technologies are quite new and success depends on the performance of the new technology (Bessant et al., 2009). Roger (2003) considered some criteria for the successful technological product innovation (table 2) that can be reflected while people in a hub are judging upon the new technologies ideas.

<b>Relative advantage</b>	degree to which the product or service is perceived better than competing product or service
<b>Compatibility</b>	degree to which an innovation is perceived to be in line with the existing value, experience, needs of the potentials adopter
<b>Complexity</b>	degree to which an innovation is perceived to be difficult to understand for us
<b>Trialability</b>	degree to which an innovation can be experimented on a limited basis
<b>Observability</b>	degree to which the result of an innovation is visible

**Table 2:** Criteria for Successful Product Innovation (Roger, 2003)

Finally in the complex part both technologies and markets are quite new and developers and users should develop the market together (Co-creation) (Bessant et al., 2009). Accordingly, as Sandberg, (2008) argued, a high degree of R&D and marketing integration is required in order to overcome the difficulties in market and technological uncertainties.

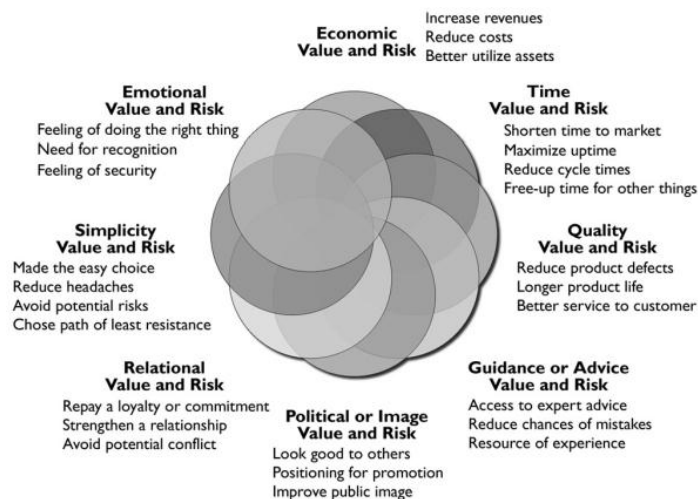
Thus, mapping the ideas based on portfolio approach and matrix explained might create an understanding who could be involved in a hub to judge the idea. Nevertheless, the people who sit in an innovation hub to evaluate ideas should know the right metrics for judging radical innovation projects.

## 2.2.4 Selection Metrics:

One of the most important factors discussed for innovation success is how much an innovative product or service create value for a customer. Such could be also applied within an innovation process. Monroe (1991) defined a *customer perceived value* as :

$$\text{Customer Perceived Value} = \frac{\text{Perceived Benefits}}{\text{Perceived Sacrifice}}$$

Perceived benefits usually entails physical, service attributes and technical support, as well as other indicators of perceived quality, e.g. the purchase price. Perceived sacrifice includes the purchase price, acquisition costs, transportation, installation, order handling, repairs and maintenance, and risk of failure or poor performance (Monroe, 1991). Moreover, studies of Stinnett (2005) identifies 8 major denominations of value that a customer may be interested in deriving from a relationship with a firm (Picture 13). However, the value and reasons that customer consider for purchasing a product or service may vary over time (Stinnett, 2005).



**Picture 13:** Eight Major Denominators of Value (Stinnett, 2005)

Furthermore, Kim and Mauborgne (2000) studies of 100 companies that not only innovated successfully and repeatedly, but also whose product and services displaced , end up with a systematic approach to reduce uncertainty of innovation. The matrix developed by them has two elements and 36 boxes (picture 14). The first element is the customer buying stages which is discussed in Appendix 5. The second element is the utility levers of *simplicity, image, fun, physical and financial risk, convenience and finally customer productivity* that help customer to function faster, better and in different ways. According to Kim and Mauborgne (2000), companies can either improve their offering for each segment of the matrix or focus on the voids within each box and innovate within the untapped elements of customer buying experiences.

		The Six Stages of the Buyer Experience Cycle					
		Purchase	Delivery	Use	Supplements	Maintenance	Disposal
The Six Utility Levers	Customer productivity						
	Simplicity						
	Convenience						
	Risk						
	Firm and image						
	Environmental friendliness						

**Picture 14:** The Utility Map (Kim and Mauborgne, 2000)

Therefore, mapping an idea within the utility map can create a picture of the value an idea is generating for a company. Such may further assist firm in selling a concept as a value added service or product to other firms.

In addition, Tidd and Bodley (2002) identified some criteria for screening and selecting the projects with high novelties as *probability of commercial success, probability of technical success, degree of internal commitment, market size, competition, market share, and core competencies*.

Finally, as venture capitalist life has declared, they only accept 3 to 5 % of the technologies offered to them (of which 60 % will be a success) while considering the following items for judgments: *the entrepreneur’s personality, the entrepreneur’s experience, characteristics of product, characteristics of market, financial factors* (Bessant et al., 2009) (more info in Appendix 6).

In conclusion, the theories regarding the selection criteria can be outlined in table 3, and one can regard **Customer**, **Market** impact, **Entrepreneur** personality and impact on the **Organization** as the main areas that criteria are discussed about.

Criteria		
The utility map	the entrepreneur’s personality	Probability of commercial success
	the entrepreneur’s experience	Probability of technical success
	characteristics of product	Degree of Internal commitment
	characteristics of market	Market size
	financial factors	Competition
		Market Share
	Core Competencies	
<i>Kim and Mauborgne (2000).</i>	<i>Bessant et. al,(2009)</i>	<i>Tidd and Bodley (2002)</i>

**Table 3:** Selection criteria of theoretical findings

The utility map is mainly focusing on the customer, in the second column the personal characteristics of entrepreneurs are addressed and finally some market (size, share and commercial success) and organizational issues (internal commitment, core competencies) are noted in the second and third column of table 3.

### 2.2.5 Selection Means and Mindsets:

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In this section first the means or tools that have been identified against radical innovation projects will be explained. After that, different mindsets that might hinder the development of radical innovation projects in large firms are outlined.

#### ***Wrong Means:***

Christensen et al., (2008) identified some assessment means that discourage investing in radical innovation. First using the discounted cash flow (DCF) is in favor of incremental projects and cause managers to underestimate the real returns and benefits of investment in innovation. Secondly, when managers' performance is assessed by improvement in earnings per share (EPS), such encourage short term investments and returns and diverts investment whose pay off are beyond immediate horizon. Third, using the fixed cost and sunk cost unwisely might discourage the radical innovation projects. Finally, the stage gate process when it is based on the feasibility, development and launch stages with meetings to review the potential of the project. In that case, stage gates are demanding data on estimated market, revenues and costs that does not fit for generating radical innovation. Christensen et al., (2008) argue that such techniques need to be adjusted to reduce the balance of risk taking.

In addition, Cooper and Edgett (2007) argue that racing to market and over emphasis on financial criteria (NPV, Payback Period, and Productivity Index) are the roadblocks for understating the root of shortage in game changing innovation.

#### ***Mindsets:***

Last of all, Bessant et al., (2009) identified twelve excuses for rejecting radical innovation projects as: *It is not our business, It is not a business (not big enough), Not invented here, Invented here, We are not cannibals, It ain't break why fix it, Great mind thinks alike, Existing customers won't want it, We have never done it before, We are doing ok as we are, Let's set up a pilot.*

#### **Selection Example from Shell GameChanger (Shell, 2011 and Skarzynski and Gibson, 2008):**

Shell GameChanger program has been developed for breakthrough innovations to expect the novel ideas within the energy system portfolio with assessments criteria as:

1. **Novelty:** Is the idea truly and fundamentally new and different?
2. **Value:** could the idea create substantial new value if it works?
3. **Why Shell:** does Shell enable the idea to become bigger, and do we care if it does?
4. **Credible Plan:** is there a plan to manage primary risks prudently by qualified people?

Then, ideas enter a six-person peer review that meet every week and refresh with new people every six months. The panel discusses an idea with generator and less than a week the decision will be provided. GameChanger knows that there is a chance of 20 % success in finding breakthrough project and they try not to weed out loser but to keep big winners.

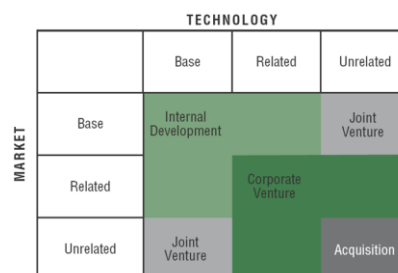
## 2.3 Implementation of radical innovation projects:

Implementation of radical innovation project would be different from incremental projects because sometime they are beyond the core competencies or current strategies of a firm or existing business unit (Bessant and Tidd, 2009). Therefore, in the following section theories like venturing, incubation and acceleration that assist a firm to implement a radical innovation idea within its corporate are going to be discussed.

### 2.3.1 Venturing:

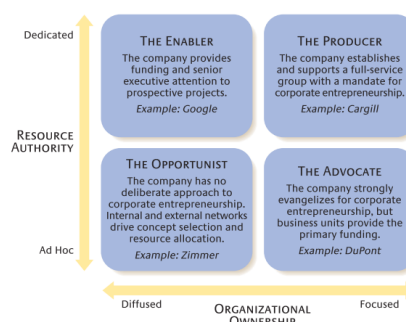
In this section, due to existence of functions in Volvo Corporate structure such as GIB-SPA, GIB-T (corporate functions to take care of big opportunities within soft product and technology) and Volvo Technology Transfer (picture 1), venturing is going to be explained. Such discussion may further assist the understanding of an innovation process for implementing the ideas with radical innovation potential within a firm.

Ventures normally are defined as a range of different ways for developing innovation and they can have different forms as pictures 15 demonstrate. Corporate ventures are used when organizations need to exploit some internal competencies and keep control over the business whereas joint ventures and alliances are in place when one would like to use partner's competencies and firms should release some control measures. Spin out and new ventures are the extreme case when there is no connection with core competencies (Burgelman, 1984).



**Picture 15:** Ventures (Burgelman, 1984)

Additionally, Wolcott and Lippitz (2007) studies of 30 Global large firms characterized two dimensions and four approaches to corporate entrepreneurship (Picture 16). The dimensions are the ownership and funding, meaning who and where in the company is responsible for venturing.



**Picture 16:** The 4 Model of Corporate Entrepreneurship (Wolcott and Lippitz, 2007)

The dimensions as displayed created four distinct approaches (further info Appendix 7):

1. **The Opportunistic:** no dedicated ownership or resources for venturing that relies on supportive organizational climate to encourage proposals which are developed and evaluated on a project by project basis when a firm is open to experimentation.
2. **The Enabler:** no formal corporate ownership but there is a dedicated support, processes and resources. This approach suits firms where new ventures could be owned by existing division in business. For example Google provide time (20 %), funding and rewards for the development of ideas which extend the core business focusing on 70 % core business, 20 % emerging business and 10% speculative business. In Google the founders of new business receive “Founders Award” of millions of dollars. This model extensively requires entrepreneurial mind set within idea generators.
3. **The Advocate:** organizational ownership is clearly defined. This works when there are sufficient resources in the business but insufficient specialist’s skills or support for venturing. DuPont has created the Market Driven Growth initiative and decided on access and mentoring by senior staff.
4. **The Producer:** includes both formal ownership and dedicated funding of ventures. Such demands corporate commitment, resources and venturing while there is a mass of potential projects which requires latent entrepreneurship and cross unit collaboration. This model has been considered as a proper tool to deal with disruptive opportunities. Examples include IBM’s Emerging Business Opportunities program and Cargill’s Emerging Business initiative to build new business rather than just product or services.

Studies show that the business venture groups at Lucent Technologies, Cisco, and Nortel Networks despite a healthy financial standpoint, suffered from lack of persistent experience and expertise necessary for operating in the regimes of high uncertainty that Business Innovation demands. They finally failed to contribute to the overall strategic growth and renewal of the firm (Gompers and Lerner, 2001). The main reason of failure was lack of strategic alliance of corporate ventures with company’s strategies and being focused on developing single projects (O’ Connor et al., 2008).

On the other hand, the research of Tidd and Taurins (1999) showed that firms need to know the underlying reasons for establishing corporate ventures such as; *Grow the business, Exploit underutilized resources, Introduce pressure on internal suppliers, Divest non-core activities, Satisfy managers’ ambitions, Spread the risk and cost of product development, Combat cyclical demands of mainstream activities, Learn about the process of venturing, Diversify the business, Develop new technological or market competencies*. These points may assist firms in defining the main goal for developing corporate venturing within a firm, it can later assist firm in developing the right KPIs for venturing activities.

Moreover, as the research of Garvin and Levesque (2006) stated, large firms can grow new business creations through corporate entrepreneurship while performing three kinds of



balancing acts on Strategy, Operation and Organization: *balance trial and error strategy with rigor and discipline, balance operational experience with invention* (for example, it is important that firm appoint colleagues with high innovative and entrepreneurial skills in the company, for managing the new ventures) and *balance new businesses' identity with integration*. Consequently, lack of performing the balancing tasks might hinder the new business creation in firms heavily engaged with operational excellence (Garvin and Levesque, 2006).

Last but not least, Garvin and Levesque (2006) indicated inappropriate corporate budgeting and human resources systems may increase the poor fit between the new businesses and old systems. For instance, when corporate budgeting is in favor of incremental projects and no room for development of new business has been considered, also human resources departments are just recruiting for current needs, and innovativeness and entrepreneurship has no space in performance evaluation for new or old hiring's. Then, the success of corporate entrepreneurship and new business creation will not be guaranteed.

2.3.2 Incubation:

The research of O'Connor et al., (2008) identified three processes as Discovery, Incubation and Acceleration (Appendix 8) for breakthrough innovation. The discovery phase is mainly dealing with identifying the opportunities. While incubation and acceleration functions or process are identified to support the balancing acts of invention and operational excellence already explained by Garvin and Levesque, (2006).

Incubation is a business creation unit whose elements are explained in table 4. In contrast to business development, incubation has a proactive role and can have project and corporate levels. The uncertainties in incubation deal with market, technological, organizational and resources and sometime it takes three to five years to resolve the uncertainties (O' Connor et al., 2008).

<b>Mandate and Responsibilities</b>	to nurture the portfolio of opportunities
<b>Structure and Processes</b>	Linked to but not part of R&D, for unaligned and multilinked opportunities under corporate umbrella
<b>Resources and Skills</b>	<b>skills:</b> entrepreneurial, interpersonal skill, Strategic thinkers <b>Resources:</b> Provided from Business Unit with no interfere or Corporate and when commercialized deliver to business unit and reimburse
<b>Leadership and Governance</b>	Chief Technology officer if has Business skills (Entrepreneurial) otherwise an incubator leader should be assigned.
<b>Metrics and Reward Systems</b>	Learning and Reducing business risks or uncertainties

**Table 4:** Incubation Management System Element (O' Connor et al., 2008)

There are two tools that are applicable for an incubation unit of a firm; skunk work and probe and learn.

### ***Skunk Work:***

One good strategy for dealing with radical ideas is to allow virtual incubators as third party consultants outside the existing corporate to bridge the selection and execution challenge. Such activity is called Skunk Work in Lockheed and Siemens call them Satellite SMEs and is practiced by companies like IBM, Cannon, Honda and Xerox PARC (O' Connor et al., 2008).

Developing dual structure (skunk work and virtual incubator) is often used to protect new and often high-risk ideas from the mainstream organization until they have achieved some measure of commercial viability. They work well when they have CEO-level support, clear objectives, and their own separate sources of finance. In situations that parent company managers meddle in the evaluation, and when they are expected to support multiple, changing objectives then they fall into trouble (Bessant et al., 2009).

### ***Probe and Learn:***

Some researchers believe that firms should create an extremely fast iterative cycle to allow prospective innovators to get started whether their hypothesis are valid or not and see what they learn from experimentation and rapidly iterate that learning (Skarzynski and Gibson, 2008).

Prop and learn is an iterative process, totally different from stage process of product development such as idea generation, screening and evaluation, selection, development, testing and market launch. The first step in probe and learning is to introduce an early version of a product to a plausible initial market. Entrepreneurs try to use prototyping as a stepping stone toward new options so as to mobilize resources (Schrage, 2000). Such exercise can increase our technological and market learning whether and how it can be scaled up, which segment of market could be receptive and what exogenous factors needs further consideration (Cooper, 2001). In situations where there is a gap between the actual and perceived risk of an idea, a company can use experiment and prototyping to resolve the issue (Skarzynski and Gibson, 2008). There are many different ways of prototyping such as physical models, simulation and paper-pencil prototypes that are applicable for product and service concepts (Neyer et al., 2009). All the same, using probe and learning highly depends on the type and the novelty of a technological project a firm is dealing with.

### **2.3.3 Acceleration:**

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O' Connor et al., (2008) 10 years research in breakthrough innovation finally arrived to call the execution art of radical innovation as "Acceleration" which is more about escalation rather than experimentation (the basis for incubation). In the meantime, acceleration deals with developing the necessary infrastructure for the business, including a management team, marketing capabilities, manufacturing or operations and delivery systems, and the associated network of partners. There could be five elements in acceleration team (table 5) (O' Connor et al., 2008).

<b>Mandate and Responsibilities</b>	Coordinate the acceleration task with the organization, help new breakthrough businesses grow and join the firm, educate the mainstream organization about the role and function
<b>Structure and Processes</b>	Depending on aligned or unaligned ( Multilinked ) Acceleration team can fit within business units or Corporate ( <b>Appendix 9</b> )
<b>Resources and Skills</b>	Acceleration requires high financial resources; the team must be able to judge health, diversity, and pacing of the portfolio.
<b>Leadership and Governance</b>	Require high political and communications skills to describe the needs of portfolio to the mainstream organization and battle for resources with Public relation, HR, Legal and other functions.
<b>Metrics and Reward Systems</b>	Difficult to measure due to lack of Traceability, Spillover to Other Platforms, Uplift, and Impact of New Businesses on Strategic Intent, however all the signs and fights for developing a new business should be measured as the acceleration role's in company

**Table 5:** Acceleration Management System Element (O' Connor et al., 2008)

Furthermore as O' Connor et al., (2008) research identified, incubation and acceleration could be taken care by R&D, Business Units and Corporate depending whether an idea is aligned, multi aligned or not aligned with business units strategies (Table 6).

	<b>Aligned</b>	<b>Multialigned</b>	<b>Not aligned</b>
<b>Incubation</b>	R&D and Business Unit ( tricky and Corporate still need to oversee them)	Corporate	Corporate
<b>Acceleration</b>	Trade-Off but better in BU with corporate supervision	?	Corporate

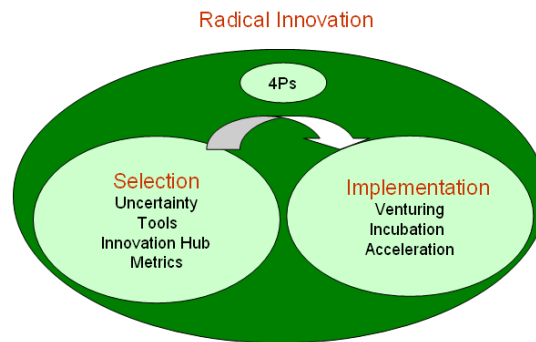
**Table 6:** Owner of Incubation and Acceleration Process (O' Connor et al., 2008)

Usually when a project is aligned to a business unit, the incubation can be performed by R&D or corporate unit. But in multi and not aligned situations, normally corporate unit would take care of the incubation. Finally in acceleration phase for aligned projects, there is a trade-off between the business and corporate units whereas, for not aligned projects, corporate unit would perform the acceleration. Last, firms depending on the venturing model (Opportunistic, Enabler, Advocate and Producer) that employ can execute the incubation and acceleration in their organization.

## 2.4 Conclusion:

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In general, the main purpose of the theoretical framework was to prepare the basis for understanding the radical innovation, selection and implementation settings in large firms. The outcome of theoretical framework has been illustrated in picture 17 and, as already explained, it has three main elements as Radical Innovation, Selection and Implementation.



**Picture 17:** The theoretical framework of the paper

In the radical innovation different definition from an idea until the idea become a tangible artifact (invention) were discussed and finally different terms that large firms use for calling the high novelty project was outlined. In addition, it was explained that radical innovation can have different change dimension as Product & Service, Process, Position and Paradigm (4Ps). Therefore, firms might assess themselves against the 4Ps of innovation in order to see in which dimension they should push for radical innovation.

In the selection part, theoretical findings were grouped into Uncertainties, Tools, Innovation Hub and Metrics. The Uncertainty part was imposing different questions to an idea so as to clarify the unknowns around an idea. For instance, the size, profitability and feasibility areas were stated by Skarzynski and Gibson (2008), while Day (2007) discussed the win, worth and real matrix for identifying the uncertainties. Then it was explained that firms can try to resolve the uncertainties throughout their innovation process, since in radical innovation journey they are dealing with unknown – unknowns.

Regarding the selection tools, different theories such as portfolio management or risk matrix were addressed and it was understood that a portfolio with five dimensions (Technology, Market, Revenue Potential, Organizational Fit and Time) could be useful to be tested for mapping the ideas. However, the stage within a radical innovation process that a portfolio could be employed will be explored in the analysis. In the end, different metrics and means that are working for or against the selection of radical innovation project were addressed and the result was displayed in table 3. It was realized that selection metrics identified from theories in this paper were around four dimensions of Market, Customer, Organization and Entrepreneur. Last, different mindsets that are not working in support of radical innovation projects were outlined.

In the implementation section, four different corporate venturing model common in large firms (Opportunistic, Advocate, Enabler and Producer) were debated. In general it was

found that the best model for the survival of radical innovation projects was a producer model and people in charge of the model should have entrepreneurship mindsets. Then the discussion was directed into two processes of incubation and acceleration.

The incubation unit was considered as a business creation unit that depending on the ideas' organizational fit, different units like R&D, business or corporate can manage that process. As well, skunk work and probe and learn were addressed as the tools applicable for incubation process. On the other hand, an acceleration unit or process was explained mainly to help the new business creations grow in a firm while it can be managed by the corporate units. Finally five elements: *Mandate and Responsibilities, Structure and Processes, Resources and Skills, Leadership and Governance, Metrics and Reward Systems* were discussed concerning a management system for both incubation and acceleration.

As a final point, three balancing tasks as *balance trial and error strategy with rigor and discipline, balance operational experience with invention* and *balance new businesses' identity with integration* were described as important factors for survival of radical innovation projects in large firms. Last, the important role of human resource and corporate budgeting departments were highlighted for new business creation in large firms. It was explained how far lack of attention to entrepreneurship in hiring and performance evaluation and budgeting incremental project might hinder the radical innovation effort.

In order to support the understanding of selection and implementation of radical innovation projects, in the next chapter the methodologies that can guide our discussion with Volvo Technology and other large firms is going to be described.

### 3. Methodology:

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Methodology is the path that assists us in achieving the goals of our project and the research questions will guide us in order to choose the right methodology for this study.

- ***What would be an appropriate process for Volvo Technology to grow ideas with radical innovation potential generated from Innovation Jams?***
  - How can the ideas with radical innovation potentials be selected?
  - How can the ideas with radical innovation potentials be implemented?

In order to answer the main research question two sub questions have been formed. To answer the first sub question a framework or process need to be developed to see what type of ideas with different novelty degrees are generated in an Innovation Jam. In order to make it happen this paper started with a literature review to understand how radical innovation project can be selected. Later, it is supported by the multiple case studies of large firms. Then, the paper focus would be on how the selected ideas can be further developed while identifying the methods that exist both in literature and large companies (case studies) for implementing high novelty ideas in a firm.

#### 3.1 Research Strategy:

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There are normally “qualitative and quantitative techniques” for doing research. Bryman and Bell (2007) stated that qualitative research emphasizes words rather than quantification for collecting and analyzing data, whereas quantitative techniques translate the information to numbers or measures. They further noted qualitative research entail a view of social reality in shifting individuals’ creation, emphasizes an inductive approach to generate theories and consider individuals interpretation of social world. Therefore, the best strategy that suits our research is qualitative with an inductive approach.

Since qualitative research has the advantage of providing a picture of the whole situation, it also entails more flexibility. For instance, during the research it is probable that certain aspects were forgotten or questions were formulated in the wrong way. Then there is a room to adjust them based on the experience made. However it is always difficult to generalize the frameworks or theories generated from qualitative approach within a limited amount of time (Bryman and Bell, 2007 and Yin, 2009).

#### 3.2 Research Method:

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The research method applied to answer our research question is case study. Since case studies are used to understand a real life phenomenon in depth; however understandings may encompass certain contextual conditions (Yin, 2009). Additionally, case studies discuss the detailed analysis of single organization, location, person or event (Bryman and Bell, 2007). There are also some arguments against case studies like: room for biased views, little basis for generalization, time consuming, and lack of developing a causal relationship (Yin, 2009).

### ***Grounded theory:***

In order to reduce the objectives against case study, this paper relies mainly on the grounded theory. Because grounded theory is the most widely used framework for analyzing qualitative data with two central features. First, it deals with developing theory out of data secondly, it has an iterative approach meaning that data collection and analysis proceed in tandem that repeatedly refer back to each other (Bryman and Bell, 2007).

Moreover, grounded theory can have the following applications; 1: Theoretical sampling assisting us in data gathering from evolving theories. 2: Coding: where data are broken down into components and received a name. 3: Theoretical saturation: dealing with both coding and collecting data, where we reach a stage that new data no longer illuminate the concept. 4: Constant comparison: referring to the process of keeping a close connection between data and conceptualization. The outcome of grounded theory could be concepts, categories (a concept that represent a real world phenomenon), properties of category, hypothesis and theory (Bryman and Bell, 2007). Such is exactly what this paper is trying to achieve.

Grounded theory stays also with its limitation as follow: Bulmer (1979) argument whether researchers can start their research until analysis without any theory, is not still clear. Because grounded theory may affect the observation of researchers to existing phenomenon. And some aspect like differences between concepts and categories are not clear and nobody is really sure whether grounded theory ends with a theory or not (Bryman and Bell, 2007).

### **3.3 Literature review:**

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In order to prepare our grounded theory for data collection, a systematic literature review was performed by forming the following keywords:

***Key words:*** *Radical innovation, Selection, Implementation*

The different combinations of keywords were searched in data basis such as: Google Scholar, Business Source Premier, Emerald, and Science Direct, to find the relevant theories. In the meantime, the 10 years research by O'Connor et al., (2008) among large established firms regarding breakthrough innovation published as a book called "Grabbling for Lightning" was identified as helpful tool for some parts.

The theoretical framework was structured base on three headlines as **Innovation; Selection of radical innovation projects** and **Implementation**. Accordingly, these key headlines were kept for the codification part of the data collection (empirical) and analysis.

### **3.4 Research design:**

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Case studies usually have four applications: first, to *explain casual links* of real life interventions, secondly *to describe* a real life context that an intervention occurred, third to *illustrate* certain topics within an evaluation and finally *to illustrate* some interventions that

their evaluation has no clear set of outcome (Yin ,2009). In addition, Yin (2003) considers different types of case studies like single or multiple case studies, or the representative case study type with an explorative approach. This paper has a descriptive single case study approach in explaining the case of Volvo Technology. Secondly, in order to complement the literature review for answering our main research question, it was decided to study other large established firms with an explorative approach (snapshot) to see how they are dealing with selecting a right path for survival of radical ideas.

To identify the cases, Yin (2009) five components for a research design: *A study question, its propositions (what could be studied), its unit of analysis, the logic linking the data to the propositions, the criteria for interpreting the findings*; was used as a tool for selecting the companies. Lastly, keeping our research question in mind in addition to the fact that Volvo Group has a Scandinavian root, Seven Nordics large firm (more than 500 employees) and two American firms who have already established an innovation or business development function (had an organizational position either for new business development or innovation) within their structure were chosen for multiple case studies. However, it is important to note that three out of seven cases were finally decided not be considered in our empirical data, since the collected data was not adding more knowledge.

### 3.5 Data Collection:

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For qualitative research, the case study data can come from many sources like: documentation, archival records, interviews, direct observations, participant-observation and physical artifacts and one researcher may find the six sources potentially relevant and complementary (Yin, 2009). There is also a distinction between primary and secondary sources of data. Primary data are collected from a first-hand source like interviews, observations and questionnaires. Whereas secondary sources of data can be found on internet, books, in articles, either from an organization or external from general public. This research entails both types of primary and secondary data that could be divided into internal and external Volvo.

#### **Internal Volvo:**

Semi-structured interviews with VTEC Technology & Innovation office was performed with innovation director, chief project manager innovation and also four innovation coaches within different technological areas. Moreover, in some cases, the data available on the VTEC intranet was used to explain the case. Then pursuing a snowball sampling different sources for exploring a single idea was considered. For instance, three innovation projects considered as radical to Volvo were chosen to be explored. (Questions are provided in Appendix 10). The author was also involved in one of the Jams that VTEC ran within New Technologies and an observation was also used to see how ICEP innovation process is being performed.

#### **External Volvo:**

Semi-structured interviews were applied with companies who could qualify our case study criteria's (large firms with more than 500 employees while having an innovation or



new business creation function in place). Interviews were done both in face to face formats and via telephone due to distance and time issues. The main interview questions were based upon the theoretical framework considered for this research as

- How do you define innovation?
- What is the definition of radical or breakthrough innovation?
- How do you evaluate and select the ideas with radical innovation potentials?
  - *What selection metrics do you apply to choose radical innovation projects?*
  - *Do you have a kind of innovation hub in place to evaluate the projects?*
  - *Is there a kind of portfolio management framework to evaluate the projects?*
- What process exists in your system to deal with radical innovation projects?  
(Corporate venturing, incubation, probe and learn, skunk work and acceleration)

Moreover, in some cases some power point materials for respected companies were analyzed and used in the empirical part as secondary data sources. Lastly, tape recording, and immediate transcript was considered to remove problems with coding of qualitative data. Since Bryman and Bell (2007) explained how possible loss of the context of what has been said and losing the flow can affect the quality of our analysis.

### 3.6 Analysis:

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Rousseau (1985) emphasizes making the level of analysis clear in business research. Level of analysis in this paper starts with selecting and implementing the ideas with radical innovation potentials and end with the process for VTEC innovation Jams to grow ideas with radical innovation potentials. However, the analysis might include other business units or areas in Volvo Group, due to their role in implementation of radical innovation projects. And to perform analysis, Yin (2009) proposes four general strategies for analyzing case studies, of which *Relying on Theoretical Propositions* was applied to this paper. The theoretical framework regarding how to define and evaluate ideas with radical innovation potentials and tools for implementing them in large firms directed us through data collection.

Furthermore, Bryman and Bell (2007) considered reliability, replication and validity the criteria for evaluating a business research. The reliability of above research findings depends on whether another researcher can repeat the same findings. Since the thesis had a qualitative strategy, the issue with the reliability of the findings does not matter.

Internal validity relates mainly to casualty and explains if observed consequences serves its drivers and not produced by something else (Bryman and Bell, 2007). In terms of internal validity, the literature review on selection and implementation of radical innovation prepares the ground for forming semi-structured interviews and content analysis. Later, the feedback of interviewee or people in charge of the departments was collected against the findings to increase the internal validity. Additionally, general information about the Volvo Technology and Volvo Group was provided in order to increase the external validity. However, the external validity of the thesis may depend on the similarity of another case with the ones used in this research.

## 4. Empirical:

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The empirical findings of each company have been divided into three segments of innovation, evaluation of radical innovation projects and implementation, similar to the theoretical frame of reference. The findings are both primary data collected through open interview questions and secondary data based on the analysis of the presentation received from the companies. The name of the companies except Volvo Technology is considered as anonymous in order to prevent any biased interpretation over the findings.

### 4.1 Volvo Technology :

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Volvo Technology was established in 1969 and became a business unit within Volvo Group in 1997 that operates as an innovation company (innovation catalyst), partly as a research institute with limited customer base.

#### 4.1.1 Innovation:

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Volvo Technology is regarded as an Innovation catalyst within Volvo Group and defines innovation as **“creating and implementing new ideas with net values”**. They strongly pursue innovation as the means for *sustainable growth, profitability, improve brand strength and attracting the best people*.

In order to stimulate creativity, more cross functional knowledge sharing and developing an innovative culture in the Group, Volvo Technology has employed a mythology called Innovation Jam (termed by IBM in 2001) since 2009. An idea generating and sharing event, to gain most out of diversity while generating new ideas with the potential to be incremental or radical to Volvo. The Jams are also going to support the vision of Volvo Group as *“To be valued as the world’s leading supplier of transport solutions”*. So far, Volvo Technology innovation team has run 4 innovation jams in Volvo Technology, 6 innovation Jams for other business units or areas and 2 innovation jams for external firms.

The innovation process in Volvo Technology used for the Jams, follows a process called ICEP developed by Volvo Technology, which is the abbreviation of the following process; Injection, Capture, (Selection), Explore and Pre-commercialization (Picture 18).



Picture 18: ICEP (Volvo Technology)

In the *Inject phase* a strategic focus area following the trends, needs and inspiration is identified and announced by email and through intranet to employees before the Jam takes place. Then, ideas will be generated by employees during a two-day virtual event and this stage is called *Capture phase*. During this stage there are some moderators (the people who are familiar with Jam focus area) who facilitate the brainstorming and idea generating among the employees. After two days virtual brainstorming with moderators, the ideas that

have *potential business value* and seem to be *feasible* with *high level of novelty* will be selected by the moderators, and then idea generation task enters the third step. In the *Select phase*, idea generators present their pitch to a steering committee and refined ideas will be discussed. For their pitch, idea generators should present:

1. *Why the idea is needed and what potential gains it will have for VTEC or Volvo Group?*
2. *Who will be the customer of the project?*
3. *What output the explore phase will achieve (Data, Reports, Presentations...)?*
4. *A project plan based on who will do what, when and to what cost?*
5. *Why their idea is better than alternative solutions?*

The steering committees vary depending on type of the Jam for instance in the “New Technologies Jam” in Volvo Technology, Innovation and Technology Director, New Technology Director and the Innovation Chief Project Manager, were the member of the steering board.

#### 4.1.2 Evaluation for ideas with radical innovation potential:

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After that, the steering committee, following a cross-functional evaluation and Intellectual property right considerations review, select and combine similar ideas that could be used for a project. This stage normally takes two weeks and the main criteria that are judged here by the expert is the commitment from the idea generators, clarity of the project and commitment from idea generators managers to allow them pursue their ideas. For example, in the New Technology Jam out of 250 ideas, 39 proposals were selected and after grouping some of the proposals the outcome was 17 innovation projects. For each project VTEC innovation team allocate one person in order to manage the projects. That person is mainly one of the idea generators within that project group who knows the technology area very well.

Next, in the *Explore phase* ideas are developed and Business & Transfer plan is prepared and project will receive a fund and will be guided by project managers and Innovation Coaches. (Coaches are the innovation ambassadors within four VTEC departments that assist and guide idea generators and project managers to follow their projects). The exploration phases of each idea take different timeline and funding strategy. Sometime the exploration phase might take three steps for funding, depending on the success and findings of the exploration phase of each idea. Last, in *Transfer phase* a prototype or business plan of ideas will be provided to other business units or business areas in Volvo Group in order the idea or project to be further implemented.

#### 4.1.3 Implementation:

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For transferring the generated idea, different possible options among BA or BUs within Volvo Group exist for ideas to land. Picture 1 was trying to display a snapshot of different landing ground within Volvo Group for an idea. One option was sending an idea into Volvo Technology Transfer (Corporate Venture organization within Volvo Group); another would be raising the idea to other Business Areas (Like Truck), or asking Volvo IT to develop a prototype. Also GIB-SPA or GIB-T as a resource function within Volvo Group corporate structure can take care of big opportunities within soft product and technologies. Finally,

VTEC could invest in an idea through virtual incubators or innovation projects. For example, recently VTEC has set up two virtual incubator functions (Satellite or skunk work SMEs) by assigning CEOs who leads the three function of Technical, Design and Business Development in a small scale. The incubators are formed to explore two ideas generated from Innovation Jams which are potential to be radial. Both incubators are functioning as sub-units under the Volvo Technology Transfer organization (a venturing firm in Volvo Group).

Even though there are different settings in the Volvo Group for implementing the ideas, the discussion with innovation coaches emphasizes some critical points. First was creating extra time for idea generators to pursue their projects, since idea generators might be busy running their normal projects. Secondly, there should be a guaranty for long term funding that can support the idea with high novelties which require heavy investments. For example, interview with three project managers of projects considered to be radical to Volvo Group revealed that sometime it might take 3 to 7 years for an idea to be implemented. As a result, developing such projects require a long term investments. Third, to develop an information flow within the Volvo Group that enables the people in business units like Volvo Technology, to sense the market or Business Areas' desires. Last but not least, is understanding of the capacity for radical innovation within Volvo group (e.g. how many new line of business is Volvo Group aiming for?).

Furthermore, the interview with three project managers that their projects were considered as radical innovation to Volvo Technology highlighted the following point for the implementation of radical innovation:

- Support and commitment from top managers ( CEOs)
- Fit the Volvo Values ( Safety, Quality and Environment)
- Fit with the Vision of the company

Although all three projects were commercialized in the market, two of them were facing with building more capacity within Volvo Group to expand the market for them.

## 4.2 Company A:

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The Group develops, produces and markets personal care products, tissue; packaging, publication papers and solid wood products, and have sales in more than 100 countries with 45,000 employees (Company A annual report).

### 4.2.1 Innovation:

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“Creating and finding insightful solution and bringing them to the market”

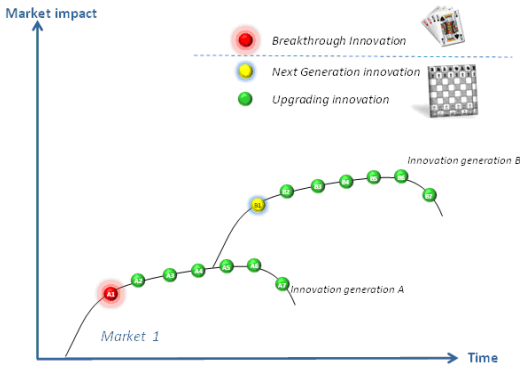
They have developed an idea management system trying to bring in the customer insight into the system. Each year they receive almost 1000 ideas that are in line with their patent portfolio but not very value driven at the end. Finally, the company has decided not to be very technology push driven rather follow the co-creating value concept which tries to benefit from lead users insight into their system.

After some years' experience and due to the misunderstanding occurred among the business people in the company like sales and marketing for the hassle that radical innovation project would bring, the company has decided not to opt for radical innovation as wordings and use different types of innovation as explained in table 7.

<b>Breakthrough (BT)</b>	Developing <b>new-to-company product, services and/or Business Model generations</b> or creating next-generation <b>replacements</b> for existing products and services
<b>Next generation (NG)</b>	<b>Supporting existing products, services and business models</b> by increasing the performance or features of an existing product, service or business model in order to <b>grow</b> .
<b>Upgrade Grow (UG)</b>	<b>Supporting existing products, services and business models</b> by increasing the performance or features of an existing product, service or business model in order to <b>grow</b> .
<b>Upgrade Maintain (UM)</b>	<b>Supporting existing products, services and business models</b> by increasing the performance or features of an existing product, service or business model in order to <b>maintain</b> our business.
<b>Cost save (CS)</b>	<b>Increasing operational productivity</b> by decreasing costs in the supply chain or go-to-market.

**Table 7:** Company A Innovation Types

As picture 19 exhibit company A starts with a Breakthrough Innovation (BT) which is considered red in the picture, then the BT can be improved and turn into the Next Generation when it achieves certain market impact. Meanwhile, the Upgraded Innovation can either grow or be maintained for the business. Finally, there could be improvement within supply chain to decrease the cost of an innovation and such would be considered as Cost Save.



**Picture 19:** Company A Innovation types

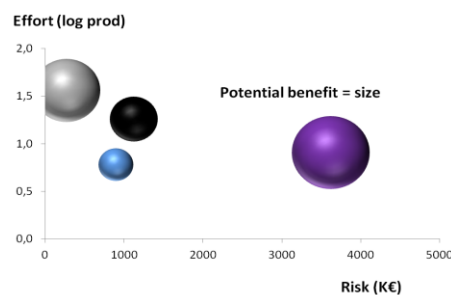
4.2.2 Evaluation for ideas with radical innovation potential:

Company A used to have 15 criteria for decision making but now they are trying to make it as simple as possible and currently by using three items as; **Risk, Effort and Benefit** for choosing the ideas. Here, we can see how the evaluation is being done for them.

- **Risk**
  - Market risk x consequence cost (% x K€) (Considering both the risk to fail in % and the consequence it would have in K€ by multiplying them)
  - Technology risk x consequence cost (% x K€)
- **Effort**
  - Brand difficulty (1-5) Can we align this to our own brands? (1= fully aligned , 5= or no fit )
  - Business model difficulty (1-5) (Deviation to our current business models)

- Insight difficulty (1-5) (Availability of consumer insights )
- Technology difficulty (1-5) (Availability of technology insights (1= knowledge in-house, 5=undefined or non-existing))
- **Benefit**
  - Market potential (1-5)<sup>2</sup> (What is the size of *potential* customer segment worldwide?)
  - Learning potential (1-5) (How much learning's can we get? (1= nothing, 5 = Essentials))
  - Uniqueness potential (1-5) ( how unique the market is for them)

Two important points need to be addressed, first in situations that company A is dealing with breakthrough innovations the market and technology risk changes to uncertainty. The second point is the market potential power employed under the benefit segment. In the end, after calculating the Risk, Effort and Benefit the firm will create a portfolio of projects as shown in picture 20 and the larger and closer they are to the reference point, the better those projects would be.



Picture 20: the project portfolio of Company A

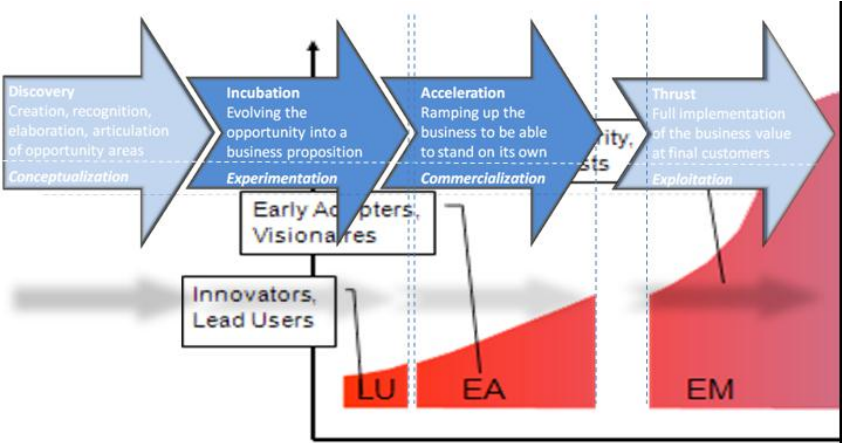
As the Innovation Manager clarified they first run the Effort assessment, after certain exploration they run risk and benefit assessments. In conclusion, a portfolio of risk, effort and benefit will be identified.

#### 4.2.3 Implementation:

The innovation director explained that Company A had already implemented change management workshops to educate the managers regarding innovation. Now they have come to a level of understanding to believe that innovation is a learning journey rather than an event and their main focus is how much learning has been created by an innovation project. While focusing on their vision and mission, they try to measure the learning gained throughout the journey based on subjectivity, **KPIs** (under construction), and **CSF** (critical success factors: Time, Incentives, and Key partners).

However, company A radical innovation process follows the DIA (Discover, Incubate and Accelerate) process, they have added one more item as **Thrust** to push more for developing the ideas. The innovation manager mentioned that the discovery is easy and incubators can easily fail as long as acceleration is not being practiced. In the acceleration part, Beta version prototypes of product and business model can be tested against the lead users in order to see how it may work in real practice. Making mistakes and learning has become the rule of thumb in acceleration, and business managers believe that there is no failure in this journey. Additionally as picture 21 shows when an innovation reaches the market, so as to

innovation grow from early adopters to early majority company A has considered extra capacity to cross the Chasm by the role of a Thrust function.



**Picture 21:** Implementation Process in company A

Likewise, they are considering Intrepreneurship for project development. Although there are not many entrepreneurs, they have started to consider entrepreneurship skills in new hiring’s, and they have developed program for educating employees on entrepreneurship as a tool to help them implement their high novelty projects. Finally, the company is going to launch their corporate venturing function soon in order to take care of big opportunities.

4.3 Company B:

Company B is a leading provider of communications infrastructure, services and multimedia solutions. They constantly innovate to empower people, business and society while being present in more than 180 countries with almost 80, 000 employees (Company B annual report).

4.3.1innovation:

“Creating value from new ideas”

The innovation and new business development director explained how the approach toward innovation from technology push has changed to more like a pull approach. He noted that their journey of innovation start when a need or demand being already created within the company. They have developed an idea management system in which a line, business or corporate unit can open an area that an innovation should occur.

As the innovation director explained, there is no real definition for incremental or radical types of ideas in the company but when an idea is placed on the idea management system, its novelty degree almost imply the degree of change (incremental or radical). And according to their experience, the more ideas are generated from the line organization the more incremental they are.

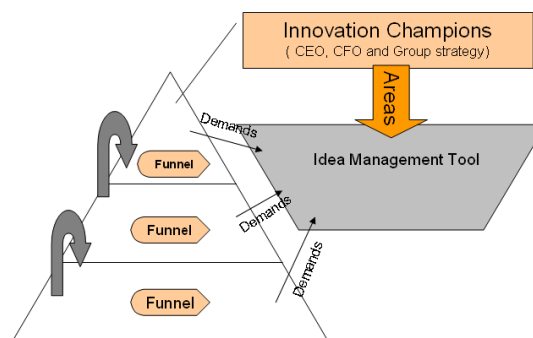
### 4.3.2 Evaluation for ideas with radical innovation potential:

The innovation director emphasized that the judgment over the ideas are mainly based on subjective assessment. He further explained that each level of organization has its own cross-functional team to evaluate the ideas. The team is not fixed and different people are invited based on type of ideas, sometime even from outside the company. Generally, their evaluation criteria follow three main items:

- Certain revenue potential
- Relevant to the company to leverage core assets
- Feasibility to pursue the opportunity within certain amount of time.  
(Consider cannibalization and political reason to pursue an idea or not)

### 4.3.3 Implementation:

The innovation director explained that in order to drive a more pull based innovation initiatives they have considered a hierarchy for innovation within corporate, business unit and line organization and each level has its own managers, innovation funnel and process to deal with new ideas (Picture 22).



**Picture 22:** Interpreted Company B Innovation System

As interpreted (by the author of the paper) in picture 22 each level of the company has its own funnel for Screening, Pre study, Deep Diving (team up with expert to see what kind value an idea can capture). They have also considered fundings to set up incubators around an idea and probe how it will work. In case one level is not capable of taking care of one idea it will be sent to higher level of organization and finally if the opportunity requires large investment it reaches the corporate level (an Escalation model). At the corporate the innovation champion (CEO, CFO and Group strategy) will evaluate the idea to see if they have an option to set an internal venture around the ideas to create value from it.

Moreover, the innovation director is sitting on the group level strategy unit that is placed high up the hierarchy of the company and sets the strategy for company innovations. Moreover, such function is setting the areas for high novelty project initiation. They have also considered Innovation Champion in three different levels of corporate, business and line to take care of new business opportunities. Company B CEO, CFO and Group strategy are the member of the corporate level Innovation Champion.



In addition, company B has also considered some kind of bootlegging (Google Friday), free time for employees to innovate which varies depending on the project type and level.

Finally, their idea management system has helped Company B realize the capacity for innovation while increasing the commitment throughout the organization to implement and create value from ideas; as the innovation director explained.

#### 4.4 Company C:

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Company C is a bio tech company which is present in almost 30 countries with 5,400 employees.

##### 4.4.1 Innovation:

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The new business development manager explained that the company does not have specific definition neither for innovation nor radical innovation. The business development and innovation so far has been very technology push driven. The technology push developments have been more successful than the market pull (scouting) due to the ownership that R&D has over the projects and funding. However, sometime technologies are developed without market assessment and they will not be utilized further and will be shut down. In order to resolve the issue the company has started to develop an open innovation strategies to share the technologies with others.

##### 4.4.2 Evaluation for ideas with radical innovation potential:

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Selecting new business ideas are based on the current business model and their KPIs are based on the R&D organization approval, stage gate process approval and value in Pipeline (NPV and pick sales = annual expected sales). There are also some issues like market and manufacturability that affects deciding upon a certain idea. For instance, the company is struggling with manufacturability (what prevents a customer to apply the company product into the manufacturing process). Secondly, there are also other internal factors such as nonaligned target; resistance made from not invented here syndrome, lack of belief and not enough R&D resources like scientists that affect evaluating a specific idea.

By the help of Radical Innovation Group in USA, the company has developed a framework called MTOR model that deals with high novelty ideas with uncertainties around Market, Technology, Organization and Resources. They apply the framework against the projects or ideas with high novelty that tackles new business opportunities. In each phase of their process (Scouting, Validation, Incubation and Acceleration), they focus on certain areas that uncertainties exit and after each stage they check if such uncertainties have been removed. Then, the idea is qualified to enter the next stage (Picture 23).

Phases	Scouting	Validation	Incubation	Acceleration
Categories				
Market	<ul style="list-style-type: none"> <li>Idea of market potential</li> <li>Business model idea</li> </ul>	<ul style="list-style-type: none"> <li>Application possibilities</li> <li>value Proposition</li> </ul>	<ul style="list-style-type: none"> <li>Market learning</li> <li>Business model</li> <li>Market entry strategy</li> </ul>	<ul style="list-style-type: none"> <li>Marketing plan</li> </ul>
Technology	<ul style="list-style-type: none"> <li>Technical idea</li> </ul>	<ul style="list-style-type: none"> <li>Technical feasibility and capabilities</li> </ul>	<ul style="list-style-type: none"> <li>Prototype</li> </ul>	<ul style="list-style-type: none"> <li>New product development plan</li> </ul>
Organization	<ul style="list-style-type: none"> <li>Fit to</li> </ul>	<ul style="list-style-type: none"> <li>Strategic context for innovation</li> <li>Senior level commitment</li> </ul>	<ul style="list-style-type: none"> <li>Structure and system to support new business development projects</li> </ul>	<ul style="list-style-type: none"> <li>Organizational placement and transition management</li> </ul>
Resources	<ul style="list-style-type: none"> <li>Initial mapping of internal and external competencies</li> </ul>	<ul style="list-style-type: none"> <li>Availability of funding and right people</li> </ul>	<ul style="list-style-type: none"> <li>New business creation talent</li> <li>Partnerships (internal and external)</li> </ul>	<ul style="list-style-type: none"> <li>Business team composition</li> <li>Partnerships aligned for business maturity</li> </ul>

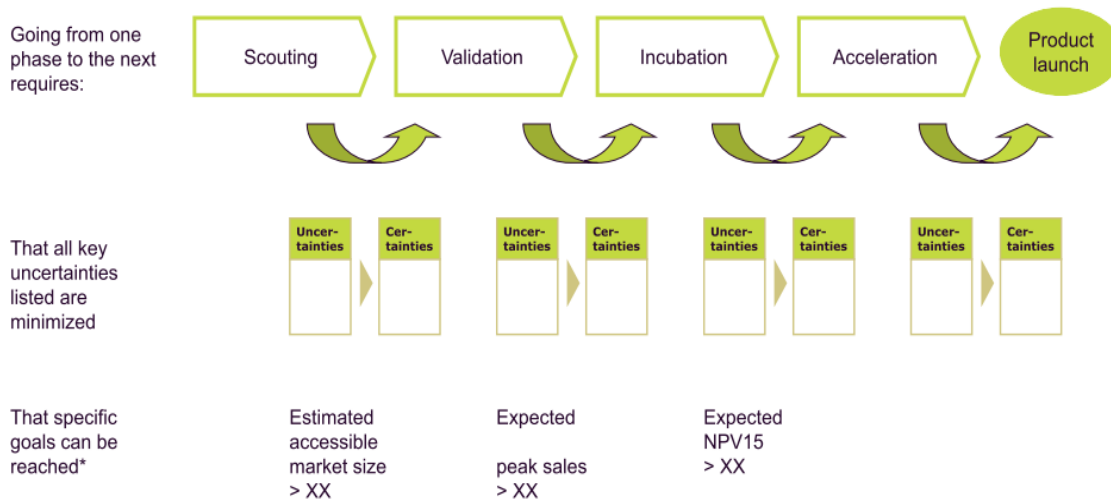
**Picture 23:** Company D Evaluation procedure

#### 4.4.3 Implementation:

The company does not have any type of venturing activities for commercializing new ideas since most of the development highly depends on the R&D funding. Finally, as the new business development person noted the whole process goes around four stages:

- Market research
- Value chain assessment
- MTOR
- Building the business case

The business development process in the company is based on the MTOR model (Picture 23). The purpose of the MTOR model is to find the uncertainties, show the stoppers and finally minimize the uncertainties. The company believes that journey toward new business development is dealing with reducing uncertainties. As we can see from the picture Market and Technologies are the external factors for reducing uncertainties and Organizational and Resources internal. Organizational and Resources as internal uncertainties are the main issues, because even if they have identified a good business opportunities, if there is not enough resources and organization for its development the project would not be successful.



**Picture 24:** Company C Matrix of Key Uncertainties

As picture 24 displays, the phases for reducing uncertainties are called Scouting, Validation, Incubation and Acceleration. And the main task of this matrix is to ask the right question from market, technology, organization and resources to reduce the uncertainties while the business idea is pushing forward. Then the business development function will pursue the development.

#### 4.5 Company D: ( Secondary Data)

Company D is a leading global provider of products, technologies, software, solutions and services. The company product is present in almost 170 countries with 324,600 employees (Company E annual report).

##### 4.5.1 Innovation:

Innovation for the fourth company was considered as finding, funding and implementing ideas that can result in new high profile products, services, and processes. And they had considered four success factors for innovation effort. First they would see what benefits an idea would have **for the company** (Value Chain enablement, new business Model, New IP, Process efficiency and effectiveness) second, what benefits ideas have **for customers**. Third, how risk and reward of new product or service offering could be shared **with customer** and finally how an idea can **enable a customer**?

But as they have explained, if an idea has yes into the following questions, then an idea has the potential to be considered as Game- Changing:

Must have a YES to at least one of the following:

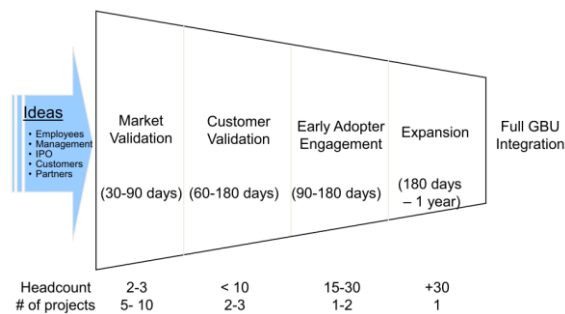
- Will this idea change the customer experience/expectation?
- Will this idea change the competitive landscape/position?
- Will this idea change the economic structure of the industry?

Must have a YES to the following:

- Does the firm have a contribution to make in this space?
- Will this idea generate sufficient margin to the business?

#### 4.5.2 Evaluation for ideas with radical innovation potential:

When a breakthrough ideas passed the general criteria as; Organizational Fit, Strategic Advantage, Demand, Pursuit, Success Metrics and Management. Then the ideas enter an innovation funnel process for further evaluation. The funnel process (picture 25) entails Market Validation, Customer Validation, and Early Adopter Engagement as tools for evaluation of the ideas with game-changing potentials.



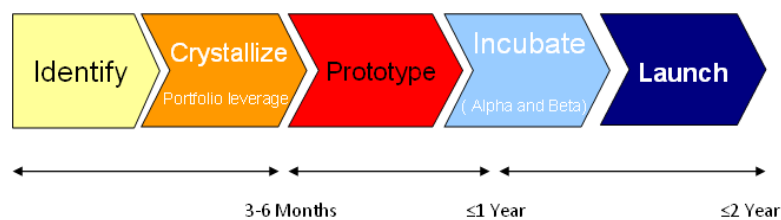
**Picture 25:** Company D breakthrough innovation funnel

As it is clear from the picture, normally 5 to 10 ideas enter the process and finally less than one year, one idea should enter one of their business units after the validation process.

#### 4.5.3 Implementation:

The company has established a group around one of their innovation platforms to select a small number of ideas in various stages of development and provide them with fundings and staffing to accelerate their progress.

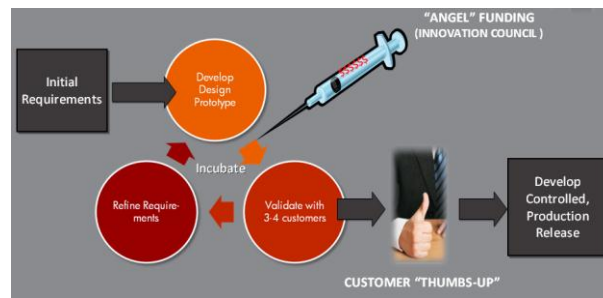
As the company explained for one of their business unit, an idea is being accelerated through the following process (Picture 26). Accordingly, it takes almost two years for an idea reaches the launch phase and prototyping and incubation are the main methods that are used for Implementation their ideas.



**Picture 26:** Innovation process within one Business unit of company D

Picture 27 clearly displays how the incubation process is performed in the specific business unit. It first starts by developing the design prototype and it enters the validation

stage by 3-4 customers and it may be refined further. Also as we can see from picture 27 angel funding are also in place for supporting the incubation.



**Picture 27:** Incubation process for one BUs of company D

On the other hand, company D had established an Innovation Program Office for one of their business areas to facilitate funding and tools to nurture and bring to market the disruptive and game-changing opportunities. Although the unit is within the business area, they are dealing with project apart from core business. In general, Innovation Program Office has the task to manage projects that:

- Support long-term strategic goals
- Provide significant new revenue potential and growth rate
- Sustain operational margin structure
- Support a strong customer value proposition
- Leverage the company brand and/or portfolio

#### 4.6 Company E: ( Secondary Data)

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Company E designs and sells consumer electronics, networking, voice, and communications technology and service. They are present with almost 70, 000 employees worldwide.

##### 4.6.1 Innovation:

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Company E had considered three types of innovation as:

1. **Application innovation:** Creating differentiation by finding and exploiting a new application or use for an existing technology. The cornerstone of solution-oriented marketing. An example of this would be the creation of MP3 players by using flash or hard disk storage technology originally developed for computers.
2. **Product innovation:** Creating a new product in a high-growth market, for example, the Segway Transporter is a new type of transportation device that addresses a previously unaddressed market.
3. **Platform innovation:** Aggregating (and hiding the complexity of ) various legacy technologies by creating a new integrated solution that can help drive further adoption of a technology beyond traditional 'early adopters'. An example of this is the iPod + iTunes system which integrates the player, software, and music store in a seamless service that is virtually foolproof.

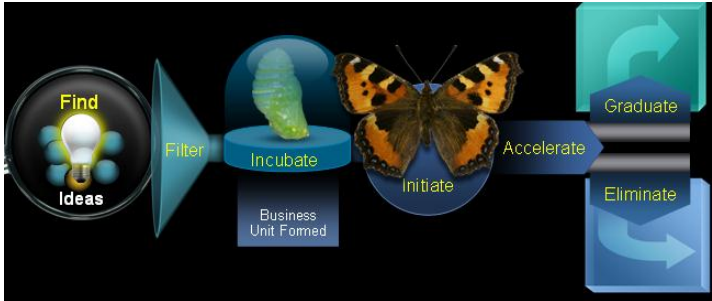
The company believes that platform innovation will be a critical opportunity for them and this type of innovation plays well to the size, ability to create and promote new architectures in the marketplace, and use the power of IP (convergence, virtualization) to drive simplicity.

4.6.2 Evaluation for ideas with radical innovation potential:

The company strategic analysis regarding the PESTEL (Political, Economic, Social, Technological, Environmental and Legal) has declared some notification regarding the Globalization, Global Warming and Green World Consciousness, Social Networking Phenomenon, and Technology Impact on the Society. Following such analysis, the areas that the company requires further investment has been identified.

Traditionally the company used its R&D to develop enhancements to existing product areas and acquisitions to get into new markets. But a new Group (Emerging Technology Group- ETG) to deal with gamechanging innovation and a process in the firm called ‘internal venturing model’ (Picture 28) has been developed to organically develop new markets by taking advantage of the resources and talent already available inside the firm.

The Internal Venture Framework starts with receiving ideas from employees, universities, venture capitalists, and other sources. Then they have an extensive “filter” function where they have created the Action Learning Forum, a leadership development as 6 week project.



**Picture 28:** Company E Internal Venture Framework

In addition, the Emerging Technology Group follows the venture capital model that says 75% of Venture capital investment is successful; consequently in order to achieve their aim of 15 new business units, they invest in 20 ideas. Along with that since venture capitals invest almost in 2 % of the proposal, 1000 ideas are generated in total.

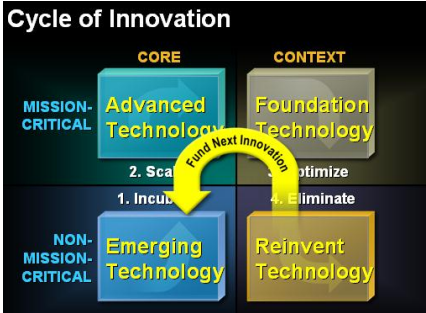
Finally they use a cross-functional approach by inviting both internal and external experts in order to evaluate the ideas. They take a set of nominated directors from all different functions around the world, and top faculty from leading universities and business schools to lead development exercise – they come up with 3 new business ideas and 2 teams compete on each idea, they do the market analysis, and create a go to market. Then they have to pitch it to a board of Senior Vice Presidents just like a startup would pitch an idea to a group of venture capitalists, to convince them to begin this new start up.

Once a good idea is identified and passes through filtering process –a new business unit is initiated as a new emerging technology. Then through a strategic and focused way the business is accelerated in one customer segment with one application. Finally it will be decided whether to graduate a business unit or to eliminate it.

4.6.3 Implementation:

Moreover, the company has developed a framework to classify and manage a balanced portfolio of initiatives. Each quadrant creates a different imperative for management. As technologies mature, they move progressively through each of the quadrants (Picture 29).

Quadrant 1: core (to future) but not yet significant enough (in terms of revenue contribution) to become mission-critical. Once succeed and scaled up, will be converted into advanced technologies, where the imperative is to scale them to as many customers as possible and to link them to other technologies in portfolio (as integrated architectures). Over time, advanced technologies mature and become part of the overall foundation. Then the company seeks further efficiencies in terms of cost and management to provide ongoing differentiation. Finally, as technologies reach obsolescence, they may have an opportunity to potentially re-invent in a new, converged way. By continuously cycling technologies through these different quadrants the firm ensures a balanced portfolio of innovation investments and redeploys resources to drive continuous innovation.



Picture 29: Company E Cycle of Breakthrough Innovation

4.7 Company F:

Company F is a global producer of components and solutions with 22,000 employees worldwide.

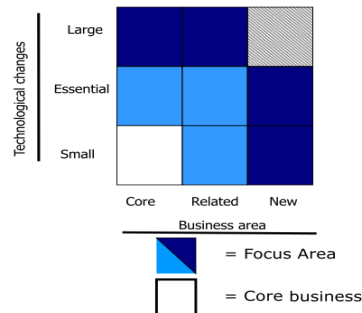
4.7.1 Innovation:

Company F has set a strategy to extend its core business to adjacent areas by leveraging the core business assets. Accordingly they have considered once a year competition in order employees generate ideas for the defined objectives.

The competition pursued three different goals:

- *Finding a business that could be incorporated into the main business*
- *Developing a new line of business*
- *and developing a new function separately*

They started their program with the aim for creating 10 new businesses by receiving 2000 ideas, creating 200 business opportunity and tailoring it to developing 50 business cases. Moreover, they have identified their focus area depending on where an idea land in the matrix displayed in picture 30.



**Picture 30:** Portfolio Matrix of Company F

#### 4.7.2 Evaluation for ideas with radical innovation potential:

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The following criteria are used for idea evaluation in the discovery phase of the process.

- Fit Core Business Strategy
- Competence fit with the Core
- Degree of Uncertainty (Management type)
- Market maturity
- Distribution channel / Customer base
- Time to market
- Partnering set-up
- Exit roads

And depending on the size and type of the project, whether it will have an owner within the company or not, internal and external people would sit on the investment committees to evaluate the ideas. For instance, the business development managers of each business unit of firms or external capital ventures depending on the type ideas would participate in the committee. However, the emphasis was to bring people from cross functional capabilities into the evaluation team.

#### 4.7.3 Implementation:

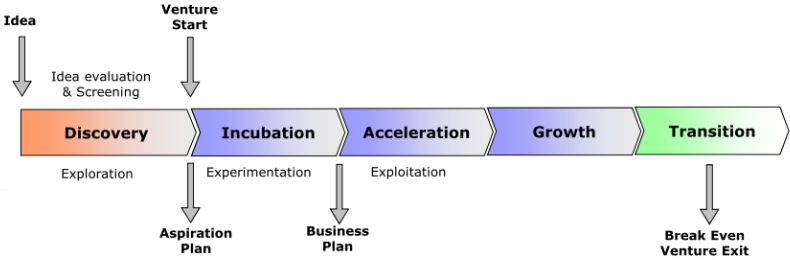
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To support the strategy already explained a separate organization had been created and was called the Venture Firm with separate management team and funding capacity for the following main purposes:

- Implementing the high novelty business opportunities
- Educating the employees about new business development
- Creating an entrepreneurship climate



They have developed a breakthrough innovation process which is displayed in picture 31 that depending on different type of project it would end up with different time plan. As the process show, in the discovery part new ideas are generated, and then base on an aspiration plan venturing start through incubation. When the business plan is ready, the exploitation phase or acceleration would start to be followed by the Growth process which is dealing with growing the market from early adopters to majority. Finally, the process will end with a transition step in which decisions whether a venture joins the main stream or spin off, will be made.



**Picture 31:** Company F breakthrough innovation process

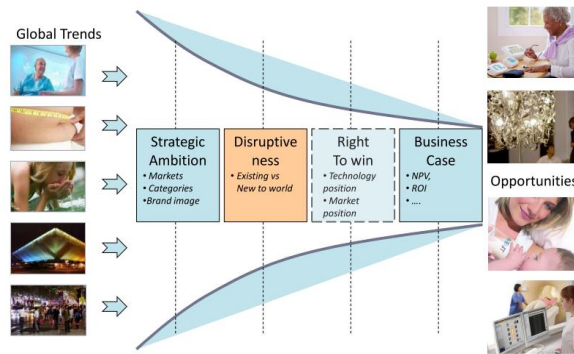
The CEO of ventures mentioned that creating a separate organization with business creation skills with support and commitment of top management was the main success factor behind the venture organization. The venture organization was working as an ambidextrous organization with the aim to support the core business of the firm. Having an incubation and acceleration functions assisted the company to find the right landing ground for breakthrough ideas. Moreover, the company had developed a career path within the firm that when an idea passed the discovery phase, the idea generator could leave his or her position and with the help of the venture firm they pursued the development of their idea.

4.8 Company G: (Secondary Data)

Company G is one of largest electronic companies that employ 119,000 people in more than 60 countries.

4.8.1 Innovation:

Company G defines radical innovation base on the disruptiveness it entails into four categories : *improved product, new in category, new adjacent category and new to the world*. They have noted that their disruptiveness of an idea will determine how to innovate. Normally they follow the funnel in picture 32 for their radical innovation. Following the global trends, they clarify their strategic ambitions and disruptiveness of ideas. Next they see if the project would be right to win base on the technology and market position, and finally they develop a business case for a project.



Picture 32: Company G innovation funnel

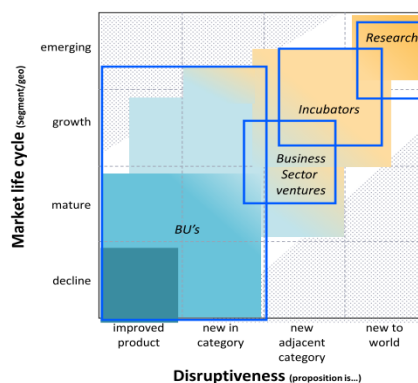
#### 4.8.2 Evaluation for ideas with radical innovation potential:

As it has been presented in picture 32, company G has considered Strategic Ambition (Market, Categories and Brand image), Disruptiveness (Existing versus new to the world), Right to Win (Technology and Market position) and Business Case (NPV, ROI...) as the main criteria for selecting projects.

#### 4.8.3 Implementation:

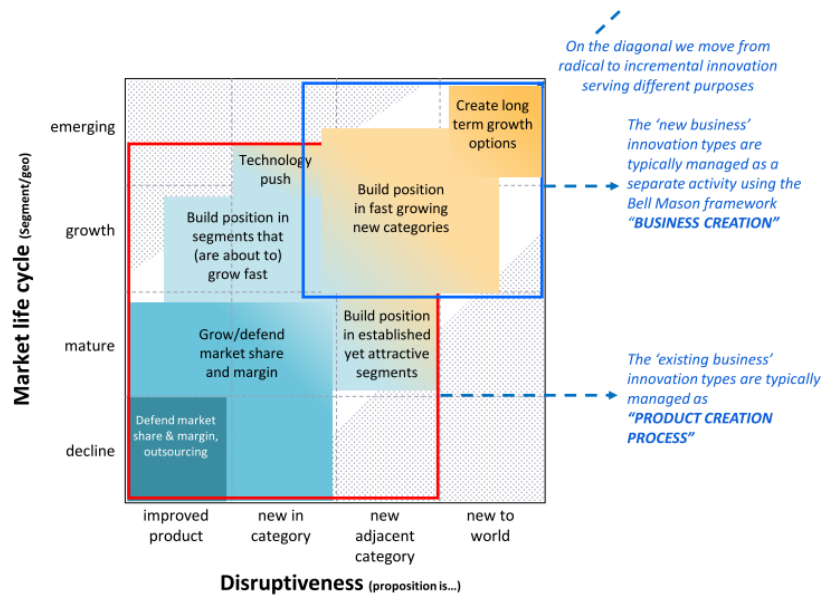
They have identified the *big company syndrome*: “Why large companies like babies and adults, but don’t know how to deal with teenagers”. They have said there are different reasons why teenager projects are not well developed within business units. First, those projects require an experimentation area to deal with unknowable. Second, they require longer time to be developed that are beyond a business unit patient. Third, they require out of box thinking and need to deal with the chasm in the adoption curve. Fourth, those ideas will have different conflict of interest with BU regarding, marketing, channel, communication, partner and business model strategy. Fifth, they require cross unit synergies. Finally the current units lack some kind of knowledge to deal with type of projects.

To overcome the syndrome they have developed a 4X4 matrix to identify the different innovation perspectives over an idea or project (Picture 33). Because they believe different type of innovation requires different framework to manage innovation.



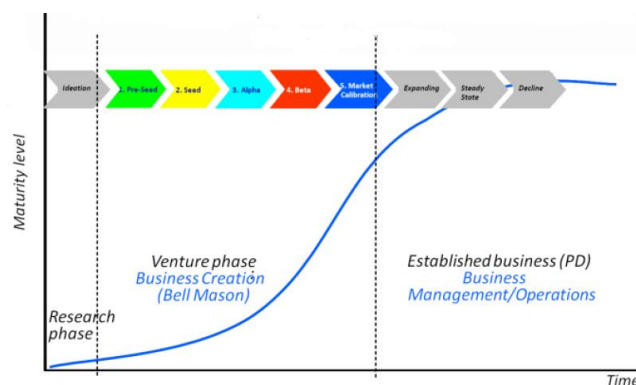
Picture 33: Company G innovation matrix.

On the whole, there are two main axes in the matrix, market life cycle (vertical) and disruptiveness (horizontal), and depending on where a project land, different entities would be responsible for that project. Further, they have developed two units as product and new business creation to take care of different opportunities that occur within the firm. Picture 34 shows the different areas of responsibilities within each unit.



**Picture 34:** Company G innovation units.

To take care of the business creation they have developed a venture group governed by Business Development Board to take care of teenagers. They have considered different KPIs in order to compare the success of each venture. And they are using the venturing process in picture 35 developed by Bell Mason research and consultancy group. The process has three stages that starts with a research phase as discovery and then it proceeds with Pre seed, Seed, Alpha, Beta, Market calibration for the venture phase. At last, it ends with expanding, steady state and decline at the end of the venturing process which will be taken care by established business.



**Picture 35:** Company G venturing process

## 5. Analysis:

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*The current chapter is going to analyze the empirical and theoretical findings and their implications on the Volvo Technology Innovation Jam process. The analysis is going to have the same structure as theoretical and empirical findings as; Innovation, Selection and Implementation.*

### 5.1 Innovation:

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It was explained that innovation usually starts with an idea or concept, then it becomes an invention (Trott, 2002) when the inventions are commercialized in the market they turn into innovation (Dodgson et al., 2008). Then, Bessant and Tidd (2009) explained that innovation can have four dimensions of Product & Service, Position, Paradigm and Process.

Also, the observation of “New Technology Jam” in VTEC confirmed that Innovation can have more perspectives rather than product like service and process. And in the empirical findings, it was identified that Company E defined innovation in three different forms as product, platform and application and finally considered platform innovation as the most important one. Also, the discussion with company A confirmed that innovation cannot be restricted only to product or services whereas it can have broader perspectives. So was the case with company D (this paper lack sufficient data regarding other companies’ types of innovation).

Thus, one good implication of the 4Ps of innovation for an innovation Jam could be first, identifying the type of Ps (Product, Process, Position and Paradigm) that a generated idea belong to. For instance, a firm like VTEC can observe whether the idea is a process, product or maybe positioning type. Secondly, VTEC may run some kind of innovation assessment in order to see in which areas the innovation Jam process should focus more. For instance, if they realize that they need more idea in order to commercialize the product in emerging markets then Jams should aim for generating positioning ideas and so is the case for product, paradigm and process innovations.

#### 5.1.1 Radical Innovation:

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When definition of Skarzynski and Gibson (2008) as an idea is **radical** if it passes one of the following questions:

1. Does it have power to dramatically reset customer expectations and behaviors?
2. Does it have the power to change the basis for competitive advantage?
3. Does it have the power to change industry economics?

And a project is **radical** when entails one of the below points (Leifer et al., 2000 and O’Connor and McDermott, 2004):

- 30- 50 % significance in cost reduction
- 5 – 10 % improvement in features
- New to the world or market performance features

were discussed with the innovation team in Volvo Technology, it was found hard to answer the above questions at early stages of an innovation process, because idea generators are facing with a lot of uncertainties and it is impossible to find the proper answer to; if an idea is going to be new to the world performance feature or is dramatically resetting the customer expectations and behaviors. On the contrary, those definitions were appropriate when an idea is commercialized in the market. Therefore, one possibility was to explore how other firms are dealing with innovation definitions.

The result of empirical findings regarding innovation and radical innovation definition is outlined in table 8. It is clear that some companies in our empirical findings have come up with a definition for innovation but no exact definition was identified for radical innovation. Some are talking about the different type of innovations, some even do not use radical innovation as wordings and they have started to use breakthrough innovation. For instance company A after using the Radical Innovation as wording for many years, decided to change it with Breakthrough Innovation.

	Innovation	Radical Innovation
Company A	<i>Creating and finding insightful solution and bringing them to the market</i>	Breakthrough and next generation innovation : high impact on market
Company B	<i>Creating value from new ideas</i>	High novelties
Company C	No definition	High novelties
Company D	<i>Finding, funding and implementing ideas that can result in, new high profile products, services, and processes</i>	When it change customer experience/expectation or competitive landscape/position or economic structure of the industry
Company E	Different types identified not the definition.	Create and promote new architectures in the marketplace
Company F	Not identified	Developing new line of business
Company G	Not identified	Emerging and new to the world or category
VTEC	<i>Creating and implementing new ideas with net values</i>	?

**Table 8:** Innovation and Radical Innovation (Empirical findings)

In conclusion, it was recognized that in early phases of an innovation process, firms cannot really call an idea radical or incremental until it is commercialized in the market. Such was in line with Rogers (1983) and Robertson (1971) in considering the customer perspectives over the novelties of innovations. However, the main purpose of radical innovation among companies studied was to **create a new line of business for the company**. This finding was also approved by the purpose of VTEC in seeking for radical innovation and is in line with the purpose of radical innovation stated by O’Connor and McDermott (2004) in the theoretical section.

5.2 Selection of radical innovation projects:

It is highly important that firms apply the right uncertainty, selection metrics and tools for ideas that have the potential to create a new line of business, because firms’ resources are restricted and it is impossible to support all kinds of ideas.

### 5.2.1 Uncertainties:

Ignorance management (Davila et al., 2006) was discussed as a tool to make unknown-known in situation that firms are dealing with radical innovation. Such method was approved by our observation from company C. They had developed a model called MTOR that was dealing with Market, Technology, Organizational and Resource uncertainties. The MTOR model was considering different questions to ask throughout innovation process and it checks if uncertainties have turned into certainties.

On the other hand, Skarzynski and Gibson (2008) considered Size, Feasibility and Profitability as the main criteria for judging over the ideas, whereas Day (2007) had developed the Real, Win and Worth framework. The discussion with VTEC innovation team approved the applicability of both theories, and later it was found that the question in all models were around the **Idea**, **Market** impact and **Organization**. For instance, there were some questions whether the idea is radical or not, or how clear the concept is. And regarding the market (customer is part if it), the desire of customer for purchasing the innovation or considering the reaction of competitors were the uncertainties areas. Finally, there were questions regarding the availability of resources, competencies, manufacturability or value chain support for the implementation of the idea, which were considered for the organizational area.

Therefore, if the questions that are dealing with market and financial measures (exact Cost, Benefit or market size and feasibility) that are unclear at the ideation phase are excluded from Skarzynski & Gibson (2008) and Day (2007), then the uncertainty table can be outlined as table 9.

<b>Idea</b>	How radical is the ideas? (Technology, Market or Business Model novelty)
	Does it fit overall strategy?
	Is the concept clear?
<b>Market</b>	How big is the potential market?
	Is there a customer desire?
	How competitors will respond?
	Can we understand the market?
<b>Organization</b>	Do we have the resources, the competencies, the capabilities to make this happen, or can we get them through partnership?
	Do we have the value chain support?
	Will the top management support it?
	Can we gain competitive advantage?
	How much would be the revenue potential?
	Are the risk/ Uncertainties acceptable?

**Table 9:** Uncertainties

The purpose of questions is not to decide whether to accept or reject an idea but to understand the different uncertainties a firm is dealing with around an idea. However, it is very tricky where within an innovation process to apply and use the above question. One discussion in Volvo Technology showed that one possibility to apply the above uncertainties

could be at the select phase of ICEP process and ask the idea generators later to resolve them throughout the exploration phase. Therefore, in order to make the uncertainty areas more clear in the next section, the selection criteria will be reviewed in order to see if there would be a common ground for the uncertainties and selection criteria.

5.2.2 Selection Criteria:

Table 3 had summarized theoretical findings as regards to the criteria identified for selection of radical innovation projects. Reviewing the criteria disclosed four important considerations existing around a project: first was the impact of the project on **customers** by creating a value, then the **personal characteristics** of entrepreneurs; after that how the project is going to **impact the company** and **the market**. As a result, one can regard the customer, idea generator, company and market as the most important points that require contemplation when selecting an idea with radical innovation potential.

Also, table 10 summarizes the selection criteria that companies in our study apply in their process. Company E is not included in the table, since they had not provided any selection criteria in their materials.

Companies							
	A	B	C	D	F	G	Shell
Risk	Market risk	Certain revenue potential	Market	Benefit for the company (Value Chain, IP, New business model, process)	Core Business Strategy	Disruptiveness	Novelty
	Technology risk	Relevant to the company to leverage core assets	Technology	Benefit for the customer	Competence fit with the Core	Market Life cycle	Value
	Brand difficulty	Feasibility to pursue the opportunity within certain amount of time	Organization	How risk and reward can be shared with customer	Degree of Uncertainty (Management type)		Why Shell
Effort	Business model difficulty		Resources	How enable the customer?	Market maturity		Credible Plan
	Insight difficulty				Distribution channel		
	Technology difficulty				Time to market		
Benefit	Market potential				Partnering set-up		
	Learning potential				Exit roads		
	Uniqueness potential						

Table 10: Empirical findings selection criteria

Company A starts its process first with the Effort assessment, then after certain exploration they run Risk and Benefit assessments. Finally a portfolio of risk, effort and benefit will be identified (Picture 20), and based on the portfolio they will decide which project to follow. In contrast, Company C considers Market, Technology, Organization and Resources as the uncertainties to be explored throughout scouting, validation, incubation and acceleration stages. One implication of their selection process is that they are evaluating the project base on the uncertainties they carry with themselves. Company D applies its selection criteria at the beginning of their breakthrough innovation funnel, while Company G considers the criteria into different stages of their innovation funnel. But it was not identified how and in which stage of an innovation process company B and F are considering their assessment criteria. Finally, Shell GameChanger is considering Novelty, Value, Why Shell and Credible Plan as the criteria for selecting the breakthrough ideas at the beginning of their process.

There are different internal and external factors among the criteria to draw different implications from. First, the way selection in company A, C and G is being performed, imply that **selection in a radical innovation process might be an iterative process rather than a single stage.** Such raises a question whether considering a selection stage in a process for radical innovation like Picture 2 (the Innovation Process of Bessant and Tidd, 2009) is correct or not. Moreover, it can highlight how challenging is the selection of ideas with radical innovation potential in large firm.

For instance, there was not a much shared criterion among all companies studied in this paper; depending on the industry, ideas or concept each company considers specific criteria. And it was difficult to judge whether one criterion is right or wrong. However, if we compare the theoretical implication by considering customer, person, company and market, (deducted from table 3) one can see the same points shared among the empirical findings.

Finally, if the VTEC selection criteria that exist within the capture and selection phase of ICEP (table 11) be compared with the empirical and theoretical findings. It would be noted that the innovation team in VTEC could consider more emphasis on the **company** and **customer** side, early in capture or selection phase of the ICEP process, since a lack of reflection to these areas are interpreted from table 11.

Capture	Select
Novelty level	Why the idea is needed?
Business Potential	What potential gains?
Feasibility	Who will be the customer?
Gut feel	Deliverables from Explore phase
	Alternative solutions?
	Commitment from the idea team
	Clarity of the project
	Commitment from idea team managers

**Table 11:** Volvo Technology selection criteria

Similarly, applying the Utility Map (Kim and Mauborgne, 2000) to capture the customer value can be a useful tool to be considered for Capture and Select stage of ICEP. However, it will be interesting to see if Utility Map can work for high novelty ideas that their customers are not even identified. Last, there could be more assessment on Volvo Group organizational resources in order to make sure that resources, competencies and capabilities are available in other Business units or areas to support the development of the potential radical idea. This area was also emphasized by innovation coaches in VTEC in understanding the capacity for radical innovation.

**5.2.3 Selection Means and Mindsets:**

Cooper and Edgett (2007) and Christensen et al., (2008) highlighted that imposing market and financial questions and developing different gates to evaluate the ideas when the market is unclear is not appropriate for radical innovation projects. However, unfortunately the analysis regarding the means cannot be extensively developed, since not enough observation concerning the financial means (NPV, DCF, Earning per Share, Productivity Index and Payback Period) was available.



Last but not least, Bessant et al., (2009) had identified twelve excuses for rejecting radical innovation which was explained in the theoretical section. Also Company A innovation director emphasized how important it was for them to change the executive mindsets regarding the journey of innovation toward learning. This area cannot also be explored further due to the lack of data collected regarding this factor.

#### 5.2.4 Selection Tools:

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In this section the analysis is going to address the three main selection tools (innovation architecture, new business creation goal setting and portfolio management) that can assist large firms in selecting the radical innovation potentials ideas.

##### ***Innovation Architecture:***

Innovation architecture (Skarzynski and Gibson, 2008) development by the help of scenarios (plausible futures with attention to political, economic, social, technological, environmental and legal: PESTEL) was explained as an effective way for creating and exploring futures to help firms manage their ignorance (Stamm and Bessant, 2006) and a useful tool for testing assumptions with high uncertainty (Strauss and Radnor , 2004).

Moreover, it was explained that the inject phase of the ICEP innovation process in VTEC was guided by the trends, needs and inspiration (not scenarios). Later in the capture phase the ideas were grouped base on a shared theme existing in each Jam. And, interviews with three project managers of radical innovation in VTEC showed how time consuming developing radical innovation might be. Such might have an implication to the inject phase of the Jams while the micro function of the market such as PESTEL, from the time an idea is generated until it is developed might change. As a result, an idea that has been considered as radical potential might not carry the same criteria when developed. For instance, due to the emerging importance of market like China and India, employing scenario making might shift the injection phase of ICEP process more to these areas than technological development that suits the premium markets. Therefore, the inject phase of the ICEP process should regard plausible futures, that can be developed through scenario making.

##### ***New Business creation goal setting:***

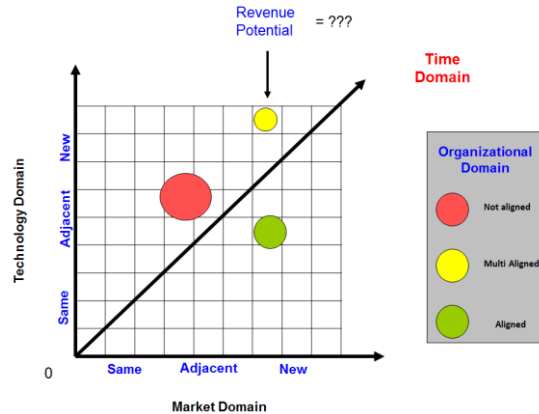
Theoretical findings explained that venture capitalist accepts 3-5% of proposal of which 60 % would be successful (Bessant et al., 2009) ( $A \times 3\% = B \times 60\% = C$ : new line of business). In addition, in empirical section it was found that company E was aiming for 10 new ventures and started their process with 2000 ideas then selected 200, next 50 and finally they arrived to 10 new line of business. Likewise, company F believed that venture capitalist accepts 2 % of the project, of which 75 % will be successful. So, in order to reach 15 Emerging Technologies, they started with 1000 ideas. Consequently, identifying the final target of new business creation base on a firm capacity could be an important selection factor. Such will assist firm like VTEC in estimating the number of ideas that they should select in each phases of a radical innovation process. Later, it can assist firms in realizing their capacity for radical innovation (new business creation) that was emphasized in O' Connor et al., (2008) 10 years research.

### Portfolio Management:

Portfolio Management approach by O'Connor et al., (2008) and Day (2007) was discussed in the theoretical framework as a useful tool to select radical innovation projects. And empirical findings from company A explained how they start their selection process first with the effort assessment, then they run risk and benefit assessments. Finally a portfolio of risk, effort and benefit will be identified (picture 20) and base on the portfolio they will decide which project to follow. Therefore, employing a portfolio management approach for mapping the novelty level of ideas been generated in Jam was considered as useful tool for Volvo Technology Innovation jam process.

A portfolio approach as Cooper (2001) stated can assist firms like VTEC to have strategic focus on the project mix and it can encourage a better selection decision making. Yet, applying and finding the right methods to map the ideas in early phase of an innovation process is very critical.

Accordingly, two portfolio approaches explained in picture 9 and 10 were discussed with VTEC innovation team. The discussions guided the analysis to a portfolio displayed in picture 36. Five dimensions as Market, Technology novelty to the firm and Organizational fit and Revenue potential were considered as the domains. Consistent with picture 36, idea generators can choose green for organizational aligned, yellow for multi- aligned and red for not aligned opportunities.



Picture 36: Portfolio for Selection and Exploration Phase of ICEP

Revenue dimension and the Risk Matrix question (provided in Appendix 3) were difficult to be considered at early stages of ICEP process since it was too early to ask those questions from idea generators. Consequently, the portfolio while considering the revenue potential and Risk Matrix question was considered as a useful tool to be applied at the later stages like the exploration phase of ICEP model. It was decided to be handed to the idea generators and coaches in order to map and reach an agreement over the novelty area of an idea. Such mapping can construct an understanding regarding the novelties and size that an idea entails. In addition, based on the portfolio at hand, a firm like VTEC may decide how many ideas from different zone to choose for further exploration and funding.

As a result, the portfolio explained in picture 36 creates a good picture of different options a firm is dealing with in terms of high or low novelties and organizational fit. Finally, it can generate an understanding of how many ideas from high, medium and low novelties can be chosen for exploration.

### 5.2.5 Innovation Hub:

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The empirical findings clearly show that settings like the Innovation Hub (Leifer et al., 2001) explained in this paper was in place in some companies to select the ideas. Company B had developed innovation champion at corporate, business and line levels. Company E had considered a filter stage in its venturing process that proposal were pitched to the vice presidents, business professors or venture capitalists for evaluation. In addition, company F had formed an investment committee to evaluate the ideas. Also, VTEC had applied a steering committee to evaluate the ideas, while the members were changing depending on the type of Jams.

And as Bessant et al., (2009) explained, inviting right people in an innovation hub is highly critical for ideas to be evaluated fairly. For instance VTEC invited the New Technology Director, the Innovation Director and Chief Project Manager Innovation in the last jam (New Technologies) in order to judge the ideas in the selection phase of ICEP. The innovation team in VTEC noted that it was hard at that stage to involve market people early in the ICEP process, since new technology ideas were not yet formed to be discussed with them (even not clear to the technology team, let alone sharing it with market people).

In addition, considering the technology versus market matrix Bessant et al., (2009) that was explained in picture 12, complimented by the result of portfolio mapping of picture 36, might create a view of where market or lead users could be invited to a hub. For example, market people could be involved later in the exploration phases when ideas are more developed. Or, they could be involved in select phase of ICEP in situation that technological ideas are generating from the market and ideas might have high market novelties which require the knowledge of marketing people.

### 5.3 Implementation of radical innovation projects:

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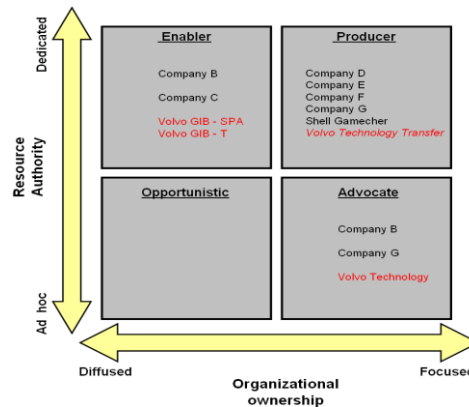
The implementation analysis is mainly going to discuss the different corporate entrepreneurship settings that were discussed in theoretical findings against the case studies and Volvo Group landing ground provided in picture 1.

#### 5.3.1 Venturing:

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The research of Wolcott and Lippitz, (2007) developed a framework that was explained already in picture 16. The framework showed four methods that firms apply for corporate entrepreneurship as: Opportunistic, Enabler, Advocates and Producer. The Implementation tools, especially the venturing part, in empirical findings of companies were compared against the model and based on the information at hand; companies were placed on the four quadrants.

As it is shown in picture 37, five of the companies had the producer model in practice. Company D has developed an Innovation Program Office for one of their innovation platforms to take care of business opportunities. Company E has formed an Emerging Technology Group with an internal venture framework and innovation cycle to take care of new opportunities. And Company F has formed a venture organization with a CEO and allocated fundings to develop 10 new business lines for the firm. Finally, Company G had considered a business creation unit equipped with a venturing process to develop emerging business opportunities.



**Picture 37:** Analysis of Empirical Findings Corporate Entrepreneurship

Having explained in picture 22, Company B had developed an escalating procedure for innovation that was similar to the Enable and Advocate model. And company G had also regarded an advocate model to take care of the product creation opportunities that were residing on the mature and decline market life cycle.

Finally, when the Volvo Group settings for taking care of business opportunities were analyzed, it was found that Volvo Group has already a kind of Enabler, Advocate and Producer model. Forming corporate units like Volvo GIB- SPA and GIB-T to take care of the business opportunities within soft product and technology were a kind of enabler model. In contrast each business unit or area had some fundings to take care of new opportunities within their mission. Last, the discussion with innovation team approved the analysis that Volvo Technology Transfer (Business Unit) could be considered as a producer model as long as they have enough resources to take care of high novelty and big business opportunities.

Moreover, Appendix 7 explained that each model has its own implications and strategic goals. For instance, producer model was considered as the method to take care of disruptive business opportunities, Enabler model to facilitate entrepreneurial team and employees that can facilitate an innovative culture and Advocate model to reinvigorate and support corporate entrepreneurial teams. Thus, our findings emphasize the fact that in order to deal with new to the world offerings, companies might consider a Producer model for corporate venturing. Such can happen though balancing the world of operational excellence and invention in a firm by developing a focused organizational ownership with dedicated resources to take care of new business creation(Garvin and Levesque, 2006), a kind of dual structure.

In addition, Volvo Technology might benefit from an enabler model as Google in picture 16 (Wolcott and Lippitz, 2007), as long as not only they provide funding for innovation projects, but also extra time (a kind of Google Friday) for employees dedicated to radical innovation projects. Such factor was also emphasized through interview with innovation coaches. At the same time, human resource department, not only should consider performance evaluation of employees based on their innovativeness, but also they should consider entrepreneurial capabilities among new hiring.

To finish, as O'Connor et al., (2008) discussed the key issue in Corporate Venturing is to consider new ventures as temporary and to accept that they should join the mainstream later in the process. And empirical findings from company E venturing framework in picture 28 and cycle of innovation in picture 29, in addition to venturing process of company G in picture 35, emphasize the fact that venturing is a temporary function with a life cycle that at one point the ventures should join the mainstream. Last but not least a firm like VTEC should bear in mind the balancing task of strategies, invention and operational excellence and integration versus new business identity as Garvin and Levesque (2006) explained. This could be facilitated by developing Innovation strategies.

### 5.3.2 Incubation and Acceleration:

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The main characteristics of incubation and acceleration were stated by O'Connor et al., (2008) as business creation and growing new business opportunities. And Company A, C, D, E, and F all either confirmed or declared the incubation and acceleration process explained in their innovation process. Also, company B explained that the funnels existing in each level is taking care of the incubation and acceleration.

Furthermore as O'Connor et al., (2008) research stated, incubation and acceleration could be taken care of by R&D, Business Units and corporate depending whether an idea is aligned, multi aligned or not aligned with business units strategies. And the observation from Company A, D and E showed the existence of a kind of Producer Model to take care of the incubation and acceleration. In contrast, company B had an Enabler and Advocate Model for performing the incubation and acceleration. In company C, incubation and acceleration was still being performed by the current business units (Mainly R&D) in contrast Company F has developed a venturing firm (Producer model) to handle both processes. Consequently, it is important to realize which model suits the incubation and acceleration process.

Mapping the ideas base on the portfolio in picture 36 can create an understanding of how incubation or acceleration of the ideas can be performed following the Enabler, Advocate or Producer model for Volvo. For instance, for Multialigned ideas GIB- SPA or GIB-T can take care of the incubation and acceleration. Whereas for aligned ideas either VTEC or other Business Areas or Units can perform the incubation or acceleration. Finally, for not aligned ideas, Volvo Technology Transfer by the support and supervision of Volvo corporate can pursue the incubation and acceleration of the projects. And later they should integrate new ventures either within other business units in Volvo Group or Spin them off.

### 5.3.3 Thrust or Growth:

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Another interesting process to consider is Thrust or Growth function deduced from the innovation process of company A in picture 21 and company F in picture 31. Those functions as stated by the firms start their activity when an innovation arrives to market. Their main purpose is to facilitate a capacity for growth within a firm in order to push the innovation from lead users to early adopters (crossing the chasm). Since, commercializing innovation was out of this paper scope, this area was not covered in the theoretical framework. But such process might be considered for a possible radical innovation process.

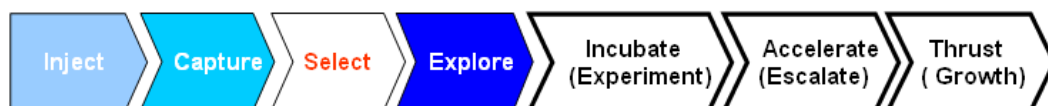
It was highlighted in Volvo Technology empirical findings that two of the radical innovation projects were dealing with the issue to develop a capacity to expand their market. For that reason, developing a Growth or Thrust function in a radical innovation process is necessary for a radical innovation process in order to speculate, expanding the market for radical innovation projects.

### 5.3.4 Radical Innovation Process:

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Incubation and acceleration was outlined by O'Connor et al., (2008) (appendix 8) as important process for large firms to facilitate the new business creation.

Having compared the process existing from Company A (picture 21), Company C (picture 23), Company E (picture 28), Company F (picture 31) also the 10 years research of O'Connor et al., (2008) (Appendix 9) among large established firms, implied that that VTEC, ICEP process for innovation Jams need some modification in order to tackle growing ideas with radical innovation potentials. One possible process for radical innovation for Volvo Technology Innovation Jam (or other idea funnel) or Volvo Group would be picture 38:



**Picture 38:** Possible Radical Innovation Process

As one can see the main contribution of the process is on the pre commercialization or transfer stage of the ICEP process. As it was explained in picture 18, the ICEP process used to end with a Pre-Commercialize or Transfer stage. As a result, there are more stages for a radical innovation process that VTEC can consider after the Explore stage, like the role of incubators, accelerators and thrust functions that was explained by company A as a tool to build capacity for crossing the chasm.

Another implication of the above process for Volvo Technology as the innovation catalyst would be, if VTEC as a business unit in Volvo Group can take care of the whole innovation process. Theoretically, depending on the alignment type and investment requirement, other business units or area or even corporate levels may take care of the innovation process. Nonetheless, the entire process should have an owner or orchestrator

in order to manage the balance between, Discovery, Incubation and Acceleration that O' Connor et al., (2008) identified in its 10 years breakthrough innovation research.

Since VTEC might not own the process to the end, one more implication of the above findings for Innovation Jams is developing an early commitment from the people in other BA or BUs in order to support the high novelty with aligned or multialigned characteristics. This may happen by adjusting the injection phase of picture 38 according to the potential needs or desire that other BU or BA have. Such could be in line with the Company B and A movement from Technology push to Market pull.

In the end, the above analysis might also challenge the definition of innovation in VTEC as "***creating and implementing new ideas with net values***", when it comes to radical innovation. Since implementation of some radical innovation projects might be beyond the Volvo Technology capabilities, and it might require the Volvo Group commitment.

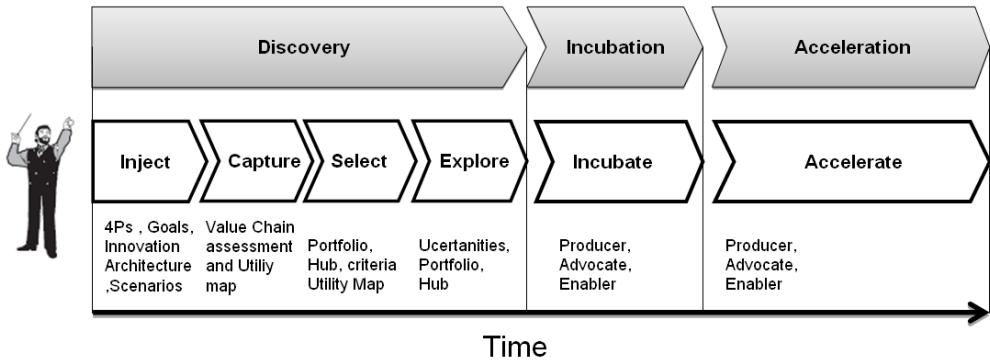
**6. Conclusion:**

The present chapter first attempts to answer the main research question as “**What would be an appropriate process for Volvo Technology to grow ideas with radical innovation potential generated from Innovation Jams?**” Then it will outline the way the paper contributes to the literature regarding radical innovation process. Subsequently, various practical implications will be addressed and the chapter ends with some future research proposals.

The main purpose of the radical innovation found in this paper was to create a new line of the business, and it was observed that radical innovations can vary along the Product & Service, Process, Paradigm and Positioning (4 Ps of innovation) dimensions. Therefore, the generated ideas from Innovation Jams could be sorted on 4Ps dimension or perhaps firms like VTEC can target the Jam into a Product & Service, Process, Paradigm and Positioning dimension of innovation.

Then, an appropriate process resulted from this paper for growing ideas with radical innovation potential is in line with the discovery, incubation and acceleration that O’ Connor et al., (2008) acknowledged. If one considers the VTEC Innovation Jam as a method for generating ideas, then the process could be displayed as picture 39. The findings of this paper that can assist VTEC in performing a better decision making for ideas with radical innovation potentials has been noted under each single stage in picture 39.

The discovery phase of the process would be divided into the Inject, Capture, Select and Explore stages. As well, the incubation phase of the Jam would entail the Incubate stage and finally, the process ends with an Accelerate stage. The Growth or Thrust stages explained in picture 38 were excluded here so as to pursue the focus of the paper regarding the implementation of radical innovation projects within a large firm.



**Picture 39:** Innovation process for growing ideas with radical innovation potential

This radical innovation process is time dependent and as already stated, it is highly important that VTEC or the team running the Jams ensure a plausible future approach (future scenarios) in the injection phase. Such can lower the uncertainties regarding Political, Economic, Social, Technological, Environment and Legal from the time an idea is generated until it is commercialized in the market.



Secondly, a firm like VTEC should estimate the capacity for radical innovation, including how many new line of business they are aiming for, how long the process should take (1 year, perhaps 3-5 years) and speculate a rough budget that some ideas might require to be further developed. Nevertheless, the capacity of radical innovation according to O'Connor et al., (2008) research might vary depending on the internal and external forces but it does not undermine the importance for having certain goals before initiating the Jams.

Selection was considered as an iterative process in a radical innovation process in which applying the right metrics, means and mindsets for identifying the ideas with radical innovation potentials is highly critical. Different criteria and means were extensively explored in this paper and it was observed that different companies in different industries consider specific range of criteria to evaluate their projects. As well, it was hard to consider the right or wrong criteria but it was clear that imposing the financial metrics and gates in early phases discourages the development of ideas with radical innovation potentials.

The theoretical selection criteria were sorted into *Organizational*, *Market* and *Customer impact*, *Personal Characteristics* of idea generator. They were also supported by the questions considered for uncertainties within the Idea, Organization, and Market (Including Customer). Last, the importance of having the right mindsets to evaluate the ideas in large firms should be recalled by the people running the innovation jams. Companies can run change management programs to identify the wrong mindset and educate the employees in that respect.

As far as the selection tools were concerned, employing a portfolio management approach (emphasis on technology, market, organizational fit, revenue potential and time) that was discussed in this paper (Picture 36) can create an overview of the ideas' novelty. Such tool was considered to be employed in VTEC innovation Jams, in order to visualize the novelty level and organizational fit of the ideas. This assists VTEC innovation team not only to decide upon the right amount of ideas for exploration in different areas but also consider early commitment (in high market novelty situations) from Market or potential customers in order to legitimize their effort. In addition, after the exploration phase there was a need for an innovation hub consisting of not only people from inside the firm but maybe venture capitals or university professors to evaluate the proposal for incubation.

After that, depending on the organizational fit and the purpose of venturing, firms like VTEC following an advocate, enabler or producer corporate entrepreneurship model can pursue the implementation of ideas. Of which the producer model was considered as the most suitable model for implementing radical innovation projects in large firms. In this paper, the role of Volvo Technology Transfer in Volvo Group was found to be highly critical, even though they need to be further supported by Volvo Corporate functions. Also, it was emphasized so as to develop an innovative culture, VTEC might also consider developing an Enabler model with the help of human resource and corporate budgeting as explained in the analysis.

Furthermore, according to the findings, a radical innovation process might have an owner or conductor who knows the organization well and has a high level of entrepreneurship skills. Such findings had an important implication to the VTEC Innovation

Jam. It was hard to see if VTEC can own the full process since Volvo Technology has been a business unit among the Volvo Group function. One solution was if VTEC can take care of the discovery phase and after that the idea will be transferred to people in charge of producer, advocate or enabler model (Picture 37). Then it is crucial to see whether the transfer can be done smoothly in situations that a business unit has not initiated it (not demand driven). Consequently, in situation that the owner of the whole process will not be VTEC, it was found highly critical that Jams focus on a Market pull (demand driven) approach rather than technology push. That means creating an internal demand in Volvo Group for radical innovation supply by understanding the unmet elements of potential customers need. This method can later not only safeguard the transfer of ideas to other business units or areas in Volvo Group, but also affect the final commercial success of radical innovations in the market.

As a final point, sometime after the creation of a new line of business, firms should consider either spin the new line of business off or integrate it into their organization while balancing the new business identity with integration already addressed. Such highly depends on the firm's corporate and business strategy as O'Connor et al., (2008) stated. Consequently, a firm like Volvo Group should consider a corporate business strategy to guide the mission of the group toward both operational excellence and new business creation (radical innovation).

## 6.1 Discussion:

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Here, some reflection regarding radical innovation that might have theoretical and managerial reflections is going to be discussed.

First of all, firms should believe that that radical innovation is a **learning journey** rather than a production event. It means that during the process of radical innovation firms might happen to learn a lot of new things that they were not aware of before. Therefore, it is highly critical that firms employ right performance measurements metrics or KPIs: to measure the learning that occurs during their journey rather than the output (a new product or service). For instance, Davila et al., (2006) has proposed the *Input, Throughput and Output* framework that can assist firms in measuring their process rather than outputs.

Secondly, as it was argued in the introduction of this paper, radical innovation has become a must for sustaining the large firm's competitive advantages. However, **understanding the capacity of a firm for radical innovation** will play a key role whether ideas with potential to be radical or not can turn into innovation. To determine that, human resource and finance or budgeting departments' role is crucial, since these two units are working with the most important resources of a firm. Human resources can develop performance management technique that can encourage innovation and time for innovation among employees and finance departments can provide or speculate the budget for the unknowns (radical innovation). Lack of the commitment of finance and human resource departments might endanger the innovation efforts.

Finally, large firms should consider some growth targets for new business creation and accordingly develop **innovation strategies** to pursue them, since nowadays growth cannot

solely be generated from the operational excellence world. The innovation strategies should be communicated by the top management to the firm in order to catalyze not only the exploitation but also the exploration. As well, the commitment of top management is the key issue in arriving to the new business creation goals and making the radical or breakthrough innovation happens in large firms.

## 6.2 Future Research:

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This paper had the purpose to create an understanding of how selection and implementation of radical innovation is performed in large firms. And it managed to contribute to the discovery phase of the DIA process already identified by O'Connor et al., (2008) by studying the Innovation Jam in Volvo Technology, while focusing on the selection and implementation of radical innovation project in large firms. However, since the age of the Innovation Jam in Volvo Group is less than two years, it was hard to identify the possible sub categories of incubation and acceleration of the process. Maybe a further research within Volvo Group can contribute more to the incubation and acceleration phase of the process, to see what other small step is required for an incubation and acceleration to function well. Last, they could also see how effective idea generation might be if the ideas will be injected from end customers (e.g. external sources) rather than employees.

One longitudinal future research might be able to complement this research by taking more thorough pictures from the large firms already studied in this paper, or even add more case studies from Scandinavian large firms in order to increase the validity of the findings. Such research could also add more to the understanding of how a possible radical innovation process can function in a large firm. Finally, the research might be able to widen its scope by looking into the searching and capturing value (Thrust or Growth) stages that were out of this paper scope.

To finish, a researcher might be able to delve into a measurement process within the discovery, incubation and acceleration for a radical innovation process. That performance measurement process might be able to keep the balance between discovery, incubation and acceleration that O' Connor et al., (2008) emphasized. It can add value while balancing the three main cornerstone of radical innovation in tandem and assist firm in forming the right KPIs for their radical innovation effort.

## Appendix 1:

Volvo Technology established in 1969 and became a business unit within Volvo Group in 1997 that operates as an innovation company, partly as a research institute with limited customer base: Volvo Group, Volvo Cars, Selected Suppliers, and Public Bodies. Volvo TECH has around 500 employees around offices in Gothenburg, Lyon, Greensboro, Chesapeake, Hagerstown, Los Angeles, also exploring how to establish presence in Asia.



## Appendix 2:

Dimension	Definition	Examples
Offerings	Develop innovative new products or services.	<ul style="list-style-type: none"> <li>• Gillette Mach3Turbo razor</li> <li>• Apple iPod music player and iTunes music service</li> </ul>
Platform	Use common components or building blocks to create derivative offerings.	<ul style="list-style-type: none"> <li>• General Motors OnStar telematics platform</li> <li>• Disney animated movies</li> </ul>
Solutions	Create integrated and customized offerings that solve end-to-end customer problems.	<ul style="list-style-type: none"> <li>• UPS logistics services Supply Chain Solutions</li> <li>• DuPont Building Innovations for construction</li> </ul>
Customers	Discover unmet customer needs or identify underserved customer segments.	<ul style="list-style-type: none"> <li>• Enterprise Rent-A-Car focus on replacement car renters</li> <li>• Green Mountain Energy focus on "green power"</li> </ul>
Customer Experience	Redesign customer interactions across all touch points and all moments of contact.	<ul style="list-style-type: none"> <li>• Washington Mutual Occasio retail banking concept</li> <li>• Cabela's "store as entertainment experience" concept</li> </ul>
Value Capture	Redefine how company gets paid or create innovative new revenue streams.	<ul style="list-style-type: none"> <li>• Google paid search</li> <li>• Blockbuster revenue-sharing with movie distributors</li> </ul>
Processes	Redesign core operating processes to improve efficiency and effectiveness.	<ul style="list-style-type: none"> <li>• Toyota Production System for operations</li> <li>• General Electric Design for Six Sigma (DFSS)</li> </ul>
Organization	Change form, function or activity scope of the firm.	<ul style="list-style-type: none"> <li>• Cisco partner-centric networked virtual organization</li> <li>• Procter &amp; Gamble front-back hybrid organization for customer focus</li> </ul>
Supply Chain	Think differently about sourcing and fulfillment.	<ul style="list-style-type: none"> <li>• Moen ProjectNet for collaborative design with suppliers</li> <li>• General Motors Celta use of integrated supply and online sales</li> </ul>
Presence	Create new distribution channels or innovative points of presence, including the places where offerings can be bought or used by customers.	<ul style="list-style-type: none"> <li>• Starbucks music CD sales in coffee stores</li> <li>• Diebold RemoteTeller System for banking</li> </ul>
Networking	Create network-centric intelligent and integrated offerings.	<ul style="list-style-type: none"> <li>• Otis Remote Elevator Monitoring service</li> <li>• Department of Defense Network Centric Warfare</li> </ul>
Brand	Leverage a brand into new domains.	<ul style="list-style-type: none"> <li>• Virgin Group "branded venture capital"</li> <li>• Yahoo! as a lifestyle brand</li> </ul>

12 dimension of business innovation (Sawhney et al., 2006)

## Appendix 3:

	Intended Market					
	...be the same as in our present market	2	3	4	5	
Customers' behavior and decision-making processes will...	1	2	3	4	5	
Our distribution and sales activities will...	1	2	3	4	5	
The competitive set (incumbents or potential entrants) will...	1	2	3	4	5	
	...highly relevant	2	3	4	5	
Our brand promise is...	1	2	3	4	5	
Our current customer relationships are...	1	2	3	4	5	
Our knowledge of competitors' behavior and intentions is...	1	2	3	4	5	
						<b>TOTAL</b> (x-axis coordinate)
	Product/Technology					
	...is fully applicable	2	3	4	5	
Our current development capability...	1	2	3	4	5	
Our technology competency...	1	2	3	4	5	
Our intellectual property protection...	1	2	3	4	5	
Our manufacturing and service delivery system...	1	2	3	4	5	
	...are identical to those of our current offerings	2	3	4	5	
The required knowledge and science bases...	1	2	3	4	5	
The necessary product and service functions...	1	2	3	4	5	
The expected quality standards...	1	2	3	4	5	
						<b>TOTAL</b> (y-axis coordinate)

Positioning project on the Risk Matrix (Day, 2007)

## Appendix 4:

The process will involve the following steps:

1. A cross functional group of customers, suppliers, regulators and other stakeholders.
2. Each individual articulate, map, and choose options related to innovation issue being addressed.
3. Each individual decide which criteria are important to them and provide the reasons why.
4. The group assigns scores to outcome/performance of various options.
5. Weightings are added, rating and ranking the importance of each criterion.
6. Results are computed.

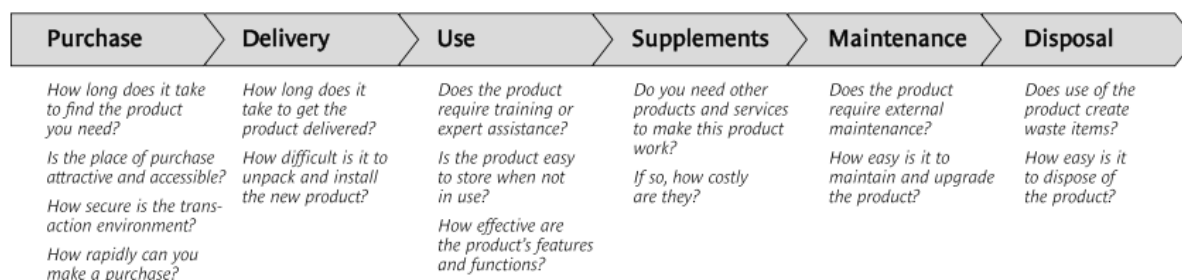
Managers should be careful not to misjudge weighting and voting on options and inappropriate interpretation of results may cause some limitations.

## Appendix 5:

### Uncovering the Buyer Experience Cycle

A customer's product experience passes through six basic stages. To help companies assess the quality of a buyer's total experience, we have identified the key questions for each stage. Individually, these questions may be obvious, but taken together, they uncover the full picture of the experience cycle.

#### The Buyer Experience Cycle



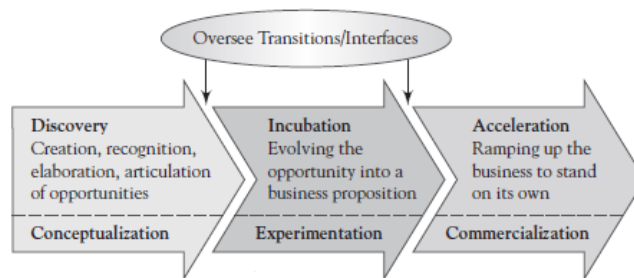
## Appendix 6:

Criteria	European	American	Asian
Ability to evaluate and react to risk	3.6	3.3	3.5
Capable of Sustained effort	3.6	3.6	3.7
Familiarity with market	3.5	3.6	3.6
leadership ability	3.2	3.4	3
Relevant track record	3	3.2	2.9
Product prototype exist	3	2.4	2.9
Product demonstrated market acceptance	2.9	2.5	2.8
Product features can be protected	2.7	3.1	2.6
Product is high technology	1.5	2.3	1.4
Target market has high growth rate	3	3.3	3.2
Can stimulate existing market	2.4	2.4	2.5
Little threat of competition within 3 years	2.2	2.4	2.4
Venture will create a new market	1.8	1.8	2.2
Financial return >10 times within 10 years	2.9	3.4	2.9

## Appendix 7:

	<b>Enabler Model</b>	<b>Advocate Model</b>	<b>Producer Model</b>
<b>Strategic Goal</b>	Facilitate entrepreneurial employees and teams.	Reinvigorate or transform business units; support corporate entrepreneurship teams.	Exploit crosscutting or disruptive opportunities.
<b>Essential Function</b>	Provide independent funding and top executive attention to future business leaders with new ideas.	Evangelize, coach and facilitate business units in pursuing new opportunities.	Provide full-service corporate entrepreneurship by conceiving, screening, funding, coaching, scaling and reintegrating new business concepts.
<b>Inputs</b>	Dedicated money, executive engagement, recruiting and personnel development.	Well-connected corporate veterans with a small staff of business building coaches and a CEO imprimatur.	Well-connected corporate veteran leadership with full-time staff and significant, independent funding.
<b>Outputs</b>	Proven concepts, but generally within the company's strategic frame. (Note: Enabler programs can also help facilitate overall cultural change.)	New businesses relatively close to a business-unit core or significant business-unit process efficiencies.	Self-sustaining and/or potentially disruptive new businesses that may or may not fit any existing business unit.
<b>Success Factors</b>	<ul style="list-style-type: none"> <li>• Culture of innovation</li> <li>• Structural flexibility for teams to pursue projects</li> <li>• Well-defined executive involvement in milestone funding decisions</li> <li>• Effectively communicated selection process and criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Expertise in building new businesses</li> <li>• Significant team facilitation capabilities</li> <li>• Skill in coalition building and internal and external networking</li> <li>• Senior executive visibility and support</li> </ul>	<ul style="list-style-type: none"> <li>• Respected leadership with significant internal decision authority</li> <li>• Expertise in building new businesses</li> <li>• Explicit attention to corporate entrepreneurship executive career incentives</li> </ul>
<b>Typical Challenges</b>	<ul style="list-style-type: none"> <li>• Senior executive bandwidth</li> <li>• Maintaining coherence and discipline with respect to corporate brands.</li> <li>• Finding and satisfying project champions (that is, ensuring that enabler processes do not become a "black hole" for ideas).</li> </ul>	<ul style="list-style-type: none"> <li>• Overcoming business-unit near-term pressures</li> <li>• Finding "business builders" among executives who are traditionally rewarded more for execution than innovation.</li> </ul>	<ul style="list-style-type: none"> <li>• Reintegrating successful projects into the core</li> <li>• Leadership succession</li> <li>• Lack of business-unit support</li> </ul>

## Appendix 8:



Building Block of Breakthrough Innovation Connor et al., (2008)

## Appendix 9:

### Acceleration Location Options and Trade-Offs

<i>Alignment of Breakthrough Innovation Business with Existing Businesses</i>	<i>In Business Unit or Divisions</i>	<i>At Corporate Level</i>
Aligned	<p><i>Pros</i></p> <p>Workable if acceleration-related metrics are imposed on the division by corporate and if all business units are expected to accelerate businesses.</p> <p>Eases acceptance of the business if the business unit is required to invest in it earlier.</p> <p><i>Cons</i></p> <p>Metrics in business units are mismatched with those appropriate for acceleration.</p> <p>Big successes for BUs in early acceleration are viewed as rounding errors in the division's current planning horizon.</p> <p>Too tight a link with a business unit causes pressure toward incrementalization.</p>	<p><i>Pros</i></p> <p>Funding with corporate money protects business units by not hindering their profit picture for far-future businesses.</p> <p>Protects against lack of attention due to urgent matters associated with current customers and product lines that may occur within business units.</p> <p><i>Cons</i></p> <p>Problem of not-grown-here turf wars.</p> <p>Transition to operating division can be difficult in terms of budget and planning cycle, as well as availability of appropriate personnel and facilities.</p> <p>Can't attract the business unit's interest.</p> <p>Extra coordination with business unit required to avoid or manage duplicate visits to customers and channel members from those representing the accelerating businesses and traditional sale force representing the business unit's product line.</p>

<i>Alignment of Breakthrough Innovation Business with Existing Businesses</i>	<i>In Business Unit or Divisions</i>	<i>At Corporate Level</i>
Unaligned	<p><i>Pros</i></p> <p>None</p> <p><i>Cons</i></p> <p>Business units not designed to invest in growing businesses that do not fit their strategic intent or operating model.</p> <p>Force-fitted businesses will constantly battle for resources that the business unit is unwilling to invest in if the business unit cannot find other ways to leverage those resources (for example, new manufacturing equipment to accommodate a different product process from one the business unit traditionally uses).</p>	<p><i>Pros</i></p> <p>Allows freedom to try out business models that may not fit any current operating unit.</p> <p>Allows focus on a portfolio of accelerating businesses, with decisions on when and how to pace them to be made based on big picture.</p> <p>Forces continued discussion with senior leadership regarding link with strategic intent.</p> <p><i>Cons</i></p> <p>Requires investment in a new infrastructure—an accelerator at the corporate level.</p>

## Appendix 10:

*Interview questions with 4 innovation coaches:*

- *Please explain your role as an innovation coach?*
- *What is your definition of radical innovation?*
- *What are the main issues you are dealing with in implementing radical innovation?*

*Interview questions with 3 Radical innovation (Completely new to Volvo) project managers:*

- *What was the purpose of the project?*
- *What was the main driver behind the project?*
- *How long did it take to be commercialized?*
- *What was the main success factor?*
- *What is the main issue with the project right now?*



## References:

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- Assink, M. (2006), *Inhibitors of disruptive innovation capability: a conceptual model*. European Journal of Innovation Management Vol. 9 No. 2, 2006 pp. 215-233.
- Bessant, J. and Tidd, J. (2009), *Managing Innovation: Integrating Technological, Market and Organizational Change*. UK: Wiley.
- Bessant J., Möslin C., Neyer A., Piller F. and Stamm B. (2009), *Radical Innovation: Making the Right Bets*. The Advanced Institute of Management Research (AIM).
- Bessant, J., Stamm, B., Moeslein, K., Neyer, AK. (2010), *Backing outsiders: selection strategies for discontinuous innovation*. R&D Management. 40 (4), 345-356.
- Bjelland, O., and Wood, R. (2008), *An inside view of IBMs "Innovation Jam."* MIT Sloan Management Review. 50 (1), 31-40.
- Bryman, A. and Bell, E. (2007), *Business Research Methods*. New York: Oxford University Press Inc.
- Bulmer, M. (1979), 'Concepts in the Analysis of Qualitative Data', Sociological Review, 27:651-77.
- Burgelman, R. (1984), *Managing the internal corporate venturing process*. Sloan Management Review, 25 (2), 33-48.
- Chandy, R.K. and Tellis, G.J. (1998), "Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize," Journal of Marketing Research, 35, 4: 474-487. — (2000) "The Incumbent's Curse? Incumbency, Size, and Radical Product Innovation," Journal of Marketing, 64, 3: 1-17.
- Christensen, C. M., Kaufman, S. P., Shih, W. C. (2008), *Innovation Killers*. Harvard Business Review. 86 (1), 98-105.
- Christensen, C.M. (1997), *The Innovators Dilemma: when new technologies cause great firms to fail*. Boston, Massachusetts: Harvard Business School Press.
- Coles, C. and Mitchell, D. (2004), *Business Model Innovation Breakthrough Moves*. Journal of Business Strategy. 25 (1), 16-26.
- Cooper, R. (2001), *Winning at New Products*. London: Kogan Page.
- Cooper, R. and Edgett, A. (2007), *Generating Breakthrough New Product Ideas, Feeding the Innovation Funnel*. Canada: Product Development Institute.
- Davila, T., Epstein, M. J., Shelton, R. (2006), *Making Innovation Work*. Pearson Education Inc. Publishing as Wharton school Publishing.
- Day, G.S. (2007), *Is It Real? Can We Win? Is It Worth Doing?* Harvard Business Review. 85 (12), 110-120.
- Dodgson, D., Gann, D., Salter, A. (2008), *The Management of Technological Innovation*. Oxford University Press.
- Edquist, C. (1997), *Systems of Innovation: Technologies, Institutions and Organization*. London: Pinter.
- Ettlie, J. (1999) *Managing Innovation*. New York: John Wiley & Sons, Inc.
- Garvin, D. and Levesque, L. (2006), *Meeting the Challenge of Corporate Entrepreneurship*. Harvard Business Review. 1 (1), 1-12.

- Gompers, P., and Lerner, J. (2001), *The Venture Capital Revolution*. Journal of Economic Perspectives, 15 (2), 145 – 168;
- Hamm, S. (2006), *The View from Top*. Available: [http://www.businessweek.com/magazine/content/06\\_14/b3978073.htm](http://www.businessweek.com/magazine/content/06_14/b3978073.htm). Last accessed Jan 2011
- Hamel, G. (2002), “*Innovation now.*” Fast Company, (65), 114-124.
- Kim, W. C. and Mauborgne, R. (2000), *Knowing a Winning Business Idea When You See One*. Harvard Business Review. (1), 129-137.
- Leifer, R., Rice, M. and Veryzer, R. (2000), *Radical innovation: how mature companies can outsmart upstarts*. Boston, MA: Harvard Business School Press
- Leifer, R., McDermott, C.M., O’Conner, G.C., Peters, L.S., Rice, M.P. and Veryzer, R.W. (2000), *Radical Innovation: How mature companies can outsmart upstarts*. Harvard Business School Press.
- Leifer, R., O’Connor, G. and Rice, M. (2001), *Implementing Radical Innovation in Mature Firms: The role of hubs*. Academy of Management Executive, (15) Issue 3, P102-113,
- Markids, C. and Geroski, P. (2005), *Fast Second*. San Francisco: Jossey-Bass A Wiley Imprint.
- McDermott, C. and O’Connor, G.C. (2002), “*Managing Radical Innovation: An Overview of Emergent Strategy Issues*”. Journal of Product Innovation Management, 19, 6: 424–438.
- Mitchell, D. and Coles, C. (2004), *Business Model Innovation Breakthrough Moves*. Journal of Business Strategy. 25 (1), 16-26.
- Monroe, K. B. (1991), *Pricing – Making Profitable Decisions*. Mc Graw-Hill, New York, NY
- Neyer, A.K., Doll, B. and Moeslein, K.M. (2009), *Mission (im) possible? – Prototyping service innovation*. In: Kazi, A.S., Wolf, P., Jonischkeit, R. and Troxler, P. (eds), *Supporting Service Innovation through Knowledge Management: Practical Insights and Case Studies*. Zurich: Knowledge Board & Swiss KM Forum Communities for the Global Knowledge Community. pp. 142–165.
- O’Connor, G.C. and McDermott, C.M. (2004), *The human side of radical innovation*. Journal of Engineering and Technology Management.
- O’Connor, G., Leifer, R., Paulson, A., and Peters, L., (2008), *Grabbing Lightning. Building a Capability for Breakthrough Innovation*. San Francisco: John Wiley & Sons, Inc.
- Porter, M. (1990), *The Competitive Advantage of Nations*. London: Macmillan.
- Osterwalder, A. and Pigneur, Y. (2010), *Business Model Generation*. Canada: John Wiley & Sons, Inc.
- Robertson, T.S. (1971), *Innovative Behavior and Communication*. New York: Holt, Rinehart and Winston.
- Rogers, E. (2003), *Diffusion of Innovations*. New York: Free Press.
- Rousseau, D. (1985), *Issues of level in organizational research*. Research in Organizational Behavior. 7 (1), 1-37.
- Sandberg, B. (2008), *Managing and Marketing Radical Innovation*. New York: Routledge.

- Sawhney, M., Welcott, R. and Arroniz, I., (2006), *The 12 Different Ways for Companies to Innovate*. MIT Sloan Management Review. 47 (3), 74-81.
- Schrage, M. (2000), *Serious Play: How the World's Best Companies Stimulate to Innovate*. New York: Harvard Business Review Press.
- Shell. (2011), *What is GameChanger?* Available: [http://www.shell.com/home/content/innovation/innovative\\_thinking/game\\_changer/what\\_is\\_gamechanger/](http://www.shell.com/home/content/innovation/innovative_thinking/game_changer/what_is_gamechanger/).
- Skarzynski, P. and Gibson, R. (2008), *Innovation to the Core*. USA: Harvard Business School.
- Stamm, B. and Bessant, J. (2006), *Is discontinuous on your corporate radar?* Advanced institute of management research.
- Stinnett, B. (2005), *Think Like Your Customer: A Winning Strategy to Maximize Sales by Understanding How and Why Your Customers Buy*. USA: McGraw Hill Publication.
- Strauss, J.D. and Radnor, M. (2004), "Road mapping for dynamic and uncertain environments". Research and Technology Management, Vol. 47 No. 2, pp. 51-7.
- Tidd, J. and Taurins, S. (1999), *learn or leverage? Strategic diversification and organizational learning through corporate ventures*. Creativity and Innovation Management, 8 (2), 122-129.
- Tidd, J. and Bodley, K. (2002), *Effect of Novelty on New Product Development Processes and Tools*. R&D Management, 32 (2), 127-38.
- Trott, P. (2002), *Innovation Management and New Product Development*. Harlow: Pearson Education Limited.
- Yin, R. (2003), *Case Study Research: Design and Methods, Applied Social Research Methods Series*. London: Sage Publication.
- Yin, R. (2009), *Case Study Research: Design and Methods, Applied Social Research Methods Series*. London: Sage Publication.
- Von Hippel, E. (1986), *Lead users: a source of novel product concepts*. Management Science, 32 (7), 791-805.
- Wolcott, R.C. and Lippitz, M. J. (2007), *The Four Models of Corporate Entrepreneurship*. MIT Sloan Management Review, fall, 74-82.